AUSTRALIAN COUNCIL FOR INTERNATIONAL DEVELOPMENT

e-reader: Design for Development & Humanitarian Innovation

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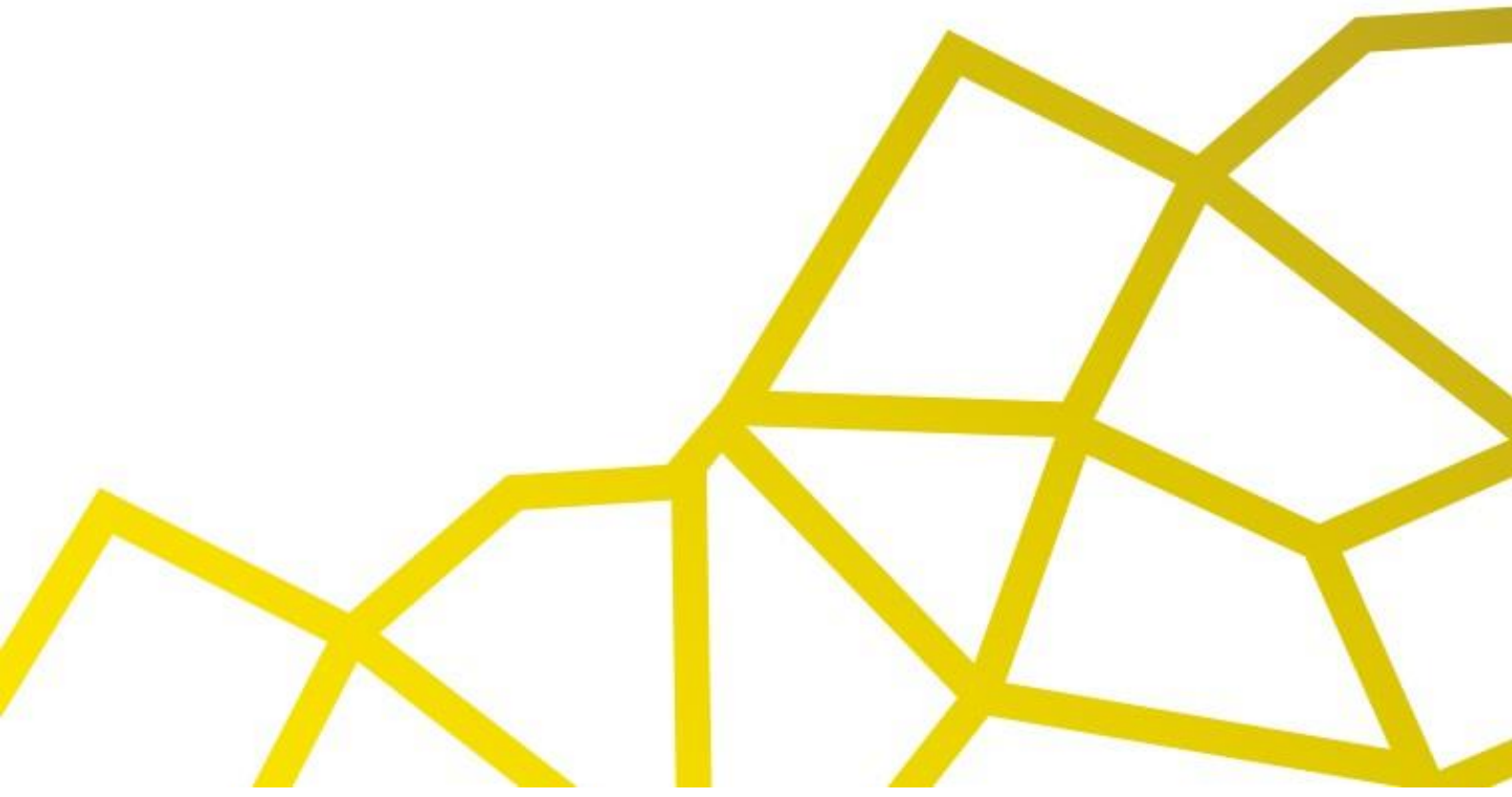

Reading List

1. Angharad T. “Design, Poverty, and Sustainable Development”, *Design Issues*, 22: 4, Autumn 2006.

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6. Buchanan, R. “Human Dignity and Human Rights: Towards a Human-centred Framework for Design”, *Design Issues*, 17:3, 2001.

7. Dorst, K. “The Nature of Design Thinking”, In Dorst, K., Stewart, S., Staudinger, I., Paton, B., and Dong, A. (Eds.) Proceedings of the 8th Design Thinking Research Symposium, University of Technology, Sydney, NSW, 19-20 October, 2010.

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9. Glencorse, B. “Design Thinking for Accountability”, *Stanford Social Innovation Review,* Apr, 2014.

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Design, Poverty, and Sustainable Development

Angharad Thomas

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Introduction and Context

Design in a poor context, or for the alleviation of poverty, has received little or no attention. An informal discourse analysis shows that design and poverty have not been linked, the two being seen as mutually exclusive. This paper aims to examine the relationships between design and designers, poverty and the poor, and sustainable development, which aims to alleviate poverty. On the face of it, there would appear to be little that links them; however, this paper aims to identify specific design initiatives that relate to poor people in the southern hemisphere as producers and consumers of designed goods.[1] It briefly outlines definitions of poverty and sustainable development, then describes selected design interventions. It analyzes the contribution that these initiatives make to the reduction of poverty, and to the different aspects of sustainable development.

Defining the Key Terms: Poverty and Sustainable Development

Both of these terms are contested, and their meaning and the problem of defining them has been discussed extensively elsewhere.[2, 3] In the context of this paper, poverty is defined as living on less than $1 dollar a day, a state affecting about 1.2 billion of the world's six billion people. Sustainable development is that development that considers social, environmental, and economic factors together in a systemic way over a period of time.[4]

Design in Poor Contexts: Some Examples

What is design's contribution[5] to poverty reduction? I want to separate the discussion of design in poor economies into two parts: the *production* of goods that provide income and generate wealth for poor producers, and the *consumption* of goods in poor markets.

Production

Craft goods made for export are handicrafts made as part of income-generating or poverty-reduction schemes. The products, of all kinds, but typically such things as textiles, clothing, jewelry, pottery, paper goods, and the like reach developed world markets through several routes: first, by tourists visiting "Third World" countries; second, through expatriates temporarily living in the developing countries;

1 The poorer nations of the world are given various labels: underdeveloped, less-developed, less-industrialized, developing, and the Third World. Like all labels, these mask huge differences between countries and within them; and, as Southeast Asia and China industrialize and develop at such a pace; they become increasingly misleading.

2 Poverty: the facts. The Child Poverty Action Group Website: http://www.cpag.org.uk (accessed July 27, 2004) has clear definitions. *The Chronic Poverty Report 2004–05* (Manchester, UK: Chronic Poverty Research Centre, 2004) is a comprehensive source of information about the very poorest people in the world. Available online at: http://www.chronicpoverty.org.

3 World Commission on Environment and Development, *Our Common Future* [The Bruntland Report] (Oxford: Oxford University Press, 1987) is considered to be the source of the concept of sustainable development.

4 Ian Moffat, Nick Handley, and Mike Wilson, *Measuring and Modeling Sustainable Development* (Carnforth, UK: Parthenon Publishing, 2001) includes a useful discussion of the meanings of the term.

5 Design, in the context of this paper, is the design of products and things that are used in everyday life including tools and equipment, textiles, and other consumer products such as clothes.

and, third, when exported directly. Examples of these craft goods are found across the developed world in fair trade catalogs and shops, such as Oxfam shops or other fair trade importers.[6] The design element often consists of "traditional" emblems or motifs, but often adapted by developed world designers or advisers for the developed market. An example of these goods is the Tripura Tribal Scarf from the People Tree Catalog (Winter 2004–05), "a stunning lightweight scarf handwoven by the Tripura tribe in the hills of Bangladesh."[7] People Tree is a London-based fair trade fashion company that sells a wide range of clothing, accessories, and household goods through its Website and a mail order catalog. Other goods are designed or commissioned by importers, such as the line of jute bags made for People Tree by Action Bag Handicrafts in Bangladesh. "Their aim is to create long-term job opportunities for poor women, to develop business skills, and to produce high-quality goods using ecologically-sound materials."[8] Poor producer groups often do not have design capabilities in the conventional sense, and little or no knowledge of the market demands of the developed world. Producers, especially if female, usually have had little formal schooling and may be illiterate. This raises problems about communicating design and production requirements, and quality control issues. Despite the small size of this market in comparison to more mainstream trade, the money earned by poor individuals from participating in such schemes can be life changing, and much anecdotal support is given to this in the catalogs selling their goods. For example, the winter 2004–05 People Tree catalog provides information about the producers of their goods, including one of their knitwear suppliers, a school in Nepal that provides employment and other support.[9] However, it must be noted that this market is precarious, since it largely is fashion-driven and dependent on the sale of ornamental or other nonessential goods. Therefore, it is vulnerable to wide market fluctuations. Design input often comes from the producers, themselves, who have an indigenous knowledge of their particular kind of production. But for continuing marketing success, especially for the export markets, external design input is needed— usually from an aid worker or NGO. The author's work with the Kusona Kwemadzinai embroidery producer group in Zimbabwe showed that design innovation and product development, as well as market development, came from the foreign aid worker assigned to working with the women. Unfortunately, this was not sustainable despite efforts made to transfer skills, knowledge, and information to the members of the group.[10] Design and product development, as well as marketing skills, for producers who often are illiterate probably is unrealistic but the long-term sustainability of this type of production must be considered. A systematic assessment of the economic benefits of these craft activities is difficult, and other forms of economic activity such as selling vegetables might be more profit-

6 For example, in the UK, the Natural Collection catalog and Website: http://www.naturalcollection.com; or People Tree: http://www.peopletree.co.uk.

7 People Tree catalog (Winter 2004/2005), 17.

8 Ibid., 56.

9 Ibid., 68.

10 Angharad Thomas, "Zimbabwean Embroideries: An Income-generating Project for Mothers of Disabled Children" in *Text: For the Study of Textile Art, Design, and History* 25 (Winter, 1997): 12–15.

able and sustainable, particularly for female producers.[11] However, under certain conditions, craft production can make a significant contribution to poverty alleviation.

Design and Production of Goods by Poor People for Poor People

The poor people of the undeveloped countries produce goods for consumption within their own communities. Goods of all kinds are made in the informal economies of poor countries, including furniture and household goods. Many producers have no design capacity, and copy from existing products. Sometimes, designs are imported, as in the case of baskets seen by the author in Zimbabwe made to a design from the UK. Copying, although a useful way of producing goods, does not allow the makers to develop design skills to improve their products.

In Brazil, the Grupo de Desenho Industrial e Desenvolvimento Sustentável (GDDS) at the Universidade Federal de Campina Grande, led by Dr. Luiz Guimarães, has worked with poor communities on several initiatives, which involve producers and consumers in the design process. The group's philosophy is:

> We understand that designers should discard their peculiar presumptions if they are really serious about improving the low-income populations' situation. The experiences described show that we have to commit ourselves with these people because we have much to contribute with the solution of their problems. However, we have to be humble and recognize that we have much to learn by interacting with this community.[12]

The group, which includes academics and students from the University's product design course, works with the poorest of the local population in the region. The first case study reports on a project with washerwomen to develop a pedal-powered machine to ease the physical burden of their job.[13] The project is unusual in its participatory approach to a low-status group of users doing manual work. Important insights were gained by working closely with the user group, and the washing equipment was redesigned in consultation with the washerwomen: "... with the users suggesting modifications and improvements related to the utilization of the equipment ... the washerwomen's involvement in the design process revealed problems that the [outside] investigation alone would not. Economic benefits were considered more important than health benefits ...." [14]

The second case study shows participative design using waste materials with waste collectors and sorters. In this project, in its early stages as reported,[15] students from the University worked with low-income groups that collect rubbish to design goods that will add to the income of these people.

11 Personal communication from an aid worker in Zimbabwe, 1999.

12 Luiz Guimarães and Wagner Batista, "Industrial Design for Excluded Communities in the Northeastern Region of Brazil" (paper presented at the Conference of II Congresso Internacional de Pesquisa em Design, Rio de Janeiro, October 15–18, 2003).

13 Ibid.

14 Ibid.

15 Luiz Guimarães and Wagner Batista, "Education for Citizenship: Training Product Designers in Northeast Brazil" (paper presented at the Conference of International Council of Societies of Industrial Design, Hanover, Germany, 2003).

These Brazilian projects demonstrate that designers, design academics, and design students can contribute to the well-being and income-generating capacity of poor people, and contribute to poverty alleviation if their involvement is managed in an appropriate way.

Design for Poor Markets

The next two examples involve products designed for sale in poor or marginalized markets, and in which the design was initiated by designers/organizations in developed countries.

The clockwork radio is a landmark product,[16] and a good example of design for a poor, rural market. It was developed from an idea by Trevor Bayliss[17] in the UK. It resulted from a series of fortuitous meetings both in the UK and South Africa between people who believed that it was a product that would make a difference in poor people's lives. In this situation, the inventor, Trevor Bayliss, the financier, and the manufacturers acted as change agents. The radio is manufactured by a company employing disabled workers. The innovative technology made the windup radio an appropriate communication tool for reaching a rural audience the South African government needed to alert to the AIDS epidemic. The technology has been refined, and now is in use in many situations where power supplies are not available or unreliable. The technology also has been extended and applied to powering flashlights and battery chargers.[18]

The second example of a company making products for a "Third World" market is the ExpLAN computer company, a UK firm making computers and power systems targeted at low-income economies. These are designed in the UK, but eventually will be manufactured under license in the consumer countries. According to the company's literature:

> Intended Market: Developing Countries in Africa, Southern Asia and South America. Objectives: To provide a computer technology appropriate for the majority of needs within the Third World, using renewable energy resources and promoting sustainable development ideals.[19]

The company is developing a range of computers for use in remote locations with the specific objectives of encouraging trade, enabling enhanced communication both from and to the community, fostering educational links with schools in developed countries, and providing access to medical data including AIDS awareness.

The ExpLAN "Solo" computer is powered by a specially designed power source and storage unit, the "SPSU," which can use renewable sources as well as whatever electricity may be available. It can be used for other equipment in addition to the Solo computer. According to the company's literature: "The SPSU enables the use

16 "Clockwork Radio" (video recording) (QED) (London: BBC, 1996 videocassette).

17 Website: http://www.windupradio.com/trevor.htm (accessed January 6, 2005).

18 Website: http://www.simplyfreeplay.co.uk (accessed July 14, 2004).

19 Website: http://www.explan.co,uk/solo/index.shtml (accessed January 6, 2005).

of low-wattage electronic devices in remote areas that are not served by a mains electricity distribution network." [20] The company plans to assemble the equipment through a series of "cottage industry-style manufacturing bases." These will partner with ExpLAN for technical support. The ultimate goal of the project is to provide a "facilitating technology rather than one that controls or restricts opportunities." [21]

Other products designed specifically for consumption by a poor market are those developed by the Intermediate Technology Development Group (ITDG),[22] a UK-based nongovernmental organization (NGO) that promotes the development of enabling and sustainable machines and tools. Two of ITDG's development projects are for fuel-efficient stoves and solar-powered lanterns, both in Kenya, and are documented in Design Without Borders's "Experiences from Incorporating Industrial Design into Projects for Development and Humanitarian Aid." [23]

The design of the stove was developed in a participatory way with local users to ensure "that community-level needs are incorporated, and indigenous knowledge is used to full advantage." [24] It has advantages for both its users and producers. Users need less fuel, and so save time and effort in collecting wood. The stove can recoup its purchase price in less than two months, depending on installation costs. It is safer and easier to use in the kitchen, and therefore contributes to family health because less smoke is produced than with a conventional stove. The risk of accidents also is lowered. The stove is produced by local women potters who have benefited both economically and socially, since they are able to make "decent incomes" from stove production. They also have received social benefits such as better family relationships because of the income gained, and increased self-esteem from taking part in activities associated with stove production such as training other potters and hosting visitors, national and international.[25]

The second ITDG-led project is the design and development of a solar lantern.[26] This project arose from the need across the globe, for self-powered electric light sources, since one-third of the world's population has no access to electricity from utilities.[27] In Kenya, where the solar lantern was researched and pilot-tested, ninety-six percent of households use paraffin for lighting. Solar- rechargeable lighting was identified as an appropriate source of low- cost and flexible lighting, so the solar lantern project was started. The design specification for this product was drawn up after consultation with rural communities about their needs, and their opinions of existing solar-powered lights and how they could be improved. Suitable technologies were chosen for manufacturing, and a number of prototype lanterns made. These were distributed to households for testing. The consumer reaction to the solar-powered lantern was very positive, and it now is in production. Although users were not

20 Ibid.

21 Ibid.

22 Recently renamed "Practical Action," http://www.itdg.org (accessed August 31, 2005).

23 *Design without Borders,* A. K. Haugeto and S. A. Knutslien, eds. (Oslo: Norsk Form, 2004).

24 Rob Aley, "Appropriate Technology and Sustainable Human Development" in *Design without Borders,* A. K. Haugeto and S. A. Knutslien, eds. (Oslo: Norsk Form, 2004), 51–60.

25 Ibid., 53.

26 Ibid., 54.

27 Ibid., 54.

directly involved with the design of the lamp, their needs were taken into account when the specifications were drawn up, and again in user testing of the product. The designers were able to fulfil the needs of a poor market.

Analysis: How Is Design Making a Contribution to Poverty Reduction and Sustainable Development?

This section analyses the contribution made by each design intervention to poverty reduction and four aspects of sustainable development: economic, social, environmental, and institutional. Comments on each of these are tabulated below.

Table 1
Table showing each design intervention and its impact on poverty reduction and aspects lof sustainable development.

Example and design source	Benefit to poor people	Economically sustainable	Environmentally sustainable	Socially sustainable	Institutionally sustainable
Craft goods made for export External design input	Enables income generation	Dependent on fashion, and difficult to please consumers in distant markets. Non- essential goods	Yes, in some cases. May use available natural resources, may recycle, or may be very light on resource input.	Also social development and support can be given between group members: a meal may be produced at the workplace.	Probably not. Depends on the design of the project itself. Often reliant on a single person whose input and leadership is necessary to drive the project.
Craft production, informal economy Internal design input	Income generation	Depends on local market	Elements of environmental sustainability (e.g., if re-cycled materials are used)	Social development between group members	Possibly, if no NGO or donor- funded involvement, but reliant on personal organization.
GDDS, Brazil. Design input external, but participative	Income generation; health benefits	Yes	Yes, this is considered in the design of the goods.	Social development	Depends on specialist input of design academics and students
The clockwork radio External design input	Income generation for producers. Access to information.	Yes	Makes a contribution to environmental sustainability, by not needing batteries.	Contributes to social development: media can act as focus for communities.	Commercial production linked with institutions supporting disabled workforce
ExpLAN computer External design input	Access to computing and information	Yes	Yes	Aims to encourage social development	Will depend on how the setup is done at the user end
Stove designed participatively	Income for producers	Yes, producers make a living	Reduces wood consumption	Social benefits for producers	Producer groups set up
Solar light External design input	Improved light at reduced cost	Tension between development/ commercial needs	Uses solar technology	Allows for increased social interaction	Depends if it goes into commercial production

Throughout these examples, the design input is either from an external source or, if it is from a local source, is of low quality since local design capabilities are not developed. This is because there is little design education or training available in poor countries, and especially to the rural poor.

Comment: Craft Goods Made for Export

Craft production has been shown as a first step in development that is linked to the industrialization of the manufacturing process,[28] although it can be argued that it is a sustainable means of production for many types of goods for mass markets.[29] Craft production is strongly favored by the fair trade sector, which often is supported by local or international NGOs, but can be susceptible to changing market and fashion trends. Most of these goods are nonessential ornamental or gift items that are dispensable or able to be made elsewhere at a lower price. To be able to compete, a good design input—ensuring that goods are produced in colors that will sell, or of appropriate sizes—is very important. This market also is typically oversupplied with far more poor producer groups wanting to supply goods than the market will support.[30] Although both the producer groups and the organization importing them both aim for sustainability, particularly economic sustainability, it is unlikely to happen in the short term because the design and market input usually comes from single individuals who champion the work of the group. When the champion moves on, the organization can find itself in decline. Examples of this are common throughout southern Africa.[31] Therefore, this type of activity very often is unsustainable, both economically and institutionally. Some projects set themselves up with environmental sustainability as a goal, and these may succeed on this criteria—paper- making from the bark of a shrub that has to be pollarded to encourage biodiversity,[32] projects that reuse materials in their production, and those that use organic or non-environmentally damaging dyestuffs will succeed here. With an appropriate design input, many more goods could be designed to integrate elements of environmental sustainability.

Craft Production in the Informal Economy

This type of production also can bring benefits to poor producers; allowing them to have a livelihood while producing useful goods. Craft production in the informal sector without any donor or NGO support may be economically sustainable if a market is available; say for shopping baskets or for household goods and implements. It also can contribute to environmental sustainability if materials are recycled, such as those used in the production of the Zimbabwean shopping baskets. Institutionally, this sort of small-scale enterprise is sensitive to individual inputs, and may be completely informal. Socially, as with any group activity, interpersonal relationships can hinder or stop production. A design input can give goods a market advantage in terms of appearance, functionality, or price if it enables, for example, fewer materials to be used in their manufacture. There have been examples of professionally-trained designers working with producer groups in the informal economy. One such collaboration produced stylish and fashionable furniture that sold well in Zimbabwe in the 1990s.[33] This type of input is hard to maintain

28 Gavin Kitching, *Development and Underdevelopment in Historical Perspective* (London: Methuen, 1982), Chapter 1.

29 John Ballyn, independent consultant on craft production, Network of Development Researchers Gregynog Colloquium, University of Wales, argues that craft or artisan production can make a large contribution to manufacturing output (personal communication, May 2004).

30 Author's own experience 1994–1999 bringing goods from Zimbabwe to UK Fair Trade organizations.

31 Weya and Kusona Kwemadzimal women visited by author in Zimbabwe in late-1990s.

32 For example, Mountain Giftwrap from One Village: http://www.onevillage.org/cards-giftwrap.htm (accessed August 21, 2005).

33 Author's observations in Zimbabwe, 1996.

since the arrangements for collaboration often are only temporary and voluntary. It also is very difficult to, and unreasonable to expect that, design skills can be transferred, in a limited period of time, to otherwise untrained workers.

Work of Grupo de Desenho Industrial e Desenvolvimento Sustentável, Brazil

The work of this group is specifically aimed at benefiting the poor communities with which it works. Projects aim to be economically beneficial, because income comes from selling the goods, so this is built into the design of the project. Wherever possible, and this is an economic decision as much as an environmental one, materials are recycled or reused, making the production environmentally sustainable. Since the projects are dependent on a particular group of staff and students from the local university, they are, at this moment in their development, unsustainable. These links will need to be strengthened and institutionalized to ensure sustainability and continued development. To help ensure this, the authors recommend a participatory approach to any intervention and the identification of local innovators in order to develop or create the community's innovative capability.[34] A range of skills will have to be learned by the producer groups before these activities are sustainable without an external input but, at the same time, the designer must be prepared to have a "wider understanding of the socio-economic context and of human relationships."[35] The same is true for many poor producer groups, but if a process of education and capacity-building is undertaken, then this might be feasible. The GDDS is aware of these longer-term problems of sustainability, and makes comprehensive recommendations about how design interventions with poor communities should be approached, some of which have been mentioned above.

The Clockwork Radio

This has had obvious benefits for many people, including those employed in its manufacture and those who are able to receive radio broadcasts without having to use unreliable or expensive sources of electricity.[36] The development of the clockwork radio depended on several fortuitous events—the inventor learning that there was a need for radios in rural Africa, as well as the acceptance of the project by a sympathetic manufacturer. It is now economically sustainable and in commercial production. It is environmentally sustainable in use because of its wind-up technology, but the environmental impact of its manufacture it is not clear. The role of design in the form of invention, innovation, problem-solving, and manufacture has been crucial in making the clockwork radio a reality, although only a part of the overall picture. Design continues to contribute to the sustainability of the project, since new models of the radio have been produced that are smaller and lighter than the original and

34 Luiz Guimarães and Wagner Batista, "Industrial Design for Excluded Communities in the Northeastern Region of Brazil" (paper presented at the Conference of II Congresso Internacional de Pesquisa em Design, Rio de Janeiro, October 15–18, 2003).

35 Ibid.

36 Ibid. and QED video, "The Clockwork Radio."

available in different colors. The product line also has been expanded to include other clockwork equipment such as flashlights and cellular phone chargers.[37] Design input is enabling the Baygen Company and its associated nonprofit, the Freeplay Foundation,[38] to contribute to sustainable economic growth and to social and humanitarian outcomes for producers and consumers.

ExpLAN Computers Ltd.

For the users, the ExpLAN computer will not make a direct contribution to poverty reduction. It will, however, enable poor people access to communication and information via the personal computer. However, plans call for production of the units in the countries where they will be used, and this will generate local jobs. For the users, having access to the ExpLAN computer therefore should contribute to sustainable development. The ExpLAN computer has sustainability designed into it. It will be economically sustainable, use energy sources that are sustainable, and have sustainable social development built into the project.[39] Plans are in place to ensure that production is local and sustainable, and institutionalized in local production units. However, it is run by a company with a desire for equitable social change that perhaps makes it vulnerable to personnel changes. It appears to be sustainable in every aspect, although longer-term evaluation will be needed to see if this is the case. Ironically, there is no formal design input because the company does not employ or use a designer. All of the personnel involved in the project come from the technical side of personal computing.[40]

Work Done by the Intermediate Technology Development Group

The fuel-efficient stove development, led by the ITDG, fulfils all the requirements of sustainable development. It has led to its producers earning viable incomes, thereby contributing to poverty reduction and therefore is economically sustainable. And it has reduced wood consumption and uses local materials, so it is environmentally sustainable. The project is socially sustainable since the producers work in groups, and also have received significant social benefits themselves from being involved in the stove production. The production has been institutionalized in the setting up of formal producer groups. Since a participatory approach was used in the development of the design and manufacture of the stove, the benefits to users have been maximized and the project seems to be making a real contribution to sustainable development.[41]

> The participation of communities in (appropriate technology) development initiatives can help ensure that results will be sustainable after external agencies withdraw—economically and in terms of human capacity and commitment.[42]

37 Website: http://www.freeplayenergy.com/index.php?section=products (accessed August 31, 2005).

38 Website: http://www.freeplayfoundation.org (accessed November 8, 2005).

39 Information from company Website.

40 Personal communication, 2005.

41 Rob Aley, "Appropriate Technology and Sustainable Human Development" in *Design without Borders,* A. K. Haugeto and S. A. Knutslien, eds. (Oslo: Norsk Form, 2004), 53.

42 Ibid., 54.

The solar light, also led by the ITDG, is now in production with "demand growing rapidly."[43] It appears to economically sustainable, although a conflict has been noted between the needs of the development and the commercial sectors in terms of production methods. Over the long term, the institutionalization of the production may be jeopardized if this is not resolved. In environmental terms, it uses solar technology and thus reduces environmentally-damaging battery usage; although other aspects of its manufacture have not been environmentally assessed for their impact. Industrial designers were able to make a significant contribution to the development of the lamp by drawing up a comprehensive design brief in consultation with potential users, by studying existing solar lamps, and by using this data in designing their lamp. Subsequent feedback from test users was very positive. Designers have been able to contribute to an aspect of sustainable development.

Designing for Sustainable Development and Poverty Reduction

I now want to look across these examples at each aspect of sustainable development: economic, environmental, and social in order to assess the potential challenges facing designers who wish to make a contribution to sustainable development and poverty reduction. For designers to have an impact on reducing poverty, the goods they design must be *economically* viable. In many small-scale ventures, this is the hardest criterion to meet. Comprehensive knowledge of markets and lifestyles is needed when designing goods for export markets. Large commercial organizations have the resources to provide this information at the point of design and manufacture. The fair trade or NGO sectors often do not have this capability, and products from this sector can reflect this lack of input. However, many of the organizations involved in designing for poverty reduction have *environmental* sustainability at their heart. All of the seven examples given have at least an element of environmental sustainability, and several have more than that. Most projects do not have the benefit of measured environmental impact or life-cycle analysis, even though this would be the ideal. All of the design initiatives documented have social benefits for the participants. It is impossible to tell, without a long-term study, what the effects of this will be, and whether or not it will be sustainable over the longer term, say ten to fifteen years. Designing for *institutional* sustainability is harder to measure, and it seems that many of the examples may not be institutionally sustainable because they depend on a particular person or group of people for their existence and continuation. These people are value-driven, and believe strongly in what they are doing. Unless there are plans for the future, organizations can become vulnerable if these driving forces are no longer available to work with them.

43 Ibid., 57.

Conclusions

Apart from the few exceptions documented, the extremely poor do not constitute a market for designed or designer goods. To live on $1 a day, which I take as the definition of absolute poverty, and on which 1.2 billion people currently are surviving globally, precludes any choice of goods. Contrast this with someone of means in the developed world where it is possible to have all sorts of material goods designed to one's personal desires: houses, clothes, appliances, automobiles, and all types of luxury consumer goods. The very poor may work to produce goods that are designed for consumption in the developed world. They also may use goods that have been designed and discarded by the developed world. And they may, through the actions of an NGO, use tools that have been designed to alleviate their poverty. The poor are not without design and designed goods, but their choice of them is severely curtailed. The examples given in this paper show that, used in appropriate ways by designers and others, as agents of change, design can be brought into the lives of poor people and improve their livelihoods by increasing income and making available to them better goods, products, and equipment.

Recently, there has been an articulation of awareness that the poor can form a significant market for goods and services. This argument is made by C. K. Prahalad in *The Fortune at the Bottom of the Pyramid*.[44] Although design is a component of many of the case studies presented by Prahalad, such as the development of the Jaipur Foot, a prosthetic lower limb that is provided and serviced free to those who need it, design inputs are not identified or included in the analysis, although design must have taken place during its development. There is a need for design to be recognized and identified in these situations, so that it can be credited for what it enables people to do, and applied again in other contexts as in the Brazilian example quoted earlier in this paper.

Although not in the majority of the "design world," some designers are prepared and interested to take on work for minorities or for social good. In graphic design and advertising, sectors of the design world most highly commercialized, there has long been a tradition of *pro bono* work in which design for charities or campaigns is done free of charge or at reduced rates. In "The Weaving of Design and Community," Julie Baugnet[45] gives examples of designers in the State of Minnesota in the U.S. working on projects that benefit a variety of local communities. Other interventions have been documented in *Conscientious Objectives: Designing for an Ethical Message*,[46] although only one of the examples given is directly relevant to the global alleviation of poverty, and that only of historical interest.[47] However, there is the general sense that the world is facing very massive problems, and that the design community is not addressing them in the way that it might. There are both UK and global groups interested in design in a developmental context, as well as active constituencies of eco-designers. If these groups can raise awareness

44 Coimbatore Krishna Prahalad, *The Fortune at the Bottom of the Pyramid: Eradicating Poverty through Profits* (Upper Saddle River, NJ: Wharton School Publishing, 2005).

45 Julie Baugnet, "The Weaving of Design and Community" in *Citizen Designer: Perspectives on Design Responsibility,* S. Heller and V. Vienne, eds. (New York: Allworth Press, 2003), 95–99.

46 John Cranmer and Yolanda Zappaterra, *Conscientious Objectives: Designing for an Ethical Message* (Mies, Switzerland: RotoVision, 2003).

47 The example of a birth control campaign for illiterate people in Bangladesh dating from the 1970s is presented by Studio Dunbar, Holland.

among the global design world, and especially at a design education level, the dominant consumer culture of design could be challenged. Within the context of global capitalism, there are niche markets and means of production that can alleviate the lot of the extremely poor; and the existence and growth of the fair trade[48] initiatives is evidence of this. Although activity in this sector is mainly in foodstuffs, there still is an opportunity for design input, for example, in packaging. Designers who do work in these niches are far removed from the "designer as star" world of design- driven consumption.[49] Designers who are value-driven need to link with each other to share their experiences and projects. This is happening in the UK with the formation of the Cardiff Group,[50] and on the Internet in discussion groups such as the designindevelopment one hosted by Yahoo, and Think Cycle, Open and Collaborative Design,[51] and in Norway with the nongovernmental organization Norsk Form.[52] There will be a UK seminar series during 2005–07 entitled: "Educating Designers for Global Citizenship," in which design educators and practitioners from Brazil, Southern Africa, India, the U.S., and the UK will be able to network and share ideas about the role of the designer in enabling sustainable development; and how design education can contribute to raising the awareness of design students of global challenges. The author's own work in design education indicates that students are interested in the ways in which design can contribute to the common good.

Schemes such as the RSA Design competitions in the UK, in which student designers are challenged with briefs for designing around social issues including climate change and emergency relief, indicates that this is the case.[53] Value-driven designers need networks and support mechanisms in the design industry so that they can share their ideas and work more effectively in support of the ideals in which they believe.

48 Fair Trade Foundation: http://www.fairtrade.org.uk (accessed August 31, 2005).

49 Typified by the London Festival of Design, September 2005: http://www.londondesignfestival.com (accessed August 31, 2005).

50 Website: http://www.thecardiffgroup.org.uk.

51 Website: http://www.thinkcycle.org/home (accessed November 8, 2005).

52 Website: http://www.norskfoorm.no (accessed August 31, 2005).

53 Website: http://www.thersa.org.uk/rsadesign/designdirections/index.html (accessed November 8, 2005).

OCCASIONAL POLICY PAPER

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United Nations
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Humanitarian Innovation:
The State of the Art

ALEXANDER BETTS AND LOUISE BLOOM

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Humanitarian Innovation: The State of the Art

ALEXANDER BETTS AND LOUISE BLOOM

The humanitarian system faces grave challenges, as record numbers of people are displaced for longer periods by natural disasters and escalating conflicts. At the same time new technologies, partners, and concepts allow humanitarian actors to understand and address problems quickly and effectively. To contend with these growing, and changing, demands, organizations are increasingly exploring the idea of "humanitarian innovation," which draws upon concepts from the private sector to adapt and improve the humanitarian system. As a sign of its importance, "Transformation through Innovation" will be one of four themes of the 2016 World Humanitarian Summit.

Humanitarians have used the term "innovation" to refer to the role of technology, products and processes from other sectors, new forms of partnership, and the use of the ideas and coping capacities of crisis-affected people. However, as with many emerging ideas, use of the term in the humanitarian system has lacked conceptual clarity, leading to misuse, overuse, and the risk that it may become hollow rhetoric.

A better understanding of the potential and purpose of the innovation cycle and an innovation mindset can bring great benefits to the humanitarian system. This paper sets out to develop a common language and framework as a basis for dialogue, debate, and collaboration. The purpose is not to provide a definitive or comprehensive account but to offer ideas and examples to inspire further discussion.

Each section of the paper highlights an aspect of the concept: 1) the rise of humanitarian innovation and the innovation ecosystem; 2) the unique challenges of humanitarian innovation; 3) the innovation cycle in practice; 4) the role of crisis-affected people; and 5) advancing the debate.

1. The Rise of Humanitarian Innovation

The first source of consolidated thinking on innovation within the humanitarian system was the Active Learning Network for Accountability and Performance in Humanitarian Action (ALNAP). It held an initial Innovations Fair in November 2009, followed by a series of meetings. That same year the UK Department for International Development (DFID) announced a £3 million investment in innovation in the humanitarian system. Since then, an increasing number of organizations have formally adopted innovation processes to stimulate new thinking on the provision of humanitarian assistance (DFID 2012, Ramalingam et al. 2009, Steed 2010). UN agencies and many NGOs have dedicated staff, innovation labs, challenge grants or other initiatives to prompt new ways of solving problems and adapting to opportunities. Meanwhile, a growing number of donors, private sector actors, universities, and others outside of the traditional humanitarian system have entered into innovation partnerships.

Despite this trend, the term "innovation" remains poorly understood in some humanitarian circles and its meaning and value remain contested. Building on existing literature and practice, this paper adopts the following definition for innovation: a means of adaptation and improvement through finding and scaling solutions to problems, in the form of products, processes or wider business models. There are a number of additional elements to the term. First, the concept can be applied to nearly any specialized area, from logistics, to medicine, to media, and may include technology but is not reducible to it. Second, innovation is not the same as invention: it need not involve the creation of something absolutely

novel, but often takes the form of adapting something to a different context. Third, a solution does not require a particular threshold of change to qualify as innovation. It may be "game-changing" in having a high degree of technological progress and market impact, or it may be incremental.[i]

Factors Driving Humanitarian Innovation

Demand for a New Business Model

The trajectory of humanitarian assistance is unsustainable. The number of people affected by humanitarian crises has almost doubled, and the cost of international humanitarian aid has more than tripled, in the last 10 years.[ii] Further, humanitarian tools and services are, in many cases, ill-suited to modern emergencies. Most were designed for rural camp settings and short time frames. However, more than half of all refugees now live in urban areas, with very different coping mechanisms and basic needs. For many, connectivity and access to information are as critical as access to basic livelihoods. In addition, emergencies are rarely short-lived: in the last eight years, six countries have needed humanitarian assistance every year, while UNHCR reported in 2014 that the average period of displacement is 17 years.[iii] Despite the dramatic change in the operating environment, the structure of the humanitarian system has remained essentially closed and unchanged. As a result, pressure is building to fundamentally alter the way business is done, and many humanitarian actors and donors are looking to innovation as a vehicle for introducing these changes.

Private Sector Engagement

Over the past decade, faced with growing resource constraints, humanitarian agencies have held high hopes for contributions from the private sector, particularly the business community. Initially seen simply as an alternative source of funding, since about 2010 the private sector has been acknowledged as playing other roles, most notably in product and process innovation. It has also been increasingly recognized as operating at various scales, from multi-national corporations to national companies to small businesses created by refugees and internally displaced persons.

A variety of motives and modes of engagement characterize private sector involvement in humanitarian innovation, such as philanthropic contributions from foundations or individuals, and corporate social responsibility (CSR) initiatives that connect humanitarianism to brand or to existing research and development (R&D). Some private sector actors are motivated by the opportunity to develop solutions that, if proven to work in a disaster, could be commercialized for the bottom two billion who live on less than $2 per day. In addition, with globalization comes the recognition that a company's bottom line is linked to the risks and vulnerabilities of their offices, supply chains and staff, and that an effective humanitarian response is also in their interest. In addition, a growing number of "social entrepreneurs", such as Samasource, Dimagi, and Technology for Tomorrow, illustrate the potential for this kind of humanitarian enterprise. Meanwhile, larger corporations such as Deloitte, Ericsson, and IKEA (through the Ikea Foundation) are providing humanitarian goods and services in the name of corporate social responsibility.

While many humanitarian actors are drawn to the funding and know-how that the private sector offers, some remain hesitant about whether a profit motive compromises the ability to uphold humanitarian principles and to operate in the most resource-scarce conditions. Furthermore, across the humanitarian system, more systematic research on the role of the business sector is needed.

Partnerships

A range of actors now bring unique capacities to the international humanitarian system, including diaspora groups, businesses, and local first responders. However, traditional humanitarian actors have been slow to establish partnerships that leverage the assets that each has to offer. As noted in the 2013 report of the UN Secretary General to ECOSOC, "as new actors emerge, the current system has not adapted quickly and flexibly enough to meet the new realities. There is a need to build a more inclusive global humanitarian system, with stronger relationships at the global, regional and national levels." As a central component of innovation, partnership is important not just for coordination within the system, but also as a means to draw in ideas, good practices, and resources from private technology developers, military R&D agencies, universities and affected people themselves.

Technology Development

The innovation trend builds upon earlier and parallel debates on the potential for technology to strengthen emergency response. In just one example of the transformative potential of technology, cellular phones have provided a new platform for needs assessment and feedback mechanisms for affected people. While only 4 per cent of households in Sub-Saharan Africa have Internet connections, for example, cell phone penetration is at 75 per cent in Africa as of 2012, and is expected to reach 97 per cent by 2017.[iv] New technology-based tools and volunteer and technical communities, such as Crisis Mappers, are available to respond to emergencies like the 2010 Haitian earthquake and 2013 Typhoon Haiyan in the Philippines, further stimulating this debate. Prominent examples of humanitarian technology include GPS-enabled mapping systems for response coordination, social media analysis to conduct damage assessments, use of dedicated hashtags on Twitter to coordinate rescues and relief, and mobile phone-enabled funds transfers in the aftermath of crises.

Actors and Types of Innovation

These factors have spurred humanitarian innovation by practitioners and donors in three broad categories: grants and finance, research and development, and collaborations and networks. Table 1 provides a snapshot of initiatives emerging in each category. Some of these initiatives are happening at a large scale across several countries, while others are nascent or localized. The projects and institutions in each category interact and collaborate in diverse and dynamic ways, so these categories are not narrowly fixed, but illustrative of the roles that different actors can play. Table 1, on the following page, reflects the dynamic nature of interactions within the humanitarian system.

Table 1: Examples of Humanitarian Innovation

	Grants and Finance	Research and Development	Collaborations and Networks
United Nations	• WHS Regional Innovation Grants • UNICEF First 72 Grant • Innovation Funds: UNICEF and UNHCR • WFP Cooperating Partners Innovation Fund • OCHA Humanitarian Research and Innovation Grant	• WFP: Division for Policy, Programming and Innovation; Business Innovation Support Office • UNICEF: T4D; Innovation Labs • OCHA Humanitarian Exchange Language	• UNHCR Ideas (SpigitEngage platform) • UN Innovation Network (multi-agency) • UNHCR's Innovation Circle • UNHCR's iFellows
NGOs	• Humanitarian Innovation Fund	• World Vision (e.g. Last Mile Mobile Solutions) • MSF Innovation • Mercy Corps Social Innovation • Oxfam Open Innovation • ICRC Innovation • CARE: Digital Early Warning Program • Norwegian Refugee Council • Internews Center for Innovation and Learning	• START Consortium, Beta • Cash Learning Partnership (CaLP): NGO partners, IFRC and Visa. • Digital Humanitarian Network
Private Sector	• Deloitte Humanitarian Innovation Programme • IKEA Foundation • Google.org • GlaskoSmithKline Healthcare Innovation Awards	• IKEA Foundation • DHL logistics partnership with OCHA • IDEO.org (*e.g. MobileMoney; Drones for Good*) and Open IDEO platform • Gates Foundation	• UN Foundation Accelerator • Aidmatrix supply chain management • Kenyans for Kenya • CiYuan Initiative (Business for Social Responsibility) • Philippines Corporate Network for Disaster Response
Universities and Think Tanks		• University of Oxford HIP • Harvard Humanitarian Initiative & Humanitarian Academy • Duke University (*Innovation Co-Lab*) • Massachusetts Institute of Technology (*e.g. Development Innovation Network*) • Qatari Computing and Research Institute • EBS Business School • Stanford University's Design School and Center for International Security and Cooperation	• Singularity University • Stanford University's *Center for Innovation on Global Health* • MIT's International Development Innovation Network
Government	• DFID & USAID Development Innovation Fund (sub-set Humanitarian Innovation Initiative) • Humanitarian Innovation Fund donors include UK DFID, Canadian International Development Agency and the Swedish Ministry of Foreign Affairs • ECHO innovation financing (e.g. Gargaar project)	• US Government, FEMA Innovation Teams • DFID Research and Evidence Division and earmarked innovation funds. • Luxembourg Ministry of Foreign Affairs' satellite based platform *Emergency.lu*	• One off events for innovation coordination and discussion (i.e. DFID, ECHO)

The wide range of actors in the humanitarian system offers the potential for new connections, mutual learning, and cross-fertilization. Figure 1 depicts the spread of actors and the opportunities for connections, with both common linkages (solid lines) and less-common ones (dotted lines). With greater engagement in the kinds of initiatives highlighted above, this network has the potential to provide an innovation "ecosystem" that can accelerate adaptation and learning.

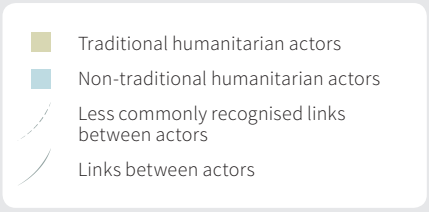
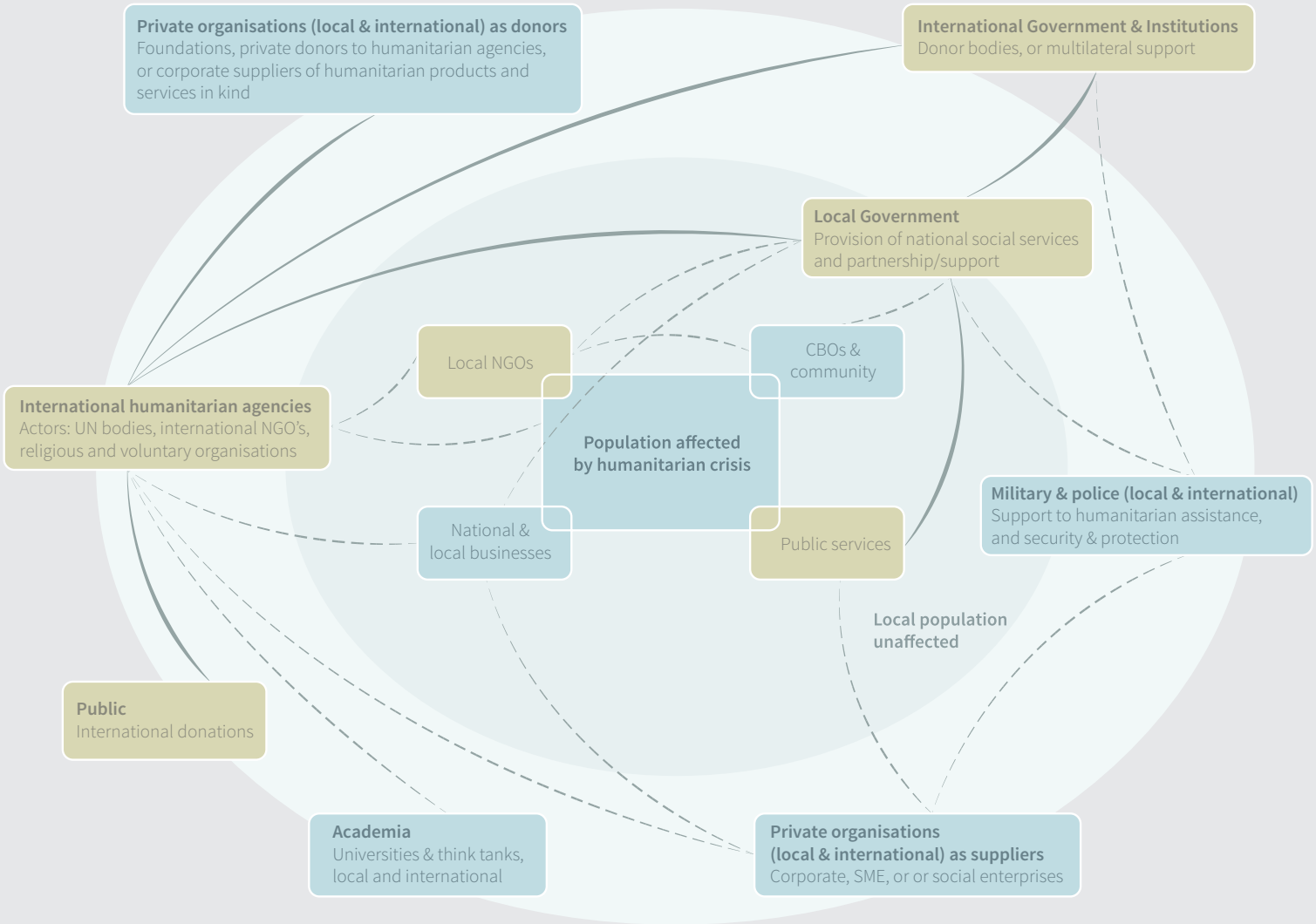


***Figure 1:** The Humanitarian Ecosystem*



Local context
- Disruption to local, physical, social and economic environment and systems
- Varying capacity of local regulation for organisations, customs, business, and welfare, local public support services, local private market systems
- Humanitarian systems – clusters and information flows
- Typical flows of goods and services to affected population predominantly from humanitarian agencies and government

International context
- International law
- Humanitarian standards e.g. Sphere Standards and Red Cross Code of Conduct
- International trade and markets

2. The Unique Challenges of Humanitarian Innovation

The rich ecosystem depicted in the previous page reflects the depth of capacities and opportunities for cross-fertilization, but it also illustrates the complexity of the humanitarian system. Innovators must contend with a system that lacks flexible financing, an appetite for risk, and a marketplace for new ideas. This section explores some of these and other challenges unique to humanitarian innovation.

A Closed Market

The humanitarian system's market structure differs from that of many other goods and services. On the demand side, humanitarian goods are generally thought of as "global public goods". Rather than conferring a benefit exclusively on the purchaser, the reduction of suffering benefits all governments and other humanitarian actors, whether or not they actually contribute to providing the goods. This logic leads to the widely held belief that humanitarian goods must be exclusively or predominantly funded by the intergovernmental public sector, through the collective action of governments, because there is no incentive for private actors to take part.

Conceptual History

The modern concept of innovation began with the development of **theories of diffusion**, which explain how new ideas come to be adopted over time (Rogers 1962, Rogers 1971). Subsequently, management theory developed the notion of **innovation for businesses**, exploring how private actors move from problem identification to solutions. The concept of **social innovation** then adapted traditional innovation management to social challenges (Mulgan 2007, Brown and Wyatt 2010, Mumford 2002).

Popular literature has highlighted innovation within private companies like Google, Apple, and Facebook. Steven Johnson's 2011 book *Where Good Ideas Come From*, for instance, highlights the centrality of **cross-fertilization**, recognizing that breakthrough ideas often come from collaborations among people of diverse backgrounds and different sectors. Ron Adner's 2012 book *The Wide Lens* notes that innovation often emerges from **ecosystems**, within which complementary networks of actors enable the development of ideas.

	Type of Good	Basis of Provision	Provider
Conventional View	Humanitarian Public Good	Reduce Suffering	States/IOs/NGOs
Supplementary View	Humanitarian Private Good	Mixed Motives (e.g. Profit, Sustainability)	Humanitarian Entrepreneurs

Table 2: The Demand Side of the Market for Humanitarian Assistance

On the supply side, there is a further assumption that humanitarian goods can only come from a closed and tightly regulated group of suppliers. Inter-agency coordination and procurement tend to privilege a small group of mainly UN organizations and international NGOs, whether or not they are the most efficient or effective providers. These organizations may, in turn, privilege known suppliers rather than reaching out to alternative solution holders.

On the final side of the transaction, the users of humanitarian goods do not have the traditional characteristics that economists ascribe to the individual. Their ability to choose alternative goods is often limited by their circumstances. The system lacks a mechanism for feedback from affected people directly to donors and humanitarian agencies. Rather than being guided by such feedback, the "success" of humanitarian actors is mainly measured by their fulfillment

	Market Structure	Basis of Contract	Diversity of Providers
Conventional View	Oligopoly	Regulatory Privilege	Closed System
Alternative View	Perfect Competition	Price and Quality	Open System

Table 3: Supply Side of the Market for Humanitarian Assistance

of donor requirements, further reducing the pressure to adapt or innovate.

An alternative model would base the opportunity to supply humanitarian goods not just on regulatory privilege, but on performance and value, opening the system up to non-traditional ideas and suppliers, including the military and the private sector.

This conceptual understanding of the market for humanitarian goods and services is of great relevance to the role of innovation. Innovation offers a means to "crowd in" rather than "crowd out" alternative sources of ideas, tools, and services. There may be untapped opportunities obscured by barriers to entry such as the lack of openness to non-humanitarian actors, procurement rules, limited grants and start-up capital for humanitarian enterprise, and the view of beneficiaries as aid recipients rather than consumers or end-users in untapped markets.

Ethical Constraints

Any efforts to bring in outside actors must consider a second unique feature of the humanitarian system: the precarious circumstances of the user. There are inherent power asymmetries between those providing protection or aid and those in need of that assistance. Bringing new actors and new forms of experimentation into the humanitarian context also risks exacerbating conflict, local power dynamics, or cultural sensitivities.

Organizations such as UNHCR and UNICEF, industry groups like the GSM Association and companies such as Deloitte have developed codes of conduct or frameworks related to innovation, and existing humanitarian principles continue to serve as a useful guide. However, while a range of general standards exist for humanitarian action (e.g. Sphere and the Humanitarian Accountability Partnership Standard), they do not provide a specific set of ethical principles for innovation, particularly regarding issues of experimentation, intellectual property, and the role of for-profit actors. Humanitarian actors have called for a process to reflect on these ethical challenges, bringing together practitioners, the private sector, and academia, as well as experts in applied ethics and the development of humanitarian codes of conduct.

Attempts to innovate by developing pilots at the field level may have ethical consequences at three levels: individuals, their communities, and the wider humanitarian system. Table 4 (page 13) highlights some of the issues and principles to consider at each level, building on recent thinking such as the UNICEF Principles for Innovation and Technology in Development.[v]

Aversion to Risk

The consequences of failure in humanitarian efforts are high, and emergencies tend to be high profile and political. As a result, many donors and agencies have a strong aversion to untested approaches, and to activities that do not contribute directly to the immediate response. These two factors have incentivized humanitarian agencies to continue business as usual while discouraging R&D and long-term business development. In contrast, private businesses, particularly in the technology sector, are encouraged to adopt a "fail fast" approach to innovation, investing in a range of ideas with the assurance that many failures will also bring the best solutions in the long run (Babineaux and Krumboltz 2014). Private sector innovation has been driven by the need to look to the future and "get there first" with new products and business models. The financial structure that supports the humanitarian system does not provide such incentives. Rather, it encourages evaluation and lessons learned that are retrospective and rarely feed into future planning. These

forms of evaluation are driven by the demands of accountability for public spending, leaving the system unprepared to respond to trends or opportunities by planning for – and learning from – failure.

There are some recent exceptions to this trend among donors, notably the USAID/DFID Humanitarian Innovation Initiative, which launched its first call for proposals in April 2013, offering up to $1 million for each selected project.

The Humanitarian Innovation Fund is another example of a seed-funding model for piloting new solutions. Many donors engage through bi-lateral grants, such as Cida's financing for the Last Mile Mobile Solution or ECHO's support to the Gargaar project for Somali refugees, among many others. As funding for innovation grows, some donors note that the pool of solid projects has been small, pointing to the need for greater support for innovative thinking, partnerships, and design tools.

Table 4: Framework for Analyzing Ethical Principles in Humanitarian Innovation

Level of Impact	Innovation Principle	Risk	Mitigation
Individual	Demand-driven and user-centered	Innovations are driven by ideas from outside the affected community or from available products, rather by the priorities of affected people, resulting in limited or even negative change.	Integrate crisis-affected communities in all stages of the innovation process. Adopt user-centered approaches to innovation.
	Open source	Technology and data are not made available to the larger community and new tools are not shared with those who could benefit in other arenas.	Adopt open source approaches that enable all implicated individuals to access, understand and engage with information.
	Informed consent	Consent cannot be meaningfully given due to the vulnerable context of the user and the implicit contingency of aid on participation in pilots.	Ensure all individuals engaged directly or indirectly in the innovation process provide informed consent. Establish ethical review boards to review whether meaningful consent is possible in a given project.
Community	Do no harm	Where data security and privacy cannot be ensured, these can put people at risk of exploitation by private and public actors. Experimental projects can also exacerbate or stimulate conflicts and power struggles.	Consult and work closely with a range of local partners from different sectors to ensure an adequate portrayal of needs, context, and risk. Build in safeguards to mitigate risks.
	Representative consultation	Marginalized and acutely vulnerable sectors of an affected population (women, children, people with disabilities, ethnic and religious minorities, and others) are excluded from critical design and testing decisions that will affect them. Outcomes may exacerbate existing vulnerabilities.	Ensure that those consulted in all phases of the innovation cycle, represent all sectors of the affected population, particularly those subject to marginalization or for whom the project may have unique impacts.
	Sustainability and local ownership	Innovations from the outside will displace local businesses or substitute for government services. They may also introduce tools, technologies, or other processes that are not sustainable, due to lack of funds, training, or infrastructure.	Ensure that the local market and local systems are well understood before implementation, and that measures are in place for long-term impact and sustainability.
System	Proven impact	Without clear definitions of success and proper baseline data, proving the true value and impact of a given innovation will be a challenge, hindering efforts to bring only the best projects to scale.	Establish a clear methodology for defining and measuring success, with baseline data, to assess concrete progress. (DFID: "No innovation without evaluation.")
	Accountability	Risk that lack of responsibility of accountability to the affected population and donors results in short-lived projects which have little impact and at worse cause more harm.	Improve mechanisms for sustained dialogue and communication during all stages of the innovation process.
	Humanitarian principles	These principles are defined to ensure that humanitarian actors are set apart from others in an emergency, particularly where conflict is involved. When violated, humanitarians become in distinguishable from others, undermining access to crisis-affected people. Outside actors may not subscribe to these principles, and their conduct may contradict them, putting the humanitarian system and affected population at risk.	Bring greater awareness to non-traditional humanitarian actors about the principles and how they are to be managed.
	No conflict of interest	Particularly for partners such as corporations or military actors, whose reach may be global and whose motives and aims differ from those of humanitarians, past actions may provoke suspicion from the affected population.	Draw upon best practices from across the sector for setting expectations in partnerships, establishing clear terms of refer-encethat can be applied to humanitarian innovation.

3. The Innovation Cycle in Practice

Despite the many challenges, actors within and outside the humanitarian system have successfully undertaken innovations. This section explores some examples, using "the innovation cycle" as a framework for analyzing them. As noted above, innovation is a means of finding and scaling solutions to problems, in the form of products, processes or wider business models. A range of models have been used for thinking about the innovation process (Ramalingam et al 2009);[vi] however, the most simple is to view it in four stages (Betts and Bloom 2013): 1) defining a problem or identifying an opportunity; 2) finding potential solutions; 3) testing, adapting and implementing a solution; and 4) appropriately scaling the solution (See Figure 2)

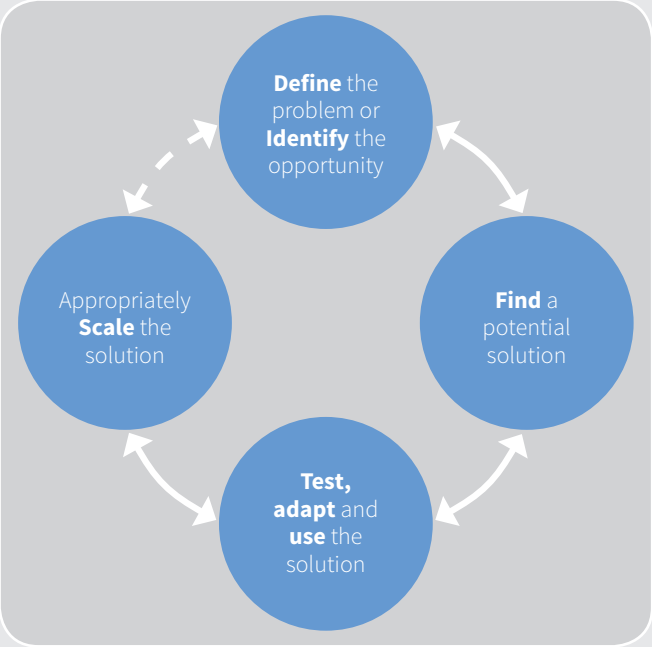


Figure 2: The Innovation Process

The cyclical depiction of the innovation process illustrates the continuous learning and feedback in each stage (Betts et al 2012). The introduction of a solution is not the end of the process, but the beginning of testing, learning and refining. The process may lead back to a redefinition of the problem, to testing that rules out the idea, or to a solution that can be replicated and scaled. Innovations may take the form of products, processes, positions, or paradigms. This section looks at examples of the most common forms, product and process innovations.

Product Innovations

Most product innovations begin outside the humanitarian environment, typically led by commercial enterprises. The consumer market is made up of humanitarian organizations purchasing items for a variety of contexts, often on behalf of crisis-affected people. Individuals, small companies or larger product suppliers define the problem and opportunity for new products and invest in their R&D before pitching them to humanitarian agencies. There is often only a limited commercial market for such products, largely for camping, hiking or for military use. Even sales to humanitarian agencies are often limited due to the lack of consultation with humanitarian actors during the design process, which therefore limits the fit or robustness of the final products. In addition, emergency equipment is often only required in the first phase of a response, while in the long-term local products and more sustainable solutions are preferred.

While humanitarian agencies rarely develop products in-house, partnerships with private companies and academic institutions are becoming more common. Examples include WASH kits designed by Oxfam, World Vision's Last Mile Mobile Solutions (LMMS[vii]) distribution tracking software, and the new UNHCR shelter developed in partnership with the IKEA Foundation.[viii] A common barrier to R&D within humanitarian agencies and through partnerships is donor procurement regulations, such as tenders and supplier offer comparisons, which may not favor suppliers who invest in research and development.

Process Innovations

In contrast, process innovations, which adapt modes of delivery and models of operation, typically originate with humanitarian agency staff themselves, especially in emergency settings. During the first phase of a rapid onset emergency,

process innovation may even happen at the hands of grant writers designing programs and budgets rapidly to respond to changing needs and to secure funding.

Examples of process innovations in the humanitarian system include Cash Programming, Community Led Total Sanitation (CLTS), and the Emergency Market Mapping Assessment (EMMA) toolkit. Process and product innovations often work closely together: it is common to hear people speaking about product innovations that will solve a multitude of process issues or vice versa (Ramalingam et al 2009). The use of cash in emergencies, for example, has been followed by product innovations such as mobile money transfer technology, which have enhanced the effectiveness of the process innovation. In the case of the Community Managed Acute Malnutrition approach, products such as the high-calorie therapeutic food product Plumpy'Nut, are combined with behavior change programs at the local level, as well as communities of practice at the global level.[ix] While some innovations can be scaled quickly, the iteration and re-use of ideas is often ad hoc and fails to incorporate feedback or expert findings from outside the sector, leading to misuse of tools and poor adaptation.

The table below shows examples of product and process innovations, the stages of innovation, and lessons learned, while the annexes describe each case in detail.

Table 5: The Innovation Process in Practice

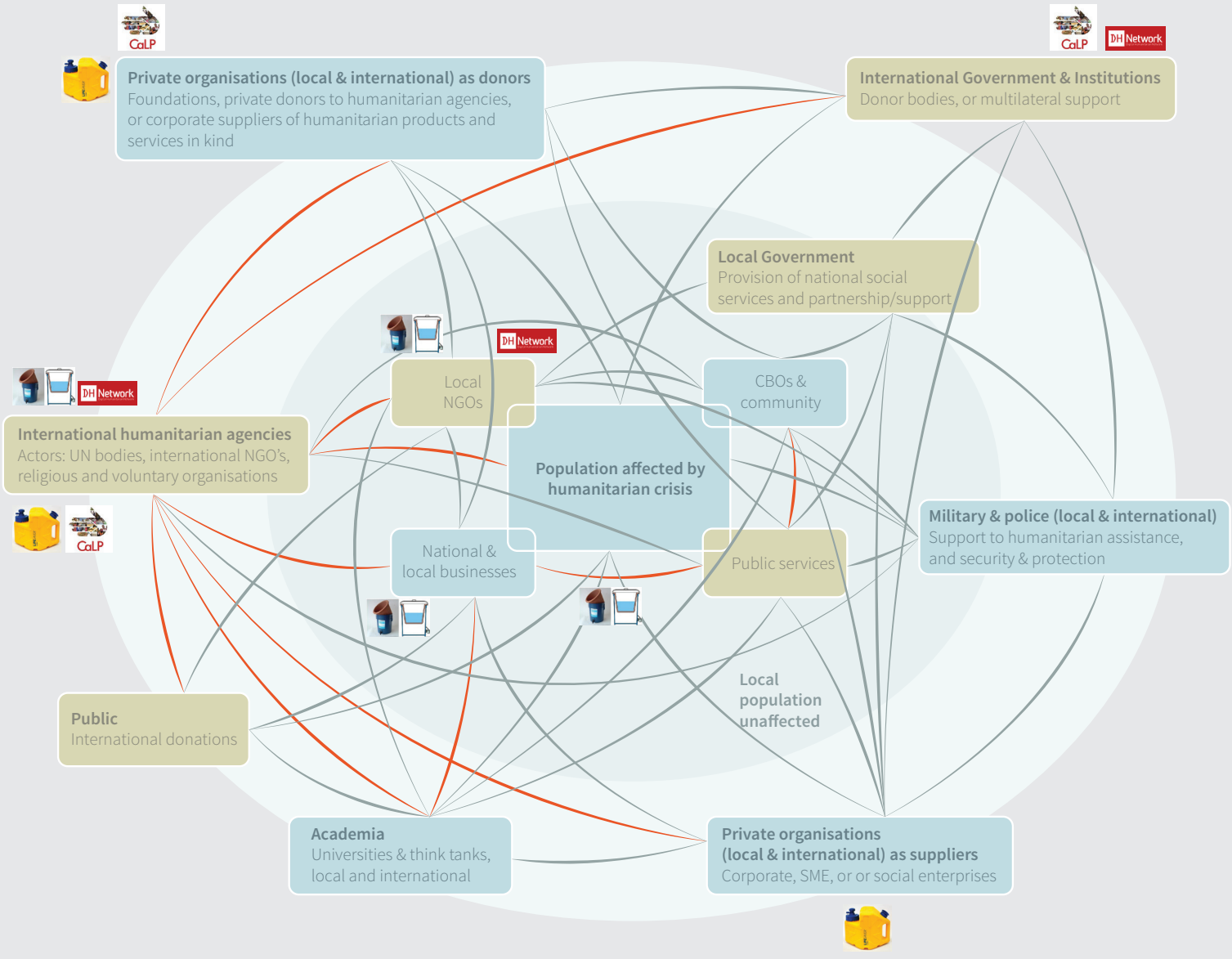
	Product innovations	
	 **Ceramic Water Filter**	 **Lifesaver Cube**
Defining the problem or finding an opportunity	The lack of **clean water** among poor communities is a well-understood and widespread problem. There is a secondary problem of limited **local employment** opportunities.	Water is easily contaminated after collection, and **point-of-use filtration is an opportunity** space for new designs and approaches. **After the 2004 Tsunami**, an engineer developed several water filtration products for use in emergencies.
Finding a solution	The filter was developed in Guatemala and used locally. In the 1990's, Potters for Peace **recognized an opportunity to scale up** manufacturing and use, working with local materials and potters, for adoption in similar rural and semi-urban locations.	Technical development took 12 months from the time that the basic filtration technology was developed.
Piloting, adapting and implementing the solution	• Potters for Peace trains partners and potters in standardized production of the filters. The approach has been **amended from lessons learnt, including failures**. • The solution can be **adapted for local markets**, using local tools, raw materials, clay and skills. • More than 40 university studies have been conducted on the ceramic water filters through coordination with Potters for Peace, enabling **ongoing research and development**.	• **Consultations** with Oxfam and DFID ensured the product was robust and considered the humanitarian environment in its design. • The product out-performs others in the market (as measured by the size of bacteria it can filter).
Scaling the solution	• The solution has been scaled by **sharing the design and process** with local partners. Local skills are the basis for the manufacture, and a strong network of NGO customers maintains demand. • Potters for Peace is a non-profit but get over 50% of **income from consulting and pottery sales**. • **A global network of potters** produces the filters, for international actors to buy locally.	• The product is sold to NGOs, military and camping markets, and is **not reliant on any one market**. • The company is a **pre-approved supplier** for DFID's Rapid Response Network, giving it access to humanitarian agencies. • The product is patented and can only be produced by Lifesaver Systems.
Lessons Learned	• Local relationships and international networks get the product to a wider market. • Local materials and skills create profitable, low-cost solutions for local producers. • Existing networks of artisans or technicians foster quality and sustainability. • Work and business opportunities builds local support and makes use of skills. • Solutions match existing culture and practice, backed by international experts or institutions, encouraging adoption.	• Early consultation with purchasers enables acceptance of solutions developed by non-humanitarian actors, silencing concerns that "they just don't get it." • Technology exceeds the minimum requirements of experts and makes it preferable in competitive sectors. • Appeal to non-humanitarian markets may increase investment in product development.

Process innovations	
The Cash Learning Partnership	**Digital Humanitarian Network**
Several agencies demonstrated that **cash programming could work** in the response to the 2004 Tsunami, despite gaps in monitoring and managing implementation.	Initiated in 2012 by t**wo individuals inspired by the need to coordinate digital services** among volunteer groups.
• A **steering committee of** five **NGOs, with interest from governments and donors,** created CaLP to "support capacity building, research and information sharing". • CaLP is made up of practitioners who understand needs and solutions. • **Collaboration** with private sector and academia built knowledge.	**Groups and volunteers** were already carrying out data collection and analysis. The creation of a network-of-networks provided access to "formal" organizations and a needed service.
• CaLP **has developed research materials and tools** since 2006. • The **small circle of users** means that the scope of work is well defined and target audience understood.	Different volunteer groups are activated by formal groups during an emergency. Over the few years of operation, guidelines have been developed to **share learning with agencies and volunteers**.
• Tools are used by humanitarian actors and guided by the steering committee and multi-stakeholder meetings. • Cash programming is now used **beyond livelihoods and food-security**, to assess and support markets (i.e. WASH).	The network is still very new but **growing in recognition** and drawing in more volunteers through its umbrella.
• System-wide support for a new practice (cash-based programing) enables greater funding for related products and partnerships. • The relatively **small circle of users** of its outputs (namely traditional humanitarian agencies), means that the scope of its work is well defined and target audience well understood. • Poorly understood methods may be seen as a **panacea** and overused.	• Diversity of technical capacities among members contributes to the versatility of the networks. • Individuals are critical to launching new initiatives, particularly in providing vision for voluntary networks.

Building on the system depicted in Figure 1 earlier, Figure 3 illustrates the ways that actors collaborated to contribute to the innovations described on the previous page. Most innovation resulted from partnership among several, though not necessarily all, actors in the system, each with different capacities. The icons representing each innovation are positioned next to the partners involved.

By understanding this wider system and recognizing their role in it, humanitarian actors may better exploit untapped opportunities. Taking full advantage of the capacities in the system will require incentives within humanitarian organizations to encourage interaction, collaboration and partnership, even with non-traditional partners.

***Figure 3:** The Humanitarian Ecosystem - Examples of Collaboration in Innovation*



4. Innovation within Affected Communities

The humanitarian innovation debate has been broadly top-down, focusing mainly on improving the tools and practices of international humanitarian actors. This top-down approach tends to be short-term and project-based, addressing predefined problems with solutions from external actors. While an important part of the debate, this focus overlooks the talents, skills, and aspirations of crisis-affected people themselves. How can the humanitarian system encourage user-led design and innovation by affected people that responds better to their needs?

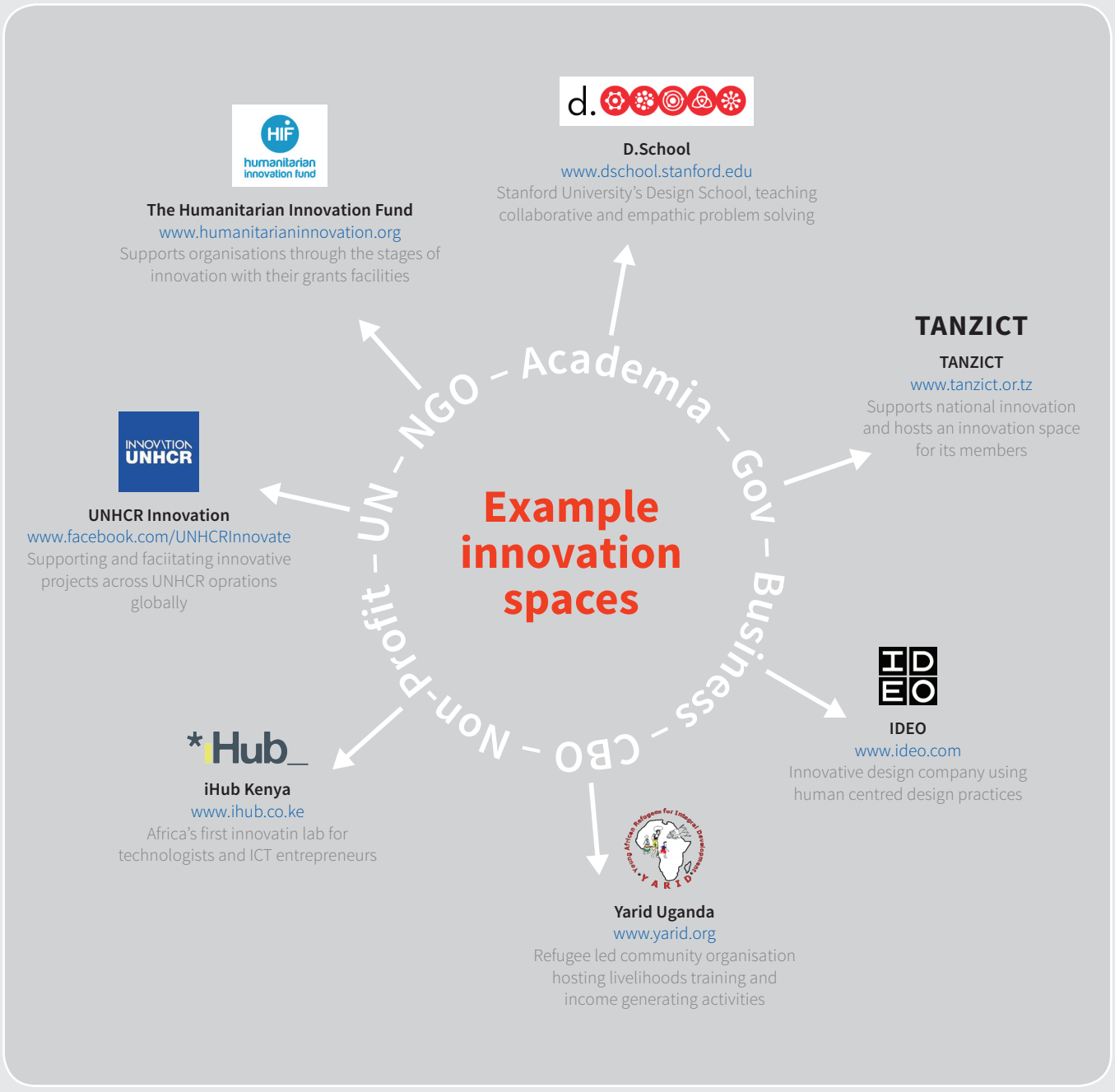
The literature on user-centered design, indigenous innovation, and participatory methods provides an alternative, bottom-up model that builds on the capacities of affected populations (Betts and Bloom 2013). The concept has two key elements: 1) recognizing and understanding innovation capacity within communities and 2) putting these communities and local systems at the heart of the innovation process, regardless of where ideas or resources originate. The bottom-up, or, community-centered, approach is not a new idea for humanitarian work. Participatory approaches are well known among development and humanitarian practitioners, and can facilitate ideas and solutions within a community. However, participatory approaches have often failed because they take information but offer no new solutions. Combined with these participatory strategies, the innovation cycle offers a hands-on model for engagement.

The most cutting-edge research in this area concerns refugees. When refugees cross borders, they must adapt their livelihoods to new regulations, social networks, and markets. In Uganda, where the government recognizes refugees' right to work and allows an unusually high freedom of movement, there is significant innovation that includes engagement with the private sector and technology-enabled livelihood activities. Rather than being isolated communities dependent on humanitarian assistance, refugee settlements like Nakivale and Kyangwali in Uganda are vibrant and inter-connected economic communities in which bottom-up innovation flourishes (Betts et al 2014; Kaplan and Omata 2013).

This is not to say that bottom-up innovation should be romanticized. Affected populations frequently need significant external support, especially during the emergency phase, and bottom-up solutions are subject to local power dynamics that can exclude the groups most in need of humanitarian response. In more constrained regulatory environments, refugees may not even have a right to work, and even in Uganda livelihoods innovation was constrained by access to capital, training, and infrastructure. International donors wishing to support local innovation have also struggled to provide direct grants, given unwieldy financial and management standards.

Although bottom-up innovation is subject to these legal, economic, and social constraints, enabling conditions can be encouraged. One emerging area of interest concerns various forms of "innovation spaces," which can be physical or virtual spaces for sharing ideas and resources. Many of these spaces are dedicated to innovation for the development sector, but they provide a model that has potential to address humanitarian challenges as well. From major companies like Google, to small hubs like iHub in Nairobi, to Mara Launchpad in Kampala, to "maker spaces" around the world (see Figure 4, next page), a growing litany of spaces encourages and supports sustainable innovation. UNICEF's Innovations Lab Kosovo provides Kosovar youth both mentorship and seed grants to pilot and develop social enterprise initiatives. In response to Cyclone Nargis, the Paung Ku consortium funded the initiatives of self-help groups and community-based organizations,[x] and a Learning Resource Centre provided information and training services while acting as a clearinghouse for external collaboration with the local initiatives.

Figure 4: Example Innovation Spaces



Innovation spaces may overcome barriers at different stages of the innovation process, by providing resources, funding, skills, collaborative processes, or simply safe environments to test ideas. The greatest benefit of these seems to come from the networks that are created, even if virtual or online. They not only support community innovation, but also proximity to community-defined needs and the ability to build on local capacities, rather than duplicating them.

5. Advancing the Debate

A growing group of individuals and organizations is pushing against significant barriers to create a more conducive ecosystem that can invite new ideas, provide transparency about resources, and facilitate scaling. However, further collaboration is needed to encourage strategic and responsible innovation in the humanitarian system. The areas identified below address the unique challenges of innovating in the humanitarian system, drawing on the lessons learned from the case studies.

Focusing on the user:

The humanitarian system has primarily invested in innovation that can improve responses by international organizations. However, the skills, talents, and aspirations of affected communities remain a largely untapped source of sustainable and creative solutions. The case studies indicate that user-led design tends to lead to community buy-in, sustainability, and easier scalability, especially when it builds on local relationships and provides visible economic benefits. At a minimum, early consultation in design can ensure that solutions fit with cultural practices (as with the Potters for Peace ceramic filters). Early consultation is particularly important for researchers and entrepreneurs newly engaging with the humanitarian system.

To encourage a focus on the user, the system needs greater investment in innovation spaces and opportunities that mentor, accelerate, and incubate the initiative of affected populations and local organizations. In addition, international organizations can ensure that users drive the process of defining priority areas for innovation, testing out products and processes to meet those needs, and providing feedback during implementation and scaling.

Expanding the Market:

United Nations organizations have been insulated from free market competition, while a small number of NGOs operate in an artificial oligopolistic market with significant barriers to entry for smaller entities or those from other sectors. Although this small and highly specialized market is unlikely to shift dramatically, other actors can be brought in through a platform for brokering or facilitating connections. Expanding this "controlled competition" will encourage a wider set of actors to make valuable contributions, as demonstrated by the Humanitarian Innovation Fund's WASH Challenge, the UN Foundation Accelerator, and the Grand Challenges model used by the Bill and Melinda Gates Foundation and the Government of Canada. In addition to encouraging new actors and greater competition, market forces can be harnessed when there is a viable commercial use for a product, such as Lifestraw's camping and military uses. Ideally, commercial markets in crisis prone countries would be targeted to develop local production and maintenance capacity for new products.

Encouraging Responsible Risk:

As noted above, humanitarian donors and agencies have historically been risk-averse, driven in part by the fear that failure can lead to immense suffering and even loss of life. In addition, most donors and humanitarian organizations assess performance at the project level, without looking at the larger picture.

However, organizations are starting to look at the overall value produced by a portfolio or series of projects. This portfolio approach spreads risk across a set of projects — some "high risk" and some more traditional — so that "the impact from one or two big, transformational successes in a portfolio can justify the opportunity cost of many failures,"[xi] and the benefits of iterative development can be seen. Creating a more flexible system of funding and evaluation that supports learning from, and not punishing, failures can help maximize scarce resources and social impact, as long as ethical standards are established and followed.

Fostering Collaboration:

Humanitarian actors have a culture of isolation that creates barriers to innovation, due to funding incentives and the view that only they can uphold humanitarian principles. Business and other actors, many of which have vast technical and financial resources, have aims distinct from, and sometimes in conflict with, those of humanitarian actors.

Even within the system, there is a risk that individual efforts by donors, UN agencies, and NGOs will result in one-off solutions that are not shared and diffused. What many actors are now calling for is not a traditional coordination mechanism but rather a functional ecosystem in which actors can work collaboratively together. This outcome will require a more nuanced and shared understanding of roles, incentives, capacities, principles, financing, skills, knowledge, mindsets, research and development, and resources.

Collaboration is also another way to share the risks that hinder innovation, as each institution can contribute within its capacity, rather than investing in new areas of technical expertise. Collaboration should go beyond institutions to support and connect the individuals who often play a vital role in recognizing and diffusing new ideas. Fostering this will require a re-think on incentives, which today tend to favour competitive models, as organizations compete for public funds.

Building a supporting environment for innovation:

Many organizations, notably UN agencies, face the challenge of building in-house acceptance of innovation activities. Even where innovation is encouraged, field workers often wish to keep their initiatives to themselves rather than sharing what they have learned, for fear of intervention from headquarters. However, innovation needs to be encouraged as part of the work of all humanitarians, within a culture of adaptation, change and constant improvement.

Such cultural change is a challenge, particularly in large organizations. However, an innovation mindset can be fostered through changes in incentives and practices: opportunities to reflect creatively; dialogue that transcends bureaucratic hierarchies; connecting field and technical staff with headquarters and with one another; secondments within other organizations and sectors; greater human resource mobility across organizations; and encouraging rather than punishing early failure as a means of learning. The ultimate aspiration should be to create a humanitarian culture within which support for principled and participatory innovation is the norm.

As part of changing mindsets, leaders must ensure practical measures are in place to support, rather than obstruct, their staff's effort to implement an innovation approach. Many staff are in need of information on resources and support throughout the cycle, not solely in financial terms but also through mentorship, tools and training. Organizations should also review any structures and regulations that inhibit innovation, such as barriers to movement into and out of the system to acquire new experiences or skills or procurement rules that limit flexibility to pilot alternative products, processes or partnerships, particularly with the private sector.

Upholding Principles:

In the context of providing assistance and protection to vulnerable populations, innovators must be vigilant about adherence to humanitarian principles. Even a small number of cases of exploitation could discredit the endeavor of humanitarian innovation. It is important that the humanitarian system develops clear and transparent principles or codes of conduct to ensure that humanitarian innovation upholds ethical considerations. Such principles might take the form of Voluntary Codes of Conduct, for example, creating a brand incentive to new actors to uphold those ethical standards in their humanitarian work.

Conclusion

Innovation is already and irreversibly part of the humanitarian system, driven by a demand for new models, growing private sector engagement, and rapid technological change. By creating shared definitions and principles, identifying good practices, and lifting barriers to ethical, user-led innovation, humanitarian actors can help transform the sector and meet the challenges of an ever-changing world.

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[i] Jim Kalbach outlines a model based on four zones of innovation: incremental (low tech progress, low market impact), breakthrough (high tech progress, low market impact), disruptive (low tech progress, high market impact), and game-changer (high tech progress, high market impact). He suggests that the first of these should be the most significant proportion of most organizations' innovation activities, with a 5:2:2:1 ratio for organizations' innovation investments across these four types. http://experiencinginformation.wordpress.com/2012/06/03/clarifying-innovation-four-zones-of-innovation

[ii] "Saving Lives Today and Tomorrow: Managing the Risk of Humanitarian Crises." OCHA, 2014.

[iii] See "Global Estimates 2014," available at http://www.internal-displacement.org/assets/publications/2014/201409-global-estimates.pdf.

[iv] See GSMA report on "The Mobile Economy 2013", available at http://www.gsmamobileeconomy.com/GSMA%20Mobile%20Economy%202013.pdf

[v] See http://unicefstories.org/principles/. UNICEF innovation principles have been endorsed or adopted by the following partners: UNICEF, USAID, Gates Foundation, EOSG Global Pulse, WFP, OCHA, UNDP, SIDA, IKEA Foundation, UN Foundation, and UNHCR.

[vi] See the Humanitarian Innovation Fund's website for how it depicts "the innovation process", http://www.humanitarianinnovation.org/innovation/process

[vii] See Last Mile Mobile Solutions website http://www.lastmilemobilesolutions.com/

[viii] See "Designing a better home for refugee children", available at http://www.ikeafoundation.org/designing-a-better-home-for-refugee-children/

[ix] For more detail see http://www.cmamforum.org/.

[x] Read the full ALNAP report on the Paung Ku initiative at http://www.alnap.org/resource/5790.aspx

[xi] "Strategic Philanthropy for a Complex World." Stanford Social Innovation Review. Summer 2014.

Annex 1: Examples of Humanitarian Innovation

1) Ceramic Water Filters

A huge variety of low-tech products, also known as appropriate or intermediate technologies, are produced by local inventors and tradesmen using available materials. However, few are scaled and used world-wide due to the challenge of designing low-tech products to be replicable and up to a standard, while remaining appropriate to the local context and materials. The ceramic water filter, made from local clays in small-scale factories, is an exception. Although not originally designed for humanitarian response, the product has made its way into humanitarian supply chains.

Background

Although ceramic filters were invented in the late 1800's, Dr. Fernando Mazariegos developed the ceramic pot model in Guatemala in 1981. In the 1990's Ron Rivera of Potters for Peace, a non-profit organization working with subsistence potters in Central America, adapted the design and standardized the manufacturing and training processes used to disseminate the filter. The filter uses the skills of craftsmen and potters and locally available materials, and offers an affordable and familiar product for household use. Potters for Peace helps partners to help establish small factories or workshops. The organization sends volunteers to train local potters and help set up the manufacturing equipment and process to ensure quality. Follow-up visits support over 50 small factories and workshops worldwide.

The devices work by filtering water through small cracks and through air holes created when sawdust or cornhusks mixed into the clay are burnt away during firing. Additional bacteria are killed off by a colloidal silver layer coating the inside and outside of the filter. The filter meets WHO standards and is thought to remove 99.88% of water borne disease agents.

Reflections on the process

The proliferation of workshops to produce ceramic filters has been enabled not just by individual champions, but also by external factors. Good relationships between potters and the organization Potters for Peace were already in place before the ceramic water filter project took off. The

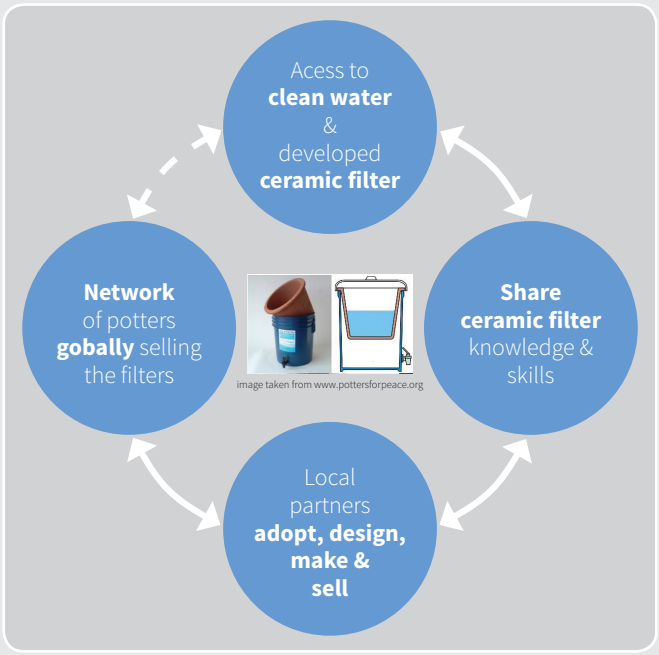

Figure 1: The Innovation process for ceramic water filters

clay material and local crafts skills required to make the ceramic filters are also found in rural areas around the globe, making training relatively straightforward. The relatively low investment needed makes the manufacturing process accessible and replicable. Potters for Peace gained financial independence from these activities, helping the organization maintain long-term relationships with the independent factories in the form of training and support.

The filters are easy to use in the home since people are already accustomed to storing water in similar receptacles. Point-of-use water filtration endorsement by the UN and WHO then helped scale devices such as the ceramic water filter. University interest, as well as support from international organizations, also helped to spread local manufacture and development. Finally, the workshops and small factories are established to meet the demand of local partners who approached Potters for Peace, so there was little need to build buy-in from stakeholders.

The filters have already spread to larger local manufacturers for purchase during emergency responses by NGOs, as in

Myanmar for the response to Cyclone Nargis in 2008. Local suppliers are often sought after in humanitarian procurement, especially in the case of Myanmar due to strict and expensive import regulations. In Myanmar there are currently four suppliers mapped on the Potters for Peace site.[i]

The model could be tried with other low-tech products, helping to ensure that quality standards of a locally produced product are met. In fact, there are new ideas and products created each day, but an effective delivery model for getting them into markets seems to be the key determinant for scale and sustainable use in low-income and humanitarian contexts.

2) The Lifesaver Cube

Originally inspired by the aftermath of the 2004 tsunami, Lifesaver Systems water filtration products reach the military, camping and humanitarian markets alike. One of the newest products is the Lifesaver Cube, which carries 5L of water and uses an inbuilt hand pump and filter to provide clean drinking water for household use.

Background

The Lifesaver Cube filters 5000L over its lifespan, enough to provide the WHO daily clean water requirement of up to 3.7L per person for a family of five for nine months. Despite misleading claims selling the product as "the new solution in the fight against water poverty", like many point-of-use filters, the Lifesaver Cube is a relatively short-term solution for the first phase of an emergency. What makes this product stand out is its performance in filter technology, as the product filters out bacteria and viruses to a smaller size (15 nanometres) than other point-of-use filters. Tests from the Tropical School of Hygiene and Medicine support the performance of the Lifesaver Cube against viruses and bacteria, although, like most other filters, not salt and heavy metals.

Reflections on the process

DFID and Oxfam were consulted in the development of the product, and their feedback was taken into consideration for the design. Lifesaver Systems has been pre-approved to supply to emergency responses as part of DFID's rapid response network.[ii] This buy-in from humanitarian actors may help the scale of the product, and has certainly helped in creating a robust filter for harsh conditions. However, it may face the same challenges for long-term use as most distributed items: maintenance after the emergency phase.

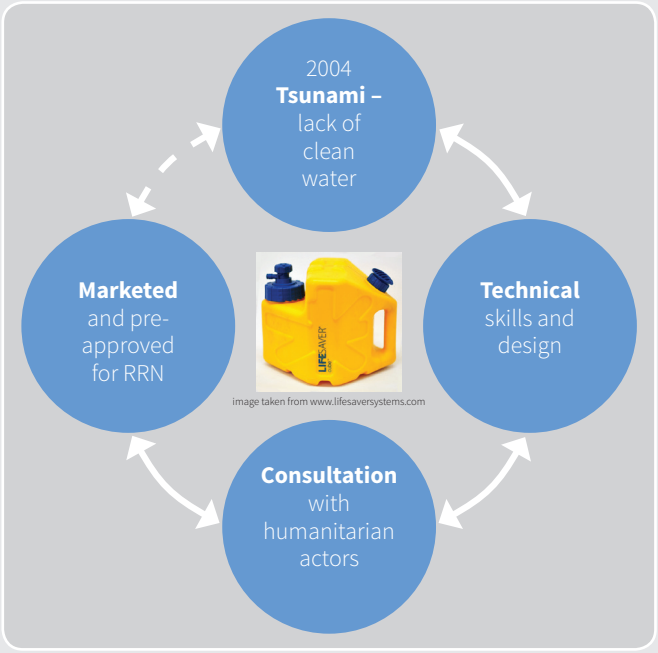

Figure 2: The innovation process for the Lifesaver Cube

In an effort to quickly scale point-of-use water filters, as UNICEF[iii] and WHO[iv] call for, companies often oversimplify the problem, lacking a full understanding of the context. The Lifesaver Cube has not faced the same critique as the Lifestraw, which has been criticized for not solving the real problem of water access and transport. However, although its storage capacity addresses this problem, even the Lifesaver Cube requires nearby water sources during an emergency response. The inventor of the Lifesaver Cube has stated, "[W]here do people live? Near water. All we have to do is make that water clean."[v] Unfortunately, the solution is often more complex.

3) Cash Programming

Since 2004, interest has grown in delivering cash or vouchers in place of, or as a supplement to, traditional aid such as food and non-food items. While money has been used as a form of aid for hundreds of years, in modern humanitarian assistance, distributions of cash are only now scaling as a widely accepted response.

Background

As attention builds to empowering communities, recognizing local markets and finding more cost effective ways to deliver aid, cash programming is an attractive new alternative. Along with new practices comes the need for processes and skills to execute them. The Cash Learning Partnership (CaLP), established to better understand and promote the use of cash programming, is developing research, evaluation and other knowledge on the topic.

CaLP produces and shares resources on the topic, disseminating new concepts, developing mechanisms, researching and sharing lessons learned. Recognition of the need for cash programming has led to CaLP's broad funding sources including international donors and States, as well as private sector support from Visa. These resources, combined with buy-in from practitioners and donors, have encouraged collaborative innovation in this emerging area.

Reflections on the process

The interest in promoting effective cash programming comes from several motivations in the humanitarian sector. Proponents argue that cash programming:

- **empowers recipients** and enables them to make their own choices.
- **supports restoration of the local economy** as people use purchasing power to buy locally.
- **is a cost effective way to deliver aid** to beneficiaries.
- **involves low-cost research, development and advocacy** (compared to product development).
- **addresses recent major humanitarian shortcomings.** The 2004 tsunami and 2010 Haitian earthquake spurred calls for improving practices that came under extreme strain in large responses. Extensive, unrestricted funding facilitated new ideas and approaches.

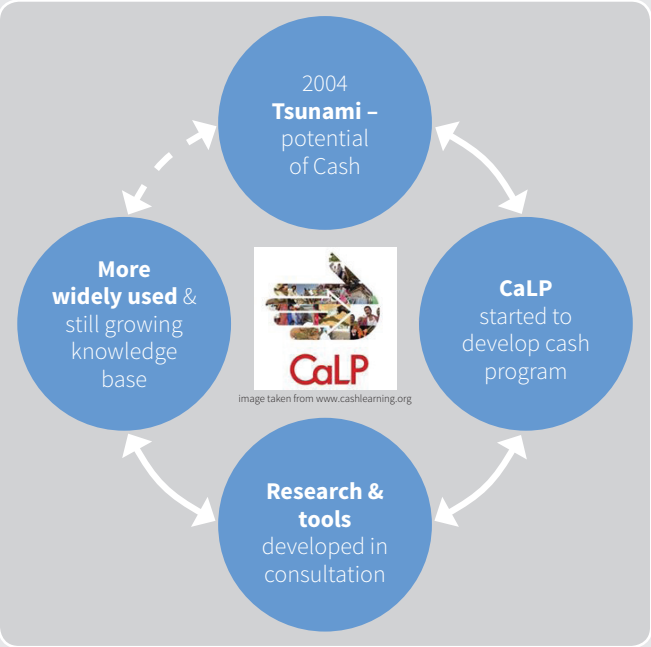

Figure 3: The Innovation process for CaLP

- **acknowledges the changes in the nature of food as a global commodity.**[vi] Food surpluses are declining the North, even as recognition grows that food insecurity is often linked to a lack of access to markets and not necessarily a shortage of food.

Cash-based responses also expanded rapidly due to the financial downturn, as donors and organizations look for cost effective options. Cash delivery has also been enhanced through existing and emerging technologies, primarily mobile phones and cash transfer cards.

Another enabling factor has been the consensus that learning should be shared among the small pool of practitioners and like-minded organizations. CaLP has demonstrated that partnerships focused on research and guidance can provide accountability and best practices from early in the evolution of a new concept. Buy-in from agencies is helped by the fact that the steering committee is made up of humanitarian organizations.

New approaches can test the skills and expertise of existing staff, while conversations tend to focus on managing the delivery of cash, rather than assessing the impact of the

responses. Centralized resources such as CaLP help address these issues, and there is more potential for collaboration beyond traditional humanitarian actors to incorporate new skills and lessons into design and development.

4) Digital Humanitarian Network

Academics, small start-ups, and a large public volunteer base with coding, mapping or other skills are developing internet and communication-based technologies (ICT) specifically for humanitarian work. Supporting development of ICT in emergencies, the Digital Humanitarian Network (DHN)[vii] is a volunteer network of almost 20 organizations that provide skills and digital services in emergency settings, such as using data from social media to identify the immediate needs of communities. Information sharing through new technology and networks is also becoming more common among humanitarian organizations, such as the Humanitarian Genome project,[viii] which is developing a search engine for evaluations and best practices to strengthen emergency response.

The DHN aims to be a "consortium of Volunteer & Technical Communities (V&TCs) and to provide an interface between formal, professional humanitarian organizations and informal yet skilled-and-agile volunteer & technical networks."[ix] Members specialize in services ranging from mapping to translation, contributing to data capture and analysis for humanitarian response.

Background

The recent UN OCHA report on Humanitarianism in the Network Age (HINA) covers the key discussions and insights regarding technology and process innovations affecting humanitarian work in the field. The most notable point made by this report concerns the opportunity to enable two-way communication with affected populations and to engage them in making decisions and finding solutions. The report makes four key points:

- Information is a basic need in humanitarian response.
- How humanitarian information is collected, shared, and analyzed needs to change fundamentally.
- There is a need for new capacities and ways of thinking to understand and use new information sources.
- New technologies bring new risks, and humanitarians need to develop guidelines to ensure that information is used in an ethical and secure manner.

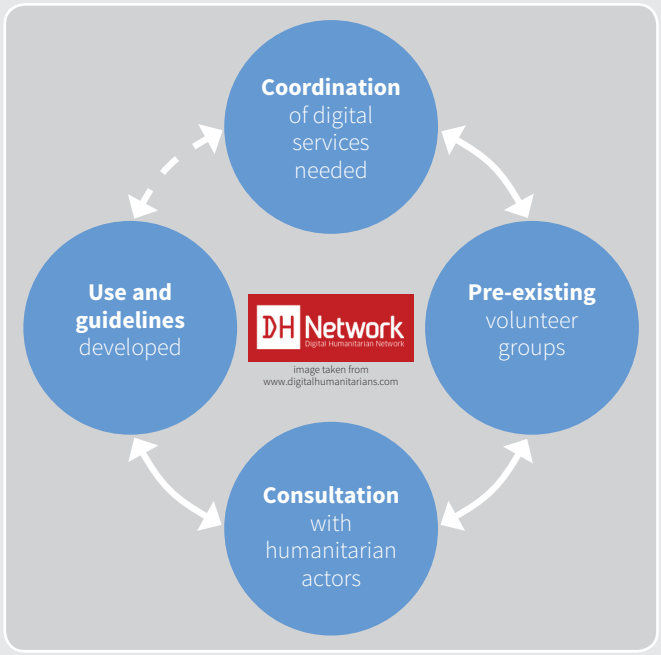

Figure 4: The innovation process for the Digital Humanitarian Network

Mobile phone technology has become cheaper and more available, accounting for a rise in subscriptions to an estimated 95.5% of the world's population, with an estimated 3 billion actual users by the end of 2014.[x] Innovations have piggybacked onto this technology, expanding access to information and communication for humanitarian agencies, affected populations and other stakeholders during a response. Research into a vast range of mobile product and process innovation includes development of mobile health diagnosis and treatment, and new ideas for water point monitoring and distribution. The use of SMS and mobile networks has already shown success for money transfer and capture of mass data that can be fed into online social media and data analysis.

Reflections on the process

The story of the DHN shows the importance of individuals as drivers of innovations and ideas. Innovation thinkers Andrej Verity (OCHA) and Patrick Meier founded the network.

>>

Another lesson can be found in the HINA report's emphasis on the importance of "connecting raw data to analysis and then analysis to decision makers." Although the DHN can provide capture and analysis of some of the vast amount of publically available data, good decisions still have to be made about what information to use and what to do with the results.

Finally, because humanitarian responses experiment with public and crowdsourced data, the humanitarian community should formulate clear guidelines of how the data can be used. Humanitarians need to reflect on the purpose of that data in particular contexts, and how to engage the populations providing the data. Like many innovations in the humanitarian sector, new and emerging ideas in data analytics should not be seen as a panacea, but appropriately applied where they can have the greatest impact.

5) Implications for humanitarian innovation

Drawing on these examples, a number of observations emerge that may inspire further discussion on humanitarian innovation in practice:

- Key individuals play a vital role in pushing new ideas.
- Collaborative innovation needs to be timely to capture interest and funding opportunities.
- Researchers and entrepreneurs from outside the traditional humanitarian agencies benefit from collaborating with end-users and agencies to define problem statements and designs.
- Existing relationships with partners and the community help obtain buy-in and diffusion.
- Creating solutions that fit into, use, and support local systems and markets may scale faster and more sustainably.
- Positioning a new idea within a wider ecosystem of humanitarian innovation increases opportunities and resources.

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[i] Potters for Peace factory locations, available online at http://pottersforpeace.com/filter-map/

[ii] "Disasters: Rapid response network ready if crises hit", May 2012, available online at https://www.gov.uk/government/news/disasters-rapid-response-network-ready-if-crises-hit

[iii] UNICEF, Promotion of household water treatment and safe storage in UNICEF WASH programmes, 2008, available at http://www.unicef.org/wash/files/Scaling_up_HWTS_Jan_25th_with_comments.pdf

[iv] WHO, 2009, Scaling Up Household Water Treatment Among Low-Income Populations, available online at http://whqlibdoc.who.int/hq/2009/WHO_HSE_WSH_09.02_eng.pdf

[v] "Lifesaver: Tales From The Inventor", available online at http://inventionstories.com/invention_stories/invention_stories/tales_from_the_inventor/lifesaver/

[vi] See Norad, "We Accept Cash: Mapping Study on the Use of Cash Transfers in Humanitarian, Recovery and Transitional Response", 2011, available online at http://www.norad.no/en/tools-and-publications/publications/publication?key=380278

[vii] See http://digitalhumanitarians.com/

[viii] "The Humanitarian Genome (HG): Generating Organizational Wisdom", available online at http://www.humanitarianinnovation.org/projects/small/humanitarian-genome

[ix] Digital Humanitarian Network website http://digitalhumanitarians.com/about

[x] International Telecommunication Union, "The World in 2014 ICT: Facts and Figures", April 2014, available online at http://www.itu.int/en/ITU-D/Statistics/Documents/facts/ICTFactsFigures2014-e.pdf

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The two worlds of humanitarian innovation

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Contents

List of abbreviations

ALNAP	Active Learning Network for Accountability and Performance
BOP	Bottom of the pyramid
CIYOTA	COBURWAS International Youth Organization to Transform Africa
CLTS	Community-led total sanitation
ICT	Information and communications technology
OCHA	Office for the Coordination of Humanitarian Affairs
UNHCR	Office of the United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
WFP	World Food Program

Glossary

Jugaad (Hindi)	Indigenous innovation

1 Introduction

A constant challenge for humanitarian actors is how to meaningfully include and adequately consult so-called beneficiary populations. At all stages of humanitarian action, there is a tendency for solutions to be brought 'from the outside', with accountability channels directed primarily to donors rather than beneficiaries. Yet, as has been increasingly recognised, the people in need of protection, the communities themselves, frequently have skills, talents and networks that enable them to adapt and innovate in the face of humanitarian crisis. However, the humanitarian system as a whole has historically struggled to recognise and embrace the potential for more participatory and inclusive approaches, whether at the emergency, protracted crisis or recovery phases.

In recent years, discussions of 'humanitarian innovation' have emerged as a way of potentially transforming humanitarian practice. A range of humanitarian international organisations (e.g. UNICEF, UNHCR, WFP and OCHA) and NGOs (e.g. Save the Children, HIF and ALNAP) have embraced 'the innovation turn'. However, a significant proportion of existing approaches to humanitarian innovation have focused mainly on a 'top-down' approach, designing solutions that can improve organisational responses within the humanitarian context. This approach is valuable and offers opportunities to re-think responses across the range of sub-sectors that comprise humanitarianism. However, it is not the only way to approach humanitarian innovation. Alternatively, this paper argues, there is a different and complementary approach to humanitarian innovation that can be grounded in community participation, engaging the skills, talents and aspirations of so-called beneficiary populations.

These two worlds of humanitarian innovation are described in this paper as the following: one which falls solely into the institutionalised practice of a small number of humanitarian actors, and which focuses on upwards accountability to donors and traditionally takes a more 'top-down' approach in implementing solutions for affected populations; and another which fosters and builds on the existing innovative capabilities and systems of local communities. There is currently little attention given to the latter 'bottom-up' world of humanitarian innovation, whereas there appears to be a heavy focus on the world where innovation serves as a tool to solve institutionalised management issues faced by international actors. In order to address this potentially expanding gap in the understanding and practice of humanitarian innovation, this paper seeks to build new concepts in order to understand 'bottom-up' humanitarian innovation and look for ways forward as to how the two worlds can be brought closer together, addressing the challenge of finding opportunities for self-reliance amongst crisis-affected populations.

Developing a bottom-up approach to innovation is important for a number of reasons. Solutions are more likely to be appropriate and accepted by local communities. This approach can foster sustainable solutions based on self-reliance. It can also contribute to greater accountability to beneficiaries. Yet, in order to be analytically meaningful, the notion of bottom-up innovation needs conceptual work. What exactly does bottom-up innovation mean? In this paper, the concept of bottom-up humanitarian innovation is developed by drawing upon and integrating three core bodies of literature: innovation theory, design theory and participatory approaches to development.

First, innovation theory covers many disciplines and has had most attention in the form of 'innovation management studies', where innovation processes and models are described for

application in large scale business operations (for example (Tidd and Bessant 2009). Innovation theory, however, also offers concepts of 'social innovation', 'user innovation', 'reverse innovation' and 'indigenous innovation', which all make use of existing local systems and innovation from the ground up. A clear gap from this first area of analysis shows that the general understanding of what drives 'user' or 'indigenous' innovation is very weak. Little research has been done to understand how local innovation naturally occurs or may be facilitated in order to contribute to sustained livelihoods and opportunities.

Second, although design theory traditionally looks at the initial design of a product, a variety of new approaches demonstrate that design practice is no longer confined to product or process design at the start of an initiative. Design is now seen as a process which is integrated from the start through to implementation of a range of products, services and processes. Design theories have therefore begun to overlap with some innovation thinking, iterating and adapting a solution over time. Specific design approaches however, do diverge from innovation thinking and offer new insights on how to include users and local systems in designs led by external actors. 'Design thinking' (Brown 2009), as one theory, offers a holistic methodology to combine skills from multidisciplinary teams and to consider local systems in the design of a whole process. Design approaches are not well diffused into humanitarian work, but there are lessons which could help initiatives to acknowledge local systems more methodically than is currently practised.

Third, participatory approaches to development have been developed over the last thirty years to include communities in projects implemented by external actors (Brock and Pettit 2007, Chambers 2007, Hickey and Mohan 2004). Participatory approaches come in many forms, from self-help groups to community mapping workshops and are often facilitated exercises. In the literature, participation is the subject of a wide range of critical reflection (Cooke and Kothari 2001), offering an opportunity to reflect on how people's own ideas, problem-solving skills and decision-making can best be facilitated by external actors.

By drawing upon these three bodies of literature, the challenges of bottom-up humanitarian innovation can be better understood. However, individually and collectively they nevertheless leave considerable conceptual gaps. This paper therefore uses the lessons and gaps identified across these literatures to begin to flesh out an applied research framework, which seeks to capture examples and data for how humanitarian innovation may occur from the bottom-up, and therefore lead to an informed understanding and use in practice.

The framework to research humanitarian innovation from the bottom-up is intended to inform humanitarian policy and practice in considering local solutions and systems as the basis for any intervention. The framework provides a structured way to consider what humanitarian innovation can offer to overcome the challenges of inclusion, participation and fostering self-reliance amongst communities during, and for the many years following, a humanitarian crisis. This research therefore aims to create a space where the two worlds of humanitarian innovation can come together with a shared purpose that puts local systems and capacities at its core.

2 Humanitarian innovation so far

Innovation thinking cuts across many disciplines, ranging from policy and national strategies, to management studies, theories for business start-ups, individuals and local markets. The interpretation of humanitarian innovation has therefore evolved from many years of innovation theory and practice across multiple sectors and thinkers. 'Novation is a term that first appeared in law in the thirteenth century' (Godin 2008) and as a concept has moved from being defined as 'imitation' to 'invention' and now to 'innovation', (Godin 2008) each demonstrating the concept of a new idea being scaled up over time. Despite these early definitions however, literary theories on innovation were not documented until the late 1800's when Gabriel Tarde developed theories of diffusion: the way in which ideas are widely taken up by people. Tarde believed that in order to achieve social change, ideas must be replicated and adapted across societies (Kinnunen 1996).

Diffusion and innovation studies are not explicitly defined in one academic discipline but have emerged as theories which cut across a variety of studies and industrial sectors (J.Fagerberg 2005). Tarde's initial work on the diffusion of innovations was inspired by the physical sciences for use in social theories of change (Kinnunen 1996), whereby 'major social change in societies or cultures requires penetration of inventions. They are infrequent products of genius […] Innovations change the course of social phenomena and help people to adapt to their changing environment'. (Kinnunen 1996:433)

The early work on diffusion theories continued to be developed at a small scale but were more famously picked up again much later by Rogers in the 1960s, when he developed diffusion and innovation theory further (Rogers 1962, Rogers 1971). The concepts and models developed by Rogers are still widely used today. For example Rogers' S-Curve in diffusion theory is used in management thinking by individuals and organisations to help analyse the rate at which new innovations will be adopted within society over time. The bell curve below shows that innovators, followed by early adopters and then the early majority are the types of people who take on new innovations first. Over time this can be translated into an S-Curve (shown in the lighter shade below), highlighting how much of the innovations market share is achieved over time.

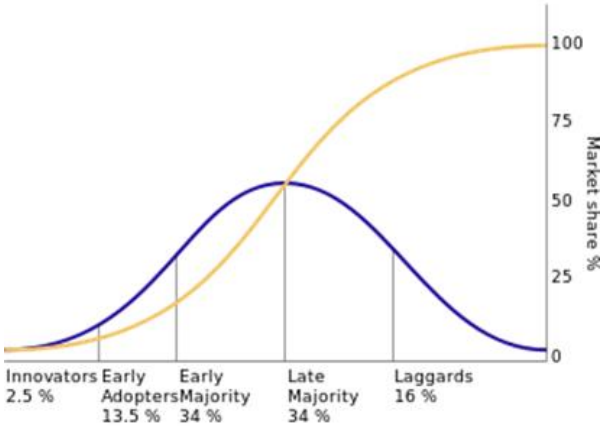

Figure 1: Rogers' adoption/innovation cycle showing adoption of an innovation over time, by different groups in society

Note on wider use of diffusion theory in humanitarianism: The concept of diffusion has also been taken into the emerging humanitarian innovation discussions (HIF 2012) to try and think about the way in which innovations diffuse amongst humanitarian agencies. Additionally, for small scale rural farming in Ghana and Cameroon, one study showed that the S-Curve holds true for the adoption of new farming equipment in the local market (Yengoh et al. 2009). The concepts and analysis of the adoption of innovations in developing countries has not received much attention, but has been used to try and understand the social influences on people's decision making and reasons for adoption (Burt 1973, Banerjee 2012). Adoption of innovations at this local scale has focused on communications, social influence and networks (Burt 1973, Rogers 1971).

Beyond diffusion theories, which have their roots in sociology, innovation management concepts define innovation as a process that goes from problem identification to development to adaption and then, finally, to diffusion of the product or process. These concepts have focused on innovation for businesses, predominantly in the global private sector. There has been no shortage of these models and concepts developed in management theory, which are widely used to influence practice in creating competitive advantage and to help businesses build and maintain a profitable space in the global market (Kim and Nelson 2000, Rogers 2003, Morel-Guimaraes et al. 2005, Kelley 2005, Tidd and Bessant 2009, Fitzgerald et al. 2010, Wojcicki 2011). The diagram below shows one of these models which demonstrates a simplified process of innovation (Tidd and Bessant 2009). This is used to introduce the concept of the innovation process: searching, selecting, implementing and capturing benefits.

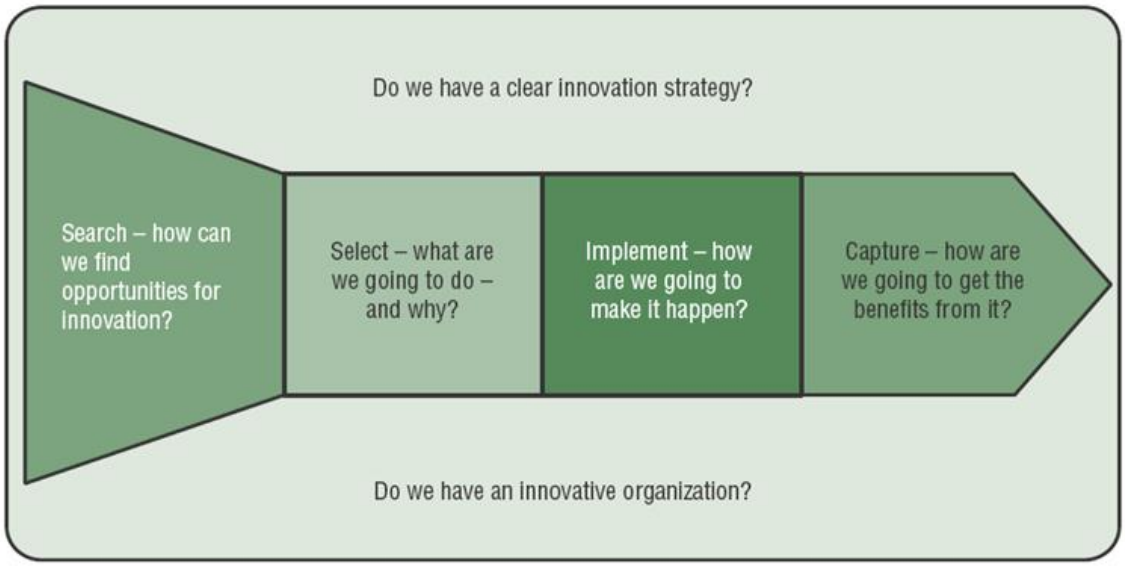

Figure 2: Simplified model of the innovation process, Tidd and Bessant 2009

However, Tidd and Bessant also discuss that a simplified view of innovation risks being taken only as a 'partial' view, since the innovation process is more complicated; it can also be incremental over time, adapted by different people, and more importantly introduces change as part of a wider system, not a 'single isolated change'. There is a significant amount of resources, such as those discussed above, on how to categorise and manage innovation within

large organisations or how to enhance an individuals' capacity to innovate for them. Innovating as a business start-up and for entrepreneurial activity is also currently a common application of these ideas. 'Risk', 'starting small', creating 'safe spaces to fail', and staying 'lean' are all terms associated with innovation since they encourage an iterative learning process that is needed to create, adapt and scale an idea. Learning takes place at each stage from the initial opportunity or problem, to piloting and then to implementation, and finally, to the ideas being scaled up by diffusion into new locations or markets. Concepts such as these have more recently been taken into new sectors, beyond their traditional use within firms.

Innovation beyond the private sector

'Social innovation' is one such concept, which has evolved from traditional innovation management theories, and is explored in more detail later in this paper. To summarise, the concepts used in social innovation build on the wider innovation process whilst focusing on social change. Social innovation, in whichever sector, emphasises the focus on society in both its intended impact and in its process (Mulgan 2007, Brown and Wyatt 2010, Mumford 2002). Socially-orientated innovations for national and regional developmental issues have also been used to inform country strategies. Innovation metrics at a national and regional level are denoted by a variety of development indicators. *The Innovation for Development Report* (Lopez-Claros 2010) uses five pillars of measurement: institutional environment; human capital, training and social exclusion; regulatory framework; research and development; and the adoption and use of information and communication technologies. The Global Innovation Index (INSEAD 2012) takes similar measurement categories, defining inputs (institutions, human capital and research, market sophistication, and business sophistication) and outputs (knowledge and technology outputs, and creative outputs). The Organisation for Economic Co-operation and Development (OECD) holds that for innovation at the national and regional levels:

> *[t]he current measurement framework fails to measure the social impacts of innovation. The development of measures that provide an assessment of the impact of innovations on well-being, or their contributions to achieving social goals, needs to be promoted. This includes better measurement of the people dimension of innovation. (OECD 2010b)*

This demonstrates that although innovation is now reaching beyond commercial incentives there is concern over how to include wider social measures, beyond traditional economic indicators. The inclusion of social measures is especially poorly documented for informal markets, micro enterprises and innovation at a local level.

Humanitarian innovation

Drawing upon a variety of existing theories (including that of social innovation), innovation has recently been developed as a concept for humanitarian action at an operational level (Ramalingam et al. 2009b, Steed 2010, DFID 2012). Although the term 'innovation' has been used to describe new products, project approaches and systems in international aid, the innovation concepts themselves have not been widely unpacked, adapted or standardised in practice or thinking for humanitarianism. 'Humanitarian innovation' therefore remains poorly understood within many international debates.

The limited amount of literature produced so far on humanitarian innovation has had a focus on innovation processes and practices specific to humanitarian agencies. In response to the Humanitarian Emergency Response Review (HERR 2011), the Department for International

Development (DFID) has adopted innovation as a central theme in its recent strategy, to guide some of its principles for doing things differently and piloting new approaches to humanitarianism (DFID 2012). This use of 'innovation' adopts the term as a creative way to encourage new partnerships and approaches, but does not define in detail its use or meaning. Ramalingam et al. (2009b) explore innovation theories a bit further by defining what is particular about its application to the humanitarian sector or by using case studies to analyse the innovation process within the humanitarian context.

Both within the humanitarian sector and in general innovation thinking, there has been a tendency to heavily focus on product innovations and physical technologies, where the 'innovation' label can be associated with a concrete material outcome (such as (AidEx 2012). In particular, many discussions of humanitarian innovation focus on product innovations, highlighting technologies such as the role of new information and communications technology (ICT) (see, for example, (OCHA 2013). However, this material view of innovation does not provide a complete or coherent perspective on humanitarian innovation. Innovation is not reducible to its product constituents. Instead it is best understood as a process: a lens for understanding incremental or transformative adaptation. A good example of this view of innovation as process is provided by the Humanitarian Innovation Fund (HIF), which provides grants for new humanitarian projects, and uses the innovation process shown below in Figure 3 (HIF 2010).

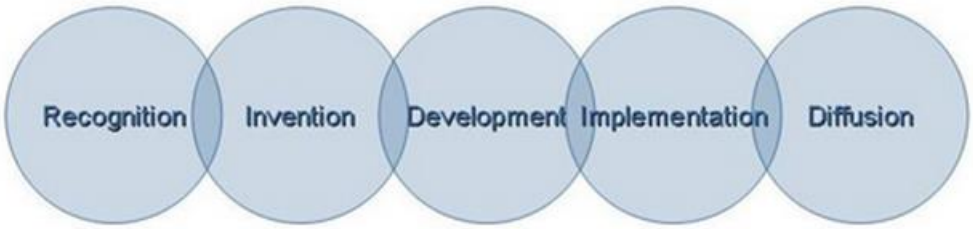

Figure 3: The innovation process as described by the Humanitarian Innovation Fund (HIF 2010)

Some approaches in which innovation initiatives have viewed innovation as a concept that goes beyond an exclusive focus on products attempt to look at innovation within the holistic context of the local market systems in which it takes place. For example, in its market-based approaches to development, the UK-based NGO, Practical Action, believes that '[i]nnovation cannot exist without markets, and markets cannot adapt and survive without innovation: they are two sides of the same coin.'(Practical Action 2013c). Here markets are seen as a central point for enabling individuals' livelihoods. In Practical Action's programmes, marginalised actors are supported to overcome the barriers to entering these markets, which in turn may contribute to wider local and national development. Although not always perceived as being solely in line with the concept of innovation, market-based approaches are widely used in development practice (SEEP 2013, Oxfam 2013), and are being further developed for first phase emergency response programming – which in itself may be considered a collaborative innovation process within the sector (Albu 2011, Barrett et al. 2009). Such approaches are highly relevant to innovation insofar as understanding that the broader market context in which adaptation takes place can contribute to unlocking sustainable and market-based solutions that may nevertheless have a social purpose (Mulgan 2007).

Despite its early stage of development, there are already some criticisms of innovation in the humanitarian arena. Some fear 'innovation' to be just a buzzword which agencies and management use blindly (Ramalingam 2013). Against such claims, though, Ramalingam (co-author of the chapter on Innovations for the 8th ALNAP Review (2009b)) suggests that if innovation is unpacked in more detail, as a process for understanding adaptation, it has potentially significant importance for humanitarian action (Ramalingam 2013) . Yet, realising the potential for innovation within humanitarianism first requires that we have a clear conceptual understanding of what innovation means.

Drawing upon the existing innovation literature, we view innovation as a process of change and adaptation. It describes a way to find solutions to problems and scale them, whether through products, processes or wider business models based on four stages. The stages are: 1) defining a problem or identifying an opportunity; 2) finding potential solutions; 3) testing, adapting and implementing a solution, and 4) appropriate scaling of the solution. The stages themselves are not linear and have feedback and learning at each stage. Figure 4 below shows this visually.

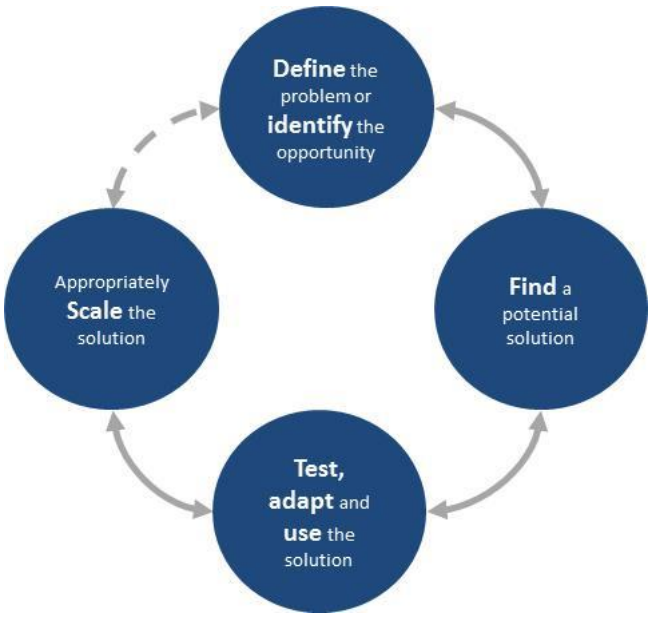

Figure 4: Innovation process used for the Humanitarian Innovation Project

This view of innovation as process enables barriers and opportunities to be identified at each of the four stages (Betts et al. 2012) It thereby opens up a perspective that can be used as a framework for both research and practice. It also provides a view that is inherently compatible with both top-down and bottom-up perspective, insofar as it enables any actor, whether an individual, group or institution, to participate within the stages of the process. It is this model that will therefore be the basis for the bottom-up innovation framework outlined later in this paper.

As this review of humanitarian innovation has shown, thinking and practice around how best to use and enhance innovation for improved humanitarian action is just starting to emerge. At this pivotal stage, this paper presents a way forward for humanitarian innovation, which captures the core thinking so far and challenges it to look closer at the innovation led by the affected populations that the humanitarian sector seeks to serve.

3 The two worlds of humanitarian innovation

An emerging discussion about humanitarian innovation has so far drawn mainly on the traditional understanding and models taken from innovation management theory. This new way of thinking may offer humanitarian actors a fresh perspective on their existing internal procedures and methods of managing programmes in complex environments. However, the application of innovation to address humanitarian and development concerns is relatively new. As its application evolves, there is a risk that innovation for humanitarian approaches will remain focused on improving internal standards and procedures for humanitarian agencies, and thereby miss the opportunity to also draw upon and foster existing innovation that is thriving within affected communities, affected populations and the 'global South', for example. Below we will begin to unpack the concept of 'bottom-up' humanitarian innovation, which puts local capacity and systems at its heart.

So what does the current humanitarian innovation dialogue tell us about the differences between these approaches? Firstly, although Ramalingam et al.'s (2009b) recommendations focus on the humanitarian agency as a key actor in the humanitarian sphere, the paper also includes recommendations to partner with actors from 'outside the sector' and that 'the innovations agenda should have as its guiding light the idea of a paradigmatic shift in attitude, enabled by the principles of disaster prevention, local ownership and beneficiary engagement.' (Ramalingam et al. 2009b:81)

'Local ownership and partnership and beneficiary participation' are underlying principles for humanitarian agencies. However, it is widely recognised that these principles are rarely executed in humanitarian and development interventions, and the ideologies which are documented struggle to come to the fore (Cornwall 2002, Byrne and Groupe Urgence Réhabilitation Développement 2003, Ramalingam et al. 2009b, Chambers 2012). Ramalingam et al. describe the requirement for gaining knowledge and experience from 'users' in order to innovate:

> *Helping people affected by a humanitarian crisis to find innovative ways in which they can help themselves is a core task for aid workers. The boundaries between a humanitarian 'firm' and its 'users' therefore should be an extremely porous one. Aid organisations give at least lip-service to notions such as 'paying attention to the views of all stakeholders' and 'involving end-users at all stages' in the design and delivery of programmes…[and] although innovations have stemmed from re-thinking the relationship between aid agencies and the recipients of aid, the recipients themselves have not been active in these changes. (Ramalingam et al. 2009b)*

It is these two worlds of the 'firm' and 'users' which we intend to describe further. The traditional 'top-down' world of humanitarian innovation may include new ideas and products that have been used in previous crises, but stories of product misuse or poor adoption of externally implemented initiatives are commonly found. In recent fieldwork as part of the Humanitarian Innovation Project (HIP 2012) in the refugee settlements of Uganda, many refugees interviewed explained that NGO interventions did not always identify their most pressing problems and therefore determine solutions. As an example, many externally distributed mosquito nets were instead used as rope in the construction of houses, since 'the same people get many nets', one refugee explained. This one story represents how 'users' may not have been involved 'at all stages'. One explanation for situations such as these may be that

there is often little time and funding allocated in NGO projects to test and adapt a solution appropriately, as is required in a process of innovation.

The struggle between these two worlds is most notable when observing the gaps between theory and practice. Theories of community inclusion are documented in principles, values and guidelines (for example *The Code of Conduct for the International Red Cross and Red Crescent Movement and Non-Governmental Organizations (NGOs) in Disaster Relief* (IFRC and ICRC 1994)). However 'humanitarian interventions have historically been top-down in nature' (Proudlock and Ramalingam 2008). This has been a topic of discussion for many types of intervention and particularly in reviewing the methods of evaluation in projects to understand the impact of humanitarian aid, where 'participation by affected populations has not been a key feature of impact assessments' (Proudlock and Ramalingam 2008). This discussion also includes the question of who the evaluation or extracted information is for. Too often, evaluation is undertaken simply to satisfy agencies and donors, rather than to improve outcomes for the targeted population (Proudlock and Ramalingam 2008). Using feedback from beneficiaries to account for impact and improve projects is a challenge for the wider social sector, and rarely prioritised. This is the opposite to the private sector, where meeting the needs of customers ensures that companies stay in business.

> *In business, companies often receive a prompt wake-up call when they don't listen to their customers… In the social sector, however, we may not get timely notice if we ignore our beneficiaries. Beneficiaries have few choices. They frequently accept a flawed intervention rather than no help at all. (Twersky et al. 2013)*

The Listening Project (M.B.Anderson et al. 2012) is one initiative that tries to adopt a more bottom-up perspective in the humanitarian and development sectors, in which over 6,000 recipients, observers or providers of aid were interviewed. The project argues that:

> *If we did nothing else to improve the aid system, the very act of adding occasions and opportunities for aid providers to listen to people with whom we work, and to let them know that their ideas and judgments are valued, would by itself bring a fundamental shift in the relationship of aid providers with aid recipients. It would address the current of cynicism we hear and transform the sense of disrespect that lies at the heart of much of the disappointment with, and resentment of, aid's impacts. Listening is a value. (M.B.Anderson et al. 2012:146)*

As discussed, the underlying principles of people-centred, inclusive approaches are already crucial to humanitarian principles. However, more innovative approaches to inclusion are required to enable self-reliance and sustainable opportunities for local populations. Therefore, this paper now turns to three areas of theory in order to begin to build a framework for bottom-up innovation: innovation theories, design theories and participatory methods. These key areas focus on local innovation, 'user' perspectives and participation in the design, implementation, evaluation and diffusion of ideas and products. The paper then uses these perspectives to develop an approach to innovation that considers the cultural, social, economic and political drivers that define an individual's livelihood and customs, and thereby brings the two worlds of humanitarian innovation closer together.

4 Learning from innovation theory

The origins of the theory of innovation diffusion lie in a social context, whereas innovation theories are dominated by business and industrialised approaches with a focus on management practice and markets. However, there are lessons to be learned across the wide variety that innovation thinking offers. This section explores some key innovation themes that contribute to a bottom-up perspective. First of all this section looks at 'social innovation', followed by a focus on literature and practice in the context of 'user innovation'. The concepts of 'reverse innovation' and 'markets at the bottom of the pyramid' are then discussed, whereby innovations from the emerging markets in developing nations help to scale and drive innovations globally. Finally, the concept of 'indigenous innovation' is introduced. These themes do not focus on specific innovation models for management, but instead explore the interpretation and use of 'innovation' from a variety of sectoral perspectives.

Social innovation

'Social innovation' has many similarities to traditional management innovation in its processes. However, it instead takes social change – rather than profit-maximisation – as its main goal (Mulgan 2007, Murray et al. 2010). Social innovation has been described in relation to the work of different actors, including individuals, movements and organisations. Individuals are seen as innovators, whereas in movements, individuals carry the ideas but the movement takes centre stage to form a change. For organisations, innovation is aimed at efficiency and management. Mulgan (2007), though, describes social change as being wider than these individuals or institutions and he highlights barriers that may prevent such social change from occurring. These include too much focus on efficiency, clouding social reform potential; variation in people's interests and priorities; people's pre-existing 'assumptions, values and norms'; and, finally, managing relationships between the people who shape change.

For social innovation, 'the role of the customer changes from a passive to an active player: to a producer in their own right' (Murray et al. 2010), and there is an emphasis on collaboration and a 'creative blending of ideas from multiple sources' (Murray et al. 2010). Social innovation 'as people focused innovation' (IICD 2013) is practised by the International Institute for Communication and Development (IICD), for example, using 'participatory, multi-stakeholder approaches to seek innovative ways to use ICT' rather than seeing technological approaches as a solution to development in their own right. Many other examples of methods in social innovation are outlined in *The Book of Open Social Innovation* (Murray et al. 2010), and networks have been established to develop a practice and build knowledge networks for social innovation (i.e.SIX 2013).

In their work, Murray et al (2010) take social innovation to describe six steps of the innovation process as shown in the diagram below. In comparison to the traditional innovation processes, additional steps of 'sustainability' and 'systematic change' are added.

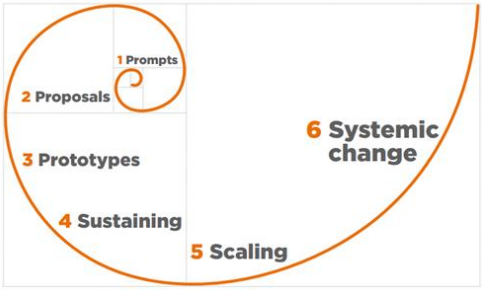

Figure 5: Taken from *The Open Book of Social Innovation (Murray et al. 2010)*

For the later stages in this process of social innovation, the scaling and systematic change require 'effective demand' and 'capacity to grow' (Mulgan 2007). It is also thought that for stages of growth, the innovation 'nearly always involves outgrowing founders' (Mulgan 2007). This implies that there is a need for flexibility and a variety of skills over time for innovations to scale up. The social innovation approach also emphasises the importance of the networks and 'linkages' that connect individuals, ideas, money and power, which can maximise the collective impact of diverse skill sets. The overarching motivation behind social innovation is to bring innovation theory closer to a bottom-up approach by more fully considering the social impact and importance of the 'customer'. However social interventions are still open to critiques of adopting 'top-down' approaches if they are not implemented with users at the core, and the challenge of measuring social impact is still unsolved in these new concepts of social innovation. This leads us to look closer at the concept of 'user innovation' in the next section.

User innovation

'User innovation' is acknowledged to be an important part of maintaining organisational 'edge'. It recognises that the observation of users and the their involvement in innovating new ideas within organisations is needed (Tidd and Bessant 2009). Consumers are no longer seen as passive users, but are understood to actively adapt innovations (Rogers 2003). Von Hippel defines 'lead users' as selected users who inform innovation (Hippel 2005). A toolkit has been produced to guide organisations on getting the most out of lead users (Von Hippel and Katz 2002). However, the collection *Perspectives on User Innovation* draws from a wider variety of stories and sectors (Flowers and Henwood 2010) which demonstrate that there is not yet a standard definition or view on innovation led by the end-users of new products or services. Users are becoming more and more integrated into innovation systems and processes, and may interact with innovations in different ways, creating innovations, modifying or even resisting 'official' innovations (Flowers and Henwood 2010). According to Flowers and Henwood:

> *…the boundary between producers and consumers of technologies has become less distinct and users play important roles throughout the entire innovation process, potentially developing or extending technologies or applying them in entirely novel and unexpected ways. (Flowers and Henwood 2010:3)*

Flowers and Henwood describe how different approaches to innovation in literature perceive the role of the user. They explain that in innovation studies, the supply side is a central focus, maintaining users as 'customers' or 'contributors' and in some cases rejecting users in the innovation process. However, in science and technology theories the users are seen as being

integrated into the whole process as active shapers, and within innovation management users are seen to help develop growth for the business.

Active user innovation has been accelerated by developments in ICT. For example, software platforms are increasingly adapted or used to suit local contexts (Bilgram et al. 2010, Hyysalo and Stewart 2010, von Hippel 2009). Open source applications and software provide an opportunity for innovation to take place at all levels, by individuals, entrepreneurs, small to global businesses, informal and formal private sectors, and within NGOs and governments. Open innovation and crowd sourcing online platforms offer a virtual meeting space within which ideas can be collaboratively suggested and developed by an online community (Bingham 2011).

End-users are becoming more and more involved in innovation, although it is recognised that barriers exist to users fully cooperating in the innovation process led by organisations, and these need to be understood in more detail (Braun and Herstatt 2009). We should learn how these challenges to user innovation can be overcome to put users at the centre of any contextual analysis before external innovations are assumed to provide the best solutions locally. Moving on to another perspective of innovation from a local level, by users, consumers or organisational employees, the following section looks at 'reverse innovation' and 'markets at the bottom of the pyramid'.

Reverse innovation and markets at the bottom of the pyramid

Innovation, as we have discussed so far, may be inspired in many ways. Govindarajan and Trimble (Govindarajan and Trimble 2012) view 'bottom of the pyramid' (BOP) markets as one of the greatest potential sources of growth and innovation for businesses. The BOP market is defined as the majority of the world living in developing countries, estimated to be made up of over four billion potential consumers (Prahalad 2012), where these people are not traditionally targeted for consumer products by global businesses. The concept of 'reverse innovation' builds on this to highlight how innovation in these emerging markets happens and can provide opportunities for innovation that can subsequently be applied even in developed economies (Govindarajan and Trimble 2012).

Five gaps between the needs of 'emerging economies' and the 'rich world' are identified by Govindarajan and Trimble, demonstrating that innovations from the 'rich world' are often not appropriate for the 'emerging economies' and that 'clean-slate innovation' needs to take place (Govindarajan and Trimble 2012). The five gaps which are identified are:

1. There is an acceptance of lower performance in products or services in emerging economies due to price;
2. There is limited infrastructure in poor countries;
3. Sustainability is more of a concern in emerging economies and they are therefore more likely to adopt environmentally sustainable products or services;
4. The regulatory systems are less developed in poor countries, so innovations may move faster in these markets; and
5. Each country has its own preferences and tastes.

Reverse innovation in action
Partners in Health pioneered an anthropological approach to understanding HIV patients in Haiti and Peru. By using community health workers to make home visits and to diagnose barriers to treatment within people lives, a 'clean slate solution' was developed. This approach proved to have a great impact on the wellbeing and treatment decisions made for patients. As an international organisation, with movements of staff between countries of operation and the United States, the idea was 'leveraged to other parts of the world' and diffused for use in the US where it also had an improved impact for patients (Govindarajan and Trimble 2012).

Despite these gaps, an emphasis is put on the fact that innovations from developing countries can 'flow uphill' and benefit the global economy, as they are adapted and scaled through global channels. Reverse innovation presents an opportunity to recognise potential in places not seen before, and create opportunities for marginalised market players and new potential consumers. The concept supports the idea that markets play an integral role in innovation at all levels and may aid scalability. This recognition of the relevance to innovation of BOP markets takes us beyond the existing innovation literature's narrow focus on 'rich' global markets.

The Fortune at the Bottom of the Pyramid (Prahalad 2006) paints a picture of these vast, untapped markets in the developing world. He argues that firms and global businesses should recognise the potential that the billions of people living in these markets have for new profits and global business growth. In one of Prahalad's last papers he described the potential this market has for business innovation. 'We have traditionally assumed that the focus of innovation is products and technologies for the developed markets' (Prahalad 2012:11) but the BOP markets demand wider thinking for 'developing an appropriate ecosystem that enables a new business system to function' (Prahalad 2012:11). The variety and unique contexts that BOPs present mean that there is no 'monolith' solution and that each solution must be specific to an industry and to a 'particular target within the BOP' (Prahalad 2012). Prahalad emphasises the focus on understanding the consumer, starting with 'deep immersion' into the lives of consumers. He presents the four A's to use in BOP markets which focus more on meeting customer needs, compared to traditional developed market approaches. The four A's are: creating *Awareness* for consumers in the BOP markets; enabling *Access*; ensuring that products and services are *Affordable*; and finally, a focus on *Availability* considering local distribution constraints.

Consequently, the BOP may be seen as a source of innovation, and certainly goes towards an improved understanding and design approach, which is better targeted at the consumer. However there are heated debates around the ethics and power controls present in this approach (SBS 2012, Dolan 2012). Prahalad claims that '[m]any global firms are increasingly using the BOP markets as a laboratory for innovation not only for the BOP markets but also for the established country markets' (Prahalad 2012:11). Furthermore, if it is believed that 'for global firms, active participation in BOP markets is not an option...[and] these markets are critical for their sustained profitable growth' (Prahalad 2012:12), then there is a risk that the consumer focus is not further developed and inappropriate products and services are introduced into markets with the potential to cause harm. One brief example of a BOP product introduction is the phenomenon of 'sachet marketing' (Trend Watching n.d.). By reviewing the economic activity of potential customers, Hindustan Lever was one of the first

to introduce small and affordable sachets of shampoo to emerging markets, where people's economic status did not previously allow them to purchase the traditional month's supply of shampoo in large bottles (Prahalad 2006). This form of marketing has been labelled as 'sachet marketing' and is prolific across several other products (i.e. coffee and cosmetics) globally, reaching the BOP through global distribution channels and local and informal traders. As mentioned above however, one concern is the unintended knock-on impact of product introductions such as these. For 'sachet marketing', the consumer focus has been central to its success and the demand seems to be present for the products in the local markets; however, due to the lack of waste and disposal infrastructure in many BOP markets the packaging waste produced by the sachets has in some cases caused a problem (Unilever 2013). The waste issue has been seen as an opportunity by Unilever to develop the product to use a lower volume of plastic in the packaging, and also partner more widely to find solutions to the problem locally and in an economically viable way. In this case a local recycling unit has been established which reclaims the oil from the plastic, which is then purchased by Unilever (Unilever 2013). Although in this one example the waste issue has been tackled, due to the vast diffusion of 'sachet marketing', there are many places where waste remains a local and unsolved challenge.

As the 'sachet marketing' example shows, partnerships in local markets appear to be a vital part of entry to BOP markets and for reverse innovation, through local traders and organisations, and in helping solve unexpected challenges. Unilever, Nokia and Nestle are a few companies working hard with BOP markets (Prahalad 2012), and for firms like these, '[c]ollaboration with NGOs, the public sector and distribution and logistics in hostile conditions are the qualities that will serve them well in becoming globally competitive' (Prahalad 2012:9).

An example of these collaborative and unique partnerships is a programme run in partnership between the NGO Care International and private sector companies. In this partnership, locally named Jita (Jita 2013), products from multi-national companies (such as Danone and Unilever) are supplied through local entrepreneur 'hub managers' who distribute products to saleswomen, who then sell the products door-to-door. These saleswomen are also trained to carry out health campaigns in rural communities in addition to their daily livelihoods activities. This is just one example which demonstrates ways in which global companies are moving beyond the corporate social responsibility (CSR) agenda and becoming increasingly involved in BOP market approaches collaboratively and for the mutual benefit of local markets and livelihoods. However, there are questions about the "'ethical and environmental implications of pursuing development through the increased consumption of consumer goods by some of the world's poorest communities' (SBS 2012), as well as the view that BOP market engagement and even partnerships with global businesses may be 'cynical marketing ploys' (SBS 2012). Dolan discusses how poor people may be 'actively converted into entrepreneurial subjects' (Dolan 2012) as NGOs and global companies propose material and traditional industrial approaches to BOP markets, conceived as a 'service to global brands' (Dolan 2012).

The fundamental incentives for BOP and reverse innovation appear to be predominantly motivated by global growth and further business development for the developed world. Innovation under this umbrella does not fully represent a complete understanding of the intricacies involved in local and bottom-up innovation. However, this perspective on innovation does offer exposure to and a focus on local innovations, leveraging local capacities and systems. Taking a closer look at the local innovations in their own right, away from the

global perspective, the final innovation section below examines the concept of 'indigenous innovation'.

Indigenous innovation

The term 'indigenous innovation' has no established definition. It is used sporadically to describe some processes of grass roots innovation. In India, *Jugaad* is the Hindi word used for indigenous innovation, described as the mindset of the innovator and the most economical way to solve a problem (Singh et al. 2011). So far, for indigenous innovations there is no exploration of how innovation occurs in an individual's livelihood activities or what processes, decisions and enablers surround those who carry out *Jugaad*. In national innovation strategies in India, indigenous innovation is recognised as an important source of innovation for the national economy and local markets (Mehta and Mokashi-Punekar 2008). There are also some views that see indigenous innovation in a similar way to BOP markets, and as a source from which to extract innovations that can benefit larger companies, again benefiting national economies on a macro scale (Mehta and Mokashi-Punekar 2008).

Exposure to indigenous innovation ideas is difficult to find internationally. Some initiatives and stories demonstrate the importance of enhancing this type of innovation. *The Boy who Harnessed the Wind* (Kamkwamba 2010) tells the story of a young Malawian boy, William, who read a book (donated to his village library) about wind turbines. William adapted what he learnt in the book to build a turbine from local materials for his family home, using the electricity to power lights and charge phones. Recognised by a foreign visitor, William was assisted in building a charity around his innovation and providing wind turbines and other renewable energy solutions more widely in his community. There are also some online examples which aim to share stories of entrepreneurship, innovation and learning amongst young communities in developing nations: Afrigadget is an online blog that publishes examples of product innovations from individuals across Africa (Afrigadget 2013), and *Young World Inventors* hosts video logs of business development (Young World Inventors 2013). Examples like these demonstrate the capabilities and innovations people produce for themselves, whilst sharing the knowledge and learning from the processes individuals have gone through to achieve change. Practical Action is an NGO which was formed out of the concepts of appropriate and intermediary technologies serving poor economies and is another group that successfully acknowledges local innovations. Practical Action focuses its work on exposing, developing and scaling technical innovations and knowledge on open online platforms (Practical Action 2013b). Many of these low-tech solutions have come from innovations by people living in communities and use locally available resources. Learning from these community and user perspectives in innovation highlights the importance of accepting existing practices and cultures, working with them, respecting them, maintaining two-way communication and, only if required, facilitating the creativity and problem solving that already exists.

Reflecting on innovation

This range of innovation examples clearly demonstrates that 'users' are an important part of any innovation. However, we can see that there is a gap in understanding the drivers for innovation amongst communities, users and customers. User innovation is observed and used by large businesses, but the indigenous innovation examples in their own right are few and need to be explored and understood in more detail. Some key points to extract from the innovation literature discussed are:

- More needs to be done to understand how 'user' and local innovation occurs;
- User focus is central to creating social change through innovation;
- Partnerships are important when working in local markets;
- There is a need for flexibility and a variety of skills over time for innovations to scale;
- Networks and 'linkages' are important for diversifying skills required in an innovation process;
- Facilitating and supporting local solutions can be shared openly to enable scaling.

The next section looks in more detail at how these 'user' perspectives have been captured in design theories and practice, to build even further on defining 'bottom-up' innovation.

5 Learning from design theory

As indicated previously in this paper, for humanitarian and development work, the targeted community groups are rarely involved in the design of the programmes (Proudlock and Ramalingam 2008). These shortfalls in integrating communities into the programme and product design may result in a lack of sensitivity for local practices and existing structures. As mentioned earlier, there is no shortage of examples of projects that have 'caused harm', not met the 'real need', been expensive and short lived; as a result of this, there is a lack of attention given to effectively involving 'users' in the design. Many of these examples are demonstrated through the Listening Project (M.B. Anderson et al. 2012). So what can design theories teach us about how projects may be thought out more thoroughly and designed to better suit existing practices and systems? Donaldson (2002) argues that for improved development initiatives, design practice can help achieve a user-centric approach from design to deployment, and also improve the on-going monitoring of programmes. In relation to product design there is also a recognised need for 'contextual information accounting' for humanitarianism (Campbell et al. 2005). Campbell et al. (2005) state that those 'equipped with methods and tools for contextual design will show a measurable improvement in contextual understanding of design problems outside their experience and expertise'. This section therefore explores what design theories may contribute to finding a more bottom-up approach to the innovation process in humanitarianism.

Practising a more integrated approach which includes 'beneficiaries' in humanitarian design can be difficult, but culture, context and social norms are an important element of defining problems, and therefore also in elaborating the design of any solution. This more holistic approach has been recognised by some practitioners with respect to product design in the developing world since the early 1970s. One example is found in the work of Schumacher (1973), where 'intermediate technologies' were defined as appropriately small-scale, low-tech solutions that were designed specifically to meet the cultural, systematic and material resource constraints of communities living in poverty. Schumacher was the founder of the NGO previously mentioned, Practical Action (formerly known as the Intermediate Technology Development Group), which started in 1966 and carries many of his values and practices in its current work. Practical Action, along with other international organisations such as International Development Enterprises (IDE), focuses on appropriate technical solutions to poverty and development. These organisations also focus on how basic and appropriate technologies can be taken into local markets, thereby creating lasting livelihood solutions for both users and market actors (Polak 2008, iDE 2013, Practical Action 2013c). Beyond these

examples (which are currently mainly focused on rural agricultural practice), approaches to improve technology or processes have not been extensively developed to capture design principles for wider humanitarian programmes.

It is here that we turn to design practices that are used outside the typical humanitarian and international development systems. 'Design for X', 'customer value chain analysis', 'participatory design', 'empathic design' and 'design thinking' and so on, are just some of the design approaches which do focus on incorporating end-user needs more fully into a design process. Some approaches go further in focusing on human and social elements for design practice and tackling some of these challenges faced in the humanitarian world, as described above. These design theories over recent years have evolved from a focus on product design at the start of a product innovation process to, more recently, a systems approach, where design for processes and services is considered at each stage of the innovation process. New approaches in design therefore obtain a deeper inclusion of the 'user' and relevant social elements in order to understand how products and processes fit into society. An overview of some of these approaches is given below:

- **'Design for X'** is an approach which aims to focus the design process on a specific function, 'X'. The objective is that by focusing on a specific function during the process of design, areas which are usually not acknowledged in the design process may be more clearly recognised. An example of this is 'design for manufacturing', focusing on design that enables efficient manufacturing and thereby minimising material waste, time and energy consumption, whilst still maintaining high product quality. Design for X may also cover many techniques that need to be considered concurrently (Huang 1996) in order to achieve its focus and design improvements. The purpose of this approach is to design products and services with wider context and considerations in mind and therefore result in a more integrated and effective solution. Design for X methodologies have looked at environmental constraints in order to try and address energy and climate issues, but have not explicitly covered many social elements. However, this broader approach to design does offer the opportunity to take culture and context-specific elements into consideration for the design of a product or process.

- **'Customer value chain analysis'** (Donaldson et al. 2006) assesses the whole supply chain of a product or service. The supply chain is analysed at each step from the creation of the raw material, through the manufacturing process and distribution to the end user and finally to disposal. By visually mapping the chain, the key stakeholders (such as manufacturers, suppliers, wholesalers and end-users) are each identified as 'customers' in the 'customer chain' map. Each 'customer' plays an important role in delivering the product or service, and therefore a better understanding of the relationships between them and the product, improving the design of the systems and items. An example of customer value chain analysis being used for an NGO programme is given below:

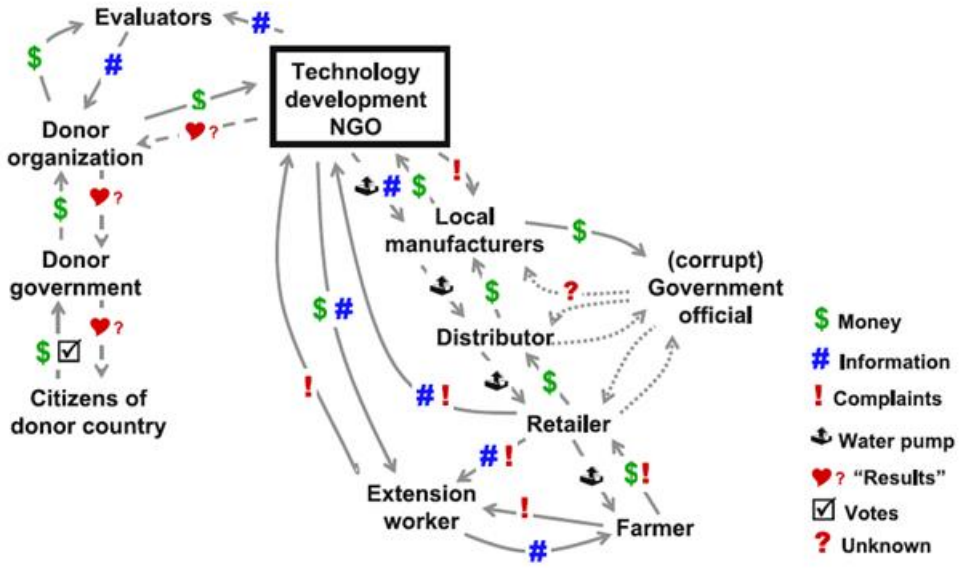

Figure 6: Customer value chain for micro-irrigation pump (Donaldson et al. 2006)

The example above shows the different relationships between the different 'customers' in the value chain of a micro-irrigation pump project by a local Kenyan NGO (Donaldson et al. 2006). The paper indicates that in this NGO example there are more customers than may be present in more commercial examples, and that there are two customer sets (one related to the donor and one to the end user). This method helped to identify the financial flows and allowed the NGO to set priority areas for sustainably exiting the programme. As a result, the water pump as a product has been successful but funding problems are still present for the programme to continue running.

- **'Participatory design'** may be defined as 'directly involving people in the co-design of the artefacts, processes and environments that shape their lives' (Simonsen and Robertson 2013 :2). For participatory design there must be 'mutual' learning for both the user and the designer. Users may interact with the designs through prototype models and mock-ups. Participatory design is most commonly used in the design of products and technologies, and has been used widely in the context of software development, which commonly emphasises the importance of customer inclusion in each stage of the design process (Schuler and Namioka 1993).

- **'Empathic design'** is a concept that has come about through the assumption that the user may not have the answers to create new ideas or be part of the innovation process when asked. Therefore this design method takes an empathic approach to try and understand the user through observation and testing of new products and services as part of the everyday lives of users (Leonard and Rayport 1997).

- **'Design thinking'** focuses on the process of design, bringing in multidisciplinary skills to understand the systems that users are a part of, designing not only services and products but the process in which they can be used and implemented (Brown 2009). Design thinking is a concept developed by Tim Brown, founder and CEO of IDEO (IDEO 2013) , and uses systems and flexible approaches to achieve 'human-centred design', believing that social elements and human focused approaches must play an integral role in design methods. The diagram below shows the stages of human-centred design: hear, create, deliver. Each stage is 'co-designed' with local people and users.

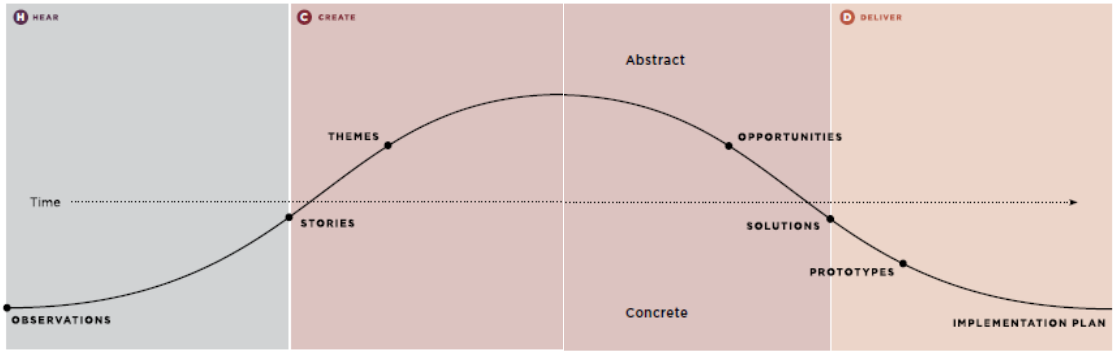

Figure 7: Human-centred design process (IDEO 2009)

Moving away from design focused on global business and technology development, the design thinking approach appears to offer some more nuanced elements for social change. It pulls in the vital human elements of design for not only products, but also systems and organisational models. Brown says that social change can be achieved through this type of design thinking (Brown 2009, Brown and Wyatt 2010). Design thinking is:

> *…a discipline that uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity. (Brown 2008)*

More recently, design thinking has been seen to overlap and compliment theories of social innovation (Brown 2009, Brown and Wyatt 2010). '[b]y working closely with the clients and consumers, design thinking allows high-impact solutions to bubble up from below rather than being imposed from the top' (Brown and Wyatt 2010). Brown discusses this process of design as a source for inspiring innovation. In fact, just as with innovation theories '[o]ne of the biggest impediments to adopting design thinking is simply fear of failure' (Brown and Wyatt 2010). A suggested remedy for this by using design thinking is described here:

> *The notion that there is nothing wrong with experimentation or failure, as long as they happen early and act as a source of learning, can be difficult to accept. But a vibrant design thinking culture will encourage prototyping—quick, cheap, and dirty—as part of the creative process and not just as a way of validating finished ideas. (Brown and Wyatt 2010)*

Browns approach to 'human-centred design' has driven the strategy of IDEO (of which Brown is currently CEO). His theory has evolved and been well defined, targeting social change through new design thinking (Brown 2009, Brown and Wyatt 2010). Design thinking is a 'radical form' of collaboration that blurs the lines between creators and consumers: 'us *with*

them' (Brown 2009). Social importance requires going beyond 'doing' design to collaborative 'thinking' involving specialist skills beyond solely those of traditional designers, seeking 'T-shaped' people who think about others:

> *The design thinking process is best thought of as a system of overlapping spaces rather than a sequence of orderly steps. There are three spaces to keep in mind: inspiration, ideation, and implementation. (Brown and Wyatt 2010)*

Intended to create a 'blend of bottom-up experimentation and guidance from above' where 'implementation is everything' and 'an experience must be as finely crafted and precision-engineered as any other product' (Brown 2009).

This approach has been used in collaboration with NGOs, social enterprises and foundations through IDEO.org since it was founded in 2011 (IDEO 2011). A project has been carried out with Water and Sanitation for the Urban Poor (WSUP) and Unilever, looking systematically at sanitation in Ghana. The project has explored latrine designs and market networks in order to design a system that can be used to extract and dispose of waste. The design involves local entrepreneurs in solutions in order for the system to be sustainable in the long term (WSUP et al. 2011a, WSUP et al. 2011b).

There seems to be little evidence that more user-centric approaches to design can have a negative impact. Some online opinions, however, have begun to challenge design thinking as a fashion buzzword and a distraction from management in large companies (Merholz 2009, Raford 2010). Additionally, Skibsted and Hansen (2011) argue that user-centric design techniques may lead to 'sameness' and stifle creativity in designs. They believe that consumers are led by brands, not the other way round, and that brand-led markets work more effectively. Even if this is the case, there is also evidence that user design and innovation is occurring by itself beyond the control of large businesses and organisations. This is particularly true in the ICT industry, as mentioned in the 'user innovation' section previously. Fast-moving ICT products and open source software are tools with which users can build and create new, and often marketable, solutions to a variety of challenges. As a result, there is a recognised gap in our understanding of what the drivers and mechanisms are by which users define designs and innovations for themselves (Schuler and Namioka 1993).

Reflecting on design

Overall, design theories are increasingly being integrated within innovation thinking, seeing design practice as a multi-disciplinary and user-focused approach that can enable the innovation process to be understood beyond just the introduction of a product. Having explored just a few areas of design theory, all of which build on the idea of taking a holistic approach to problem solving, some of the following key lessons may be taken forward for our attempts to develop a bottom-up perspective on humanitarian innovation:

- Improved design methods are required in humanitarianism;
- Taking a user / human-centred approach to designing interventions will yield more appropriate and sustainable solutions;
- Appropriate solutions can be defined or informed by users, and should be supplied by the local market;
- There are several methods and practices which could be used to help consider 'users' and 'customers' in the solution and its value chain;

- Multi-disciplined teams and a systems approach can help in the design of more 'human-centred' solutions;
- A deeper understanding of how users define solutions and innovations is required.

From these lessons there appears to be value in further understanding and exploring the use of some of the design techniques and practices for humanitarianism. However, there remains a need for a deeper understanding of how these ideas can be applied to the humanitarian context. Indeed, it is important to be aware that these perspectives alone do not entirely address concerns that problem definition and the selection of solutions may remain partly 'top-down', insofar as power imbalances between designers and users may still exist.

Despite this caution that design theories be used appropriately, there are important ways in which design theories can benefit humanitarian innovation. In particular, users do at least play a vital role in developing new ideas and multi-disciplinarily skills and user involvement is key to supporting new and appropriate solutions. The application of design thinking to development and humanitarian problems is relatively new; however, its approach encourages practice which is open to adaption and community participation. In order to build on this, the next section turns to literature on participatory approaches to development.

6 Learning from participation

Well-developed theories of participation in development are aimed at, and have been developed by, aid agencies and practitioners to ensure that interventions are as inclusive as possible of 'community' and 'local' ideas and contributions. Participation as a concept for development practice is believed to have been embedded into principles and understanding of development over the last few decades (Hickey and Mohan 2004), and with regard to humanitarian standards and guiding principles this also appears to be the case. One example of this is the *Code of Conduct for the International Red Cross and Red Crescent Movement and Non-Governmental Organizations (NGOs) in Disaster Relief*, which contains the notion of participation as one of its core and underlying principles:

> *Disaster response assistance should never be imposed upon the beneficiaries. Effective relief and lasting rehabilitation can best be achieved where the intended beneficiaries are involved in the design, management and implementation of the assistance programme. We will strive to achieve full community participation in our relief and rehabilitation programmes. (IFRC and ICRC 1994)*

Another example of participation being integral in principles and standards is demonstrated in a section on Core Standards presented by the Sphere Project, which claims that it is dedicated to guiding 'people-centred humanitarian response[s]' (Sphere Project 2011). Additionally, tThe *Humanitarian Charter and Minimum Standards in Humanitarian Response* states that:

> *…the affected population is at the centre of humanitarian action, and recognise that their active participation is essential to providing assistance in ways that best meet their needs, including those of vulnerable and socially excluded people. (Sphere Project 2011)*

Participation and inclusion of communities in humanitarian action, however, is thought to rarely be practised due 'restrictions on time, funding and expertise' (Byrne and URD 2003). Conversely, it is stated that 'there are very few situations where time pressure truly prevents a participatory approach from being adopted.' (ALNAP and URD n.d). Participatory approaches are in some cases considered to offer better links between humanitarian and development practice, as noted in Ntata's Sudan review, in which he compares both development and relief as being 'clashes' between 'insiders' and 'outsiders', and therefore 'top-down' in development corresponds to 'supply-driven' in relief whereas 'bottom-up' in the former corresponds to 'demand-driven' in the latter" (Ntata 1999). The critiques are embedded into practice, and:

> *…the principle of participation has too often been inflexibly 'proceduralized' within the approaches of aid agencies. After 'participating' in many assessments, meetings, and activities planned by aid providers, recipients often say they are disillusioned. (M.B.Anderson et al. 2012:125-6)*

The rest of this section will examine participation in practice followed by the main critiques of these approaches, and how we may move forward from the criticisms to learn from participatory approaches in informing the bottom-up approach to humanitarian innovation.

Participation in practice

Participatory approaches to development and humanitarian work have been adapted for practice in the form of a variety of participatory methods. Participatory methods as a way to implement participatory development thinking are an innovation in their own right. Evolving from practices in the 1970's, the adaptation of participatory methods, tools and guidelines has spread around the world over the last few decades. These methodologies '[a]ll frame and facilitate sequences of activities which empower participants to undertake their own appraisal or research and analysis, come to their own conclusions and take action'(Chambers 2007). A significant proportion of such participatory methods have been developed in the global South and by national NGOs.

The vast range of participatory methods cover many elements of development programming and research approaches, often using visualisation techniques, facilitating knowledge exchange and discussions amongst participants. Chambers demonstrates the evolution of participatory methods from 'participatory rural appraisal' (PRA) to 'participatory learning and action' (PLA), and then to a pluralism whereby adaptive learning must take place in order for participatory approaches to continue to be contextually appropriate (Chambers 2007). The adaptation of participatory methods has been considered to be undergoing the innovation process itself (Brock and Pettit 2007), where ideas and tools are adapted quickly whilst being taken to scale. Chambers supports the 'failing forwards and learning' mantra, which stemmed from participation discussions in the early 1990s. For PRA, it is vital to 'start, stumble, self-correct [and] share' (Chambers 2012), again partly imitating the stages of the innovation process.

A brief look at some of the participatory methods below begins to draw out examples of what participation means in practice.

- **Appreciative inquiry** has been adapted for development practice from management theory predominantly used in the private sector (Cooperrider and Whitney 2001) Whitney, 2010, (Watkins 2011). This method is intended to bring people together,

facilitating discussion for change and action. It seeks to draw out people's strengths and aspirations, taking a positive approach instead of focusing on the negative aspects and maintaining a problem focus that is often used in development projects, which typically demand outcomes and raise expectations (IISD 2000). Appreciative inquiry puts an emphasis on dreams and a way forward to help people make positive and progressive decisions.

- **Participatory market system development (PMSD)** is a method whereby a variety of market actors are brought together in a workshop. The workshop leads participants through a visual market mapping exercise and facilitates discussions which help the group to identify blockages in their local market channels. Solutions to the blockages are discussed and found as a group for collective action (Practical Action 2013a).

- **Communityled total sanitation (CLTS)** was a method developed in Bangladesh in 2000, and is now widely used amongst NGOs. CLTS facilitates a discussion amongst a community in order to recognise sanitation issues and stimulate community-led action which is aimed at eradicating open defecation and therefore leading to improved local sanitation conditions (IDS 2013). Debates on how CLTS has been implemented start to draw on and address some of the critiques discussed later in this section.

Another project focusing on the participation of disabled people shows that the participants were the 'leaders in the problem-solving process' (Werner 1998). This was achieved by helping the group to design the solutions that they would use. Methods such as these, as well as various methods developed from the 'creativity and inventiveness of local people' (Chambers 2007) have been diffused and adapted widely in development practice.

Participation has also been explored with regards to measuring the impact of humanitarian projects once they have been designed and implemented. However, one of the key challenges for participatory evaluations and impact measurement is the lack of participation by communities at the start of the project (Proudlock and Ramalingam 2008). This shows that if participation is to be used, then the entire process from problem definition to implementation and scale should be considered. Another example of application in an emergency context comes from Ntata's (1999) report from the 1998 famine in South Sudan, which explored the ways in which several international agencies involved the population in the response and their readily prescribed activities. The overview is not conclusive on the success of the participatory approaches taken, but it does acknowledge that these ways of working are subtly challenging the mindset of aid agencies.

Although participation as a concept has been seen to widely influence development thinking, debates have been on-going over the last few decades and highlight a diverse array of competing perspectives and critiques of participatory methods (Chambers 1997, Cleaver 1999, Cornwall 2000, Cooke and Kothari 2001, Hickey and Mohan 2004, Cornwall and Brock 2005, Chambers 2012). In offering a critical history of the concept, Cornwall (2000) suggests that, on the one hand, a 'compelling storyline emerges' in which there is near universal uptake of the language of participation. On the other hand, she suggests that there is frequently a disconnect between theory and practice in how these methods have been applied. Where participation is an agreed and standard principle, it may be difficult to implement in practice.

Learning from these critiques will therefore help to shape and understand the meaning of a more participatory and bottom-up approach to humanitarian innovation.

The critiques of participation

The collection of different perspectives in *Participation: The New Tyranny?* (Cooke and Kothari 2001) demonstrate the variety of concerns with participatory approaches, and aim to provide a critique beyond simplistic concerns with practice methodologies. The collection captures examples of 'participatory processes undertaken ritualistically, which had turned out to be manipulative, or which had in fact harmed those who were supposed to be empowered' (Cooke and Kothari 2001). Below I have grouped some of the critiques from this collection and the wider literature to try and capture the key issues and evolution of thinking around participatory development.

Definition

Participation has been accused of lacking definition, with critics saying that 'although we have a word in common, we give it very different meanings' (Brock and Pettit 2007). The broad use of the term 'participation' itself is thought to have led to poor interpretation and use of the methods labelled with it, leaving the approaches vulnerable to over-simplification and misuse (Francis 2001). Consequently, these issues have given rise to critiques without a common definition in themselves and greater clarity on its definition is still called for (Hickey and Mohan 2004).

This area of critique describes participation as a label for many methods that may not carry out best practice or inclusivity on the ground. The label has in some cases been misused or abused, being treated as a 'box-ticking' exercise (Chambers 2007). Out of the participation discussions around the use of terms there have also been concerns in the use of the words 'community' and 'local'. The words 'community' and 'local' are sometimes thought to encourage people to be seen and treated as a standard unit by outsiders, where one solution fits all (Guijt and Shah 1998, Cleaver 1999), even when trying to practice participatory methods.

Extraction of knowledge vs. facilitation of knowledge

A debate on what participatory methods are used for has also developed, questioning the end goal and intentions of some participatory approaches. Participatory approaches in some cases are thought to be used to extract information and knowledge from communities which may not directly benefit them (Mosse 2001), where the information is solely for the benefit of project planning and upwards accountability to donors. The intention of some participatory approaches, however, is to facilitate a knowledge exchange amongst people in order for them to take their own action (IDS 2013, Practical Action 2013a), and it is considered by some that both of these requirements can happen simultaneously (Brock and Pettit 2007, Chambers 2007). The participatory methods which are thought to 'extract information and not empower' are tied to the brand of participation but not practiced (Chambers 2007), and have been seen as 'proceduralized' (M.B.Anderson et al. 2012) ritualistic and 'manipulative' (Cooke and Kothari 2001). Cornwall (2002) highlights how the World Bank's 'enthusiasm for empowerment illustrates how a term once associated with a process through which people discovered their own potentialities has become an instrument for managed intervention'. Cornwall (2002) also states that participatory approaches are being carried out in parallel to existing local practices, rather than making programmes more inclusive and participatory in their own right.

Complexity of power and politics

The remaining core critique for participatory approaches revolves around the influence exercised by the outsider. In particular, there are concerns that participatory approaches can reify and entrench existing power relations within communities, and that there are related challenges of deciding who will participate and represent communities (Cornwall 2002, Hailey 2001).

There is a fear that participatory methods may enhance existing power structures within communities instead of empowering those who are the most marginalised. One view is that wide participation itself can mask these important power differences amongst communities (Kothari 2001). On another scale there is also concern that micro-level intervention using participatory approaches can obscure macro-level inequalities and injustice (Cooke and Kothari 2001). The power challenges also play out in critiques of where participation is located (Mohan 2001), and what constitutes appropriate spaces of participation (Cornwall 2002). In some cases participatory approaches have been seen as a way to get around local opposition to externally defined projects (Hildyard et al. 2001).

There is also critique about the selection methods used and how participants make decisions on whether to participate or not (Cleaver 2001). 'The water carrier, decision maker, manager and beneficiary are not always then manifest into one individual' (Cleaver 1999), and Cleaver acknowledges the complex web of reciprocal exchange upon which people and solutions depend. It is thought that the inclusion of the wider dynamics of economic and social change is needed to develop a more complex modelling of livelihood concerns over life courses (Cleaver 1999), beyond what is currently achieved using participatory approaches. This complexity is also interpreted through in-depth analysis of the psychology that plays out in participatory approaches, where even the presence or perceived presence of outsiders can have a distorting impact on how people behave and make decisions (Cooke 2001). Finally, there is a difficulty in integrating project concerns with participatory methods, especially when the project is seen as a set of activities that is time-bound. There is therefore a need to better understand the non-project nature of people's lives (Cleaver 1999), which inherently calls for a more nuanced understanding of local power and politics.

Moving forward

The collection of critiques above provides a relatively bleak picture for participatory development; however, more recent analysis and experiences in participation have tried to rebut these by claiming that some of these issues have more recently been tackled by practitioners. In particular, Hickey and Mohan (2004) have suggested that 'citizenship' participation principles can be applied to create a more holistic understanding of participation within the procedural and substantive aspects of development. Cornwall (2000) notes that one of the main forms of evolution in participatory methods has been to address concerns with power asymmetries by moving from participation within isolated micro-level solutions towards a more holistic understanding of participation as rooted within all aspects of community development.

Additionally, Chambers describes a new form of participation emerging within an adaptive pluralism for development (Chambers 2010), where an 'eclectic pluralism' describes a diverse set of skills, and where 'capacity to adapt and innovate' are part of a proposed new agenda. Central to this is removal of the branding of participation and thereby avoiding reliance on fixed, standardised methods irrespective of context. 'The practical challenge is often not to

over-prescribe, with the danger of entering an inhibiting top-down zone of too many rules' (Chambers 2007:24). Chambers argues that adaptive and loose training helps facilitators to adjust and adapt to the particularities of the local context.

Chambers has also used the concept of complexity to contribute to the advancement of participatory approaches (Chambers 2010). Complexity theories can help in creating a systems and network way of thinking that considers the social, political, economic and physical intricacies. The issue of complexity within development and humanitarian approaches is another emerging discussion amongst practitioners (Ramalingam et al. 2009a, Green 2012). Complexity thinking may help practitioners to move beyond an isolated view of particular projects and programmes to see social systems as inherently nested within broader social, economic and political structures. Again, this points towards a far more holistic view of participation.

Reflecting on participation

So what can we take from participatory discourses and debates? They have presented a complex range of social concerns and challenges that play out in several aspects of humanitarian, development and social programmes. However, a self-awareness of these components is vital to overcome some of the challenges, or as Chambers puts it, a 'self-critical epistemological awareness' (Chambers 1997). From the review of participatory approaches and critiques some lessons may be drawn, as listed below:

- Participatory methods are aimed at empowering affected populations to make their own decisions when defining problems and finding appropriate solutions to local challenges;
- The widespread use of 'participatory methods' has meant that their quality and impact has not been consistent;
- Power relations and politics need to be carefully understood so that they do not negatively influence the way that participation is used and the impact it has;
- Do not over-prescribe and create an inhibiting top-down zone with too many rules;
- When present, facilitators must adapt to the local context;
- Systems and networks should be fully considered as part of the wider context of development and humanitarian practice.

Participation exists within community groups without external intervention, and like grassroots innovation, little has been done to understand how this works. The innovation of individuals and 'communities' themselves has been blurred by institutional systems, project-based approaches and pre-prescribed problem definitions and solutions brought in by external actors. A systems approach and consideration of social complexities may help to overcome some of these challenges.

7 Bottom-up humanitarian innovation

The journey above has led us through an overview of how developing markets, communities and users are perceived within innovation. User-led innovations, design theories, and participation based on adaptive pluralism are all approaches that can take us closer to a

bottom-up approach in humanitarian innovation. We can learn from all of these areas of literature and practice, drawing insights from their strengths and weaknesses. These key points are brought together in the summaries below.

- **Innovation as it currently occurs amongst communities is under-acknowledged**
  We have seen that indigenous and local innovation does exist, but that it is rarely researched, understood or recognised. In the private sector, innovation by 'users' and 'customers' is an increasingly occurring practice. In some cases, this 'user' innovation is used to improve the design and delivery of products and services. However, there is a lack of in-depth understanding of how this occurs and can lead to improved innovation practice. There is an even greater lack of documented stories of bottom-up innovation within the humanitarian context, whether during an emergency, a protracted crisis or the recovery phase. Furthermore, there is a limited amount of analysis of how this type of innovation can be enabled or facilitated. As Kibreab (2004) identifies, specifically in a refugee context, there is an under-researched area of understanding refugees' own social networks and their own responses to the 'losses and challenges' following flight. Yet, by definition, refugees have to adapt – and hence innovate – because of the transformation in their access to resources.

- **Local innovation, capacities, systems and markets are key to finding sustainable humanitarian solutions**
  As noted above, there is evidently a gap in effectively understanding the local capacities and systems in existing humanitarian practice. As identified in the social innovation literature, user focus is key to creating social change through innovation. By understanding these existing systems and markets better, humanitarian approaches are forced to take stock and consider local structures and existing innovations, before implementing inappropriate external interventions. Observing these systems and markets over time also challenges the project-based approach, which is often short-lived, time bound and struggles to find time to more holistically understand local practices. Local markets also have an additional and important role to offer in allowing innovations to be taken to scale: markets can create wide opportunities and demand for innovations that have a positive impact on people's livelihood activities. Of course affected populations solve problems in challenging environments in their daily lives, yet so little is understood about how this is done and what opportunities and challenges they face.

- **Facilitation, networks and partnerships may be required where barriers to innovation prevent ideas being taken to implementation or scaled for wider use**
  Local innovation may in some cases need to be supported in order to overcome challenges and barriers at different stages of the innovation process. Affected communities may have a demand for support in areas such as risk mitigation, communications, knowledge exchange or the creation of networks, for example. Careful consideration by external actors is required if facilitation or support is to be provided, and it must be appropriate to local cultures and systems that are already in place. Facilitation of this type can learn a great deal from participation methods and critiques. For example, external actors can ensure the power balance is considered and methods do not 'over-prescribe' to create a controlling environment, and they can

ensure that facilitators adapt to the local context. There needs to be more focus in practice on actually living up to the underlying principles of bottom-up innovation: allowing people to make decisions and choices, and to be empowered to maintain their own livelihoods. People will also make the decision to adopt, use, adapt and inform innovations which are introduced by external actors, therefore keeping 'users' central throughout any process of innovation is vital. This may be achieved through networks and a diverse set of skills and partners.

Bringing the two worlds of humanitarian innovation together

As defined at the start of this paper, there is a risk that the emerging discussion of humanitarian innovation will become heavily focused on innovation management within organisations and may not take account of the local capacities and systems already in place or the innovations occurring amongst affected populations. Indeed a significant proportion of humanitarian innovation work implicitly follows this 'top-down' approach. The alternative world of humanitarian innovation is one based upon 'bottom-up', locally appropriate solutions. However, it is clear that to make this ideal a reality, a deeper understanding of the bottom-up approach to innovation is required, in order to fulfil its potential of fostering the skills and capacities of affected populations, and thereby also informing external interventions by humanitarian actors, whether NGOs, governments, international organisations, or the private sector.

Chambers (2007) has worked on the dichotomies of two similar worlds for development practice, starting with his concepts of 'things' versus 'people' where a traditional 'things' approach has been 'neo-newtonian', and focused on the physical, top-down world, neglecting the social elements important for development, and where the 'people' approach is bottom-up and people-centric. More recently, however, he has evolved this thinking to attempt not to polarise the approaches, and proposes a 'paradigm of adaptive pluralism'(Chambers 2010) whereby 'mindsets…orientations…[and]…predispositions' in development take a new form that works within the unpredictability and non-linear complexities of the varying contexts. In this new approach the roles of the external actors are based on facilitation and empowerment, where relationships are reciprocal, personal and democratic. There is dynamism and creativity, and participatory methodologies have an important role to play. It is in this paradigm that the emerging innovation practice needs also to sit where dialogue and understanding are mutual between the two worlds and the local capacities and systems are central to all humanitarian practice, whether it is initiated locally or by an external party.

This new and bottom-up perspective on humanitarian innovation can help to address the gap in how to practically achieve 'user involvement' in the assessment, design, implementation, evaluation, and sustainability of humanitarian interventions. A better focus on the 'user' and 'citizen' is required since there is a strong correlation of dissatisfaction and marginalisation felt by recipients of aid due to this gap in practice (M.B.Anderson et al. 2012). Innovation from the 'bottom-up' offers a non-project lens that starts with the communities' own initiatives and context. Regardless of where the idea originated, facilitation can also challenge the assumptions typically made in 'top-down' interventions to support the innovation process with a focus on local capacities and systems. Design and innovation thinking forces those involved in a process of innovation to think more systematically and holistically, ensuring that social and cultural elements are at the forefront of new ideas and how they evolve to implementation and then to scale. Designing and planning must be continued throughout the innovation process in a flexible and adaptive way. A diverse set of skills is vital in any

innovation of this type and these may be achieved through facilitation that includes a unique group of individuals, partnerships, and networks.

Taking these key lessons from the three areas of literature and reflecting on how the two worlds of humanitarian innovation can be brought closer together, the final section below explains a framework that will help to build an improved source of research and knowledge on this new form of humanitarian innovation from the bottom up.

8 A humanitarian innovation research framework

'Innovation' is not and should not be used as a label for objects and ideas. Instead, innovation is a process through which activities may be seen and guided, offering a more systematic and holistic approach to new initiatives than the current 'project' focus and humanitarian systems offer. Within this process, local innovation and a user focus at each stage is key. The basic stages of innovation are illustrated again below: defining the problem or identifying the opportunity; finding a potential solution; piloting and refining the solution; and finally, appropriately scaling the solution. Each stage may learn from other stages or trigger another cycle of innovation itself.

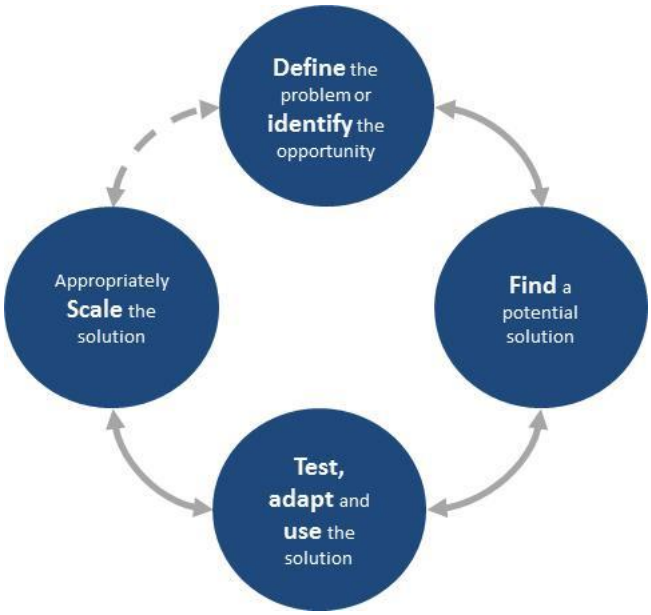

Figure 8: The innovation process used by the Humanitarian Innovation Project

The process of innovation provides a useful lens through which to coherently follow ideas from inception to the development of sustainable and appropriate solutions. It helps to understand the decision-making process that goes alongside these stages, as well as the barriers and opportunities that exist at each of these stages for a given individual, community, or organisation. Humanitarian innovation with a 'user' focus at each stage means that:

- Problems or opportunities are defined by communities themselves in accordance with demand and with what they perceive to be sustainable in the context of pre-existing local systems;

- Potential solutions are appropriate to the local context and can be sourced and maintained in the long term;
- Piloting, testing and refining the solutions is guided by user decisions and adaptions that ensure that the solution fits within the local systems;
- The adapted solution is appropriately supported to scale through local markets and systems, driven by demand and local capacity.

This lens hopes to enable a broader thinking beyond the status quo, recognising local innovative capacity and systems, thereby going beyond traditional 'top-down' solutions defined by the humanitarian organisations.
Taking this lens of innovation and the key lessons learned from this review, it is clear that making communities the core of all humanitarian innovation, generating mutual understanding and collaboration even when working in the 'procedural' world of humanitarian innovation, is vital. There are two ways in which this analysis and understanding of bottom-up innovation may be framed and researched further:

1. Using the innovation process as a lens, obtain a deeper understanding of innovations that occur within communities.

    - Understand how problems are solved and implemented and solutions are sustained and scaled in the every-day lives of the 'beneficiary communities';
    - Identify the barriers and opportunities that exist at each stage of the local innovation process;
    - Recognise how local markets and the private sector influence and effect local innovation.

2. Explore what types of models may help to facilitate humanitarian innovation. Keeping local capacities and systems central, facilitation of bottom-up innovation is believed to both foster local innovation and challenge the assumptions made in more traditional 'top-down' interventions at each stage of the innovation process.

    - Undertake case studies to understand how innovation has been facilitated in different contexts globally. (For example, through UNICEF innovation labs (UNICEF 2013))
    - Consider the literature on 'spaces' to understand the challenges and experiences in creating neutral innovation spaces that are truly inclusive and contribute to fostering local innovation (For example, see Cornwall 2002).

In order to elaborate on this framework further, two examples from the Humanitarian Innovation Project (HIP)'s work in Uganda so far help to demonstrate the types of activities that fall under the two parts of this research framework.

Example 1: How innovation occurs in the everyday lives of refugees
A young Congolese man, interviewed in Nakivale Settlement in the South West of Uganda, presented two innovation processes that he had initiated and implemented as part of his livelihood and social activities. These are shown in the table below against the four broad stages of innovation.

Stage of innovation	Video editing business	Youth radio programme
Defining the problem	Upon arrival to Nakivale the young man had no source of income.	An old megaphone was used to spread messages in the community from the church, but it was time consuming and did not spread messages very far.
Finding the solution	The first was his use of existing skills and passion for editing films and music. In order to earn money when he first arrived in Nakivale, he sought new contacts to try and find equipment and resources for filming and editing.	The young man again used his technical skills and passion for ICT to build a makeshift radio transmitter with his church youth group. The transmitter was made from locally found scrap material from an old radio, mobile phone and a calculator. He had no formal training to do this and taught himself online and learnt through others.
Adapting and using the solution	He filmed weddings, concerts and other events in the settlement by renting a camera, lighting and microphones from a variety of different refugees. He also rents a computer in order to do the editing. Access to power is a challenge and he uses the UNHCR initiated Community Technology Access centre (which includes an internet café) for power from their solar panel set-up and occasional access to the internet. He spends about 5 hours per day at the centre.	The radio programme schedule is shared between members the youth group. Even in its early stages the radio has already brought together one separated refugee family and also generates a small income through song requests. In addition the radio has started to provide public health messages.
Scaling the solution	He did not know of anyone else who was providing the same service as him in the settlement and access to capital and power limited how much he could scale his business.	If successful the radio will obtain a permit from the government, and try to initiate further income generating activities.

Table 1: Innovation processes for a video editing business and youth radio programme

This first example shows the connectedness of an individual's innovations, which are embedded into the local economy and social networks, and also highlights his resourcefulness when finding new solutions despite limited access to resources. It highlights challenges to scaling-up local innovations, in this case mainly due to lack of access to capital for equipment.

Example 2: Facilitation of local innovation

The youth group COBURWAS International Youth Organization to Transform Africa (CIYOTA 2013), which was initiated in Kyangwali Settlement in Western Uganda in 2005, focuses on providing access to education for many young refugees, orphans and national youth in the region. In addition to its education activities, CIYOTA acts as a strong community base in the settlement. When members of the group or other people in the community have an idea that they would like to implement locally, they come to CIYOTA for advice and support. The groups that have been born out of CIYOTA so far range from women's working cooperatives to a theatre group that helps to tackle social issues in the settlement. The groups use CIYOTA's buildings to have meetings, rehearse or run their

activities, and CIYOTA's strong international network enables the groups to have access to partners and funding.

This second example illustrates a model of a locally initiated innovation space that fosters communities' own ability to solve problems and bring ideas to life. With a combination of in-depth case studies on a variety of 'innovation spaces' that facilitate local innovation, HIP seeks to understand the processes, business models and impact of the different spaces. These two examples provide just an illustrative snapshot of the type of material that HIP hopes to build on by using the perspective of bottom-up innovation, therefore leading to a deeper understanding of local innovation and models for informing how it can be supported and fostered.

9 Conclusion

Innovation has rapidly emerged as one the most widely discussed themes within the humanitarian world. However, in many of the existing debates, innovation is poorly understood or based on limited research. Furthermore, existing work on humanitarian innovation can broadly be considered as occupying two very different 'worlds' of innovation: one 'top-down' and the other 'bottom-up'. The overwhelming majority of humanitarian innovation work occupies the former of these worlds. It focuses mainly on how to improve organisational response, making it more efficient, effective, and sustainable. This is crucial work, with a significant contribution to make, not least in improving responses during the emergency phase. However, it is not the only approach to humanitarian innovation. Instead, this paper has argued that it is possible to conceive of an alternative, 'bottom-up' approach to humanitarian innovation.

Attempting to move beyond the rhetoric of 'bottom-up' language, this paper has begun to elaborate what bottom-up innovation means in general, and for the humanitarian context in particular. In order to do so, it has surveyed a range of relevant literature from different disciplinary perspectives, most notably innovation theory, design theory, and participatory methods. In each case, it has highlighted the strengths and weaknesses in what these perspectives have to offer, integrating them as a way of beginning to think through a practical framework and research agenda through which to advance bottom-up humanitarian innovation that might be applied to the emergency phase, protracted crises, and recovery, in ways that draw directly upon the skills, aspirations, and entrepreneurship of so-called beneficiary communities. The aim is not to replace the role of external interventions but to offer ways in which an enabling environment can be developed that better facilitates and works within the existing adaptive capacities of communities and their wider networks. By deepening the understanding of 'user' perspectives, capacities and systems in humanitarianism, the proposed research framework outlined in the paper seeks to better recognise ways in which innovation processes already occur within affected populations and identify the opportunities and challenges that exist for creating sustainable solutions within those communities. This has the potential to enable people to move beyond humanitarian dependency and become active partners in finding their own solutions. The vision for this future practice is one which offers alternative and sustainable humanitarian solutions, in which people are no longer viewed as dependent on traditional aid hand-outs, but instead are

supported to engage in their own innovation, fostering self-reliance and leading to solutions that are sustainably integrated within existing social systems.

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Harvard
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Review

INNOVATION

Design Thinking

by Tim Brown

FROM THE JUNE 2008 ISSUE

Thomas Edison created the electric lightbulb and then wrapped an entire industry around it. The lightbulb is most often thought of as his signature invention, but Edison understood that the bulb was little more than a parlor trick without a system of electric power generation and transmission to make it truly useful. So he created that, too.

Thus Edison's genius lay in his ability to conceive of a fully developed marketplace, not simply a discrete device. He was able to envision how people would want to use what he

made, and he engineered toward that insight. He wasn't always prescient (he originally believed the phonograph would be used mainly as a business machine for recording and replaying dictation), but he invariably gave great consideration to users' needs and preferences.

Edison's approach was an early example of what is now called "design thinking"—a methodology that imbues the full spectrum of innovation activities with a human-centered design ethos. By this I mean that innovation is powered by a thorough understanding, through direct observation, of what people want and need in their lives and what they like or dislike about the way particular products are made, packaged, marketed, sold, and supported.

Many people believe that Edison's greatest invention was the modern R&D laboratory and methods of experimental investigation. Edison wasn't a narrowly specialized scientist but a broad generalist with a shrewd business sense. In his Menlo Park, New Jersey, laboratory he surrounded himself with gifted tinkerers, improvisers, and

experimenters. Indeed, he broke the mold of the “lone genius inventor” by creating a team-based approach to innovation. Although Edison biographers write of the camaraderie enjoyed by this merry band, the process also featured endless rounds of trial and error—the “99% perspiration” in Edison’s famous definition of genius. His approach was intended not to validate preconceived hypotheses but to help experimenters learn something new from each iterative stab. Innovation is hard work; Edison made it a profession that blended art, craft, science, business savvy, and an astute understanding of customers and markets.

Design thinking is a lineal descendant of that tradition. Put simply, it is a discipline that uses the designer’s sensibility and methods to match people’s needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity. Like Edison’s painstaking innovation process, it often entails a great deal of perspiration.

I believe that design thinking has much to offer a business world in which most management ideas and best practices are freely available to be copied and exploited. Leaders now look to innovation as a principal source of differentiation and competitive advantage; they would do well to incorporate design thinking into all phases of the process.

Getting Beneath the Surface

Historically, design has been treated as a downstream step in the development process—the point where designers, who have played no earlier role in the substantive work of innovation, come along and put a beautiful wrapper around the idea. To be sure, this approach has stimulated market growth in many areas by making new products and technologies aesthetically attractive and therefore more desirable to consumers or by enhancing brand perception through smart, evocative advertising and communication strategies. During the latter half of the twentieth century design became an increasingly valuable competitive asset in, for example, the consumer electronics, automotive, and consumer packaged goods industries. But in most others it remained a late-stage add-on.

Now, however, rather than asking designers to make an already developed idea more attractive to consumers, companies are asking them to create ideas that better meet consumers' needs and desires. The former role is tactical, and results in limited value creation; the latter is strategic, and leads to dramatic new forms of value.

Moreover, as economies in the developed world shift from industrial manufacturing to knowledge work and service delivery, innovation's terrain is expanding. Its objectives are no longer just physical products; they are new sorts of processes, services, IT-powered interactions, entertainments, and ways of communicating and collaborating—exactly the kinds of human-centered activities in which design thinking can make a decisive difference. (See the sidebar "A Design Thinker's Personality Profile.")

A Design Thinker's Personality Profile

Contrary to popular opinion, you don't need weird shoes or a black turtleneck to be a design thinker. Nor are design thinkers necessarily created only by design schools, even though most professionals have had some kind of design training. My

experience is that many people outside professional design have a natural aptitude for design thinking, which the right development and experiences can unlock. Here, as a starting point, are some of the characteristics to look for in design thinkers:

Empathy. They can imagine the world from multiple perspectives —those of colleagues, clients, end users, and customers (current and prospective). By taking a "people first" approach, design thinkers can imagine solutions that are inherently desirable and meet explicit or latent needs. Great design thinkers observe the world in minute detail. They notice things that others do not and use their insights to inspire innovation.

Integrative thinking. They not only rely on analytical processes (those that produce either/or choices) but also exhibit the ability to see all of the salient—and sometimes contradictory—aspects of a confounding problem and create novel solutions that go beyond and dramatically improve on existing alternatives. (See Roger Martin's *The Opposable Mind: How Successful Leaders Win Through Integrative Thinking*.)

Optimism. They assume that no matter how challenging the constraints of a given problem, at least one potential solution is better than the existing alternatives.

Experimentalism. Significant innovations don't come from incremental tweaks. Design thinkers pose questions and explore constraints in creative ways that proceed in entirely new directions.

Collaboration. The increasing complexity of products, services, and experiences has replaced the myth of the lone creative genius with the reality of the enthusiastic interdisciplinary collaborator. The best design thinkers don't simply work alongside other disciplines; many of them have significant experience in more than one. At IDEO we employ people who are engineers *and* marketers, anthropologists *and* industrial designers, architects *and* psychologists.

Consider the large health care provider Kaiser Permanente, which sought to improve the overall quality of both patients' and medical practitioners' experiences. Businesses in the service sector can often make significant innovations on the front lines of service creation and delivery. By teaching design thinking techniques to nurses, doctors, and administrators, Kaiser hoped to inspire its practitioners to contribute new ideas. Over the course of several months Kaiser teams participated in workshops with the help of my firm, IDEO, and a group of Kaiser coaches. These workshops led to a portfolio of innovations, many of which are being rolled out across the company.

One of them—a project to reengineer nursing-staff shift changes at four Kaiser hospitals—perfectly illustrates both the broader nature of innovation "products" and the value of a holistic design approach. The core project team included a strategist (formerly a nurse), an organizational-development specialist, a technology expert, a process designer, a union representative, and designers from IDEO. This group worked with innovation teams of frontline practitioners in each of the four hospitals.

During the earliest phase of the project, the core team collaborated with nurses to identify a number of problems in the way shift changes occurred. Chief among these was the fact that nurses routinely spent the first 45 minutes of each shift at the nurses' station debriefing the departing shift about the status of patients. Their methods of information exchange were different in every hospital, ranging from recorded dictation to face-to-face conversations. And they compiled the information they needed to serve patients in a variety of ways—scrawling quick notes on the back of any available scrap of paper, for example, or even on their scrubs. Despite a significant

investment of time, the nurses often failed to learn some of the things that mattered most to patients, such as how they had fared during the previous shift, which family members were with them, and whether or not certain tests or therapies had been administered. For many patients, the team learned, each shift change felt like a hole in their care. Using the insights gleaned from observing these important times of transition, the innovation teams explored potential solutions through brainstorming and rapid prototyping. (Prototypes of a service innovation will of course not be physical, but they must be tangible. Because pictures help us understand what is learned through prototyping, we often videotape the performance of prototyped services, as we did at Kaiser.)

Prototyping doesn't have to be complex and expensive. In another health care project, IDEO helped a group of surgeons develop a new device for sinus surgery. As the surgeons described the ideal physical characteristics of the instrument, one of the designers grabbed a whiteboard marker, a film canister, and a clothespin and taped them together. "Do you mean like this?" he asked. With his

rudimentary prototype in hand, the surgeons were able to be much more precise about what the ultimate design should accomplish.

> The surgeons described a new device for sinus surgery. One designer grabbed a marker, a film canister, and a clothespin and taped them together. “Do you mean like this?” he asked.

Prototypes should command only as much time, effort, and investment as are needed to generate useful feedback and evolve an idea. The more “finished” a prototype seems, the less likely its creators will be to pay attention to and profit from feedback. The goal of prototyping isn’t to finish. It is to learn about the strengths and weaknesses of the idea and to identify new directions that further prototypes might take.

The design that emerged for shift changes had nurses passing on information in front of the patient rather than at the nurses' station. In only a week the team built a working prototype that included new procedures and some simple software with which nurses could call up previous shift-change notes and add new ones. They could input patient information throughout a shift rather than scrambling at the end to pass it on. The software collated the data in a simple format customized for each nurse at the start of a shift. The result was both higher-quality knowledge transfer and reduced prep time, permitting much earlier and better-informed contact with patients.

As Kaiser measured the impact of this change over time, it learned that the mean interval between a nurse's arrival and first interaction with a patient had been more than halved, adding a huge amount of nursing time across the four hospitals. Perhaps just as important was the effect on the quality of the nurses' work experience. One nurse commented, "I'm an hour ahead, and I've only been here 45 minutes." Another said, "[This is the] first time I've ever made it out of here at the end of my shift."

Thus did a group of nurses significantly improve their patients' experience while also improving their own job satisfaction and productivity. By applying a human-centered design methodology, they were able to create a relatively small process innovation that produced an outsize impact. The new shift changes are being rolled out across the Kaiser system, and the capacity to reliably record critical patient information is being integrated into an electronic medical records initiative at the company.

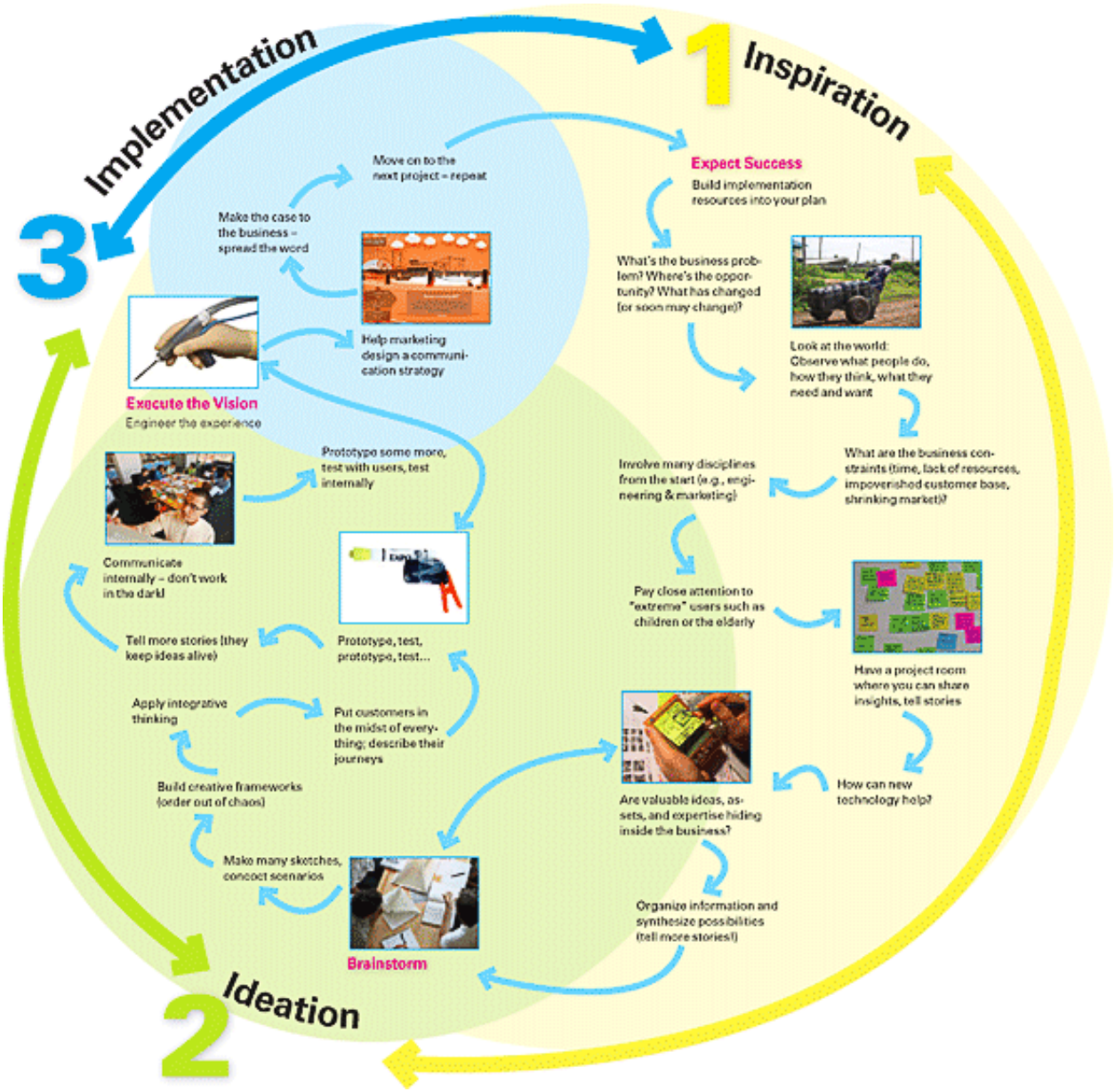
What might happen at Kaiser if every nurse, doctor, and administrator in every hospital felt empowered to tackle problems the way this group did? To find out, Kaiser has created the Garfield Innovation Center, which is run by Kaiser's original core team and acts as a consultancy to the entire organization. The center's mission is to pursue innovation that enhances the patient experience and, more broadly, to envision Kaiser's "hospital of the future." It is introducing tools for design thinking across the Kaiser system.

How Design Thinking Happens

The myth of creative genius is resilient: We believe that great ideas pop fully formed out of brilliant minds, in feats of imagination well beyond the abilities of mere mortals. But what the Kaiser nursing team accomplished was neither a sudden breakthrough nor the lightning strike of genius; it was the result of hard work augmented by a creative human-centered discovery process and followed by iterative cycles of prototyping, testing, and refinement.

The design process is best described metaphorically as a system of spaces rather than a predefined series of orderly steps. The spaces demarcate different sorts of related activities that together form the continuum of innovation. Design thinking can feel chaotic to those experiencing it for the first time. But over the life of a project participants come to see—as they did at Kaiser—that the process makes sense and achieves results, even though its architecture differs from the linear, milestone-based processes typical of other kinds of business activities.

Design projects must ultimately pass through three spaces (see the exhibit “Inspiration, Ideation, Implementation”). We label these “inspiration,” for the circumstances (be they a problem, an opportunity, or both) that motivate the search for solutions; “ideation,” for the process of generating, developing, and testing ideas that may lead to solutions; and “implementation,” for the charting of a path to market. Projects will loop back through these spaces—particularly the first two—more than once as ideas are refined and new directions taken.



Inspiration, Ideation, Implementation

Sometimes the trigger for a project is leadership's recognition of a serious change in business fortunes. In 2004 Shimano, a Japanese manufacturer of bicycle components, faced flattening growth in its traditional high-end road-racing and mountain-bike segments in the United States. The company had always relied on technology

innovations to drive its growth and naturally tried to predict where the next one might come from. This time Shimano thought a high-end casual bike that appealed to boomers would be an interesting area to explore. IDEO was invited to collaborate on the project.

During the inspiration phase, an interdisciplinary team of IDEO and Shimano people—designers, behavioral scientists, marketers, and engineers—worked to identify appropriate constraints for the project. The team began with a hunch that it should focus more broadly than on the high-end market, which might prove to be neither the only nor even the best source of new growth. So it set out to learn why 90% of American adults don't ride bikes. Looking for new ways to think about the problem, the team members spent time with all kinds of consumers. They discovered that nearly everyone they met rode a bike as a child and had happy memories of doing so. They also discovered that many Americans are intimidated by cycling today—by the retail experience (including the young, Lycra-clad athletes who serve as sales staff in most independent bike stores); by the complexity and cost of the bikes, accessories, and

specialized clothing; by the danger of cycling on roads not designed for bicycles; and by the demands of maintaining a technically sophisticated bike that is ridden infrequently.

This human-centered exploration—which took its insights from people outside Shimano's core customer base—led to the realization that a whole new category of bicycling might be able to reconnect American consumers to their experiences as children while also dealing with the root causes of their feelings of intimidation—thus revealing a large untapped market.

The design team, responsible for every aspect of what was envisioned as a holistic experience, came up with the concept of "Coasting." Coasting would aim to entice lapsed bikers into an activity that was simple, straightforward, and fun. Coasting bikes, built more for pleasure than for sport, would have no controls on the handlebars, no cables snaking along the frame. As on the earliest bikes many of us rode, the brakes would be applied by backpedaling. With the help of an onboard computer, a minimalist three gears would shift automatically as the bicycle gained speed or

slowed. The bikes would feature comfortably padded seats, be easy to operate, and require relatively little maintenance.

Coasting

A **sketch** (left, seat plus helmet storage) and a **prototype** (middle) show elements of Coasting bicycles. Shimano's Coasting **website** (right) points users to safe bike paths.

Three major manufacturers—Trek, Raleigh, and Giant—developed new bikes incorporating innovative components from Shimano. But the design team didn't stop with the bike itself. In-store retailing strategies were created for independent bike dealers, in part to alleviate the discomfort that biking novices felt in stores designed to serve enthusiasts. The team developed a brand that identified Coasting as a way to enjoy life. ("Chill. Explore. Dawdle. Lollygag. First one there's a rotten egg.") And it

designed a public relations campaign—in collaboration with local governments and cycling organizations—that identified safe places to ride.

Although many others became involved in the project when it reached the implementation phase, the application of design thinking in the earliest stages of innovation is what led to this complete solution. Indeed, the single thing one would have expected the design team to be responsible for—the look of the bikes—was intentionally deferred to later in the development process, when the team created a reference design to inspire the bike companies' own design teams. After a successful launch in 2007, seven more bicycle manufacturers signed up to produce Coasting bikes in 2008.

Taking a Systems View

Many of the world's most successful brands create breakthrough ideas that are inspired by a deep understanding of consumers' lives and use the principles of design to innovate and build value. Sometimes innovation has to account for vast differences in cultural and

socioeconomic conditions. In such cases design thinking can suggest creative alternatives to the assumptions made in developed societies.

India's Aravind Eye Care System is probably the world's largest provider of eye care. From April 2006 to March 2007 Aravind served more than 2.3 million patients and performed more than 270,000 surgeries. Founded in 1976 by Dr. G. Venkataswamy, Aravind has as its mission nothing less than the eradication of needless blindness among India's population, including the rural poor, through the effective delivery of superior ophthalmic care. (One of the company's slogans is "Quality is for everyone.") From 11 beds in Dr. Venkataswamy's home, Aravind has grown to encompass five hospitals (three others are under Aravind management), a plant that manufactures ophthalmic products, a research foundation, and a training center.

Aravind's execution of its mission and model is in some respects reminiscent of Edison's holistic concept of electric power delivery. The challenge the company faces is logistic:

how best to deliver eye care to populations far removed from the urban centers where Aravind's hospitals are located. Aravind calls itself an "eye care system" for a reason: Its business goes beyond ophthalmic care per se to transmit expert practice to populations that have historically lacked access. The company saw its network of hospitals as a beginning rather than an end.

Much of its innovative energy has focused on bringing both preventive care and diagnostic screening to the countryside. Since 1990 Aravind has held "eye camps" in India's rural areas, in an effort to register patients, administer eye exams, teach eye care, and identify people who may require surgery or advanced diagnostic services or who have conditions that warrant monitoring.

Aravind

Aravind's outreach to rural patients frequently brings basic **diagnostic tools** (left and center) and an advanced satellite-linked **telemedicine truck** (right) to remote areas of India.



In 2006 and early 2007 Aravind eye camps screened more than 500,000 patients, of whom nearly 113,000 required surgery. Access to transportation is a common problem in rural areas, so the company provides buses that take patients needing further treatment to one of its urban facilities and then home again. Over the years it has bolstered its diagnostic capabilities in the field with telemedicine trucks, which enable doctors back at Aravind's hospitals to participate in care decisions. In recent years Aravind's analysis of its screening data has led to specialized eye camps for certain demographic groups, such as school-age children and industrial and government workers; the company also holds camps specifically to screen for eye diseases associated with diabetes. All these services are free for the roughly 60% of patients who cannot afford to pay.

In developing its system of care, Aravind has consistently exhibited many characteristics of design thinking. It has used as a creative springboard two constraints: the poverty and remoteness of its clientele and its own lack of access to expensive solutions. For example, a pair of intraocular lenses made in the West costs $200, which severely limited the number of patients Aravind could help. Rather than try to persuade suppliers to change the way they did things, Aravind built its own solution: a manufacturing plant in the basement of one of its hospitals. It eventually discovered that it could use relatively inexpensive technology to produce lenses for $4 a pair.

Throughout its history—defined by the constraints of poverty, ignorance, and an enormous unmet need—Aravind has built a systemic solution to a complex social and medical problem.

Getting Back to the Surface

I argued earlier that design thinking can lead to innovation that goes beyond aesthetics, but that doesn't mean that form and aesthetics are unimportant. Magazines like to

publish photographs of the newest, coolest products for a reason: They are sexy and appeal to our emotions. Great design satisfies both our needs and our desires. Often the emotional connection to a product or an image is what engages us in the first place. Time and again we see successful products that were not necessarily the first to market but were the first to appeal to us emotionally *and* functionally. In other words, they do the job and we love them. The iPod was not the first MP3 player, but it was the first to be delightful. Target's products appeal emotionally through design and functionally through price—simultaneously.

How to Make Design Thinking Part of the Innovation Drill

Begin at the beginning. Involve design thinkers at the very start of the innovation process, before any direction has been set. Design thinking will help you explore more ideas more quickly than you could otherwise.

Take a human-centered approach. Along with business and technology considerations, innovation should factor in human behavior, needs, and preferences. Human-centered design

thinking—especially when it includes research based on direct observation—will capture unexpected insights and produce innovation that more precisely reflects what consumers want.

Try early and often. Create an expectation of rapid experimentation and prototyping. Encourage teams to create a prototype in the first week of a project. Measure progress with a metric such as average time to first prototype or number of consumers exposed to prototypes during the life of a program.

Seek outside help. Expand the innovation ecosystem by looking for opportunities to co-create with customers and consumers. Exploit Web 2.0 networks to enlarge the effective scale of your innovation team.

Blend big and small projects. Manage a portfolio of innovation that stretches from shorter-term incremental ideas to longer-term revolutionary ones. Expect business units to drive and fund incremental innovation, but be willing to initiate revolutionary innovation from the top.

Budget to the pace of innovation. Design thinking happens quickly, yet the route to market can be unpredictable. Don’t constrain the pace at which you can innovate by relying on cumbersome budgeting cycles. Be prepared to rethink your funding approach as projects proceed and teams learn more about opportunities.

Find talent any way you can. Look to hire from interdisciplinary programs like the new Institute of Design at Stanford and progressive business schools like Rotman, in Toronto. People with more-conventional design backgrounds can push solutions far beyond your expectations. You may even be able to train nondesigners with the right attributes to excel in design-thinking roles.

Design for the cycle. In many businesses people move every 12 to 18 months. But design projects may take longer than that to get from day one through implementation. Plan assignments so that design thinkers go from inspiration to ideation to implementation. Experiencing the full cycle builds better judgment and creates great long-term benefits for the organization.

This idea will grow ever more important in the future. As Daniel Pink writes in his book *A Whole New Mind*, "Abundance has satisfied, and even over-satisfied, the material needs of millions—boosting the significance of beauty and emotion and accelerating individuals' search for meaning." As more of our basic needs are met, we increasingly expect sophisticated experiences that are emotionally satisfying and meaningful. These experiences will not be simple products. They will be complex combinations of products, services, spaces, and information. They will be the ways we get educated, the

ways we are entertained, the ways we stay healthy, the ways we share and communicate. Design thinking is a tool for imagining these experiences as well as giving them a desirable form.

One example of experiential innovation comes from a financial services company. In late 2005 Bank of America launched a new savings account service called “Keep the Change.” IDEO, working with a team from the bank, helped identify a consumer behavior that many people will recognize: After paying cash for something, we put the coins we received in change into a jar at home. Once the jar is full, we take the coins to the bank and deposit them in a savings account. For many people, it’s an easy way of saving. Bank of America’s innovation was to build this behavior into a debit card account. Customers who use their debit cards to make purchases can now choose to have the total rounded up to the nearest dollar and the difference deposited in their savings accounts.

The success of this innovation lay in its appeal to an instinctive desire we have to put money aside in a painless and invisible way. Keep the Change creates an experience that feels natural because it models behavior that many of us already exhibit. To be sure, Bank of America sweetens the deal by matching 100% of the change saved in the first three months and 5% of annual totals (up to $250) thereafter. This encourages customers to try it out. But the real payoff is emotional: the gratification that comes with monthly statements showing customers they've saved money without even trying.

In less than a year the program attracted 2.5 million customers. It is credited with 700,000 new checking accounts and a million new savings accounts. Enrollment now totals more than 5 million people who together have saved more than $500 million. Keep the Change demonstrates that design thinking can identify an aspect of human behavior and then convert it into both a customer benefit and a business value.

Thomas Edison represents what many of us think of as a golden age of American innovation—a time when new ideas transformed every aspect of our lives. The need for transformation is, if anything, greater now than ever before. No matter where we look, we see problems that can be solved only through innovation: unaffordable or unavailable health care, billions of people trying to live on just a few dollars a day, energy usage that outpaces the planet's ability to support it, education systems that fail many students, companies whose traditional markets are disrupted by new technologies or demographic shifts. These problems all have people at their heart. They require a human-centered, creative, iterative, and practical approach to finding the best ideas and ultimate solutions. Design thinking is just such an approach to innovation.

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This article is about INNOVATION

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Design Thinking for Social Innovation

By Tim Brown & Jocelyn Wyatt

Stanford Social Innovation Review
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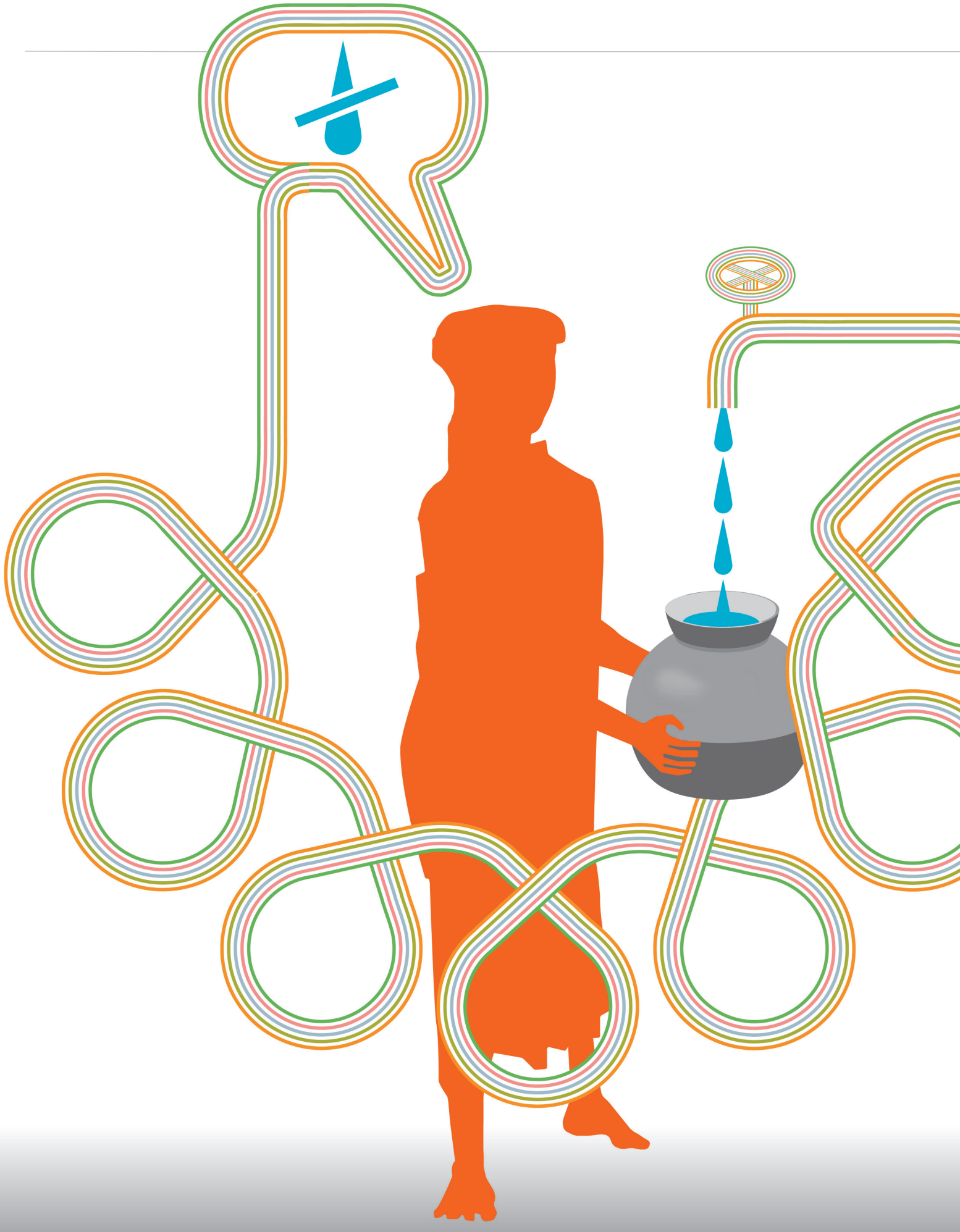

DESIGN THINKING FOR SOCIAL INNOVATION

DESIGNERS HAVE TRADITIONALLY FOCUSED ON ENHANCING THE LOOK AND FUNCTIONALITY OF PRODUCTS. RECENTLY, THEY HAVE BEGUN USING DESIGN TOOLS TO TACKLE MORE COMPLEX PROBLEMS, SUCH AS FINDING WAYS TO PROVIDE LOW-COST HEALTH CARE THROUGHOUT THE WORLD. BUSINESSES WERE FIRST TO EMBRACE THIS NEW APPROACH—CALLED DESIGN THINKING—NOW NONPROFITS ARE BEGINNING TO ADOPT IT TOO.

By Tim Brown & Jocelyn Wyatt

Illustration by John Hersey

In an area outside Hyderabad, India, between the suburbs and the countryside, a young woman—we'll call her Shanti—fetches water daily from the always-open local borehole that is about 300 feet from her home. She uses a 3-gallon plastic container that she can easily carry on her head. Shanti and her husband rely on the free water for their drinking and washing, and though they've heard that it's not as safe as water from the Naandi Foundation-run community treatment plant, they still use it. Shanti's family has been drinking the local water for generations, and although it periodically makes her and her family sick, she has no plans to stop using it.

Shanti has many reasons not to use the water from the Naandi treatment center, but they're not the reasons one might think. The center is within easy walking distance of her home—roughly a third of a mile. It is also well known and affordable (roughly 10 rupees, or 20 cents, for 5 gallons). Being able to pay the small fee has even become a status symbol for some villagers. Habit isn't a factor, either. Shanti is forgoing the safer water because of a series of flaws in the overall design of the system.

Although Shanti can walk to the facility, she can't carry the 5-gallon jerrican that the facility requires her to use. When filled with water, the plastic rectangular container is simply too heavy. The container isn't designed to be held on the hip or the head, where she likes to carry heavy objects. Shanti's husband can't help carry it, either. He works in the city and doesn't return home until after the water treatment center is closed. The treatment center also requires them to buy a monthly punch card for 5 gallons a day, far more than they need. "Why would I buy more than I need and waste money?" asks Shanti, adding she'd be more likely to purchase the Naandi water if the center allowed her to buy less.

The community treatment center was designed to produce clean and potable water, and it succeeded very well at doing just that. In fact, it works well for many people living in the community, particularly families with husbands or older sons who own bikes and can visit the treatment

plant during working hours. The designers of the center, however, missed the opportunity to design an even better system because they failed to consider the culture and needs of all of the people living in the community.

This missed opportunity, although an obvious omission in hindsight, is all too common. Time and again, initiatives falter because they are not based on the client's or customer's needs and have never been prototyped to solicit feedback. Even when people do go into the field, they may enter with preconceived notions of what the needs and solutions are. This flawed approach remains the norm in both the business and social sectors.

As Shanti's situation shows, social challenges require systemic solutions that are grounded in the client's or customer's needs. This is where many approaches founder, but it is where design thinking—a new approach to creating solutions—excels.

Traditionally, designers focused their attention on improving the look and functionality of products. Classic examples of this type of design work are Apple Computer's iPod and Herman Miller's Aeron chair. In recent years designers have broadened their approach, creating entire systems to deliver products and services.

Design thinking incorporates constituent or consumer insights in depth and rapid prototyping, all aimed at getting beyond the assumptions that block effective solutions. Design thinking—inherently optimistic, constructive, and experiential—addresses the needs of the people who will consume a product or service and the infrastructure that enables it.

Businesses are embracing design thinking because it helps them be more innovative, better differentiate their brands, and bring their products and services to market faster. Nonprofits are beginning to use design thinking as well to develop better solutions to social problems. Design thinking crosses the traditional boundaries between public, for-profit, and nonprofit sectors. By working closely with the clients and consumers, design thinking allows high-impact solutions to bubble up from below rather than being imposed from the top.

DESIGN THINKING AT WORK

Jerry Sternin, founder of the Positive Deviance Initiative and a professor at Tufts University until he died last year, was skilled at identifying what he called outsider solutions to local problems. His approach to social innovation is a good example of design thinking in action.[1] In 1990, Sternin and his wife, Monique, were working in Vietnam to decrease malnutrition among children in 10,000 villages. At the time, 65 percent of Vietnamese children under age 5 suffered from malnutrition, and most solutions relied on government donations of nutritional supplements. But the supplements never delivered the hoped-for results.[2] As an alternative, the Sternins used an approach called positive deviance, which looks for solutions among individuals and families in the community who are already doing well.[3]

The Sternins and colleagues from Save the Children surveyed four local Quong Xuong communities in the province of Than Hoa and asked for examples of "very, very poor" families whose children were healthy. They then observed the food preparation, cooking, and serving behaviors of these six families, called "positive deviants," and found a few consistent yet rare behaviors. Parents of well-nourished children collected tiny shrimps, crabs, and snails from rice paddies and added them to the food, along with the greens from sweet potatoes. Although these foods were readily available, they were typically not eaten because they were considered unsafe for children. The positive deviants also fed their children multiple smaller meals, which allowed small stomachs to hold and digest more food each day.

The Sternins and the rest of their group worked with the positive deviants to offer cooking classes to the families of children suffering from malnutrition. By the end of the program's first year, 80 percent of the 1,000 children enrolled in the program were adequately nourished. In addition, the effort had been replicated within 14 villages across Vietnam.[4]

> Design thinkers look for work-arounds and improvise solutions and find ways to incorporate those into the offerings they create. They consider what we call the edges, the places where "extreme" people live differently, think differently, and consume differently.

The Sternins' work is a good example of how positive deviance and design thinking relies on local expertise to uncover local solutions. Design thinkers look for work-arounds and improvise solutions—like the shrimps, crabs, and snails—and they find ways to incorporate those into the offerings they create. They consider what we call the edges, the places where "extreme" people live differently, think differently, and consume differently. As Monique Sternin, now director of the Positive Deviance Initiative, explains: "Both positive deviance and design thinking are human-centered approaches. Their solutions are relevant to a unique cultural context and will not necessarily work outside that specific situation."

One program that might have benefited from design thinking is mosquito net distribution in Africa. The nets are well designed and when used are effective at reducing the incidence of malaria.[5] The World Health Organization praised the nets, crediting them with significant drops in malaria deaths in children under age 5: a 51 percent decline in Ethiopia, 34 percent decline in Ghana, and 66 percent decline in Rwanda.[6] The way that the mosquito nets have been distributed, however, has had unintended consequences.

In northern Ghana, for instance, nets are provided free to pregnant women and mothers with children under age 5. These women can readily pick up free nets from local public hospitals. For everyone else, however, the nets are difficult to obtain. When we asked a

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well-educated Ghanaian named Albert, who had recently contracted malaria, whether he slept under a mosquito net, he told us no—there was no place in the city of Tamale to purchase one. Because so many people can obtain free nets, it is not profitable for shop owners to sell them. But hospitals are not equipped to sell additional nets, either.

As Albert's experience shows, it's critical that the people designing a program consider not only form and function, but distribution channels as well. One could say that the free nets were never intended for people like Albert—that he was simply out of the scope of the project. But that would be missing a huge opportunity. Without considering the whole system, the nets cannot be widely distributed, which makes the eradication of malaria impossible.

THE ORIGIN OF DESIGN THINKING

IDEO was formed in 1991 as a merger between David Kelley Design, which created Apple Computer's first mouse in 1982, and ID Two, which designed the first laptop computer, also in 1982. Initially, IDEO focused on traditional design work for business, designing products like the Palm V personal digital assistant, Oral-B toothbrushes, and Steelcase chairs. These are the types of objects that are displayed in lifestyle magazines or on pedestals in modern art museums.

By 2001, IDEO was increasingly being asked to tackle problems that seemed far afield from traditional design. A health care foundation asked us to help restructure its organization, a century-old manufacturing company wanted to better understand its clients, and a university hoped to create alternative learning environments to traditional classrooms. This type of work took IDEO from designing consumer products to designing consumer experiences.

To distinguish this new type of design work, we began referring to it as "design with a small d." But this phrase never seemed fully satisfactory. David Kelley, also the founder of Stanford University's Hasso Plattner Institute of Design (aka the "d.school"), remarked that every time someone asked him about design, he found himself inserting the word "thinking" to explain what it was that designers do. Eventually, the term *design thinking* stuck.[7]

As an approach, design thinking taps into capacities we all have but that are overlooked by more conventional problem-solving practices. Not only does it focus on creating products and services that are human centered, but the process itself is also deeply human. Design thinking relies on our ability to be intuitive, to recognize patterns, to construct ideas that have emotional meaning as well as being functional, and to express ourselves in media other than words or symbols. Nobody wants to run an organization on feeling, intuition, and inspiration, but an over-reliance on the rational and the analytical can be just as risky. Design thinking, the integrated approach at the core of the design process, provides a third way.

The design thinking process is best thought of as a system of overlapping spaces rather than a sequence of orderly steps. There are three spaces to keep in mind: *inspiration*, *ideation*, and *implementation*. Think of *inspiration* as the problem or opportunity that motivates the search for solutions; *ideation* as the process of generating, developing, and testing ideas; and *implementation* as the path that leads from the project stage into people's lives.

The reason to call these spaces, rather than steps, is that they are not always undertaken sequentially. Projects may loop back through inspiration, ideation, and implementation more than once as the team refines its ideas and explores new directions. Not surprisingly, design thinking can feel chaotic to those doing it for the first time. But over the life of a project, participants come to see that the process makes sense and achieves results, even though its form differs from the linear, milestone-based processes that organizations typically undertake.

INSPIRATION

Although it is true that designers do not always proceed through each of the three spaces in linear fashion, it is generally the case that the design process begins with the inspiration space—the problem or opportunity that motivates people to search for solutions. And the classic starting point for the inspiration phase is the brief. The brief is a set of mental constraints that gives the project team a framework from which to begin, benchmarks by which they can measure progress, and a set of objectives to be realized—such as price point, available technology, and market segment.

But just as a hypothesis is not the same as an algorithm, the brief is not a set of instructions or an attempt to answer the question before it has been posed. Rather, a well-constructed brief allows for serendipity, unpredictability, and the capricious whims of fate—the creative realm from which breakthrough ideas emerge. Too abstract and the brief risks leaving the project team wandering; too narrow a set of constraints almost guarantees that the outcome will be incremental and, likely, mediocre.

Once the brief has been constructed, it is time for the design team to discover what people's needs are. Traditional ways of doing this, such as focus groups and surveys, rarely yield important insights. In most cases, these techniques simply ask people what they want. Conventional research can be useful in pointing toward incremental improvements, but those don't usually lead to the type of breakthroughs that leave us scratching our heads and wondering why nobody ever thought of that before.

Henry Ford understood this when he said, "If I'd asked my customers what they wanted, they'd have said 'a faster horse.'" [8] Although people often can't tell us what their needs are, their actual behaviors can provide us with invaluable clues about their range of unmet needs.

A better starting point is for designers to go out into the world and observe the actual experiences of smallholder farmers, schoolchildren, and community health workers as they improvise their way through their daily lives. Working with local partners who serve as interpreters and cultural guides is also important, as well as having partners make introductions to communities, helping build credibility quickly and ensuring understanding. Through "homestays" and shadowing locals at their jobs and in their homes, design thinkers become embedded in the lives of the people they are designing for.

Earlier this year, Kara Pecknold, a student at Emily Carr University of Art and Design in Vancouver, British Columbia, took an internship with a women's cooperative in Rwanda. Her task was to develop a Web site to connect rural Rwandan weavers with the world. Pecknold soon discovered that the weavers had little or no access to computers and the Internet. Rather than ask them to maintain a Web site, she reframed the brief, broadening it to ask what services could be provided

to the community to help them improve their livelihoods. Pecknold used various design thinking techniques, drawing partly from her training and partly from IDEO's Human Centered Design toolkit, to understand the women's aspirations. (See "Toolkit for Design Thinking" at right.)

Because Pecknold didn't speak the women's language, she asked them to document their lives and aspirations with a camera and draw pictures that expressed what success looked like in their community. Through these activities, the women were able to see for themselves what was important and valuable, rather than having an outsider make those assumptions for them. During the project, Pecknold also provided each participant with the equivalent of a day's wages (500 francs, or roughly $1) to see what each person did with the money. Doing this gave her further insight into the people's lives and aspirations. Meanwhile, the women found that a mere 500 francs a day could be a significant, life-changing sum. This visualization process helped both Pecknold and the women prioritize their planning for the community.[9]

TOOLKIT FOR DESIGN THINKING

In 2008, the Bill & Melinda Gates Foundation asked IDEO to codify the process of design thinking, so that it could be easily used by grassroots nongovernmental organizations working with small farmers in the developing world. A team of IDEO designers spent three months working with Heifer International, the International Center for Research on Women, and International Development Enterprises to understand their processes for designing new products, services, and programs and integrate them with IDEO's own processes.

The result of this effort was the Human Centered Design toolkit, a methodology organizations can use to undertake the design thinking process themselves. The toolkit is available as a free download at www.hcdtoolkit.com. **—T.B. & J.W.**

IDEATION

The second space of the design thinking process is ideation. After spending time in the field observing and doing design research, a team goes through a process of synthesis in which they distill what they saw and heard into insights that can lead to solutions or opportunities for change. This approach helps multiply options to create choices and different insights about human behavior. These might be alternative visions of new product offerings, or choices among various ways of creating interactive experiences. By testing competing ideas against one another, the likelihood that the outcome will be bolder and more compelling increases.

As Linus Pauling, scientist and two-time Nobel Prize winner, put it, "To have a good idea you must first have lots of ideas."[10] Truly innovative ideas challenge the status quo and stand out from the crowd—they're creatively disruptive. They provide a wholly new solution to a problem many people didn't know they had.

Of course, more choices mean more complexity, which can make life difficult, especially for those whose job it is to control budgets and monitor timelines. The natural tendency of most organizations is to restrict choices in favor of the obvious and the incremental. Although this tendency may be more efficient in the short run, it tends to make an organization conservative and inflexible in the long run. Divergent thinking is the route, not the obstacle, to innovation.

To achieve divergent thinking, it is important to have a diverse group of people involved in the process. Multidisciplinary people—architects who have studied psychology, artists with MBAs, or engineers with marketing experience—often demonstrate this quality. They're people with the capacity and the disposition for collaboration across disciplines.

To operate within an interdisciplinary environment, an individual needs to have strengths in two dimensions—the "T-shaped" person. On the vertical axis, every member of the team needs to possess a depth of skill that allows him or her to make tangible contributions to the outcome. The top of the "T" is where the design thinker is made. It's about empathy for people and for disciplines beyond one's own. It tends to be expressed as openness, curiosity, optimism, a tendency toward learning through doing, and experimentation. (These are the same traits that we seek in our new hires at IDEO.)

Interdisciplinary teams typically move into a structured brainstorming process. Taking one provocative question at a time, the group may generate hundreds of ideas ranging from the absurd to the obvious. Each idea can be written on a Post-it note and shared with the team. Visual representations of concepts are encouraged, as this generally helps others understand complex ideas.

One rule during the brainstorming process is to defer judgment. It is important to discourage anyone taking on the often obstructive, non-generative role of devil's advocate, as Tom Kelley explains in his book *The Ten Faces of Innovation*.[11] Instead, participants are encouraged to come up with as many ideas as possible. This lets the group move into a process of grouping and sorting ideas. Good ideas naturally rise to the top, whereas the bad ones drop off early on.

InnoCentive provides a good example of how design thinking can result in hundreds of ideas. InnoCentive has created a Web site that allows people to post solutions to challenges that are defined by InnoCentive members, a mix of nonprofits and companies. More than 175,000 people—including scientists, engineers, and designers from around the world—have posted solutions.

The Rockefeller Foundation has supported 10 social innovation challenges through InnoCentive and reports an 80 percent success rate in delivering effective solutions to the nonprofits posting challenges.[12] The open innovation approach is effective in producing lots of new ideas. The responsibility for filtering through the ideas, field-testing them, iterating, and taking them to market ultimately falls to the implementer.

An InnoCentive partnership with the Global Alliance for TB Drug Development sought a theoretical solution to simplify the current TB treatment regimen. "The process is a prime example of design thinking contributing to social innovation," explained Dwayne Spradlin, InnoCentive's CEO. "With the TB drug development, the winning solver was a scientist by profession, but submitted to the challenge because his mother—the sole income provider for the family—developed TB when he was 14. She had to stop working, and he took on the responsibility of working and going to school to provide for the family."

Spradlin finds that projects within the InnoCentive community often benefit from such deep and motivating connections.[13]

IMPLEMENTATION

The third space of the design thinking process is implementation, when the best ideas generated during ideation are turned into a concrete, fully conceived action plan. At the core of the implementation process is prototyping, turning ideas into actual products and services that are then tested, iterated, and refined.

Through prototyping, the design thinking process seeks to uncover unforeseen implementation challenges and unintended consequences in order to have more reliable long-term success. Prototyping is particularly important for products and services destined for the developing world, where the lack of infrastructure, retail chains, communication networks, literacy, and other essential pieces of the system often make it difficult to design new products and services.

Prototyping can validate a component of a device, the graphics on a screen, or a detail in the interaction between a blood donor and a Red Cross volunteer. The prototypes at this point may be expensive, complex, and even indistinguishable from the real thing. As the project nears completion and heads toward real-world implementation, prototypes will likely become more complete.

After the prototyping process is finished and the ultimate product or service has been created, the design team helps create a communication strategy. Storytelling, particularly through multimedia, helps communicate the solution to a diverse set of stakeholders inside and outside of the organization, particularly across language and cultural barriers.

VisionSpring, a low-cost eye care provider in India, provides a good example of how prototyping can be a critical step in implementation. VisionSpring, which had been selling reading glasses to adults, wanted to begin providing comprehensive eye care to children. VisionSpring's design effort included everything *other than* the design of the glasses, from marketing "eye camps" through self-help groups to training teachers about the importance of eye care and transporting kids to the local eye care center.

Working with VisionSpring, IDEO designers prototyped the eye-screening process with a group of 15 children between the ages of 8 and 12. The designers first tried to screen a young girl's vision through traditional tests. Immediately, though, she burst into tears—the pressure of the experience was too great and the risk of failure too high. In hopes of diffusing this stressful situation, the designers asked the children's teacher to screen the next student. Again, the child started to cry. The designers then asked the girl to screen her teacher. She took the task very seriously, while her classmates looked on enviously. Finally, the designers had the children screen each other and talk about the process. They loved playing doctor and both respected and complied with the process.

By prototyping and creating an implementation plan to pilot and scale the project, IDEO was able to design a system for the eye screenings that worked for VisionSpring's practitioners, teachers, and children. As of September 2009, VisionSpring had conducted in India 10 eye camps for children, screened 3,000 children, transported 202 children to the local eye hospital, and provided glasses for the 69 children who needed them.

"Screening and providing glasses to kids presents many unique problems, so we turned to design thinking to provide us with an appropriate structure to develop the most appropriate marketing and distribution strategy," explained Peter Eliassen, vice president of sales and operations at VisionSpring. Eliassen added that prototyping let VisionSpring focus on the approaches that put children at ease during the screening process. "Now that we have become a design thinking organization, we continue to use prototypes to assess the feedback and viability of new market approaches from our most important customers: our vision entrepreneurs [or salespeople] and end consumers."[14]

SYSTEMIC PROBLEMS NEED SYSTEMIC SOLUTIONS

Many social enterprises already intuitively use some aspects of design thinking, but most stop short of embracing the approach as a way to move beyond today's conventional problem solving. Certainly, there are impediments to adopting design thinking in an organization. Perhaps the approach isn't embraced by the entire organization. Or maybe the organization resists taking a human-centered approach and fails to balance the perspectives of users, technology, and organizations.

One of the biggest impediments to adopting design thinking is simply fear of failure. The notion that there is nothing wrong with experimentation or failure, as long as they happen early and act as a source of learning, can be difficult to accept. But a vibrant design thinking culture will encourage prototyping—quick, cheap, and dirty—as part of the creative process and not just as a way of validating finished ideas.

As Yasmina Zaidman, director of knowledge and communications at Acumen Fund, put it, "The businesses we invest in require constant creativity and problem solving, so design thinking is a real success factor for serving the base of the economic pyramid." Design thinking can lead to hundreds of ideas and, ultimately, real-world solutions that create better outcomes for organizations and the people they serve. ■

Notes

1 "In Memoriam: Jerry Sternin," Positive Deviance Initiative.

2 "Nutrition in Viet Nam," Positive Deviance Initiative.

3 "What Is Positive Deviance?" Positive Deviance Initiative.

4 "The Viet Nam Story: Narrated by Jerry Sternin," Positive Deviance Initiative.

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HUMAN DIGNITY AND HUMAN RIGHTS:
TOWARD A HUMAN-CENTERED FRAMEWORK FOR DESIGN

DR RICHARD BUCHANAN
Carnegie Mellon University

ABSTRACT

Designers and design educators in many parts of the world are discussing a new framework for our discipline. This framework offers a new way of thinking about the diversity of design, encompassing the entire spectrum of work from craft to high-tech applications. The goal of this paper is to sketch the central features of this framework and discuss some of the implications for future development of the discipline in professional practice and in education. Design is rapidly maturing as a discipline. But along the path of consolidation and expansion are many tensions and uncertainties~the relation of design practice and design research, the relation of different branches of design, and the relation of different visions or philosophies of design. The idea of an "ecology of culture" offers a perspective on these tensions and a way to move forward with our collective enterprise of making design a central discipline of the next century.

As I walked on the shore of Cape Town last night to the opening ceremonies of our conference, I saw through the rain and mist a small sliver of land in the bay. Naively, I asked my host if it was part of the peninsula that extends south of the city or an island. With what, in retrospect, must have been great patience, she quietly explained that it was not "an" island, it was "the" island. I was embarrassed, but I knew immediately what she meant. I spent the rest of the evening thinking about the political prisoners who were held on Robben Island, human rights, and the irony of a conference within sight of Table Bay that seeks to explore the reshaping of South Africa by design.

I was helped in these thoughts by the address of the Minister of Education, Dr. Kader Asmal, who opened the conference by exploring the meaning of design, the need and opportunities for design in South Africa, and, most importantly, the grounding of design in the cultural values and political principles expressed in the new South African Constitution. I have never heard a high government official anywhere in the world speak so insightfully about the new design that is emerging around us as we near the beginning of a new century. Perhaps we were all surprised by how quickly and accurately he captured the core of our discipline and turned it back to us for action. Many of his ideas are at the forward edge of our field, and some are further ahead than we are prepared to admit. For example, I believe we all recognized his significant transformation of the old design theme of "form and function" into the new design theme of "form and content." This is one of the distinguishing marks of new design thinking: not a rejection of function, but a recognition that unless designers grasp the significant content of the products they create, their work will come to little consequence or may even lead to harm in our complex world.

I was more surprised by Dr. Asmal's account of the creation—and here he deliberately and significantly used the word "design"—of the South African Constitution. He explained that after deliberation the drafters decided not to model the document on the familiar example of the United States Constitution, with an appended Bill of Rights, but rather to give central importance from the beginning to the concept of human dignity and human rights. Though he did not elaborate the broader philosophical and historical basis for this decision, it is not difficult to find. Richard McKeon, co-chair of the international committee of distinguished philosophers that conducted the preparatory study for the Universal Declaration of Human Rights, explains that the historical development and expression of our collective understanding of human

rights has moved through three periods.1 Civil and political rights were the focus of attention in the eighteenth century; economic and social rights were the focus in the nineteenth century; and cultural rights—formally discovered in the preparatory work for the Universal Declaration—became the focus in the twentieth century. The U.S. Constitution begins with a statement of political rights, and the Bill of Rights is a statement of civil rights protected from government interference, properly suited to the historical development of human rights in the late eighteenth century. In subsequent case law, the United States has gradually elaborated its understanding of economic and social rights as well as cultural rights. The South African Constitution begins with a statement of cultural rights, suited to the current historical period in the development of human rights. It seeks to integrate civil and political rights as well as economic and social rights in a new framework of cultural values and cultural rights, placing central emphasis on human dignity. The result for South Africa is a strong document, suited to a new beginning in new circumstances. The opening article of the Constitution, quoted by Dr. Asmal, reminded me of the Preamble of the Universal Declaration of Human Rights, which announces "recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family."

As a participant in the drafting of the Constitution, Dr. Asmal's account is both historically important and a conscientious reminder of the cultural context within which our conference takes place. However, Dr. Asmal went further, and the next step of his argument brought the room to complete silence. He made the connection between practice and ultimate purpose that is so often missing in our discussions of design, whether in South Africa, the United States, or elsewhere in the world. Design, he argued, finds its purpose and true beginnings in the values and constitutional life of a country and its peoples. Stated as a

principle that embraces all countries in the emerging world culture of our planet, design is fundamentally grounded in human dignity and human rights.

I sensed in the audience an intuitive understanding of the correctness of this view, though the idea itself probably came as a surprise because we often think about the principles of design in a different way. We tend to discuss the principles of form and composition, the principles of aesthetics, the principles of usability, the principles of market economics and business operations, or the mechanical and technological principles that underpin products. In short, we tend to discuss the principles of the various methods that are employed in design thinking rather than the first principles of design, the principles on which our work is ultimately grounded and justified. The evidence of this is the great difficulty we have in discussing the ethical and political implications of design and the consequent difficulty we have in conducting good discussions with students who raise serious questions about the ultimate purpose and value of our various professions.

The implications of the idea that design is grounded in human dignity and human rights are enormous and deserve careful exploration beyond the scope of my comments on this occasion. I believe they will help us to better understand aspects of design that are otherwise obscured in the flood of poor or mediocre products that we find everywhere in the world. We should consider what we mean by human dignity and how all of the products that we make either succeed or fail to support and advance human dignity. And we should think carefully about the nature of human rights—the spectrum of civil and political, economic and social, and cultural rights—and how these rights are directly implicated in our work. The issues surrounding human dignity and human rights provide a new perspective for exploring the

many moral and ethical problems that lie at the core of the design professions.

We recognize in Dr. Asmal's argument the major tenet of new design thinking: the central place of human beings in our work. In the language of our field, we call this "human-centered design." Unfortunately, we often forget the full force and meaning of the phrase and the first principle, which it expresses. This happens, for example, when we reduce our considerations of human-centered design to matters of sheer usability and when we speak merely of "user-centered design." It is true that usability plays an important role in human-centered design, but the principles that guide our work are not exhausted when we have finished our ergonomic, psychological, sociological and anthropological studies of what fits the human body and mind. Human-centered design is fundamentally an affirmation of human dignity. It is an ongoing search for what can be done to support and strengthen the dignity of human beings as they act out their lives in varied social, economic, political, and cultural circumstances.

This is why Robben Island remained in my thoughts last evening. It reminded me that the quality of design is distinguished not merely by technical skill of execution or by aesthetic vision but by the moral and intellectual purpose toward which technical and artistic skill is directed. Robben Island, site of the prison in which Nelson Mandela and others political prisoners were isolated so long from direct participation in the national life of South Africa, is another symbol of twentieth-century design gone mad when it is not grounded on an adequate first principle. It is a symbol of the wrongful use of design to shape South Africa in a system that denied the essential dignity of all human beings. Robben Island belongs with other disturbing symbols of design in the

twentieth century, such as the one that my colleague, Dennis Doordan, chillingly cites. He reminds us that the Holocaust was one of the most thoroughly designed experiences of the twentieth century, with careful attention to every obscene detail.

Dr. Asmal's argument carries an urgent message for the work of this conference. Not only is design grounded in human dignity and human rights, it is also an essential instrument for implementing and embodying the principles of the Constitution in the everyday lives of all men, women, and children. Design is not merely an adornment of cultural life but one of the practical disciplines of responsible action for bringing the high values of a country or a culture into concrete reality, allowing us to transform abstract ideas into specific manageable form. This is evident if we consider the scope of design as it affects our lives. As an instrument of cultural life, design is the way we create all of the artifacts and communications that serve human beings, meeting their needs and desires and facilitating the exchange of information and ideas that is essential for civil and political life. Furthermore, design is the way we plan and create actions, services, and all of the other humanly shaped processes of public and private life. These are the interactions and transactions that constitute the social and economic fabric of a country. Finally, design is the way we plan and create the complex wholes that provide a framework for human culture—the human systems and sub-systems that work either in congress or in conflict with nature to support human fulfillment. These range from information and communication systems, electrical power grids, and transportation systems to our managerial organizations, our public and private institutions, and even our national constitutions. This is what leads us to say that the quality of communications, artifacts, interactions, and the environments within which all of these occur is the vivid expression of national and cultural values.

We are under no illusion that design is everything in human life, nor do we believe that individuals who specialize in one or another area of design are capable of carrying out successful work in other areas. What we do believe is that design offers a way of thinking about the world that is significant for addressing many of the problems that human beings face in contemporary culture. We believe that conscious attention to the way designers work in specialized areas of application such as communication or industrial design is relevant for work in other areas. And we believe that general access to the ways of design thinking can provide people with new tools for engaging their cultural and natural environment. As we work toward improving design thinking in each of our special areas of application, we also contribute to a more general understanding of design that others may use in ways that we cannot fully anticipate. The urgent message of Dr. Asmal is that we must get on with our work as designers in all of these areas if we are to help in sustaining the revolution that has been initiated in South Africa—and the wider revolution in human culture that is taking place around us throughout the world.

Reshaping South Africa by design

Reshaping South Africa by design is a dangerous and deliberately provocative theme, presenting us with two opposing alternatives. One alternative is the dangerous idea that South Africa—or any nation—is merely passive clay, waiting to be molded by the energy, will, and power of individual designers, guided primarily by intuition and personal opinion about the way the world should be. Perhaps the design of Brasilia is an example of this kind of vision, where a new city was carved out of remote wilderness to be the capital and working symbol of the national life of Brazil. Whether we regard the result as a success or

failure, it provides the cautionary point that reshaping a country by design can be dangerous if it simply elevates the personal vision of individual designers and neglects or ignores the circumstantial reality of people and places. Carried to an extreme, this idea is the basis of design sophistry. We have too many examples of this throughout the world.

Instead, I prefer the other alternative. I prefer to think of design not as a discipline for molding passive clay to the will of a designer—and his or her sponsor—but as a discipline of collective forethought, anticipating the possibilities for individual and collective growth that are available in any environment. I prefer, for example, the diverse projects conducted in the Brazilian city of Curitiba to the massive project of Brasilia. For me, reshaping South Africa by design means supporting the value of human beings interacting with other human beings and discovering new kinds of interactions among people and their cultural and natural environment, with a goal of enhancing human dignity and supporting human rights. This work requires more than intuition and personal opinions about what is best. It requires knowledge of the significant content of products and a willingness to work together with all of the stakeholders in an enterprise. It requires that we take good care of each other as we work toward common goals that benefit everyone.

A NEW FRAMEWORK FOR DESIGN

Our task is to use the principles of human-centered design to build a new framework for design practice, design education, and design research in South Africa. At the outset, however, we should recognize that the problems of design in South Africa, while different in important ways, are closely related to the problems of design in many other parts

of the world, including the United States. Understanding design in South Africa offers an important perspective on design everywhere.

Here are some of the ways in which I see our situations as similar, viewed from the perspective of the condition of design and then from the perspective of the communities that we serve. Design today is fragmented in many ways that are not suited to the new circumstances and challenges that we face. It is fragmented into discrete disciplines and professions that, in contemporary practice, share may features in common and increasingly must work together to address complex new design problems. It is fragmented in institutional expression in our schools, often divided into small enclaves of technical specialization that wastefully duplicate activities and resources and fail to provide the integrative knowledge of history, business practices, economics, technology, design theory, and other subjects that could prepare students to be innovative in the new environment of design practice. It is fragmented in purpose, torn between traditional ideas about craft and artifact design and new concepts of information design, interaction design, product development, entrepreneurship, and the design of human environments. In short, design is in a troubling condition. There is an urgent need to rethink our field if we are to take on the role that Dr. Asmal has proposed for designers.

With regard to the communities that we seek to serve, I have also found surprising similarities between the problems that are faced in South Africa and the United States. For example, both of our countries are sharply divided in the distribution of wealth. The distance between the rich and poor in the United States may seem slight compared to the circumstances faced in South Africa, but the distance between those who have and those who have not should concern all designers in both of our countries as they decide where to direct their talents. Similarly,

both of our countries display incredible cultural diversity. To an outside observer—particularly looking through the lens of mass media—it may appear that American culture is a monolith and, in turn, that South Africa is a simple polarity of white and black cultures. But when we get past the media stereotypes of our countries, the picture is far more complex. For example, it is true that American culture is distinctive in many ways that make it appear monolithic; but there is also a great pluralism of cultures in the United States—far more than appears to a casual observer from a distance. Cultural diversity is clearly one of our great resources in the United States, but it is also a source of ongoing confusion and conflict that we continue to explore in all aspects of design. Similarly, it is now apparent to me that cultural diversity is one of the hallmarks of South Africa, recognized by many South Africans as a great resource for the future and now increasingly explored by the design community. Of course, both of our countries face a variety of other problems in common. These include a culture of consumption that threatens to displace traditional human values, a culture of adult preoccupations that too often denies the special needs and rights of children and of elders, an educational system that is slow to adapt to new needs and opportunities, and a corporate culture that, even in the face of global economic competition, still does not adequately recognize the importance of design.

These are some of the features of our situations that we share in common, but there are also special circumstances of design in South Africa. While we could describe these in a variety of ways, it is important to focus on the issue of economic development, since proper understanding of the role of design in economic development in South Africa is a lynchpin for reshaping design education and design research—with implications for design in many other countries. For this purpose I would like to present some personal observations, recognizing

the limitations of experience and understanding that they may reflect but also hoping that an outside perspective may reveal patterns that are significant for building the new framework that is needed.

I expected to find that craft plays an important role in design and design education in South Africa, and, indeed, it does. It is evident in almost every educational program that I have visited. What I did not expect to find is so many leaders in the design community who understand the complex role of craft in economic development. They understand, for example, that a revitalization of craft is important for many reasons in South Africa. It provides employment in depressed areas. It enhances the skills and disciplines of work. It strengthens the cultural foundations of "making" or production. It restores cultural traditions and diverse cultural expression. It reveals diverse "voices" in the developing unity of South African culture. In short, the revitalization of craft enhances human dignity and contributes to the fulfillment of human rights—civil, economic, and cultural.

Equally important, however, they also understand that craft alone is not adequate for national survival in a complex global economy. For example, craft is an extremely expensive, labor intensive method of manufacturing, justifiable only when there is a large population that needs employment or when there is a market for expensive unique products. Craft cannot provide many of the kinds of standardized products that are generally needed for health and well being. Craft cannot meet the need for general distribution of essential products among a large population, since the one-off and serial production methods of craft yield only a small number of products. Moreover, craft typically provides for export to international markets only products that are considered exotic novelties, items that are on the fringe of economic exchange. These and many other reasons point to the

limitations of craft and the need to explore a new relationship with the design disciplines. Craft can have an intimate and vital connection with new design thinking, provided that the nature of craft and the role of design are well conceived. We will have more to say on this point, but for now it is enough to observe that wise design thinking will contribute in two ways. First, it will discover ways to improve craftwork through innovation in materials and processes. Second, it will discover among the explorations of craft those products and elements of products that may contribute to industrialization and mass production. There are, of course, many dangers involved in industrialization. But the alternative of a purely or primarily craft-oriented economy is worse.

The key to craft revitalization and a new creative relationship with design lies in an idea that I first learned from my colleague, Dennis Doordan. Properly understood, craft is not the repository of traditional form; it is the repository of indigenous cultural knowledge. This idea is well understood in South Africa, and this is one of the learnings that I will take back with me to share with colleagues in the United States and elsewhere. Unlike other countries where craft is sometimes understood as the repository of static traditional forms, craft in South Africa is typically innovative and evolving. Efforts at craft revitalization are not directed toward the past but toward the future. However, in addition to innovation within the traditions of craft, I have also found evidence that the revitalization of craft serves to bring forward indigenous cultural knowledge that can have strong impact on design and industrialization. I am referring not simply to visual motifs and external forms but to the knowledge of human beings, human behavior, and human values in social interaction. This is already evident in aspects of graphic and communication design, and it is perhaps even more evident in aspects of industrial design.

Unfortunately, there are very few South African educational programs in industrial design, and those that do exist are struggling in the face of difficult economic constraints, neglect by industry, and, to be candid, some old ideas about the nature of industrial design. Given the size of South Africa and the opportunities for new product development, the number of industrial design programs should be doubled or tripled within next ten years—and even this may not be adequate to meet the need. This may seem like a surprising or even radical idea, but it is well to remember that in new design thinking, the discipline of industrial design has wider application than is commonly understood. When the ideas and methods of industrial design are integrated with the new ideas of information design, interaction design, and environmental design, the widened scope of such programs becomes more apparent, as does their value for the social and economic development of the country. Industrial design is the key discipline for new product development, whether in areas of low, middle, or high technology. Many of our colleagues in engineering and the natural sciences may be uncomfortable with this idea, since their contributions are also essential for the creation of successful products. Nonetheless, industrial design and the related design disciplines are critical for realizing the whole product that must come to market. The whole product—what we may also call the "total product"—is the product that is fully realized in all of its effective and affective dimensions. The whole product is distinct from the many "partial products" that typically emerge from corporations that are dominated by engineering or computer science—where technological reasoning is not properly balanced by the other factors that influence the success of products in the marketplace and in society. Other countries throughout the world have begun to establish strong policies for the development of industrial design. How long will it take for those who shape national policy in research to realize that design research—covering a wide

range of subjects but particularly building toward design research into the development of new products—should have equal national priority with engineering and scientific research? Why should South Africa miss the opportunity to establish a unique place of leadership in many aspects of new product development?

What I have sketched thus far is my personal understanding of the special circumstance of craft in South Africa and the role of graphic and industrial design for bringing indigenous cultural knowledge to new product development and industrialization. I hope my understanding matches the understanding of colleagues in the South African design community, and I hope that my remarks simply adds momentum to the beginnings of change that I have seen in design education. However, I would like to go further in describing what I see as the special circumstances of design in South Africa and the special opportunities for new development through practice, education, and research.

For this purpose, we should take a moment to recognize what it means to expand design from its traditional focus on communications and artifacts to a new focus that includes interactions and environments. The design of interactions and environments is a new aspect of our field, unfamiliar to many people who were educated in the traditional disciplines of graphic and industrial design. For example, some of our colleagues were surprised and puzzled to learn that I was invited by the Commissioner of Taxation to deliver a seminar on new design thinking for some of the leaders of the South African Revenue Service in Pretoria. Frankly, there is similar surprise among colleagues in Australia and the United States when I explain how I am participating in the massive project to redesign the entire Australian taxation system on human-centered design principles, using progressive concepts and methodologies from the new disciplines of interaction design. In both

cases, my presentations are not directed to the design of tax forms or computer information systems, though these are certainly familiar aspects of the taxation system that could benefit from the application of new design thinking. Instead, my presentations focus on how new design thinking can be applied to the design of the entire system of taxation, with special attention to the pathways that individuals must experience in journeys through such a system. The ideas and examples I discuss are drawn from industrial design, graphic and communication design, and information design, but they are integrated within the new concepts and methods of interaction design. Without doubt, the use of design to rethink the human-centered focus of any government service—or the design of services and other activities in business and industry—is a highly unusual extension of design, as we have known it. Yet, this is an important aspect of the new design thinking toward which Dr. Asmal has pointed, and it is the kind of work toward which some designers are beginning to direct serious attention.

Interaction design is an emerging area of design practice that has significant implications for South Africa. Unfortunately, educational programs in South Africa, the United States, and elsewhere in the world are slow to realize the opportunity to bring design thinking into this new area of application. Nonetheless, I have seen at least two educational programs in South Africa that—in quite different ways—have made important changes toward new design thinking. One is an important program in information design and interaction design; the other is a reconstruction of undergraduate education in graphic and communication design with strong roots in cultural diversity. But I have seen many other programs that are now preparing for change, exploring new ideas and new reorganizations of effort. In addition, I have seen at least half a dozen projects, even in my short visit, that represent important innovations in design thinking. I believe they are

representative of some of the leading design projects in the world today.

However, I hope no one will imagine that I am suggesting a shift toward high technology or digital products as the focus of design education. While interaction design has important applications in the development of digital products—there are many examples of high technology research and development in South Africa and there is a need to explore digital technology in design education programs throughout the country—interaction design is not fundamentally concerned with digital products. Interaction design is fundamentally concerned with how people relate to other people, sometimes through the mediating influence of digital products but more often through other kinds of products. One of the best examples of this is a project led by Kate Wells, from ML Sultan Technikon. It is the "Rural Crafts and HIV Aids Awareness Project, KwaZulu Natal: A Partnership in Rural Women's Development."2 For some people, this work may appear to be a simple craft revitalization project. It is not. It is a sophisticated interaction design project that goes well beyond the crafting of artifacts. It is well suited to a special cultural environment and to a pressing social and cultural problem that requires sustained discussion and human interaction if it is to become manageable. The craft artifacts are only a stimulus to the real design product sought in this project, the interaction of people discussing the issue of AIDS in a social environment that otherwise forbids such discussion.

Such projects deserve close attention by the design community, and they must be well articulated so that the new learning may be shared in South Africa and with the rest of the world. This is a responsibility of design research—to publicly disseminate the results of work through publications and exhibition. As a colleague at ML Sultan Technikon

and the University of Natal explained during a discussion period last week, it is not enough simply to do the work or even to exhibit the resulting artifacts. Proper dissemination means explaining clearly what the innovations have been, what new concepts and methods have been employed, and what the results have been.

This is the spectrum of design that I believe is shaped within the special circumstances of South Africa. It begins in the vital role of craft, moves into the work of graphic, communication and industrial design, and extends in concrete ways to new opportunities for information and interaction design and the design of human environments and systems. However, I want to add a special note on the role of the fine arts in this context. Like many countries, South Africa continues to explore the close relationship between design and the fine arts. Indeed, most design programs are still embedded in art and design faculties within colleges and other institutions. It is important to recognize that the historical origins of this alliance lie in European institutions, where design was for so long denied the status of significant learning and where design was typically subordinated to the fine or so-called "higher" arts. This relationship has changed dramatically in recent years in many countries as designers and artists have come to understand the distinct identity of design as a discipline of thinking and of practical service to human beings. For example, many art and design colleges in the United States are beginning to recognize the independent identity of design and are beginning to reorganize with this in mind. But the growing independence of design does not harm our appreciation of the place of the fine arts in cultural life and does not diminish the importance of the fine arts for design thinking. Instead, it makes possible a better relationship when neither side of the partnership feels that it must defend its value and identity against the claims and successes of the other. My hope is that we recognize the special

challenge faced by design in South Africa at this moment in its history and work quickly to strengthen its vision and mission. The fine arts and design will both benefit.

THREE CONCEPTS FOR A NEW FRAMEWORK

What are the concepts of human-centered design that could help us to understand the scope of design within the special circumstances of existing and emerging practice in South Africa that we have discussed? I believe there are three concepts whose discussion could make a significant contribution to building a new framework for design. They concern the definition of design, the nature and quality of products in new design thinking, and the ecology of culture.

Definition of Design.

Any effort to establish a new framework for design must face the challenge of definition. Unfortunately, the design community has often foundered on the problem of definition. The reason is a misunderstanding about the nature and function of definitions in the development of a discipline or a field. If history is any guide, definitions do not settle matters once and for all—nor should they. Definitions serve tactical and strategic purposes in our thinking. They focus attention on one or another aspect of a subject and enable exploration to go forward in a particular direction for a time.

There are two kinds of definition in the design community—descriptive and formal—and both are important. Descriptive definitions tend to identify a single cause of design and elevate its importance for our attention. I have found that every designer has such a definition ready at hand and is willing to present and defend it against all comers. Indeed, I have already presented a descriptive definition of my own,

earlier in this paper. I suggested that "design is a discipline of collective forethought." Whether one agrees with this definition, I hope it cast some light on our work—particularly in the tactical context in which it was presented. There are so many descriptive definitions of design that it is no wonder we have had a difficult time explaining to others what our field—as opposed to our individual work—is really about. Some of my favorite descriptive definitions at the moment are these. "Design is the humanizing of technology," proposed by Augusto Morello, President of the International Council of Societies of Industrial Design (ICSID). "Design is making things right," proposed by Ralph Caplan, who shrewdly suggests both technical and moral correctness in our work. And here is a metaphoric definition that I also like: "Design is the glimmer in God's eye," offered by an individual who remains anonymous. There are, of course, more metaphoric descriptive definitions of design than we can count, and I find them all interesting and useful.

However, it is difficult to build an inclusive framework for design on descriptive definitions. Whichever definition is chosen may sound good for the moment, but it tends to diminish the value of other definitions and doesn't allow for growth and changing directions of exploration. I prefer a formal definition, though formal definitions are seldom as vivid and interesting on first consideration. The advantage of a formal definition is that it provides strategic understanding, based on a functional relationship of several fundamental causes of a complex subject such as design. In short, it leaves open creative space for many approaches to design while explaining the deeper contribution that each approach makes toward developing the subject. Here is the formal definition that I have used to help me make sense of the diverse approaches to design that I have encountered over the years. "Design is the creative human power to conceive, plan and realize products

that serve human beings in the accomplishment of their individual and collective purposes." I would like to explain this definition in a little more detail, since I believe its value—or the value of any formal definition we may create as the basis for a new framework for design—lies in the connections it makes possible among different approaches to our subject.

For me, "creative human power" embraces the many descriptive definitions that place emphasis on creativity and the vision of the individual designer. Individual creativity is certainly an important aspect of design. In turn, "conceive, plan and realize products" embraces the many descriptive definitions of design that place great emphasis on process and method, since it identifies the final outcome of each phase of the design process—we must conceive new ideas, plan their development in products, and then make those products in concrete form. The next clause, "that serve human beings," embraces the all of the descriptive definitions that emphasize the formal qualities of products and their impact on human beings. One aspect of this clause is that it focuses on service to human beings rather than self-expression. It places aesthetic qualities in balance with qualities of usability and qualities of technological rigor and intellectual or informational content.

Finally, the clause "in the accomplishment of their individual and collective purposes" embraces, for me, the many descriptive definitions that seek to distinguish the branches of design by areas of application or by the types of products that designers create. We must be cautious in such descriptive material definitions, since they often entrap our thinking about the scope of design. For example, we may imagine that definitions of graphic design—the design of printed materials—adequately address the scope of a branch of design thinking, without

recognizing that such a fixed scope does not at all reveal other emerging areas where the concepts of graphic design may be applied. Such definitions are a particularly good example of the tactical nature of some definitions. Definitions of "graphic design" have, indeed, served the field of design for a time, but they have broken down in recent years as "graphic designers" have been employed in many new areas, including computer interface and information and interaction design. This is why so many "graphic design" programs around the world have been renamed as "visual communication" programs and, more recently, as "communication design" programs. These designers are not concerned, fundamentally, with printed matter. They are concerned with the communication of information—whether in print, in sound, in images and text, in physical artifacts, and on the screen.

It would be tragic if discussions about a new framework for design broke down over definitional issues. Whether my formal definition is useful in your work, I hope that by distinguishing the four areas of design thinking—creativity, process, product form, and the human applications and uses of products—I have suggested a way to explore the diversity and relationship of the many visions that make up design today. A suitable formal definition does not eliminate diversity. It provides a framework for understanding the different contributions that each of us may make to the larger enterprise of design. To be of one mind in a vision of design is not to be of one opinion in its expression and exploration. We may share a common vision of design but hold different opinions about how it may be developed and practiced.

As a practical matter, it would be useful to build a concept map of design in South Africa. A matrix map with a small number of variables may reveal the collective strength of approaches in South African

design. Done well, such a map may move discussions past disputes about descriptive definitions and toward a collective understanding of how each individual or group contributes to the whole enterprise. In the best outcome, such a map would also suggest areas of common research interest for further development.

Nature of Products.

A new framework for design should also be based on a clear idea about the nature of the diverse products that designers create. Among the general public, a product is simply an artifact. It is a physical entity, usually associated with industrial design. However, this is an outdated idea that no longer matches our understanding of design. Indeed, it often hinders the work of design. Properly understood, a product is the immediate outcome of design, whether that outcome is a tangible artifact or something intangible. The product is an offer of experience. It is not an experience in itself; it assembles the materials and possibilities that a human being may turn into a personal experience. Where there is something tangible, the physical artifact is only the carrier of a more important intangible product. This is evident in the area of graphic and communication design, where we have gradually come to understand that what appears on the printed page, while certainly designed, is only part of the communication that the designer seeks to create. The product is the communication itself, which is an engagement with the viewer that induces him or her to consider the information that is presented and reach a personal decision—a judgment—about the subject that is presented. Admittedly, it has been much easier for graphic designers to regard the printed page as their product rather than a communicative engagement with the viewer. The restricted idea of product allows designers to judge their work by narrow formal and technical criteria, avoiding the deeper problem of evaluating the effectiveness of their work. Unfortunately, popular design magazines

are filled with technically correct, interesting, innovative, and sometimes exciting visual displays whose real effectiveness in achieving communication to solve a real design problem is never discussed or evaluated.

When we expand the meaning of the term "product" from a physical artifact to an engagement with human beings, the diverse branches of design become clearer, revealing the logical pattern of how designers explore the human-made world. We have already suggested the core product of graphic design, visual communication, and communication design: an engagement that induces a viewer to consider information and reach a personal decision about the subject that is presented. The diverse forms of communication design depend on whether the judgment is oriented toward the past, present, or future. In contrast to such products, there are also products that are easily recognized in the traditional practices of industrial design and engineering. What is added to the understanding of the physical artifact in traditional industrial design is awareness of how products perform in the experience of human beings. This is the direction of new thinking in industrial design, where the behavioral and social sciences—and particularly anthropology—have helped to change our notion of form from something static to something dynamic and culturally situated. Finally, there are the two new areas of products that I have already mentioned: interactions and environments. We have been slow to recognize that services, processes, and other planned activities are also products. However, important beginnings have been made in this direction and we would do well to include in any new framework of design the area of "action," including such examples as services and processes. Both communication design and industrial design can contribute to the exploration of interaction design, but this requires a new perspective and a new orientation of traditional thinking. I will say

little about the area of human environments and systems, except to suggest that designers are now exploring some of the most unusual problems of our field around issues of cultural value and human experience. Indeed, two of the most interesting projects I have found in South Africa are in this area. Their hallmark is a problem of integrating the contributions of many design disciplines within a collective vision of an environmental whole, organized around a unifying idea or value.

The central idea I want to present is that new design thinking now embraces both an external and an internal perspective on the nature of products. In traditional design, the product is regarded primarily from an external perspective. We discuss form and function, materials, and the manner of designing, producing, using, and disposing. In new design thinking we are mindful of those important considerations, but we also attempt to understand products from an internal perspective of performance, asking what is the experience of the human being that uses a product? For this reason, some new terms have entered design—and along with them, new concepts and methods.

This is most evident in the area of form. Viewed from an external perspective, form is often understood as shape or physical configuration. We ask, is the form suited to the function that the product must fulfill? Viewed from an internal perspective—inside the experience of human beings—form changes from a concept of static shape to a concept of dynamic process and performance. Dynamic form—the form of a product as it is experienced by a human being—has three distinctive qualities. First, it must be useful in performance. To be useful, the product must incorporate appropriate and well considered "content" that is properly "structured." In some cases, this involves technological reasoning, but in other cases it may involve an emphasis on accurate informational content and a structure of logical

understanding. In addition, we expect products to be usable in performance. To be usable, the product must fit both the human hand and the human mind, matching the limitations of human beings with suitable "affordances" to action and control. Finally, a product must be desirable. To be desirable, the product must speak to us in a "voice" with which we can identify, finding comfort, trust, and some measure of surprise and delight.

There is, of course, a final quality of form. It must be appropriate to the situation of use. When I was a schoolboy, the idea of propriety was anathema to me. The word stood for all that was conventional in the social world around me. As I grew older, however, I gradually came to see that what is appropriate in life is sometimes revolutionary, and what is inappropriate is sometimes the very conventionalities and injustices that appalled me as a boy. In the context of design, I have come to understand that propriety or what is appropriate takes two forms. First, propriety is the proper mixture of emphasis on what is useful, usable, and desirable in a product. The balance changes significantly when we consider, for example, the form of a medical instrument and the form of an item of high fashion clothing or jewelry. I hope that students and colleagues will consider the changing proportions of useful, usable and desirable in a wide range of products and investigate how these distinctions provide a framework for understanding the differences among all types of products. Second, propriety is the ultimate grounding of product form in the social and cultural situation of use. This aspect of propriety is illuminated by Dr. Asmal's discussion and by our understanding that the ultimate purpose of design is to enhance human dignity and support human rights. We can design products with technical precision so that they are efficient and effective in their performance, but there are some products that we should not design—

and we must be conscious of the grounds upon which we must make those ultimate decisions.

While it is important to distinguish the physical carrier of a design from the design product that we seek to create in human experience, it is also important to distinguish the product that we seek to create for human experience from the ultimate result of the product that we intend or hope will occur. This may appear to be a subtle distinction, but I believe it is critical in our field and often overlooked. My example again comes from the area of graphic design. If we design a poster to advertise an event, the design product is the communicative engagement we establish with a viewer that presents information clearly and offers the reasons for attending the event. If we do that job well, we leave for the viewer the right to decide whether to attend the event. I believe this is what it means to put design to the service of human dignity. The task of design is not to force or manipulate a viewer to reach a decision that we hope will take place. The task of design is to make the best presentation of information and reasons for a course of action so that a viewer can make the decision that is best for him or her. An example from industrial design perhaps makes the point as well. When we design a garden tool or a household machine, the physical product is only part of the design. The physical artifact carries a more important intangible design product. It carries an engagement with the human being who decides to use the product, incorporating information about control and operation as well as other reasons that allow a person to decide whether to purchase and employ the object. If designers do the job well, we leave for the user the right to decide whether and how to use the object.

What I am suggesting, therefore, is that the nature of products is far richer than we have been able to articulate in the past. Products

should not be entirely reduced to their physical carriers, nor should they be entirely assimilated to the ultimate result that comes from their use. There is an important range of decisions that designers must reach, with a gradually expanding horizon of implications. This is the check and balance of design thinking. All of the products of design are offers of experience. If we have designed well, then our offers sustain and enhance human dignity. If we are given the opportunity to design a product that, in the quiet of our soul, we believe will diminish human dignity and diminish human rights, then our responsibility as designers is clear. While we may design such a product that meets technical standards of quality, it is a product that we should avoid.

Ecology of Culture.

Any effort to build a new framework for design will inevitably founder unless it embraces the pluralism of approaches that we find throughout the design community. At best it will be the framework of a school of design thinking rather than a wide design community. Schools of design are certainly important, but our task is to build a framework that embraces and encourages a variety of schools for the collective well being of our field. We have already discussed this in the context of definitions of design, suggesting that there are many useful definitions and that we are not required to build the house of design on a single definition. But the concept of the ecology of culture—whether we are talking about design culture or the broader culture that surrounds design—should be recognized and understood in its own right. To me, the ecology of culture is the inescapable reality of our lives. It is the interdependence and interrelation of all of our diverse perspectives on knowing, doing, and making in all areas of human activity.3 The ecology of design culture is an expression of the wider idea.

No advance in design practice or design theory stands entirely on its own. Even when a new vision or practice is presented that contrasts with or contradicts the dominant culture of a time and place, the new ideas owe something to alternative and opposing ideas. What this suggests is the need for strong design history, criticism and theory—the modes of inquiry that cultivate our understanding and appreciation of design in all of its conceptual and practical forms. A framework for the advancement of design should include recognition of the importance of design research, including history, criticism, and theory. This will foster the ecology of design culture and keep alive the genetic pluralism of ideas and methods that we need for future development.

DESIGN EDUCATION AND DESIGN RESEARCH

Whatever design framework—formal or informal—emerges in South Africa, it will be conditioned by the accomplishments of the past as well as the opportunities of the future. With regard to the past, I have found many examples of older forms of design thinking in education and in the organization of educational programs. Some are understandable to me and others are not. However, the system is clearly undergoing significant change and in a few years it may not be entirely recognizable by former standards and expectations. Already there are significant changes and a variety of new visions. I will not report here on the details of what I have seen and begun to understand. I do want to note the special efforts to develop design education among children in elementary, middle, and high school. I believe these efforts are of vital importance for the future, because bringing design awareness and confidence to the future general public serves the ends suggested by Dr. Asmal. I also want to note the efforts to bring design into community colleges. Again, this serves the goal of making design a discipline of learning for everyone, whatever their career destination,

and it creates awareness that could lead some students to study design further for professional employment.

If these efforts are to succeed, they will require excellence of design education in colleges and universities. Such programs will prepare new teachers for early education and strengthen the avenues to professional practice. Of special importance, I believe, is the transformation of the technikons into universities. The implications of this change in status and vision are perhaps more significant for the development of design than we fully realize. In fact, it is a trend of design education around the world to move into universities. However, design in a university context is different from design in other institutional contexts—though we may be slow to develop all of the opportunities and quick to succumb to some of the temptations and pressures.4 There is danger for design if the practical and productive focus of our work is assimilated thoughtlessly into the theoretical focus that is common in traditional university culture. Design educators will have to develop strong arguments about the nature of their discipline and its value among traditional fields of learning. Design knowledge is not yet well recognized in universities around the world, though new programs of doctoral education should ultimately help to provide some of the evidence that is needed. Our bigger challenge is to explain why design is different from other "subject-based" disciplines, how it integrates knowledge from many other disciplines, and how it turns theoretical understanding in other disciplines into valuable products that have can have great impact on society. This is both a challenge and an opportunity for design educators, if we are wise in our efforts and do not lose the core strength of concrete making that distinguishes our discipline from disciplines that are primarily oriented toward theory or practice.

One feature of the new environment of design and design education is the need for research. While this is part of the expectation that comes with university culture, it is also a mission of our field. We have already discussed the need to disseminate the results of design work—not merely to exhibit artifacts but to explain the innovations, ideas and methods, and results of work. It does no good to our discipline to ignore this responsibility just because there are no formal institutional requirements in this area. To become a strong field, we have to consolidate and build our understanding of design in a way that seldom took place in the past.

It is for this reason that we should understand the kinds of design research that are possible and consider some of the general directions for research that seem to present themselves. Designers have tended to think of research as a single activity when, in fact, it takes many forms. Gathering information is certainly one kind of research, as is exploratory work in designing products. These we can understand and continue to develop. But should also recognize a valuable distinction among kinds of research that our colleagues in other fields routinely employ. This is a distinction among clinical, applied, and basic research.5 Clinical research simply refers to design work that is directed toward individual cases; applied research is directed toward problems in a class of products that encompasses many individual cases; and basic research is directed toward the investigation fundamental problems in understanding the general principles and causes of design. I believe that these distinctions will help in our efforts to explain design research to our colleagues in other fields and to those who are responsible for setting policy in research funding organizations.

With regard to opportunities for design research, I have found four general themes that connect what has already been accomplished

with possibilities for the future. These themes are not framed within the separate branches of design. Instead, they suggest interdisciplinary issues that are shared by many branches.

1. The first theme lies in the area of communication and information design. While design for print remains an important area for exploration, there are opportunities to break out of traditional delivery vehicles and consider the many other ways that information is or can be communicated in South Africa. This is an interdisciplinary theme that connects graphic design with most of the other areas of design and craft. It would be useful for education and new design practice to explore the common ground of the various branches of design in shaping and delivering information.

   In addition, many people have expressed uncertainty about the true identity of South Africa in its new cultural and political circumstances. To me, the cultivation of individual voices is what leads to national identity. Identity is not something imposed collectively on a country or a region, it is something discovered through individual work. Craft and the fine arts have always been an important source of "voice" in communication, whether the voice is anonymous or personally attributed. Exploration of the "voices" of South African design may help to reveal what it is that makes South African products uniquely "desirable."

2. The second theme lies in the area of industrial design, broadly conceived in its application to traditional and new products. Research is needed to explore new product development in South Africa and the opportunities to encourage entrepreneurship. This means building new alliances among colleagues in engineering, computer science, business and the social sciences in South Africa so that the quality of products is

improved and time-to-market is shortened. I am not surprised to learn that industry in South Africa is still dominated by engineering. The same is true in most parts of the world. But research and development projects can demonstrate the advantages of design for integrating knowledge from many disciplines and turning that knowledge toward concrete products that are more successful in the marketplace. This means discovering new product opportunities as well as providing clinical services to analyze and improve the quality of existing products. There is already significant work in this area in other parts of the world that can serve as a model for efforts in South Africa, but there are special opportunities for research in this country that could have international significance.

There are already important efforts to improve craft practices, focused on improving processes and experimenting with new materials. Interestingly, these efforts are not found only or even primarily in the industrial design programs that I have visited. What this suggests to me is an opportunity for industrial designers to build new connections with colleagues in other branches of design and the crafts—for example, in textiles, ceramics, and jewelry. Connections with architecture may also be potentially significant in the industrialization of certain aspects of housing.

3. The third theme lies in the area of what I have called interaction design, including the design of services, processes, and other structured activities. The beginnings of this are already evident in an excellent program in information design at the University of Pretoria and in some of the projects I have found elsewhere. But this is such a new area of work that projects are often described in surprisingly traditional terms, often failing to highlight the significant innovations in concept and method that at the core. In general, it may be useful to convene a special conference to

discuss how design can contribute to exploring interactions among individuals and communities in South Africa. Such a conference may begin to identify issues for research and collaboration with others who also have significant interest in designing for human interaction.

4. The fourth theme lies in the area of environments and human systems. We are well aware that architecture, urban planning, and civil engineering have long regarded this as the domain of their work. However, in the new circumstances of contemporary life it may be valuable to reconsider the nature of environments and investigate how other branches of design are affected by and can contribute to shaping human environments for living, working, playing and learning. Unfortunately, we too often think of human environments simply as physical places rather than as places of interaction, information, and knowledge—as cultural places. And, particularly, we have neglected any systematic investigation of the role of culture in providing the pervasive matrix ideas and values that define the core of designed environments. It may be useful to convene a conference to explore the concepts of "culture," "environment" and "human systems" in the new South Africa, with the goal of discovering how far these concepts have already been carried in the work of a wide range of design professions. This fits within an emerging concern around the world for new ideas about the relationship between design and culture, and such a conference could have both national and international impact as we begin to open up this domain of problems for research and new design practice.

CONCLUSION

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When I presented some of these ideas in more detail at a meeting of government administrators earlier in my visit to South Africa, I suddenly saw smiles from many faces around the room. Thinking that I had failed to explain clearly enough to turn these ideas into practical possibilities, I paused and asked for help in understanding the reaction of the group. The leader assured me that his colleagues were not laughing at me. They were smiling because I had unknowingly expressed the meaning of "ubuntu" in South African culture. "Ubuntu," he explained, is a central value in the new South African culture, found in design and many other aspects of life. Literally, it means shaking hands, but metaphorically it means taking care of each other. They had found in my presentation of human-centered design an unexpected coherence of the idea of "ubuntu," shaped in a new discipline of design thinking that could be applied to their work. It appears that I have traveled a long way to discover that we share common ground. For me, it was a moment of significant learning.

Notes

[1] Richard McKeon, "Philosophy and History in the Development of Human Rights," in **Freedom and History and Other Essays: An Introduction to the Thought of Richard McKeon**, ed. by Zahava K. McKeon (Chicago: University of Chicago Press, 1990).

[2] Kate Wells, "Design Messages: Rural Crafts + HIV/AIDS Awareness Project KZN 2000," in the Proceedings of the Conference on Reshaping South Africa by Design, Cape Town, 2000.

[3] Richard Buchanan, "Children of the Moving Present: The Ecology of Culture and the Search for Causes in Design," **Design Issues**, Vol. XVII, No. 1 (Winter, 2001).

[4] Richard Buchanan, "The Problem of Character in Design Education: Liberal Arts and Professional Specialization," **International Journal of Technology and Design Education**, December, 2000.

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The Nature of Design Thinking

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Abstract

In the last few years, "Design Thinking" has gained popularity—it is now seen as an exciting new paradigm for dealing with problems in sectors as a far afield as IT, Business, Education and Medicine. This potential success challenges the design research community to provide clear and unambiguous answers to two key questions: "What is the nature of design thinking?" and "What could it bring to other professions?". In this paper we sketch a provisional answer to these questions by first considering the reasoning pattern behind design thinking, and then enriching this picture by linking in key concepts from models of design activity and design thinking that have emerged over the last twenty years of design research.

1. Introduction

The term 'design thinking' has been part of the collective consciousness of design researchers since Rowe used it as the title of his 1987 book (Rowe 1987). The first DTRS symposium was an exploration of research into design and design methodology, viewed from a design thinking perspective (Cross et al. 1992). The second DTRS symposium strove to progress multiple understandings of design thinking by providing a common empirical basis (Cross et al. 1996). Multiple models of design thinking have emerged over twenty years of research, based on widely different ways of viewing design situations and using theories and models from design methodology, psychology, education, etc. Together, these streams of research create a rich and varied understanding of a very complicated human reality.

Nowadays, "Design Thinking" is identified as an exciting new paradigm for dealing with problems in many professions—most notably IT (e.g., Brooks 2010) and Business (e.g., Martin 2010). This eagerness to apply design thinking has created a sudden demand for clear and definite knowledge about design thinking (including a definition and a toolbox). This is quite a problematic challenge for a design research community that has been shy of oversimplifying design thinking, and cherished its multiple perspectives and rich pictures. This paper is an attempt to systematize our knowledge of design thinking by using a model from formal logic to describe its core challenge and reasoning patterns, and then enrich the picture by linking some of the most prevalent notions used in various descriptions of design thinking into this framework.

2. The Challenge: Abduction

To build up a conceptual framework that is fundamental enough to anchor the wide variety of design thinking approaches that designers take, and connect the many descriptions of design thinking that have arisen in design research we have to suspend the 'rich' descriptions of design and take the question of design reasoning back to the basics, the formal logic behind design reasoning. Logic provides us with a single group of core concepts that describes the reasoning in design and other professions. This 'poor' description of design also will help us explore whether design is actually that different from other fields—and should provide us with some fundamental insight on the value that introducing design in other fields might have. In this paper we will move from these Spartan beginnings to 'richer' descriptions of design

To cut to the core of design thinking we build on the way fundamentally different kinds of reasoning are described in formal logic, in particular the way Roozenburg (1995) has described the work of Peirce. We will describe the basic reasoning patterns through comparing different 'settings' of the knowns and unknowns in the equation:

WHAT	+	**HOW**	leads to	**RESULT**
(thing)		(working principle)		(observed)

In **Deduction**, we know the 'what', the 'players' in a situation we need to attend to, and we know 'how' they will operate together. This allows us to safely predict results. For instance, if we know that there are stars in the sky, and we are aware of the natural laws that govern their movement, we can predict where a star will be at a certain point in time.

WHAT	+	**HOW**	leads to	**???**

Alternatively, in **Induction**, we know the 'what' in the situation (stars), and we can observe results (position changes across the sky). But we do not know the 'how', the laws that govern these movements. The proposing of 'working principles' that could explain the observed behavior (aka hypotheses) is a creative act.

WHAT	+	**???**	leads to	**RESULT**

These two forms of analytical reasoning predict and explain phenomena that are already in the world. What if we want to create valuable new things for others, like in design and other productive professions? The basic reasoning pattern then is **Abduction**:

WHAT	+	**HOW**	leads to	**VALUE**
(thing)		(scenario)		(aspired)

Abduction comes in two forms—what they have in common is that we actually know the value that we want to achieve. In the first form of **Abduction-1**, that is often associated with 'problem solving', we also know the 'how', a 'working principle' and how that will help achieve the value we aim for. What is still missing is a 'what' (an object, a service, a system), so we set out to search for a solution.

???	+	**HOW**	leads to	**VALUE**

This is often what designers and engineers do—create an object that works within a known working principle, and within a set scenario of value creation. In the second form of **Abduction-2**, we ONLY know the end value we want to achieve.

???	+	**???**	leads to	**VALUE**
(thing)		(scenario)		(aspired)

So the challenge is to figure out 'what' to create, while there is no known or chosen 'working principle' that we can trust to lead to the aspired value. That means we have to create a 'working principle' (through a way of thinking that is close to induction) and a 'thing' (object, service, system—through a way of thinking that is close to Abduction-1) in parallel.

This will involve the development or adoption of a new 'frame'—please note that the implication that by applying a certain working principle we will create a specific value, is called a 'frame' within design literature (see (Schön 1983) and section 3.2).

Performing this complex creative feat of the creation of a thing (object, service, system) and its way of working in parallel is often seen as the core of design thinking. This double creative step requires designers to come up with proposals for the 'what' and 'how', and test them. Designers are often seen playing around with ideas, tossing up possibilities (proposals) in what may look like a hit-and-miss process. What they are in fact doing is trying out and thinking through many possibilities, thus building up a repertoire of experiences that help them developing an intuition of what will work in the problematic situation. Empirical studies of designers within cognitive psychology have shown that designers focus their creativity and analytical skills on the creation of solutions, testing and improving them, not on analysing the problem up front (Lawson 1979). The strategy of creating solution proposals, analysing these and evaluating them, and improving them until the solution is satisfying, can be recognised right across the design professions. It could be one of the core elements of the design ability.

This establishes the designing professions as thinking fundamentally differently from fields that are based on analysis (deduction, induction) and problem solving (Abduction-1, see also Dorst (2006)). But the distinction is not very clear-cut, as we have learned that design is not one way of thinking: it is a mix of different kinds of solution focused thinking (Abduction), which includes both problem solving and a form of design that involves reframing of the problem situation (in a co-evolution process). And it also contains quite a bit of analytical reasoning, as rigorous deduction is needed to check if the design solutions will work.

3. The Response: Professional design

The challenge to work in an abductive situation is central to design (Roozenburg 1995). As a response to this challenge designers have developed and professionalised specific ways of working. This is an important point for this paper: although many of the activities that designers do (i.e., framing, ideation, creative thought) are quite universal, and thus it would be inappropriate to claim them as exclusive to design or design thinking, some of these activities have been professionalized in the design disciplines in ways that could be valuable for other disciplines. It is worth studying them for that reason. In this section we will explore the special nature of some core activities that designers use in responding to abductive problem situations.

3.1 Core design activities

Although there is great variety within the world of design, the designing disciplines can be seen to lean on five main activities in meeting their abductive challenges: *formulating, representing, moving, evaluating* and *managing* (Lawson & Dorst 2009). These are the 'carriers', as it were, of design thinking. In this paragraph we name some special ways of performing these activities that have been developed within the design disciplines.

Within '**formulating**', the key activities are the identifying of the key issues in a problem arena and the framing of these in a new and original manner (see 3.2 for a more extensive description). Within the designing disciplines, the **representation** of problems and solutions (in words and sketches, sometimes using quite sophisticated visualization techniques) is important because it allows the designer to develop their ideas in conversation with these representations—e.g., by sketching an idea, looking at it critically, altering it, taking a step back again, etc (see Schön 1983). Also, designers tend to use multiple representations in parallel,

where each representation highlights other salient features of the solution that is under development. These design steps taken (the '**moves**') can be entirely original or they can be further developments of moves that are part of the designer's repertoire or the general design culture. To keep a design project on track, there is an almost continuous **evaluation** going on. Early on in the project, when problems and solutions are still vague, this evaluation necessarily takes on a subjective nature. Later on, when everything is beginning to crystallize, the evaluations should be much more formal and objective. However, designers tend to be good at suspending judgment, and allow themselves to pursue pretty risky lines of thought. They know that bringing the full force of evaluation to bear upon a fledgling idea is a very effective way of killing it, blocking any further exploration and stifling any progress in the project. **Managing** all these activities within a design project is a subtle art. Design projects are hard to plan and control, because they are a mix of a fairly linear problem solving process and an iterative learning process that is driven by the reflection-in-action and reflection-on-action (see Valkenburg et al. 1998). Briefing tends to be a continuous process as the design options develop and get clearer—this makes resource planning very difficult.

All of the activities highlighted above have been professionalized within design practice in interesting ways—knowledge about these practices has been gathered in various streams within design research. References here could include almost every paper and book written in this academic field.

3.2 Beyond problem solving: frames and reframing

How this design behaviour is different from problem solving has been illustrated most eloquently by Armand Hatchuel, as he compared two problem situations (Hatchuel 2002). Picture a group of friends coming together on a Saturday night. The one problem situation is that they are 'looking for a good movie in town', the other problem situation is that they set out to 'have a good time'. The first situation can be dealt with through conventional problem solving, the second situation requires design thinking. Hatchuel argues that there are three important differences between these situations. The first difference is that the design situation includes the (unexpected) expansion of the initial concepts in which the situation is initially framed ('a good time'). This makes the solution a process, instead of a one-off decision. There is no dominant design for what 'good time' would be, so imagination needs to be applied. A second difference is that the design situation requires the design and use of 'learning devices' in order to get to a solution. These 'learning devices' include (thought) experiments and simulation techniques. Thirdly, in designing, the understanding and creation of the social interactions is part of the design process itself. The group of friends needs to develop a way of reaching a solution that cannot be supposed to exist before the design situation arises. From this example we can see that design undoubtedly includes stretches of conventional problem solving, but that it also contains 'something else'. At the core of this 'something else' lies the activity of 'framing'. 'Framing' is the term commonly used for the creation of a novel standpoint from which a problematic situation can be tackled—this includes perceiving the situation in a certain way, adopting certain concepts to describe the situation, patterns of reasoning and problem solving that are associated with that way of seeing, leading to the possibility to act within the situation. We have already seen above that the ability to frame and reframe is central to reasoning in design situations (Abduction-2). Einstein is quoted as saying that 'A problem can never be solved from the context in which it arose'—and apart from the circularity of this statement (if the issue could be solved from its original context, it would probably have been solved before even registering as a real problem), it is true that designers tend to reframe the issues before them in a way that makes the problem amenable to solution (for an empirical study into reframing behaviour, see Paton & Dorst (2010)).

Designers tend to want to reframe, even in situations that present themselves as a problem solving (Abduction-1) problem, where reframing would not be strictly necessary. Cross has

remarked that designers tend to see many problems AS IF they were design problems (Cross 2007).

There are two important reasons for designers to concentrate on the framing of a problematic situation:

1. 'The design problem' is not stable, but changeable (Dorst 2006) Design problems are sometimes vague, often full of inner contradictions and as a result they are always open to interpretation. This process of interpretation and re-interpretation through framing is a crucial part of design creativity, it allows design to take flight and move into truly new territory. There is also a practical reason for problem evolution. The different parties that together make up the design situations are often quite unrealistic in their expectations of what design should achieve (always the highest possible quality, against the lowest possible costs). The early solution proposals that drive the problem evolution show what solutions could realistically be achieved.

2. In the real world, problematic situations arise when the equation (*what' plus 'how' leads to 'value'*) that an organization has been operating under somehow doesn't work anymore. It can be very hard to fathom what's wrong: should the 'what' be changed, the 'how' could be wrong, the 'frame' that drives the implication could be faulty or maybe the organization is misreading the values in the world? There are different ways of dealing with this problematic situation. Initially, organizations often react in a way that requires the least effort and resources: they set out in a problem solving manner to create a new 'something' that will save the day while keeping the 'how', 'frame' and 'value' constant. This is often the nature of the design situation as it first presents itself to a designer, implicitly framed by the client organization—and the designer has to explore whether the level at which the central design problem is perceived and understood by the client is right for the problematic situation to be fruitfully approached by the designer (Paton 2010). Often, the problem-as-presented first needs to be 'deconstructed' (Hekkert et al. 2003) or opened up.

Experienced designers can be seen to do this by searching for the central paradox, asking themselves what makes the problem hard to solve, and only start working towards a solution once they have established the nature of the core paradox to their satisfaction (Dorst 1997). The word 'paradox' is used here in the sense of a complex statement that consist of two or more conflicting statements—true or valid in their own right, but they cannot be combined. The core paradox, is the real opposition of views, standpoints or requirements that requires inventive design solutions or a reframing of the problematic situation. This is stark contrast to analytical problem solving, that takes place in a 'closed world' where there is no way to redefine the problematic situation (because the way in which the solution has to work is already set in stone). In her writings on Engineering Ethics, Caroline Whitbeck flags the way designers deal with paradoxes as a key special element of design thinking (Whitbeck 1998).

4. Varieties of design thinking in professional practice

Until now, design thinking has been described as a single way of thinking. The picture that has emerged will have to be broken up again as we move away from this abstraction. A first step can be made by looking at design thinking from the perspective of distinguishing different levels of design expertise (Lawson & Dorst 2009).

4.1 Levels of designing

Design is not only done by professionals is also part of everyday life. This **Naïve** state of designing is adequate for everyday use in conventional situations. Many students that enter design schools will display this naïve design behavior. They have a relatively superficial set of design solutions that they know, choose between and wish to emulate. Despite having strong convic-

tions, students at this stage find it difficult to express what they know and want—they do not have the language.

The **Novice** state involves the exploration of what design is, finding the 'rules of the game'. The main objective of education is the search for principles behind the surface of 'good design', to replace the isolated instances of the naïve designer with considered thought about the deliberations that went into a design proposal. This is also the first time students encounter design as a series of activities, as a process. The key characteristic of the **Advanced Beginner** is the recognition that design problems are highly individual and situated. Design problems at this level are considered to be less amenable to the use of standard solutions (the 'rules of the game') than they were to the Novice. The **Competent** designer can handle and understand all the normal kinds of situations which occur within the design domain, and becomes the co-creator of the design situation, through strategic thinking. This ability to steer the development of the design problem puts the designer much more in control over the project. Designers with some professional experience would be **Proficient** designers. They are good and probably successful in their chosen profession. Then on the next level up the **Expert** designer ('expert' as in 'better', not as in 'specialized') is known for a certain approach or set of values that is expressed through his/her design work. This level may be characterized by a more or less automatic recognition of situations and a quick, intuitive and dead-sure response. The **Master** designer has taken their way of working to a level of innovation that questions the established way of working of the experts, and their work is seen as representing new knowledge in the field. Such work is published in various ways: not just through design outcomes, but also through pamphlets, reflective papers, interviews, etc. The work of a **Visionary** is explicitly developing or even redefining the design field that they are working in. This might not lead to realized designs at all, but will be expressed in design ideas, exhibitions, and publications.

This linear progression is a gross oversimplification of the realities of design thinkers. Most importantly, we should see this as a process of gathering a whole repertoire of ways of design thinking, adding new ones as designers get more experience. Apparently there are at least seven different ways of design thinking that have been professionalized within the design professions: choice based, convention based, situation based, strategy based, experience based, developing new schemata and for some, redefining the field. Each of these seven kinds of design thinking come with their own methods, tools and their own critical skillset. Research among student and expert designers has revealed that these levels impact heavily on the strategies a designer uses to tackle abductive problem situations: the lower levels of expertise are bound to be more problem-focused, as the proponent will have less solutions, examples and frames in his/her repertoire, and not enough experience to apply constructive forethought in the design process. More experienced designers work in a solution-focused manner (Cross 2004).

4.2 Layers of design practice

Design thinking can also be understood to take place at different layers. Most thinking about design (and the vast bulk of design research) has always focused on what happens within design projects. That is a natural choice: projects are where the real design work takes place, and the projects are the main economic unit of any design enterprise. Yet when we study design thinkers more carefully, we observe several layers of design activity—not just within projects, but also higher-level design activity that work across projects; the layers of 'process' and 'practice' (Lawson & Dorst 2009). Leading designers develop their own ways of working, specific and quite explicit processes that underpin all the projects in the firm. They also create the 'practice', the intellectual (and physical) environment in which design takes place. In the following quote Ken Yeang is reflecting on the role he plays in his own architectural office:

> Any architect with a mind of his own, whether by design or default will produce an architecture which is identifiable to that architect...I had to study ecology, I had to

> study biology; that was the basis for most of my design work. I'm trying to develop a new form of architecture. We have this climatically responsive tropical skyscraper agenda and each project we try to see whether we can push an idea a little bit further…I give every new member of staff the practice manual to read when they join. They can see not just past designs but study the principles upon which they are based. We work these out over time, over many projects…. I do competitions more as an academic exercise. I treat competitions as research projects….it motivates the office—gets them excited—lets the mind develop new thoughts and themes. I put all the drawings together an publish a book… 'it's research, it develops ideas.'

It is interesting to note that Ken Yeang and other outstanding architects that were interviewed make clear that the stack of frames that the design firm works with are a key element of the professional design practice. They report different strategies to adopt, maintain, develop and express the frames of the organization. The practice of these outstanding designers, deliberately creating and maintaining a repertoire of frames in their offices, could inspire developments in other disciplines where the application of 'creative' or 'innovative' thought often takes place in a much more happenstance manner. All too often, creative/productive reasoning is seen purely as a moving-away-from existing solutions, only to be done when sparked by a crisis (or 'surpise' (Schön 1983)). In contrast, the professional practice of framing we described above consists of a sustained effort to create a set of well-considered original approaches to the issues of the field that can become an important part of the intellectual capital of the firm. The embedding of this higher layer of design thinking into the organisation will create an environment in which the pursuit of novelty and progress becomes a natural part of the firms' overall practice, instead of an ad-hoc panic-born scramble for novelty. It is also living proof of the fact that design thinking, though creative and open-ended, is not chaotic or beyond the control of reason. Initiating design projects through the thoughtful consideration of frames that have been developed within the context of an organization is a far cry from the popular notion (also to be found in management literature) of design basically being a rather magical, wild, more or less random trial-and-error process.

5. Applying design thinking in business

Until now we have concentrated on exploring what professional practices the design professions might have to give to other fields. The question of what is appropriate then of course depends on the needs of those other fields. Those may be many different activities and skills, depending on the application domain. Let us take the field of Business as an example and return to the point made earlier that in the business world, problematic situations may arise when the equation (*what' plus 'how' leads to 'value'*) that an organization has been operating under somehow doesn't work anymore. This could be paraphrased as:

???	+	**???**	leads to	**???**
(what)		(how)		(value)

If the Abduction-1 approach of creating a new 'what' doesn't help, the organization could be going to the Abduction-2 mode and also create a new 'how'. The organization might do this by just applying one of the other 'frames' that it has in its repertoire.

???	+	**HOW**	leads to	**VALUE**	
		frame			
		frame			**practice**
		frame			

We have seen in 4.2 that the collection of frames that an organization has at its disposal defines its Practice. Alternatively the organization might hire a consultant or designer that uses his/her experience to bring a new frame to the problematic situation. That frame could be added on to the practice of the organization for this particular project, quite superficially. If on the other hand the frame is adopted into the practice of the organization itself, transforming that practice, we talk about fundamental innovation. This type of innovation requires an organization to go beyond adopting frames, break away from its current ways of working and world view (or 'mental model' (Smulders 2006)). This is where the processes of design thinking and business innovation are potentially most intimately linked.

6. Conclusion

Professional design practices that can be caught under the label 'design thinking' can take many forms, and have the potential to impact disciplines that seek to adopt a 'design thinking' approach in many different ways. The basis of design thinking is more or less the same in all cases, but this paper has shown that there is a huge variety in kinds of design reasoning (Abduction-1 and Abduction-2), design activities (formulating, representing, moving, evaluating, managing), levels of design thinking (the 7 levels of expertise) and layers of design thinking (project, process, practice).

Moreover, in the example above we have seen that 'design thinking' can enter the life of a business on four different levels: as the design activities within an existing frame (Abduction-1), as design activities that involve reframing (Abduction-2), where the frame originates from the existing company practice, as the (skin-deep) adoption of a new frame that has been brought or developed by an outsider (design consultant), and as the deeper transformation of the organizations' practice through the true adoption or creation of a new frame within it. These different applications of design thinking require the thoughtful application of widely different elements of design thinking from the broad array presented in this paper. For instance: working within an existing frame we could use convention-based and situation-based design thinking, while creating a new frame within the organization would probably require ways of thinking that are associated with the higher levels of design expertise.

This framework has been developed out of a deep concern with the fact that nowadays, lots of disparate vaguely creative activities are combined under the label of 'design thinking'. Design thinking however is a quite specific and deliberate way of reasoning, elements of which that have been professionalized within the design disciplines in ways that could really benefit other fields. But in order to realize the true value that 'design thinking' can have for these fields, we need to articulate the kinds of design thinking and their application much more subtly and in much more detail than has been achieved in this brief paper. The frameworks presented here could be the backbone of such a new interpretation of design thinking.

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The Ethics of Innovation

An ethical framework can bridge the worlds of startup technology and international development to strengthen cross-sector innovation in the social sector.

By Chris Fabian & Robert Fabricant | Aug. 5, 2014

Technology (http://www.ssireview.org/topics/category/technology_design) is all about making new stuff, agility and adaptability, and knowing what's next. It's fast. It's cool. It wears a hoodie.

International development deals in systems and measurements to help shift government policies. It's slow. It's big. It wears cufflinks.

Each field has its own language and ethics. How do you work with *beneficiaries* (or *users*)? How do you conduct *monitoring* and *evaluation* (http://www.ssireview.org/tags/Measurement+&+Evaluation) (or *A/B tests*)? What does it mean to *implement* (or *deploy*)? These lexicons don't always connect—and when they don't, we see wasted effort and the potential to lose real global change.

An ethical framework—"a way of structuring your deliberation about ethical questions (http://mcb.unco.edu/ced/frameworks/)"—can help to bridge disparate worlds and discourses and help them work well together. Ethical questions might include: "Is this platform / product actually providing a social good?" or "Am I harming/including the user in the creation of this new solution?" or even "Do I have a right to be taking claim of this space at all?" This helps us form value-based collaborations—and allows us to better assess and monitor our work.

Here, we propose an ethical framework—very much a *strategy* or *structure*—based on nine principles (operational *tactics* and *measurements*) that UNICEF and other development sector actors developed and adopted. Building on their work, our framework includes a set of four cross-cutting values and statements that innovators can use to negotiate between the competing priorities and objectives of startup business and international development.

Innovation in International Development

In the dominant model of international development, targets such as the United Nation's Millennium Development Goals are created and managed centrally, and measured globally. International development professionals try to agree on these goals, and then work to coordinate the big systems needed to make progress against them.

In recent years, many people in international development (inside and outside of the United Nations) have added a powerful new word to their discourse: *innovation*. The term carries many meanings, all of which seem far from the realm of three-year project plans, SWOT analyses, monitoring and evaluation, and logical frameworks (log frames).

In development, innovation most often means:

- Working fast and flexibly like a Silicon Valley startup (process)
- Incorporating the latest technologies to transform the way we engage populations and measure everything (technology)
- Taking user needs into account, make sure that solutions reflect real user needs (design)
- New models of shared value partnership, thinking more like an 'incubator' than a serial-process driven system (investing)

We've used these appealing words and concepts extensively in pushing for new design and development models in our own organizations. But while Silicon Valley has proven that "creating multi-disciplinary teams" and "failing quickly" add value to Facebook and Google, have we been able to prove that "agility" (for example) adds real value to large-scale human development?

"Invention Saves Lives"

As the international development community draws on the technology community's language of innovation, private sector technology community itself is starting to approach the world of life-saving innovations.

The designers and technologists that created the personal gadgets, connectivity platforms, and Internet-enabled culture of sharing we use today are creating another portfolio of inventions that have largely charitable or humanitarian aims. A significant portion of these inventions target the most basic human technologies: toilets, water filters, smokeless indoor stoves. These efforts, though new, often 1) don't see user growth, 2) are focused on advances in engineering and manufacturing rather than systemic change, and 3) start and end as ideas or prototypes.

What happens when the preeminent tech investors and inventors of our age take on this mantle and design directly for the global poor? What are the dangers of "disruption" when dealing with vulnerable populations' lives? Should we use the same metrics to evaluate new releases of technological platforms as we do for social change?

Bridging Two Worlds

Here is a summary of the ethical framework we propose for guiding and evaluating innovation projects:

- **Innovation is humanistic:** solving big problems through human ingenuity, imagination and entrepreneurialism that can come from anywhere
- **Innovation is non-hierarchical:** drawing ideas from many different sources and incubating small, agile teams to test and iterate on them with user feedback
- **Innovation is participatory:** designing *with* (not *for)* real people.
- **Innovation is sustainable:** building skills even if most individual endeavors will ultimately fail in their societal goals

This basic framework is helpful when it is used to spur questions about specfic initiatives, which cross the spaces of technology, business, and development—questions such as:

- How do we take advantage of global knowledge, technology and expertise to solve enormous problems without imposing a paternalistic model on the solution or those who benefit from it?
- How do we design in an inclusive and participatory manner, when resource and power dynamics are so unequal?
- How do we address persistent problems that defy a single clever invention and require sustained engagement, learning, iteration, and adaptation? (Imagine if Google left its original Spreadsheets application alone, thrown up its hands, and said, "Well, people either use it or not.")
- How do we take advantage of capital markets as paths to scale, while recognizing that they are not inherently humanistic or ethical?
- How do we account for the potentially destructive results of innovations five or ten years from now without completely shutting down the sort of risk-taking that is essential to the creative process?

The Journey to a Set of Values

UNICEF's Innovation Labs provide a good example of a values-based approach to problem-

solving that effectively bridges technology and development. The labs fit into a growing constellation of tech hubs in the developing world and share the space with private-sector labs. (Many technology corporations are setting up their own labs—fueled by investments from technology giants, and modeled on Bay Area startup incubators—in the belief that having a footprint in the developing world innovation space is enough to inspire network growth or turn up new opportunities for core business.)

One of the reasons that UNICEF set up labs was to create a way to engage problem solvers in a space where problems are not just about a better product or single-pointed solution, but also about systemic changes that run from individual to community to national government and beyond.

UNICEF's labs create a translation layer between startup thinking ("If I could make this one *thing* better, then people would use my product") and development thinking ("If we can create a systems-level argument and fully monitor all aspects of our change, that change will become institutionalized over time"). These are simplifications of both systems, but the dichotomy is clear.

Without pathways to scale or market, many great ideas get lost. As Steve Davis of PATH (http://www.path.org/) puts it, "The 'iPods' of poverty alleviation and literacy have likely been invented and put to use by small organizations in some corner of the globe, but there is no market for identifying these breakthrough ideas and ensuring widespread adoption." UNICEF intends its labs to work as APIs between small local innovators, and global systems of policy-making and scale.

These labs represent an important new physical layer in the innovation ecosystem by combining private-sector entrepreneurialism with broader societal needs. Structures like this can be effective in building a community with the skills and capacity to innovate, regardless of whether individual technologies or product ideas deliver on their promise.

However, they still constitute only one *layer*, and the strata around them needs to be balanced to ensure that innovations from within the network are authentic, fair, and useful. Set up correctly, labs move away from hierarchical structures for solving big problems and toward more-participatory engagements with potential consumers of those solutions (inspired by our close partnership with the global product strategy and design firm frog (http://www.frogdesign.com/)). In many ways, they are a physical metaphor for (and instantiation of) this ethical framework.

Shifting the Paradigm

In-country innovation teams, labs, localization, and research units represent a fundamental shift in the paradigm of innovation in development by dismantling the often modern, often Western distinction between business activity and social good.

Local (but global) labs also represent a fundamental shift toward a more human-centric approach to problem solving grounded in human needs, insights, and ingenuity. People's needs are not neatly packaged up into commerce and social good. Similarly, they are not neatly divided between saving money and getting medicine for a sick kid or transport to a job site. Building one class of products for "consumers" and another for "those in need" creates false divides, as well as products that are neither sustainable nor scalable.

Some Background: Nine Principles

The thinking in this article and the ethical framework itself stems from a set of operational principles (http://www.unicef.org/innovation/innovation_73239.html) and specific thesis statements that a group of development, design, and technology experts have been building over the past two years. They include:

1. Design with the user.
2. Understand the existing ecosystem.
3. Design for scale.
4. Build for sustainability.
5. Be data driven.
6. Use open standards, open data, open source, and open innovation.
7. Reuse and improve.
8. Do no harm.
9. Be collaborative.

In Practice

UNICEF's deployment of RapidPro—a flagship, open-source platform for moving information quickly using simple mobile phones—offers another example of putting these principles to work. As the organization developed RapidPro, it faced a choice: traditional development or tech-driven innovation. In an attempt to bridge the two, (and through its Innovation Labs), RapidPro is basing development on non-hierarchical, participatory, sustainable, and humanistic design:

1. Non-hierarchical: RapidPro has a management structure that looks like a tech startup (business development, operations, sales, engineering, and design), but each part of that

structure sits in a different innovation lab.

2. Participatory: Teams develop features and applications in the field, at the point of use, with people who will eventually use the system.
3. Sustainable: The code and platform are entirely open source (AGPL (http://en.wikipedia.org/wiki/Affero_General_Public_License)), and vendors across five continents and a dedicated open-source community will support it.
4. Humanistic: A real-time information platform is important to the private sector (where are my shipments? customers?) and public sector (where are services? those in need?), and the problems it solves are applicable to every country in the world.

By aligning the purpose and processes behind building RapidPro, UNICEF is creating platform that seems to fit this emerging model of global development, but more importantly, it has created ecosystems around the platform (and its services) in more than 30 countries. This would not have been possible using either of the traditional approaches, or without innovation, technology, and business partners such as frog.

This is only one example of such an approach. There is a rising tide of interest from organizations such as internet.org to move beyond individual product innovations, and plug into broader platforms and systems that can have a massive impact on poverty and health.

Conclusion

All collaboration is difficult, because the languages and principles behind these fields have been developed independently and over time. But by working together, the fields of technology, business, and development can create bigger change than by working separately.

A framework for discourse and collaboration, and a shared ethics around approach, are necessary to make certain that there is a common vision and that great innovations can have the best impact on the world's most marginalized populations.

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Design Thinking

Design Thinking for Accountability

A new community justice system in Liberia emerges from a design-thinking approach.

By Blair Glencorse | Apr. 28, 2014

Last year, in the West Point township of Monrovia, the capital city of Liberia, an enterprising community (http://www.ssireview.org/tags/Community) leader named Thomas Tweh found himself with a serious problem. West Point crams more than 75,000 citizens into a square mile patch of land by the Atlantic Ocean—and life is very hard. Space is limited, incomes are low, formal jobs are few, and basic services are almost non-existent.

The issue Tweh faced was central to the causes of these difficulties: justice. "The people are coming to me every day—they have no justice," he told me at the time. "There are disputes over land, domestic violence, bad loans—and the courts can't deal with these problems." If you spend any time in West Point, it soon becomes clear that he is right—the formal justice system is slow, over-burdened, lacks capacity, and provides ample opportunity for corruption. Public trust in the law is very low.

With the inspiration to find better ways to ensure justice and accountability for the population of West Point, our team at the Accountability Lab (http://www.accountabilitylab.org/) sat down for a series of discussions with Tweh using a design-thinking (http://www.ssireview.org/articles/entry/design_thinking_for_social_innovation) approach. We gathered all available research on justice and accountability issues in West Point, spent time in the community talking to as many citizens as we could, and then began to think about possible solutions to the problem.

After we came up with a number of ideas that seemed unfeasible, the parameters of a workable project became clear: a top-down process of collaborating with the courts to refer cases back to the community (saving time and money, and reducing the burden on the formal system), combined

with a bottom-up program to train community members as mediators to resolve disputes sustainably as part of a Community Justice Team (CJT).

We had high hopes. We worked with Tweh to carefully select and train community mediators and a notary to document the cases. Tweh spoke to the local police and court to secure collaboration. We also conducted outreach activities to make people in West Point aware of this new service.

Everything worked brilliantly—except for the fact that no one used the system. We couldn't work out why not—did the community need more of a sense of ownership? Was the mediation office too far away for people to get to easily, or did they not trust the mediators? As we began to ideate —in design thinking, the process of testing competing ideas—we realized that there were two very different problems. First, most crimes, disputes, and conflicts in West Point happen after dark or at the weekends, when our mediators were not available to help resolve them quickly. Second, despite our public meetings, posters, radio, and word-of-mouth efforts, people didn't know about our system.

In response, we made sure that the mediators could rotate their shifts and were ready to step-in when needed at all times. They also began to go out to the community rather than waiting in the office for cases to come to them. We also bought a megaphone and hired a town crier to walk around West Point early in the mornings and remind people to use the mediation service as they began their days. This gave the service a more human face than radio announcements.

Suddenly, implementation took off—residents of West Point began to come to the CJT, which successfully settled disputes such as non-payment of child support and illegal construction. Since July last year, the CJT has resolved 76 cases without any recidivism and with the full cooperation of the authorities. This project is small, but for a total investment of around $3,000, we estimate that the CJT has saved citizens more than $7,300 in bond, administrative, and travel fees, and approximately 350 days of time that they otherwise would have spent navigating the court system. Not a bad accountability "return on investment." (You can watch a video of Tweh and the CJT in action in West Point here (http://www.youtube.com/watch?v=KWWsd-sk2-Y)).

The design thinking approach helped us understand how to make this service more people-centered and effective over time. It also helped us refine the model in response to feedback and build a communications strategy that works. As a result, we have managed to raise additional funding for the model and are coordinating with the Liberian Ministry of Interior's Peace-

Building Office (http://www.liberiapbo.ushahidi.com/) and Trust Africa (http://www.trustafrica.org/en/) to scale-up the approach in other low-income, high-density parts of Monrovia.

Inspired by these experiences and after recently spending some time at Stanford's d.school (http://dschool.stanford.edu/) (as part of the Executive Program on Social Entrepreneurship (https://www.gsb.stanford.edu/programs/social-innovation/executive-program-social-entrepreneurship)), the Accountability Lab is now applying the design-thinking approach to other areas of our work, on issues of form as well as function. In terms of reporting, for example, rather than asking local partners to fill out long surveys or matrices in English, we've designed periodic "accountability collectives (http://accountabilitylab.org/understand/acctCollectives.html) ," or oral progress sharing sessions. We take notes during these sessions to fulfill our reporting requirements, and use the time to brainstorm new ideas, see where synergies might lie, and support each other. It is a contextualized, productive, and fun way to understand the impact that our work is having and create opportunities for new thinking.

At the outset of the West Point project, we didn't realize that what we were doing was "design-thinking" per se, but now we're using the concepts to support other projects such as an accountability film school (http://www.one.org/us/2014/01/23/reel-stories-film-as-a-tool-for-social-change/) in Liberia and a portal to crowd-source public information (http://nalibeli.org/) for citizens in Nepal. Recently, I walked with Tweh around the narrow, crowded alleyways of West Point one afternoon. As he stepped around small children washing themselves next to open sewers he asked, "We've designed a program that is helping with justice—can we do the same for sanitation and education?"

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Design Thinking

Using Design Thinking to Eradicate Poverty Creation

We need to ratchet up from targeted innovation and apply design-thinking principles to one of the biggest social issues of our time: global poverty itself.

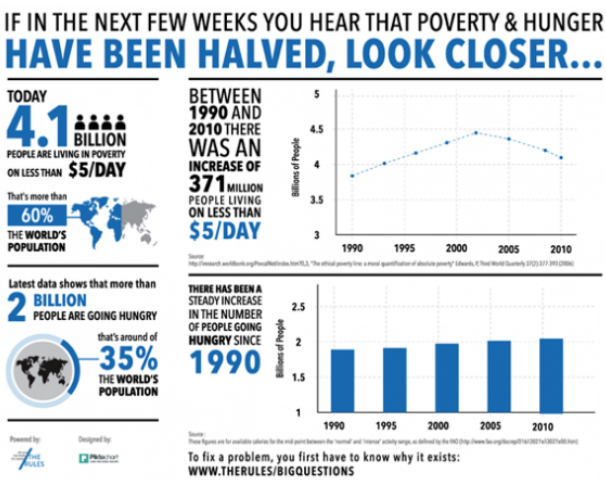
By Martin Kirk, Jason Hickel & Joe Brewer | Sep. 28, 2015

There's been a lot of hype in recent years about the power of design to solve social problems. Companies like IDEO, frog, and Smart Design—as well as numerous foundations, design schools, and nonprofits—have set out to tackle tough issues with innovations that make use of social and cognitive science, focus on systemic analysis, and pay attention to emergent patterns. They are advocates of design thinking for social impact, and they're making serious progress in areas such as improving voter registration (http://reboot.org/case-studies/ict-for-voter-registration-libya/) and education programs for people stranded in refugee camps (http://www.openideorefugee-education.com/) .

But what if we were to ratchet up from this level of targeted innovation and apply design principles to one of the biggest social issues of our time: global poverty itself?

The world's most powerful governments and international institutions are working hard right now to convince us that global poverty has been cut in half (http://blogs.wsj.com/economics/2012/02/29/worlds-extreme-poverty-cut-in-half-since-1990/) since the 90's. More and more analysts, though, are pointing out that this claim is little more than an accounting trick: UN officials have massaged the numbers to make it seem as though poverty has been reduced, when in fact it has increased (http://www.aljazeera.com/indepth/opinion/2014/08/exposing-great-poverty-reductio-201481211590729809.html) .

What this means is that the bulk of the well-meaning development projects that have been rolled out in the Global South over the past 65 years—costing hundreds of billions of dollars—have had very little positive impact on poverty numbers (with a net negative effect when ecological degradation is added to the equation). How has this happened?



When the more reasonable poverty level of $5 per day is used, we see that global poverty has increased since 1990. (Image courtesy of /TheRules)

The answer is that the preferred development model suffers from severe, monumental design flaws.

The first of these flaws is in *how the development industry defines the problem itself*. Einstein captured the challenge crisply when he said, "If I had 60 minutes to solve a problem and my life depended on it, I'd spend 55 minutes determining the right question to ask." Right now, the question development organizations ask is, "How can we eradicate poverty?" Good design thinking, on the other hand, would tell you to start with the more fundamental question, "Why does mass poverty exist?"

The first question leads you naturally and logically to things like improving health care and education, and transfers of money in the form of foreign aid and charity. All valid in their own right, perhaps, but are they designed to address symptoms or causes? If you start from the question, "How can we eradicate poverty," that distinction doesn't really matter. The interventions that come to mind all address glaring features of the problem as we see it in front of us today, and therefore seem legitimate and sufficient.

If you ask the more fundamental question, you will come up with a more fundamental answer. To start, you won't focus your initial enquiry on describing every facet of the problem you see in front of you today—poor health care, insufficient aid—but rather on the causes and conditions from which the overall reality emerged. In other words, the question will guide you to understand the processes that have created poverty over the past few centuries and continue to create it today. Now you're looking at things like the Enclosure Movement (https://en.wikipedia.org/wiki/Enclosure) , slavery, colonialism, resource plunder, structural adjustment programs (https://en.wikipedia.org/wiki/Structural_adjustment) , and financial crisis and austerity.

There is a vital current surging beneath this perspective: power. In all of these examples, active, deliberate, human decisions have been at play. Some people have been more powerful than others, and small groups have been powerful for extended periods. There has been a deep and systemic bias in the profile of who makes seminal decisions.

This brings us to the second design flaw in the standard development model: *a built-in blindness to power dynamics*.

Because the question, "How do we eradicate poverty?" focuses attention on what we see around us today, it doesn't much care what decisions or what people may have benefitted from bringing it into being. This is a very handy thing politically, because it means we don't have to examine or treat anyone or anything as culpable, past or present. It means that the wealth that many acquired through processes that produced mass impoverishment is irrelevant. It means we can comfortably usher modern organizations whose very operating logic has long required impoverishment—including political parties and their ideologies, corporations, and indeed whole industries—into high places of political power, and then believe and trust what they do there. All of this creates more than enough room for a deeply flawed assumption to reign supreme: that we are most likely to solve our problems using the very logic that created them in the first place. And we're back to the now politically inconvenient Einstein and his much-loved truism: "We cannot solve our problems with the same thinking we used when we created them."

To understand how such self-defeating logic manifests itself and manages to pass largely unchallenged, we need to look to a third design flaw in the mainstream development model—one that has to do with language. Every designer worth their salt knows that *metaphors matter*—they activate deep frameworks that guide the way users respond. Get the wrong metaphors, and design won't work, plain and simple.

We studied the language (http://www.slideshare.net/joebrewer31/the-many-faces-of-poverty) used by development practitioners on Twitter to describe poverty and found that its metaphors are, at best, confused. Some talk about it as a disease that needs eradicating, some describe as an enemy to combat and destroy, and some as a prison that cages people in. We can see very different logics at play in just these three metaphors. Do we "solve" poverty by searching for a cure that inoculates people, as if against a germ or virus? Do impoverished people need an army to fight for them here and now, or a liberator to spring open their prison doors?

Each of these common metaphors evoke the idea that poverty is natural or inevitable. They can even imply moral judgment on those who are poor. Thus, the underlying logic of these metaphors excuses us from caring much about the root causes. In other words, the basic language we use to talk about poverty is a cognitive barrier to understanding the problem in a way that all good design thinking demands: at the cause level.

All of these flaws are on display in the development industry's latest Big Plan—the Sustainable Development Goals (http://Each of these common metaphors evoke the idea that poverty is natural or inevitable. They can even imply moral judgment on those who are poor. Thus, the underlying logic of these metaphors excuses us from caring much about the root causes. In other words, the basic language we use to talk about poverty is a cognitive barrier to understanding the problem in a way that all good design thinking demands: at the cause level. All of these flaws are on display in the development industry's latest Big Plan—the Sustainable Development Goals (SDGs)—which promises something wonderful, almost irresistible: the total eradication of poverty by no later than 2030.) (SDGs)—which promises something wonderful, almost irresistible: the total eradication of poverty by no later than 2030.

Unfortunately, the underlying design of the SDGs—like the development industry from which they are emerging—is too unsound to make this ambition a reality. For one, the goals rely entirely on the same-old, one-dimensional "solution" to poverty that has failed for the past 65 years: GDP growth. The SDGs would have us believe that we can eradicate poverty by 2030 through the sort of undifferentiated, consumption-based growth that GDP measures. This is ridiculous on two counts: *basic economics and system design*.

Economist David Woodward has shown (http://wer.worldeconomicsassociation.org/papers/incrementum-ad-absurdum-global-growth-inequality-and-poverty-eradication-in-a-carbon-constrained-world/) that even if we assume the fastest rate of growth in the developing world we've seen in the last half century, it will take about 207 years for everyone currently living on less that $5 per day to break above that line—the minimum necessary to achieve normal human life expectancy. GDP masks the fact that, in our present system, 93 cents of every dollar (http://www.bloomberg.com/news/articles/2012-10-02/top-1-got-93-of-income-growth-as-rich-poor-gap-widened) created accumulates in the coffers of the top 1 percent. Trickle-down on a slope this skewed takes a really long time! In this case, 14 times as long as they are promising in the claim that all the world's poverty will be gone by 2030.

Then there's the system design. GDP growth on the scale required for wealth to trickle down enough to eradicate poverty means multiplying the size of the global economy by 175 times. It's worth stopping to think about this. To eradicate poverty using a plan designed around GDP growth means extracting, producing, and consuming 175 times more commodities than we presently do. This is guaranteed to cause climate catastrophe sufficient to make our planet uninhabitable.

So what's the alternative? Design thinking—which, if applied, would completely up-end the

priorities of the SDGs.

An approach based on whole system design would demand that we focus our greatest attention on our economic system and the root causes, rather than individual issues (such as health care and education) and immediately apparent symptoms. Practically speaking, it would place the question of how we understand (and therefore measure) progress at the very top of the priority list, rather than burying it away and leaving it as a problem for the next generation—the tired old concept of GDP growth would be laid to rest in the political graveyard, alongside apartheid and formal empire. It would demand that we examine and address the historical patterns of both sides of the economic coin—wealth and poverty—so that we can challenge the forces that create poverty.

These are not easy things to achieve, which is one reason why we seldom attempt them. They require that we challenge entrenched power and the systems that sustain it. But we must challenge them on the grand stages of global development if we are to honor not just humanity and the earth system within which we have evolved, but also our very best knowledge.

A place to start—and one that we can all build on from today onward—is to use our voices and words, creativity, skills, and compassion to demand that the international development industry change its central premise (and promise), from eradicating poverty to eradicating poverty *creation*.

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Making things happen

Social innovation and design

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ABSTRACT

The paper introduces the notion of *social innovation* and discusses how design can stimulate and support it. In order to do that, it considers several examples of radical social innovation, proposing three main typologies of innovation processes: *top-down*, when strong actors take the lead to promote and enhance a social change; *bottom-up*, when social changes emerge from grassroots activities; and *hybrid*, when a variety of bottom-up and top-down innovations take place within the framework of a coherent program. The paper indicates how each one of these three typologies implies some *design initiatives*, (meaning sequences of actions characterized by a clear design approach). Considered as a whole, these design initiatives and capabilities define the area of competence of a new field of design: *design for social innovation,* This can be defined as *a constellation of design initiatives geared to making social innovation more probable, effective, long-lasting and apt to spread*.

Social innovation and design

A very succinct definition of social innovation is: "a new idea that works in meeting social goals" (Mulgan, 2006). A more detailed one could be the following: social innovation is a process of change emerging from the creative re-combination of existing assets (from social capital to historical heritage, from traditional craftsmanship to accessible advanced technology), which aims to achieve socially recognized goals in a new way. Given these initial definitions, we can easily observe that social innovation has always been and will continue to be a normal component of every possible society. Nevertheless, though social innovation has always existed, there are two good reasons to focus on it today. The first one is that social innovation initiatives are multiplying and will become even more common in the near future in answer to the multiple, growing challenges of the on-going crisis and the much-needed transition towards sustainability. The second one is that as contemporary societies change the nature of social innovation itself is also changing, opening new and until now unthinkable possibilities (Bauwens, 2006; Tapscott, Williams, 2007; Leadbeater, 2008, Murray, 2009).

This definition of social innovation is very broad and includes a wide range of events. We can draw up a first map of them using two polarities:

- *Incremental v. radical*. Here the adjectives incremental and radical are used as in the field of technological innovation: they refer to changes that lie within the range of existing ways of thinking and doing (incremental innovation), or outside them (radical innovation).
- T*op-down v. bottom-up*. This relates to where the change starts and, therefore, who its original drivers are. If they are experts, decision makers or political activists, the innovation will be largely top-down. If they are (mainly) the people and communities directly involved, then it will be (mainly) bottom-up.

[1] DESIS-*Design for Social Innovation for Sustainability* is a network of *design labs* based in design schools (or in other design-oriented universities) promoting social innovation towards sustainability. These *DESIS Labs* are teams of professors, researchers and students who orient their didactic and research activities towards starting and/or facilitating social innovation processes. Each lab develops projects and research on the basis of its own resources and possibilities and at the same time acts as the node of a wider network of similar labs, the *DESIS Network*, which enables them to exchange experiences and collaboratively develop larger design and research programs.

In this paper I will consider examples of radical innovation emerging from both top-down and bottom-up processes, and from a combination of the two, known as *hybrid* processes. For each one of them I will discuss what the designers' role has been, seeking to offer a broad but structured vision of what design con do for social change.

I will refer to these design activities as *design for social innovation*, which includes whatever design can do to start, boost, support, strengthen and replicate social innovation (Manzini, 2011b; DESIS, 2012). In this framework, I will also use the expression *design initiative,* meaning a sequence of actions characterized by a clear design approach and by the use of specific *design devices* (such as prototypes, mock-ups, design games, models, sketches).

Top-down: when social innovation is driven by strategic design

Let's start by describing the experiences of two great Italian innovators: Franco Basaglia and Carlo Petrini. These are two extraordinary characters who worked with widely differing problems, adopting a similar approach and radically changing the then dominant ways of seeing and doing things (mental illness on the one hand and the quality of food and food systems on the other). To avoid misunderstanding, I must stress immediately that neither Basaglia nor Petrini are in fact designers. In my opinion however, both of them are, to all intents and purposes, great innovators and, *de facto,* designers. And their stories say a lot about what designers could and should do in this field.

> ***Democratic Psychiatry.*** Franco Basaglia was an exceptional psychiatrist who, in the seventies, founded the Democratic Psychiatry movement. In practical terms what he did was to "open" the psychiatric hospital in Trieste (a city in the North-East of Italy), where he was director, and at the same time start up co-operative production and service groups which brought ex-patients, nurses and doctors together in enterprises that had to be effective in economic terms (real enterprises, not entities whose very existence depends on financial backing from the state). Why did he do it? The answer is both simple and revolutionary: *"Opening the institution (the psychiatric hospital, editor's note) does not signify opening a door, it means opening ourselves towards the "patient". I would say we are starting to have confidence in these people"* (Basaglia, 1968). Let's try to explain this statement better. Basaglia's theme was mental illness, and his revolutionary (for the times) approach was that a person with a mental disability is not only a patient, but also an individual with capabilities. When seen only as a patient he/she retreats into his illness, but if we see him as a person we can support him/her to overcome his/her problems and fulfil him/herself in some positive activity. Nowadays the path laid out 40 years ago in Trieste by Basaglia has become normal practice in Italy (or at least it should be). In 1978, thanks to him, a national law was passed that opened up all psychiatric hospitals and set up new forms of assistance to the mentally ill. Since then restaurants, holiday villages, hotels and carpentry workshops have started up, all run by "madmen". Many of these activities have worked well. Some have become really successful, commercial enterprises (e.g. a co-operative of ex-patients is presently running a bar, restaurant and bookshop in the ex-psychiatric hospital in Milan, and every year organises an important cultural festival).
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> ***Slow Food.*** In 1989, Carlo Petrini founded the international Slow Food movement. Its manifesto begins with the words: "*We believe that everyone has a fundamental right to pleasure and consequently the responsibility to protect the heritage of food, tradition and culture that makes this pleasure possible"* (Petrini, 2007). However, this is not its only concern. Its presentation goes on to say: "*We consider ourselves co-producers, not consumers, because by being informed about how our food is produced and actively supporting those who produce it, we become a part of and a partner in the production"* (Petrini, 2007). In other words, Slow Food proposed a new way of looking at food consumption. But not only. Driven by the same basic motivation, Slow Food operated on the supply and valorisation of food products that would gradually disappear, if nothing were done, because they were not economically viable in the economics of the dominant agro-industrial system. In practical terms, it has cultivated food awareness on the demand side (through the actions of consumer-producer organisations: the *Condotte* –known outside Italy as C*onvivia*) and consequently a market for these high quality products. On the supply side, it has addressed farmers, breeders, fishermen, and the firms that process their products, and with them it has promoted local organisations (the *Presidia*) to back them by connecting them to each other and to their market.

Basaglia and Petrini, and obviously the teams they worked with to set up Democratic Psychiatry and Slow Food, have been the drivers of very meaningful radical social changes. And they did so by carrying out two extraordinary *strategic design* initiatives. In fact, both of them managed to link the concrete *local activities* they were involved in with *far reaching visions* able to bring people together, to awaken the best in them and to give a common meaning to so many things, great and small, that each of them were able to do.

Basaglia, and Democratic Psychiatry, proposed a more general discourse on democracy and civilisation (it is not by chance that the movement is called Democratic Psychiatry) and, at the same time, they clearly indicated that this process had to be adequately supported: that there had to be facilities (services, places and tools) to enable people (in this case the mentally ill) to overcome their difficulties and fulfil their potential capabilities.

Petrini, and Slow Food, followed a similar course generating a radical new vision on what an advanced, sustainable food system could be like. Coherently with that, adopting a strategic design approach, they created structures (the *Convivia* and the *Presidia*) to enable previously weak farmers to produce high quality products and find channels for their sale at a fair price. In so doing, Slow Food set up what we, in the design language, call an *enabling system:* a system of products and services aiming to empower the social actors involved (Jegou, Manzini, 2008).

We can summarise what Democratic Psychiatry and Slow Food did in a design strategy based on three interdependent actions: (1) Recognition of a real problem and, most importantly, of the *social resources that might be able to solve it* (people, communities and their capabilities). (2) Proposal of (organisational and economic) structures that *activate these resources*, helping them to organise themselves, to last over time and to replicate themselves in different contexts. (3) The building (and communication) of an overall vision able *to connect a myriad of local activities* and *orient them* coherently.

Bottom-up: when social innovation is driven by local communities

To introduce bottom-up innovation I will refer to a variety of everyday life innovations. However, to better understand them and their specificity, let's start by considering two of them in particular: two beautiful and successful stories of radical change at the local scale.

> ***NYC Community Gardens (USA).*** Community Gardens are groups of volunteer gardeners that maintain public gardens in New York City with the support of GreenThumb, a program within the Department of Parks and Recreation that provides material, technical and financial support to gardeners. They were initiated in response to the city's financial crisis of the 1970s, which resulted in the abandonment of public and private land. The majority of GreenThumb gardens were derelict vacant lots.
> In 1973 local residents and a group of gardening activists known as the Green Guerrillas started to plant vacant lots with "seed bombs" and cultivate tree pits in the area. One year later the City's office of Housing Preservation and Development approved the first site for rental as the "Bowery Houston Community Farm and Garden for $1 a month. Today there are hundreds of community gardens in New York City located in all five boroughs, hosting a lot of different activities.
> The volunteer gardeners, who are the backbone of this system, are very diverse in age and background. They conduct multiple activities: they plant and maintain trees, shrubs, and flowers; hold events and educational workshops; produce local urban food; open the garden to the public every day in fixed time periods. And, considering these activities as a whole, they engender community and citizens' engagement (Lupi, 2011).
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> ***Ainonghui, Farmers' Association (China).*** In 2005 in Liuzhou, Guangxi (China), a group of citizens found that they could not access good, safe food in ordinary markets. They went to villages, about a two-hour drive from the city, and found that traditional agriculture models, though struggling, still survived in the remote countryside. With the intention of helping the poor farmers and developing a stable channel of good, organic food, they founded a social enterprise: a farmers' association called Ainonghui.
> Today this farmers' association manages four organic restaurants and a community organic food store. By selling traditionally sourced food to citizens, they also educate them on what traditional/organic agriculture is and introduce a sustainable lifestyle into the city. Thanks to Ainonghui and the direct links it has created between citizens and farmers, the incomes of farmers are now better able to sustain traditional farming while allowing them to lead a better and respected life. What's more, several farmers have returned to the countryside to join in the organic food network (Zhong, 2011).

These two examples are representative of a growing number of initiatives world-wide: collaborative services where elderly people organize themselves to exchange mutual help and, at the same time, promote a new idea of welfare; groups of families who decide to share some services to reduce the economic and environmental costs, but also to create new forms of neighbourhood; new forms of social interchange and mutual help (such as time banks); systems of mobility that present alternatives to the use of individual cars (from car sharing and car pooling to the rediscovery of the possibilities

offered by bicycles) … The list could continue, touching on every area of daily life (to read more about them, see: DESIS Network, 2012).

Looking at these examples we can observe that, behind each of them, there is a group of people who have been able to imagine, develop, and manage something new, outside the standard ways of thinking and doing, i.e. to shatter mainstream ideas about how problems had to be solved. In order to do that, they had to: (1) *(re)discover the power of cooperation;* (2) *recombine, in a creative way, already existing products, services, places, knowledge, skills and traditions*; and (3) *count on their own resources*, without waiting for a general change in the politics, in the economy, or in the institutional and infrastructural assets of the system.

We will refer to them as ***creative communities****: people who cooperate in inventing, enhancing and managing viable solutions for new (and sustainable) ways of living* (Meroni, 2007)

A primary common feature of these creative communities is that they have grown out of problems posed by contemporary everyday life, such as: how can we have more green spaces in my neighbourhood? How can we organise the daily functions of the elderly if the family no longer provides the support it traditionally offered and the state no longer has the means to organise the requested services? How can we respond to the demand for natural food and healthy living conditions when living in a global metropolis? These questions are as day-to-day as they a*re radical.* In spite of its overwhelming offer of products and services, the dominant production and consumption system is unable to give answers to these very basic questions. These groups of people have been able to answer them by applying their creativity to break with mainstream models of thinking and doing and by conceiving and enhancing new ways of doing, based on original combinations of existing products, services and knowledge (Jegou, Manzini, 2008).

Thus it appears that these cases of bottom-up social innovation are *design-led processes.* But they are design-led processes with a particular characteristic: those who "design" are very diverse social actors who, consciously or not, apply ways of thinking and skills that are in all respects to be considered design activities (Bruns, Cottam, Vanstone, Winhall, 2006, Manzini, 2009). In this new context, professional designers can also play an important role by operating in two main ways: designing *with* and designing *for* communities.

> *Designing with communities:* This means participating *peer-to-peer* with other actors involved in creative community building and in collaborative service co-design. In this modality designers have to facilitate the convergence of different partners towards shared ideas and potential solutions. This kind of activity requires a series of new design skills: promoting collaboration among diverse social actors (local communities and companies, institutions and research centres); participating in the construction of shared visions and scenarios; combining existing products and services to support the creative community they are collaborating with.
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> *Designing for creative communities*. This means looking at specific typologies of collaborative service and, after observing their strengths and weakness, intervening on their contexts to make them more favourable, and to develop solutions to increase their accessibility and effectiveness and therefore their replicability. In this mode designers have to conceive and develop *solutions* for specific collaborative services and/or other enabling artefacts (such as *digital platforms, orienting scenarios* and *catalysing events* such as exhibitions, festivals and other cultural events).

Hybrid: when bottom-up and top-down meet

The social innovations we have been describing until now have been presented as *top-down* or *bottom-up* initiatives*:* actions "from the top" that are capable of generating large social transformation. Or, vice versa, actions "from the bottom" that give rise to a multiplicity of local changes. However, a closer observation indicates that social innovation, both in its starting move and in its long-term existence, often depends on more complex interactions between very diverse initiatives, where the ones undertaken directly by the people concerned (bottom-up) are often supported by different kinds

of intervention by institutions, civic organizations or companies (top-down). We will refer to them with the expression: *hybrid processes.*

For instance, a micro-nursery exists thanks to the active participation of the mothers and fathers involved. However, it may have been started looking to the experiences of other groups (and eventually interacting with some of them) and it may be backed up by specific top-down initiatives and enabling tools, e.g. a guide-book indicating, step by step, the procedure to be followed in starting up and managing such a nursery; local authority support in assessment (to guarantee its conformity to established standards); the support of a centralized service (in case of educational or medical problems that cannot be solved within the nursery itself).

The hybrid nature of these social innovation processes becomes more and more evident when the scale of change to be achieved increases. One example of a project that aims at social change on a regional scale can make this statement clearer.

> ***Feeding Milano (Italy).*** Feeding Milan is a strategic design project, promoted by Politecnico di Milano-INDACO Department, University of Gastronomic Sciences and Slow Food Italy. The project idea comes from the consideration that in the Milanese urban area the demand for high quality, fresh food hugely exceeds the actual, available production, despite the presence of a large, potential "urban larder" known as Agricultural Park South Milan.
> The strategic vision of the project is to focus on the mutual advantage represented by the proximity of city and park, by fostering the relationship between the city and the productive countryside through de-mediation of the agri-food chain (answering to the city demand for fresh and high quality food and helping the park to find new business models for its production). The final aim of the project is to create a sustainable and innovative metro-agricultural regional model. To achieve this result the promoters of the project, led by a group of designers/researchers operating at Politecnico di Milano, started a series of *design initiatives* towards the implementation of a project framework, by activating collaboration between groups of citizens and farmers, and groups of designers and food experts.
> Scenario building was the basic tool that helped designers to open the discussion with the stakeholders enrolled, and align interested groups on a vision and some directions. Conversation with the interested communities about the scenario took place in the project, within a series of contextual workshops facilitated by design researchers with specifically designed tools (storyboard, mock-up, moodboard, videos, sketches).
> Currently, Feeding Milan has started a set of new design initiatives that aims at making some of the envisioned solutions become real, in the form of *service prototypes*. These initiatives started with a series of events that are currently happening in the city: the Earth Market of Milan, a farmer market that brings farmers from the park to the city to sell their products; Veggies for the City, a project about the production and the distribution of local vegetables; The Local Bread Chain that aims at restoring a local bread chain, from crops to the final consumer. A digital platform that supports and consolidates the connections among the Feeding Milano participants and the other potentially interested stakeholders (Cantù, Simeone, 2010).

Feeding Milano is an emblematic example of a growing number of projects that, from the point of view of this paper, have similar characteristics. Here, I refer to the results of a recent research conducted within a European project (PERL / Sustainable Everyday Explorations). In this research 5 cases were selected and studied. They were: Feeding Milan (Italy), which I have already presented; Designs Of The Time: Dott07 (UK); Chongming Sustainable Community (China); Amplify (USA); Malmo Living Lab (Sweden) (Manzini, Rizzo, 2011).

Considering them from the perspective of social innovation, three main common characteristics can be observed: (1) they aim at sustainable changes on a regional scale; (2) they share the explicit goal of achieving set objectives by activating citizen participation; (3) they have been started and are driven by some specific *design initiatives* (that is, they have been - explicitly or implicitly - led by design, i.e. by design agency and/or by design schools or research groups).

From the point of view of the designers' role, it emerged that: (1) all of them are large-scale innovation processes resulting from sequences of small-scale initiatives, i.e. the *local projects are* coordinated, synergised and amplified by larger ones, the *framework projects*. (2) All of them are mainly design-driven programs aiming to trigger, coordinate and amplify local projects in order to generate sustainable changes at a larger scale.

Finally, it is noteworthy that some of these design initiatives are top-down processes, others bottom-up, and others a combination of the two. In any case, given their aims and effects, all of them are to be

considered elements of a larger participation process. They are all part of a larger social conversation on what to do and how to do it.

Conclusions: A constellation of design activities

At the beginning of this paper I introduced the notion of design for social innovations using this initial broad but loose definition: *design for social innovation* is whatever design can do to start, boost, support, strengthen and replicate social innovation.
Now, after the discussion in the previous paragraphs, and looking in particular at the hybrid social innovation processes needed to support large-scale transformations, the notion of design for social innovation must be extended. In fact, in every social innovation process, and more clearly in large-scale ones, different actors participate at different moments and in different ways in a sequence of diverse, and sometimes even contrasting, events. The design process that emerges is quite a dynamic and unforeseeable process in which different groups of citizens, supported or not by designers, may lead the conception and implementation of new solutions. In this way everybody has the chance to see, experience and evaluate new ways of being and doing: new viable solutions for given problems or hitherto unimaginable, new opportunities.

> In the light of all this, we can modify our initial definition of design for social innovation, and say that *design for social innovation is a constellation of design initiatives geared to making social innovation more probable, effective, long-lasting and apt to spread*.

With this new definition, design for social innovation converges and largely overlaps with the notion of participatory design (at least in the way it is proposed by Pelle Ehn and his colleagues of the Malmo University (Ehn, 2008; Bjorgvinsson, Ehn, Hillgren, 2009). That is, both design for social innovation and participatory design can be described as (Manzini, Rizzo, 2011):

- Highly dynamic processes: they include linear co-design processes and consensus building methodologies (i.e. the most traditional view on participatory design), but they can go far beyond them, becoming complex, interconnected but often contradictory processes.

- Creative and proactive activities, where the designers' role includes the role of mediator (between different interests) and facilitator (of other participants' ideas and initiatives), but involves more skills and, most importantly, it includes the designers' specificity in terms of creativity and design knowledge (to conceive and realize design initiatives and their correspondent design devices).

- Complex co-design activities that, to be promoted, sustained and oriented, call for prototypes, mock-ups, design games, models, sketches and other materials: a set of dedicated and designed artifacts.

It follows that the range of design activities (and therefore of requested capabilities and skills) is very wide: designers can of course act as *facilitators,* supporting on-going initiatives. But they can also be the *triggers* that start new social conversations. Similarly, they can operate as members of *co-design teams,* collaborating with groups of well-defined final users, but they can also behave as *design activists*, proactively launching socially meaningful design initiatives. At present, the role of designers as facilitators working in co-design teams is the most widely recognized. However, that of trigger and design activist seems to be very promising too (Meroni, 2010; Staszowski, 2010, Simeone, Corubolo, 2011). In fact, operating in this way designers can make best use of their specific set of capabilities and their special sensitivity. Therefore, they can be very effective in sparking off new initiatives and making dynamic social conversations about what to do and how. In other words, "making things happen" seems to be the most concise way to express what could be the most effective and specific role for designers'.

(4024 words)

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Design for Development: A Capability Approach

Ilse Oosterlaken[1]

Introduction

Experts seem to agree that in the past decades little scholarly attention has been paid in development and design scholarship to ethics and global justice issues. The subject is sometimes discussed under the heading of "design for development,"[2] "appropriate technology,"[3] or "design in a poor context, for the alleviation of poverty;"[4] but hardly ever receives an in-depth treatment and exclusive attention. Margolin and Margolin, discussing socially responsible design in a broader sense (i.e., not only addressing the needs of the global poor, but also those of the aged, the disabled, etc.), note that there are "extremely well-developed" theories about "design for the market." On the contrary, "little thought has been given to the structures, methods, and objectives of social design."[5] Yet the fact, alone, that several articles on this topic appeared in *Design Issues* in recent years is an indicator that this is starting to change.

In order to further advance this neglected area of design, I suggest a "capability approach" towards designing for society, and particularly, the world's poor. Central in this approach are human capabilities; the effective opportunities that people have to "live the lives that they have reason to value."[6] Capabilities offer an alternative for human dignity and human rights as the grounds for, or first principle of, design as has been proposed by Buchanan;[7] an alternative that may be more appealing at first sight for designers. I will first introduce the notion of the capability approach. Then I will explain its relevance for engineering and design before sketching some directions for future research on design for global justice.

The Capability Approach

The capability approach has been pioneered and developed by the economist and philosopher Amartya Sen and the philosopher Martha Nussbaum.[8] According to this approach, the proper evaluative space in questions of justice, equality, and development is not income, not resources, not primary goods, not utility (i.e., happiness or the sum of pains and pleasures) or preference satisfaction. Its proponents argue that the focus should be on human capabilities. Capabilities have been described as "what people are effectively able to do and be,"[9] or the (positive) freedom that people have "to enjoy 'valuable beings and doings.'"[10] These beings and doings are called "function-

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2 Victor Margolin, "Design for Development: Towards a History," *Design Studies* 28 (2007): 111–115.

3 Dean Nieusma, "Alternative Design Scholarship: Working towards Appropriate Design," *Design Issues* 20 (2004): 13–24.

4 Angarad Thomas, "Design, Poverty, and Sustainable Development," *Design Issues* 22 (2006): 54–65.

5 Victor Margolin and Sylvia Margolin, "A 'Social Model' of Design: Issues of Practice and Research," *Design Issues* 18 (2002): 24–30.

6 Amartya Sen, *Development as Freedom* (New York: Anchor Books, 1999).

7 Richard Buchanan, "Human Dignity and Human Rights: Thoughts on the Principles of Human-Centered Design," *Design Issues* 17:3 (2001): 35–39.

8 See among others: Martha C. Nussbaum, *Women and Human Development: The Capability Approach* (New York: Cambridge University Press, 2000).

9 Ingrid Robeyns, "The Capability Approach – A Theoretical Survey," *Journal of Human Development* 6:1 (2005): 94–114. Unless stated otherwise, this is the publication of Robeyns that I refer to.

10 Sabine Alkire, "Why the Capability Approach?" *Journal of Human Development* 6:1 (2005): 115–133. Unless stated otherwise, this is the publication of Alkire that I refer to.

ings" by Sen. Functionings "together constitute what makes a life valuable"[11] and are "constitutive of a person's being."[12] Examples of functionings are such diverse things as working, resting, being literate, being healthy, being part of a community, being able to travel, and being confident. "The distinction between achieved functionings and capabilities," as Robeyns explains, "is between the realized and the effectively possible; in other words, between achievements on the one hand, and freedoms or valuable options from which one can choose on the other."[13] According to Alkire, one reason to focus on capabilities instead of functionings is that we value free choice:

> A person who is fasting is in a state of undernutrition, which may seem very similar to a person who is starving. But in the one case, the fasting person *could* eat and chooses not to; whereas the starving person would eat if she could.[14]

Moreover, the capability approach recognizes the importance of both "well-being freedom" and "agency freedom." The latter acknowledges that people pursue not only their own well-being, but may also choose to pursue other ends; for example, the well-being of others, living up to religious ideals, or following moral norms.

Why should we focus on these capabilities in our developmental efforts, rather than utility or resources? One example often given in arguing for capabilities rather than resources is that a healthy and a handicapped person would need different amounts of resources to enable them to have the same opportunities in life. Also, for other reasons, the relationship between a certain amount of goods and what a person can do or can be varies according to Sen:

> … a person may have more income and more nutritional intake than another person, but less freedom to live a well-nourished existence because of a higher basal metabolic rate, greater vulnerability to parasitic diseases, larger body size, or pregnancy.[15]

One of the crucial insights of the capability approach is that the conversion of goods and services into functionings is influenced by personal, social, and environmental conversion factors; and that it should not be taken for granted that resource provision leads to increased capabilities or functionings.[16]

The reason why capability theorists prefer these capabilities over utility or preference satisfaction is the phenomenon which Sen has called "adaptive preferences":

> Our desires and pleasure-taking abilities adjust to circumstances; especially to make life bearable in adverse situations. The utility calculus can be deeply unfair to those who are persistently deprived.… The deprived people tend to come to terms with their deprivation because of the sheer necessity of survival; and they may, as a result, lack the courage to demand any radical change, and may even

11 Ingrid Robeyns, "The Capability Approach – A Theoretical Survey."

12 Sabine Alkire, "Why the Capability Approach?"

13 Ingrid Robeyns, "The Capability Approach – A Theoretical Survey."

14 Sabina Alkire, "Capability and Functionings: Definition and Justification" in *Briefing Notes* (Human Development and Capability Association, www.hd-ca.org, last updated 1 September 2005).

15 Amartya Sen, "Justice: Means versus Freedoms," *Philosophy and Public Affairs* 19:2 (1990): 111–121.

16 Robeyns explains this very clearly, including a nice schematic representation of how the conversion of goods and services into functionings takes place.

adjust their desires and expectations to what they unambitiously see as feasible.[17]

The capability approach is increasingly being applied in different areas. In 2006, Robeyns identified nine different types of applications of the capability approach: "(1) general assessments of human development of countries, (2) assessing small-scale development projects, (3) identifying the poor in developing countries, (4) poverty and well-being assessment in advanced economies, (5) deprivation of disabled people, (6) assessing gender inequalities, (7) debating policies, (8) critiquing and assessing social norms, practices, and discourses, and (9) functionings and capabilities as concepts in non-normative research".[18] It has led to lively debates on several issues.

One very important debate is about which capabilities matter and who (how, when) is to decide this. Different visions exist on this issue. One of several differences that Robeyns mentions between the contributions of Nussbaum and Sen is that, "Whereas in Sen's work the notion of capabilities is primarily that of a real or effective opportunity (as in social choice theory); Nussbaum's notion of capability pays more attention to people's skills and personality traits as aspects of capabilities." And while Nussbaum comes up with a concrete and—so she believes—universally applicable list of important capabilities, "Sen has always refused to endorse one specific well-defined list of capabilities," or to set priorities among different capabilities. His reasons are that the proper list of capabilities may depend on purpose and context, and should be a result of public reasoning and democracy; not something a theorist should come up with.

The question of operationalization of this view has, understandably, received quite some attention.[19] How do we expand the capabilities or positive freedoms of people, and how do we measure the results? "For some of these capabilities," says Robeyns, "the main input will be financial resources and economic production; but for others, it can also be political practices and institutions, … political participation, social or cultural practices, social structures, social institutions, public goods, social norms, traditions and habits." Alkire argues that "operationalizing is not a one-time thing," but something that is dependent upon such things as country, level of action and the problem at hand. Both Robeyns and Alkire conceive of the capability approach as interdisciplinary. Alkire especially advocates close collaboration between capability theorists and experts in relevant fields of application; for example, nutritional science or econometrics, to "trace its implications all the way through." She does not mention engineering and design, but she easily could have, as will be explained in the next section.

17 Ibid.

18 Ingrid Robeyns, "The Capability Approach in Practice," *Journal of Political Philosophy* 14:3 (2006): 351–376.

19 Flavio Comim, Mozaffar Qizilbash, and Sabina Alkire, eds., *The Capability Approach: Concepts, Measures, and Applications* (Cambridge: Cambridge University Press, 2008).

Technology as Capability Expansion

From a common sense point of view, adopting the capability approach immediately seems to be strongly compatible with recognizing and improving the contribution of technology and engineering products to development. After all, what is technology for, if not increasing the capabilities that we have as human beings? Just as the wheel enhanced our capability to transport heavy loads; more recently, the computer enhanced our capabilities to make complex calculations. Technologies have grown more complex over time, and are in an increasingly complex way intertwined with society, institutions, laws, and procedures. But ideally, we still intend them to add to our capabilities to survive (such as in the case of medical equipment); and to participate in public deliberation (such as in the case of ICT/Internet applications that facilitate political discussion).

As obvious as making this connection between technology and capabilities may seem, philosophers working on the capability approach so far do not seem to have sufficiently realized the relevance of technology, engineering, and design for capability expansion. For example, it does not figure on the list that Robeyns presents of inputs for capabilities (political practices, social institutions, habits, etc.). It has hardly received any attention in the literature. Some explorative, agenda-setting articles appeared only recently; mainly concerned with ICT.[20] Remarkably, a specific piece of technical equipment, namely a bicycle, has been used on several occasions to explain the approach:[21]

> Take a bicycle.… Having a bike gives a person the ability to move about in a certain way that he may not be able to do without the bike. So the transportation *characteristic* of the bike gives the person the *capability* of moving in a certain way. That capability may give the person utility or happiness if he seeks such movement or finds it pleasurable. So there is, as it were, a *sequence* from a commodity (in this case, a bike), to characteristics (in this case, transportation), to capability to function (in this case, the ability to move), to utility (in this case, pleasure from moving).[22]

However, the bicycle is just used as an example in explaining the *focus* of the capability approach, and nothing more. Robeyns does say that the *characteristics* of the bicycle expand the owner's capability to move around. Yet she also states that:

> We are not interested in a bicycle because it is an *object made from certain materials with a specific shape and colour*, but because it can take us to places where we want to go, and in a faster way than if we were walking. (The emphasis is mine.)

Of course, the point that Robeyns here attempts to make is that what matters in the end is capability expansion, and that the bicycle is only instrumentally important in this respect.

20 See, for example, Jeroen van den Hoven and Emma Rooksby, "Distributive Justice and the Value of Information: A (Broadly) Rawlsian Approach" in *Information Technology and Moral Philosophy*, edited by J. van den Hoven and J. Weckert (Cambridge: Cambridge University Press, 2008); Justine Johnstone, "Technology as Empowerment: A Capability Approach to Computer Ethics," *Ethics and Information Technology* 9 (2007): 73–87; Yingqin Zheng, "Exploring the Value of the Capability Approach for E-development" (paper presented at the *9th International Conference on Social Implications of Computers in Developing Countries*, Sao Paulo, Brazil, 2007).

21 For example, in Robeyns (2005), "The Capability Approach"; and Alkire (2005) "Capability and Functionings."

22 Amartya Sen, "Poor, Relatively Speaking," *Oxford Economic Papers* (New Series) 35:2 (1983): 153–169.

However, Robeyns's remark is still naive regarding the sociology and philosophy of technology, as I will explain in the next section.

The Significance of the Details of Design

Philosophers and sociologists of technology have argued in the past decades that engineering products are far from neutral instruments to be used at will for either good or bad, but rather value-laden or inherently normative.[23] Values such as privacy, autonomy, sustainability, safety, and justice can be realized in our technologies—or these could rather embed and create the opposite: injustice, insecurity, and so on. And many different design options are generally available during the development process of a new technology or product. This means that the *details of design are morally significant*. If technologies are value-laden and design features are relevant, we should—so it has been suggested—design these technologies in such a way that they incorporate our moral values. This thought has led to the emerging research field of so-called "value sensitive design," which initially was limited to R&D in the area of ICT, but is now also gaining popularity in other engineering areas.[24]

Keeping this in mind, let us discuss the bicycle a bit further. Nowadays, we may take it for granted as a piece of equipment that "can take us to places where we want to go, and in a faster way than if we were walking," as Robeyns did. However, the bicycle is not such a simple and straightforward artifact as it may seem. As it happens, it figures in a classical case study in the sociology of technology.[25] In this study, Bijker describes in detail how the development of the modern bike took place, stretching over a period of more than two centuries in which many different design varieties competed with each other. What is especially interesting is that Bijker's analysis has shown that different social groups attached different meanings to this new artifact, and that this influenced developments in its design. Initially, it was mainly viewed as a piece of sports equipment, used for racing contests. This means that the speed that a certain type of bicycle could achieve was very important. In the second half of the 19th century, the dominant model had become the so-called "high-wheeled Ordinary bicycle," which had a very large front wheel in comparison to the smaller rear wheel, and pedals connected directly to the front wheel. Because of the way in which bicycles were viewed, it developed in a direction of less rather than more safety:

> The trend of enlarging the front wheel of the velocipede had continued once speed had become so important, and this made it necessary to move the saddle forward in order to keep pedals within reach of the feet. This implied a reduction of the rear wheel's diameter— partly because otherwise the machine could not be mounted at all, partly to reduce the bicycle's weight, and partly for aesthetic reasons (it set off the grandeur of the high wheel). But these two developments moved the center of gravity of the

23 Langdon Winner, "Do Artifacts Have Politics?" *Daeddalus* 109:1 (1980): 121–136; Bruno Latour, "Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts" in *Shaping Technology / Building Society*, Wiebe E. Bijker and J. Law, eds. (Cambridge, MA: The MIT Press, 1992).

24 Jeroen van den Hoven, "ICT and Value Sensitive Design" in *The Information Society: Innovations, Legitimacy, Ethics, and Democracy*, P. Goujon, S. Lavelle, P. Duquenoy, K. Kimppa, and V. Laurent, eds. (Boston: Springer, 2007); Mary L. Cummings, "Integrating Ethics in Design through the Value-Sensitive Design Approach," *Science and Engineering Ethics* 12:4 (2006): 701–715.

25 Wiebe E. Bijker, *Of Bicycles, Bakelites, and Bulbs: Toward a Theory of Sociotechnical Change* (Cambridge, MA: The MIT Press, 1995).

> bicycle and rider far forward, to a position almost directly above the turning point of the system. Thus, only a very small counter force—for example, from the bumpiness of the road, but also from the sudden applications of the brake—would topple the whole thing.

Because of the bad condition of the roads in those days, this happened quite frequently. However, this was not considered a problem, nor a sign of bad bicycle design. Cycling was considered to be an activity for young and adventurous men. The difficulty of riding the "Ordinary" and its accident proneness only contributed to the ability of these lads to impress the ladies by participating in cycling contests in the parks. "Falls were such an accepted part of bicycling," Bijker notes, "that producers advertised their bicycles' ability to withstand falls, rather than claiming that they did not fall at all."

Thus, bicycling was rarely undertaken by senior citizens or women, and certainly not considered as a form of transportation. This, says Bijker, only changed "when manufacturers began to regard women and older men as potential bicycle buyers." The realization that there was a business opportunity here led to a whole series of new developments in bicycle design, with safety instead of speed now being a prominent goal. Some design changes were successful; others not. These attempts to reach new target groups led in the end to the dominance of the so-called "safety bicycle," which is chain driven by the rear wheel. The main function of the bicycle had become transportation.

After this bicycle detour, let us return again to the concept of value-sensitive design. A similar perspective may thus be just what is needed if we want to introduce new technologies in developing countries in such a way that it does benefit the poor by expanding their human capabilities. If one is interested in making the introduction of a new technology, such as the bicycle in 19th century Europe, or currently ICT equipment in developing countries, contribute to capability expansion, one should also be interested in its design. As the bicycle example illustrates, the design features of technologies are relevant for their effect on human capabilities. Perhaps we should not care very much about the color of the bicycle—it is hard to imagine how this could be relevant—but shape and material definitely deserve our attention. (Although, I agree with Robeyns for instrumental reasons.) We should not too easily assume that a certain product or technology will do well in expanding people's capabilities. Sen's capability approach, I propose, should be directly applied to the design and engineering of these new technologies and products for developing countries. What responsible innovation for the benefit of the global poor requires, one may say, is "capability sensitive design" of technologies for developing countries.

Capability Sensitive Design

A central question, of course, is what capability sensitive design entails, and whether or not adopting such a new design philosophy will in the end make a difference in the lives of people. This is something that needs further investigation, and the last section will point out some research directions. But first let me say something about why I expect that taking a capability approach is valuable for design scholarship and practice. In the introduction, I referred to an essay by Buchanan. He writes—and I will quote him quite extensive because of the importance and eloquence of his message—the following:

> We tend to discuss the principles of form and composition, the principles of aesthetics, the principles of usability, the principles of market economics and business operations, or the mechanical and technological principles that underpin products. In short, we are better able to discuss the principles of the various methods that are employed in design thinking than the *first* principles of design, the principles on which our work is ultimately grounded and justified. The evidence of this is the great difficulty we have in discussing the ethical and political implications of design.… The implications of the idea that design is grounded in human dignity and human rights are enormous, and they deserve careful exploration.[26]

The grounding principle of design that Buchanan envisions is related to the one I am proposing. Sen himself has declared that human capabilities and human rights are closely connected concepts. For example, he says that "there are many human rights that can be seen as rights to particular capabilities"[27]—because of the intuitively obvious connection between technology and engineering products on the one hand, and the expansion of human functionings and capabilities on the other—it will be easier for designers to incorporate and take into account human capabilities than to deal with human rights. As Johnstone phrased it:

> Because the theory is essentially naturalistic and functionalist in orientation, capability analyses are able to integrate descriptive and normative dimensions in a way that is particularly appropriate to technological domains.[28]

The effects of applying the capability approach to the domain of technology, engineering, and design may be huge. As Buchanan writes about "human-centered design":

> Unfortunately, we often forget the full force and meaning of the phrase—and the first principle which it expresses. This happens, for example, when we reduce our considerations of human-centered design to matters of sheer usability and when we speak merely of "use-centered design." It is true that usability plays an important role in human-centered

26 Richard Buchanan (2001), "Human Dignity and Human Rights."

27 Amartya Sen, "Human Rights and Capabilities," *Journal of Human Development* 6:2 (2005): 151–166.

28 Johnstone (2007), "Technology as Empowerment."

> design, but the principles that guide our work are not exhausted when we have finished our ergonomic, psychological, sociological, and anthropological studies of what fits the human body and mind.[29]

The observation is still valid. Let's illustrate this with two examples. Chalmers University of Technology (Sweden) tells prospective industrial design engineering (IDE) students that "the degree to which a product *satisfies* customers and users is … regarded as one of the most critical factors in product development." New developments mean that "previous values, such as functionality, reliability, and cost are partly to be complemented by, partly to be replaced by, other values, such as *usability*, *comfort*, aesthetics, *pleasure*, and *excitement*."[30] One could argue that there are more fundamental values at stake in design than the ones mentioned here. Likewise, in a proposal for a new IDE research program,[31] Delft University of Technology (The Netherlands) recently claimed that industrial design should contribute to the "well-being" of people, which is defined as "an *experiential* state of people and organizations, which can have many shapes, such as *satisfaction*, fulfillment, support and inspiration, protection, acknowledgement, *comfort*, *happiness*, and involvement." The words chosen by both universities (the emphasis is mine) suggest that it is currently preferences or utility rather than something such as human dignity or capabilities that are at the core of the work of many IDE departments (assuming that these examples are representative). Without denying the relevance of these notions, the concept of human capabilities offers a richer understanding of well-being: one that adds to design scholarship and practice. It certainly accommodates the ideas and preferences of design constituencies which include moral considerations concerning autonomy, privacy, sustainability, accountability, responsibility, etc., as well as the ones mentioned in the most common descriptions of the IDE communities.

What capability sensitive design as an alternative approach entails is a matter of further investigation. Yet we can easily deduct some rough pointers from the capability approach. One of the merits of the capability approach is that it has drawn attention to the existence of immense human diversity; not only in terms of what we value, but also in terms of personal and social/environmental characteristics that influence the conversion from resources into capabilities and functionings. People who have paralyzed legs, for example, will obviously not be able to ride an ordinary bicycle. In this case, a personal characteristic completely blocks the conversion of a resource into capability or functioning. One beauty of technological artifacts, however, is that they are resources whose properties can be moulded. They can—within certain limits—be designed in such a way that they take these conversion factors into account.

29 Richard Buchanan (2001), "Human Dignity and Human Rights."

30 Brochure master's programme Industrial Design Engineering, Chalmers University of Technology, Sweden. To be found at: www.chalmers.se/en/sections/education/masterprogrammes/programme-descriptions/industrial-design (accessed 14 November 2008).

31 "Towards a New Research Portfolio for IDE/TUD" (Delft: Faculty of Industrial Design Engineering, TU Delft, 2007, work in progress). To be found at: www.io.tudelft.nl/live/pagina.jsp?id=e667fbe8-b697-4d5d-a709-f61221558c4c&lang=nl (accessed 14 November 2008). It should be recognized that the document also says that the work of designers should not be "at the cost of others" and should be placed in an "ecological, social, cultural, and economic context." This is mentioned, however, as a limiting condition.

Whatever else it may entail, capability sensitive design takes human diversity into account.

A Case: Tricycles for the Disabled in Ghana

If we consider this aspect of capability sensitive design, the design of tricycles for the disabled in developing countries may be a nice illustration of what I have in mind. The disabled in developing countries have, as Van Boeijen[32] notes, little opportunities "in education, (finding) work and participation in social life," or to shape their own life. She writes:

> The possession of a tricycle can give a large number of them the possibility to travel.… A tricycle is a hand-operated vehicle that is propelled by means of a chain- or crank-lever mechanism and is suitable for driving long distances, under bad road conditions, and for the transportation of goods. All over the world small workshops in developing countries produce these tricycles in many different designs. These tricycle designs need improvements: they are often uncomfortable for the user, not suitable for the local situation, and difficult to produce. Imported tricycles from Western countries are often too expensive and not suitable for use under the average conditions in developing countries. Usually, they also lack spare parts which makes repair difficult or impossible.

At least since the 1990s, if not earlier, industrial design engineers have—in different local contexts—been working on design improvements that address these problems. In this way, they contribute to the expansion of the capability to move for an otherwise socially marginalized group.

In a case in Ghana, a local metal workshop had to stop the production of tricycles due to a lack of financial support. A team of industrial design engineering students did extensive research into local circumstances, the metal workshop, the disabled, and other stakeholders in order to find an appropriate design solution. Their tricycle, for example, has been adjusted in such a way as to enable the handicapped to sell ice cream stored in a cooler in front of the tricycle. Disabled persons are thus enabled to act as street vendors. The financial side of the tricycle production and provision also has been taken care of; among others by getting a company involved whose products can be sold by street vendors.[33] By increasing the income, opportunities, and self-respect of the handicapped in this manner, the tricycles now also contribute to capabilities other than mobility.

Capability sensitive design envisioned in this way bears strong resemblance to the familiar concept of "universal design." As Nieusma explained, this approach is all about "accounting for diversity."[34] It should be noted that, on Nieusma's analysis, my

32 Annemiel G.C. van Boeijen, "Development of Tricycle Production (DTP) in Developing Countries" in *RESNA '96 Annual Conference: Exploring New Horizons … Pioneering the 21st Century* (Salt Lake City, Utah, 1996).

33 Prabhu Kandachar, Jan Carel Diehl, Gabrielle van Leeuwen, and Jaap Daalhuizen, eds., *Design of Products and Services for the Base of the Pyramid; IDE Graduation Projects 2*. Delft: Delft University of Technology, Faculty of Industrial Design Engineering (2007).

34 Dean Nieusma (2005), "Alternative Design Scholarship."

example of the tricycles in Ghana seems rather an example of the more limited accessibility movement, a predecessor of the universal design movement. It is in no way my intention, however, to make capability sensitive design only responsive to differences in physical abilities or to just one, specific user group at a time. Moreover, future research may reveal that capability sensitive design has many more sides to it than has been discussed so far.

Participation in Design

Another feature of the capability approach is that it attaches great importance to agency, free choice, and value judgments. As mentioned earlier, Sen deliberately refrains from specifying and prioritizing a complete capability list. Not surprisingly, public deliberation and participation have thus received attention in the capability literature. It is here that research on capability sensitive design can and should make a link with participatory design which, according to Nieusma,[35] "has developed into a well-articulated, well-justified methodology for user participation in design processes" and is all about "coping with disagreements." He regrets, however, that "increasingly, participatory design methodologies are used to advance the goals of user-centered design without emphasizing the inclusion of marginalized perspectives in design processes." We are reminded here of Buchanan's reflections on the ultimate ends of design, and the contrast with the actual focus of IDE departments.

Interestingly, Frediani,[36] in exploring the connections between the capability approach and participatory methods more broadly, notices something similar. In practice, participatory methods used in developmental cooperation often do not meet the expectations, being "sometimes used merely as a tool for achieving preset objectives" and not as a process for true empowerment and improvement of people's lives. He argues[37] that "participatory methods need to be complemented by a theory that explores the nature of people's lives and the relations between the many dimensions of well-being." This theory, he says, should be comprehensive, but flexible and able to capture complex linkages between (aspects of) poverty, intervention, participation, and empowerment. He feels that the capability approach is able to offer exactly that. In my view, the capability approach may be able to offer the same revival to the ideals of participatory design.

Finally, I will try to identify some issues that definitely deserve our attention and that hopefully will lead to fruitful discussions about the ethics of design and, more specifically, the concept of capability sensitive design.

Some Directions for Future Research

Applying the capability approach to the broad domain of technology, engineering, and design will require research in a wide range of different questions and cases. Research should address issues rang-

35 Ibid.

36 Alex Apsan Frediani, *Participatory Methods and the Capability Approach* (briefing note of the Human Development and Capability Association, www.capabilityapproach.com/pubs/Briefing_on_PM_and_CA2.pdf, accessed 14 November 2008).

37 He bases his argument on a work by Cleaver: Frances Cleaver, "Institutions, Agency, and the Limitations of Participatory Approaches to Development" in *Participation: The New Tyranny?* B. Cooke and U. Kothari, eds. (London: Zed Books, 2001).

ing from design methods to the social and ethical dilemmas that the designer will encounter along the way. More theoretical reflection should go hand-in-hand with case studies of design projects. Johnstone[38] mentions four different focal points for future research into technology and human capabilities: (1) particular groups or individuals, (2) particular capabilities, (3) particular situations or context, or (4) particular interventions (technologies, artifacts). Case studies could primarily address one of these aspects or a combination of them. She discusses this in relation to ICT only. This is a domain in which a lot of design takes place, the outcome of which is relevant for people's capabilities. In a Western context, one could think of reassessing the debate on privacy and ICT applications in terms of how the latter affect capabilities to control personal information flows. In the context of developing countries, it has been pointed out independently both by Selinger and Zheng that the expectations of ICT for development are high, and that critical reflection is rare. ICT in its current form does not necessarily contribute to (for example) the empowerment of women in developing countries,[39] and a capability approach could be helpful in avoiding the "pitfalls in e-development."[40]

The sort of products that industrial design engineers are concerned with offer another domain for application. Again, the context could be Europe or the U.S. However, I would especially like to encourage a capability approach towards design for development, since both the need and the potential impact are high. Such research could, as inspired by the work of business scholar Prahalad, take place it in a business-like context. Prahalad has unleashed new enthusiasm and resources for development collaboration with his plea to the business world to come up with innovative products for the "Base of the Pyramid" (BoP).[41] His hypothesis is that companies can make a profit while poverty gets alleviated. This perspective could lead to more financial sustainability and thus the long-term effectiveness of development efforts. The design of these innovative products, however, is underexposed in the BoP literature, as Thomas[42] has noted. Moreover, one should not too easily assume that the interests of the poor and of companies are always compatible. Ethical and social dilemmas are to be expected in such a context, in which—to use Margolin's terminology—design for the market and social design come together. There is a real challenge here.

How do we proceed with such research? First and foremost, there is a (largely empirical) question of which capabilities can be expanded (or perhaps unintentionally hampered) by new technology and products, and what engineers and designers (can) contribute to this. And how can philosophical reflection on the ultimate objectives of development, as offered by the capability approach, be translated in concrete design practice, including methods and tools? As mentioned in the previous section, another important question—perhaps even more so in a BoP/business context—is who should

38 Johnstone (2007), "Technology as Empowerment."

39 Evan Selinger, "Does Microcredit 'Empower'? Reflections on the Grameen Bank Debate," *Human Studies* 31 (2008): 27–41.

40 Yingqin Zheng (2007), "Exploring the Value of the Capability Approach for E-development."

41 Coimbatore Krishna Prahalad, *The Fortune at the Bottom of the Pyramid: Eradicating Poverty through Profits* (Upper Saddle River, NJ: Wharton School Publishing, 2005). "BoP" refers to the base of the income pyramid, with four billion people living on less than $2 a day. Crabtree has argued that the BoP debate is too focused on income poverty, and should rather take a capability perspective: Andrew Crabtree (2007), *Evaluating the "Bottom of the Pyramid" from a Fundamental Capabilities Perspective* (Copenhagen: Copenhagen Business School, CBDS Working Paper Series).

42 Angarad Thomas, "Design, Poverty, and Sustainable Development."

determine which capabilities and design solutions are relevant in a specific case, and what should happen in the case of disagreement or conflicts of interests.

Capability sensitive design is not something completely new or entirely different from existing "alternative design scholarships," as Nieusma calls it. As we have seen, there is a clear link with universal design and participatory design. But rather than making capability sensitive design redundant, I consider this a strength. It indicates that capability sensitive design is able to integrate lessons learned into a more comprehensive approach which offers a clear philosophical foundation of the ultimate ends of design; is connected to an expanding body of literature in philosophy and the social sciences; and—perhaps even more important—which can provide engineers and designers the inspiration that is needed to advance design for development.[43]

43 I would like to thank Jeroen van den Hoven for his very helpful feedback on earlier versions of this article, and for his support in starting up research on this topic.

WIRED

The Human Element: Melinda Gates and Paul Farmer on Designing Global Health

PAUL FARMER AND MELINDA GATES have a lot in common. They're both Duke University alums, and they're both devoted to improving health around the world, especially in places with few resources. As co-chair of the Bill & Melinda Gates Foundation, Gates is particularly dedicated to empowering women and girls, which in turn benefits the health and prosperity of entire communities. Farmer splits his time between Boston (where he runs the Department of Global Health and Social Medicine at Harvard Medical School), Haiti, and Rwanda. He's founding director of Partners in Health, an international nonprofit that delivers health services to the rural and urban poor in a dozen countries. Gates and Farmer don't often work together, but their work certainly unites them. In New York City for UN meetings, the two friends talked to WIRED about the best ways to improve health all over the world.

WIRED: What innovation do you think is changing the most lives in the developing world?

MELINDA GATES: Human-centered design. Meeting people where they are and really taking their needs and feedback into account. When you let people participate in the design process, you find that they often have ingenious ideas about what would really help them. And it's not a onetime thing; it's an iterative process.

How does that work in practice?

PAUL FARMER: In Haiti I would see people sleeping outside the hospital with their donkey saddle under their neck — they'd been waiting there for days. And no one was asking them, "What are you eating while you're waiting? What is your family eating while you're gone?" We have to design a health delivery system by actually talking to people and asking, "What would make this service better for you?" As soon as you start asking, you get a flood of answers.

GATES: The first time I went to Haiti and saw Paul in 2003, he said, "How can we expect them to take these pills if they have nothing to eat?" He decided that they needed health care workers who could follow patients, and that they had to be people from the community.

FARMER: In Rwanda we worked with the ministry of health when it decided to vaccinate all 13-year-old girls against HPV. And we said, "OK, but what about the girls in school? How would they get the second dose? What about the third? And what about the girls not in school — how do we find them?" With community health workers. And when we studied this new system, we saw that it wasn't just improving the outcomes a little, but a lot: Rates of HPV vaccination in Rwanda are twice what they are in the US.

GATES: Transportation is a huge issue in health. I was in Malawi, and in one village they were mapping things out on a piece of butcher paper, trying to figure out why they don't transport women to facilities to give birth. Well, they realized that they didn't have a bridge to get across a stream that becomes a river during the rainy season. They realized they needed resources to build a bridge — and to buy motorcycles.

Do you see ways for communications technology to help further these efforts?

GATES: I think cell phones are a huge opportunity. I saw it firsthand when I was in India earlier this year. I met with a network of community health workers who had been given cell phones by the government. Each day via cell, the local health authority sends these workers, mostly young women from villages, a list of patients they need to visit. The workers also have training modules they can call into from their phones, and they get free airtime so they can make personal calls to their families once they've listened to their modules. Every week they meet with someone further up in the system who can answer questions. But also, if they go into a patient's home and the person doesn't trust their advice, the worker can call a more highly trained health worker and give

the phone to the patient so they can be reassured. What this means is more people are getting better health care in a really efficient way. That's the power of a simple cell phone.

FARMER: The cell phones are also a way to develop human capital. Say you have a 22-year-old woman who becomes a community health worker. Using the example Melinda gave, that person can obtain some continuing education through technology that just 10 years ago wasn't even available.

So in India, do community health workers sign up so they can get a phone?

GATES: Yes. That's part of how they are paid. And they love being more knowledgeable! All of a sudden they have so much more cachet. People say, oh, they really do know what they're talking about. And when I talk about contraceptives, I see that young women are starting to stand up to their husbands, because they're empowered by what they learn from the health workers. What about established medical professionals?

FARMER: Partners in Health built a teaching hospital in Haiti, and not too long ago I stopped by the emergency room. There had been a road accident with 12 critically injured people, but there were also more than a dozen doctors and nurses, and there was a functioning CAT scanner. Not a single person died. I had never seen that before. I watched a doctor who had always seemed so dispirited. But that night at the new hospital, he looked excited — you can see people come alive if you just give them a chance to learn and to provide better care.

Roper, Caitlin, "The Human Element: Melinda Gates and Paul Farmer on Designing Global Health." Wired Magazine. 12 Nov. 2013. http://www.wired.com/2013/11/2112gatefarmers/

Design Thinking

By Olivier Serrat

The need for 21st-century mindsets and protocols has sparked interest in design thinking. That is a human-centered, prototype-driven process for the exploration of new ideas that can be applied to operations, products, services, strategies, and even management.

A Design for Life

In a world of continuous flux, where markets mature faster and everyone is affected by information overload, organizations regard innovation, including management innovation, as the prime driver of sustainable competitive advantage. To unlock opportunities, some of them use mindsets and protocols from the field of design to make out unarticulated wants and deliberately imagine, envision, and spawn futures.

Design is more important when function is taken for granted and no longer helps stakeholders differentiate. In the last five years, design thinking has emerged as the quickest organizational path to innovation and high-performance, changing the way creativity and commerce interact.[1] In the past, design was a downstream step in the product development process, aiming to enhance the appeal of an existing product. Today, however, organizations ask designers to imagine solutions that meet explicit or latent needs and to build upstream entire systems that optimize customer experience and satisfaction.

> *The proper study of mankind is the science of design.*
>
> —Herbert Simon

Therefore, although the term "design" is commonly understood to describe an object (or end result), it is in its latest and most effective form a process, an action, and a verb, not a noun: essentially, it is a protocol to see, shape, and build. Lately, design approaches are also being applied to infuse insight into the heart of campaigns and address social and other concerns.[2]

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[1] In truth, companies such as Apple in particular, but also General Electric, Levi Strauss, Nike, and Procter & Gamble, to name a few, pioneered the notion some time ago.

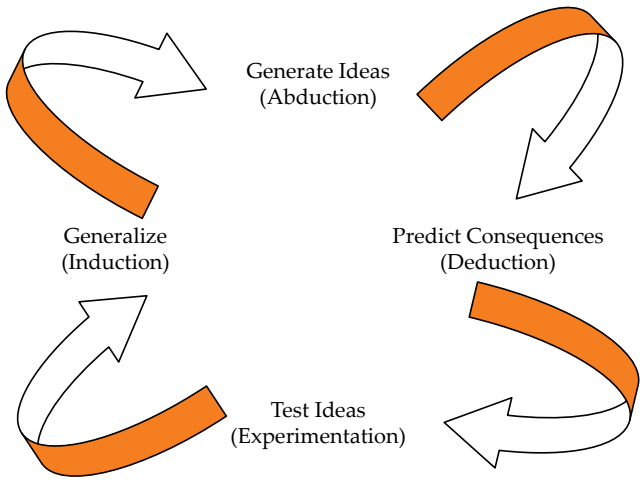
[2] See, for instance, Tim Brown and Jocelyn Wyatt. 2010. Design Thinking for Social Innovation. *Stanford Social Innovation Review*. Winter. Available: www.ssireview.org/articles/entry/design_thinking_for_social_innovation/. In 2007, Oxfam approached IDEO, a global design consultancy, with a brief. How might the charity better educate people to understand climate change? How might Oxfam translate that understanding into a better relationship with donors?

Defining Design

Herbert Simon[3] defined design as the changing of existing conditions into preferred ones.[4] Design thinking, then, is about using the sensibilities and methodologies that characterize designers to create new ideas, new alternatives, new choices, and new viabilities that satisfy stakeholder desires. It is fundamentally abductive,[5] even if designers still induce patterns and deduce answers.

Stemming from abductive reasoning, design thinking is empathic, personal, subjective, interpretive, integrative, experimental, synthetic, pictorial, dialectical, opportunistic, and optimistic. It is a frame of mind for problem solving that can balance legitimate needs for stability, efficiency, and predictability with the requirement for spontaneity, experimentation, and serendipity. In the conceptual age,[6] it is a "people first" approach to the full spectrum and minutiae of innovation activities that has applications in operations, products, services, strategies, and even management.[7]

Figure 1: The Cycle of Design Thinking



Source: Adapted from David Dunne and Roger Martin. 2006. Design Thinking and How It Will Change Management Education: An Interview and Discussion. *Academy of Management Learning and Education*. Vol. 5, No. 4, pp. 512–523.

[3] Herbert Simon (1916–2001) was an American political scientist, economist, and psychologist whose research ranged across the fields of cognitive psychology, computer science, public administration, economics, management, philosophy of science, sociology, and political science. See Herbert Simon. 1969. *The Sciences of the Artificial*. Massachusetts Institute of Technology Press.

[4] Herbert Simon saw that the rationality of individuals is limited by the information they have, the cognitive limitations of their minds, and the finite amount of time they have to make decisions. "Bounded rationality" leads them to "satisfice", that is, choose what might not be optimal but will make them sufficiently happy.

[5] Abduction is the process of inference to most likely, or best, explanations from accepted facts. Deduction means determining the conclusion. For example: "When it rains, the grass gets wet. It rains. Thus, the grass is wet." Induction means determining the rule. To illustrate: "The grass has been wet every time it has rained. Thus, when it rains, the grass gets wet." Abduction means determining the precondition. For instance: "When it rains, the grass gets wet. The grass is wet, it must have rained." Abductive thinking is very close to the concept of lateral thinking, for which numerous tools exist.

[6] Daniel Pink has identified six high-concept, high-touch abilities that have become crucial in the conceptual age. (The term "conceptual economy" describes the contribution of creativity, innovation, and design skills to economic competitiveness, especially in the global context.) The six abilities are design, story, symphony, empathy, play, and meaning. By high-concept, he means the ability to detect patterns and opportunities, to shape artistic and emotional beauty, to craft satisfying narratives, to fuse apparently unrelated ideas into an invention. By high-touch, he connotes the ability to understand the subtleties of human interaction, empathize and find happiness in the pursuit of purpose and meaning. Design is one profession that relies on all six abilities. Daniel Pink. 2005. *A Whole New Mind: Why Right-Brainers Will Rule the Future*. Penguin Books Ltd.

[7] It can, for instance, be used to develop and drive strategy, open new markets, fashion new offerings, formulate new business models, identify new applications for technology, articulate new ways of connecting to customers, and forge new partnerships.

Inside the Design Thinking Process

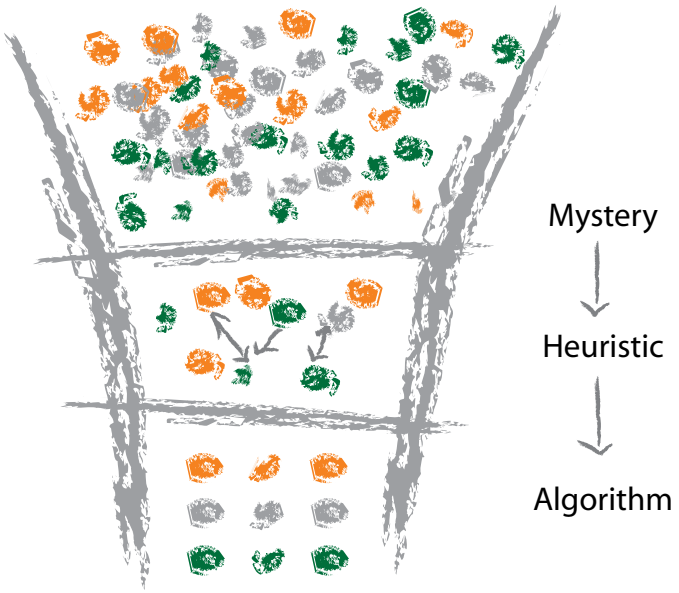
> *If I'd asked my customers what they wanted, they'd have said "a faster horse".*
>
> —Henry Ford

Design thinking revolves around three key phases: inspiration, ideation, and implementation.[8] During these phases, problems are framed, questions—also about questions—are asked, ideas are generated, and answers are obtained. The phases are not linear; they can take place concurrently and can also be repeated to build up ideas along the continuum of innovation. The design thinking process allows information and ideas to be organized, choices to be made, situations to be improved, and knowledge to be gained as depicted in Roger Martin's three-stage funnel.[9]

Design thinking is, inherently, a prototyping process powering deep understanding of what people want in their lives as well as what they like (or not) about the way that is made, packaged, marketed, sold, and supported. To this end, multidisciplinary teams of T-shaped individuals[10] are encouraged to fail often to succeed sooner through trial and error: innovations do not arise from incremental tweaks.

By the same token, design is never done: a market is always changing, least of all because good ideas are copied, and design must change with it. Design success is the integration of design thinking into an organization: at that level, it becomes a powerful tool to solve unpredictable problems.

Figure 2: The Knowledge Funnel



Source: Roger Martin. 2009. *The Design of Business: Why Design Thinking is the Next Competitive Advantage*. Harvard Business School Publishing. Rotman Designworks. 2010. Available: www.rotmandesignworks.ca/business_design.html

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8 Some articulate these further into seven: define, research, ideate, prototype, choose, implement, and learn.

9 The first stage of the knowledge funnel is the investigation of a mystery (that may have several forms). The second is the delineation of a heuristic, viz., an educated guess, intuitive judgment, rule of thumb, or simple common sense, that narrows the area of inquiry so that it may be managed. The third is the creation of an algorithm, viz., a formula. As one moves down the funnel, one creates efficiency but must necessarily leave things out. See Roger Martin. 2009. *The Design of Business: Why Design Thinking is the Next Competitive Advantage*. Harvard Business School Publishing.

10 T-shaped individuals possess deep knowledge in a core area of expertise as well as broad knowledge in disciplines such as management, finance, and business operations. Tom Kelley of IDEO has also observed a number of roles that people can play in an organization to foster innovation and new ideas and offer an effective counterpoint to naysayers. They are the anthropologist, the experimenter, the cross-pollinator, the hurdler, the collaborator, the director, the experience architect, the set designer, the caregiver, and the storyteller. See Tom Kelley. 2008. *The Ten Faces of Innovation*. Profile Books Ltd.

Table: Design Shops and Traditional Organizations

Feature	Design Shop	Traditional Organization
Goal	• Requisite reliability and validity to maintain competitive advantage	• Reliability, viz., the production of consistent replicable outcomes
Flow of Work Life	• Projects • Defined Terms	• Ongoing tasks • Permanent assignments
Style of Work	• Collaborative • Iterative	• Defined roles • Wait until the conditions are "right"
Mode of Thinking	• Deductive • Inductive • Abductive	• Deductive • Inductive
Source of Status	• Solving "wicked" problems	• Managing big budgets and large staffs
Dominant Attitude	• Nothing is impossible • Constraints magnify the challenge and increase excitement	• What can be done is what budgets allow • Constraints are the enemy
Problem-Solving Approach	• Iterative • Relies on a "build to think" process dependent on trial and error • Intuitive thinking seeks 100% validity through knowing without reasoning; design thinking attempts to bridge the predilection gap between intuitive and analytical thinking though generative reasoning	• Definitive • Relies on equations for "proof" that declare truths and certainties about the world • Analytical thinking seeks 100% reliability through induction and deduction
Validation Through	• Validation though what customers do, typically by means of direct observation and usability testing	• Validation though what customers say, typically by means of qualitative and quantitative research
Informed By	• Direct customer observation • Abductive reasoning and an interest in what might be • Reframing views as a creative challenge	• Market analysis • Aggregate customer behavior
Completed	• Design thinking continually evolves with customers	• The completion of the strategy phase marks the start of the product development phase
Focused On	• An understanding of customer activities	• An understanding of the results of customer activities
Tools Used to Communicate Strategic Vision	• Prototypes, films, and scenarios.	• Spreadsheets and PowerPoint decks
Described Through	• Pictorial representations and direct experiences with prototypes	• Words (that are often open to interpretation)
Team Members	• "T-shaped" expertise comprising a principal vertical skill and a horizontal set of secondary skills • Collaborative responsibilities • Emphasis on empathizing with team members on the extemes	• Vertical expertise • Individual responsibilities
Work Patterns	• Temporary projects with associated tasks and flexible hours	• Permanent jobs, on-going tasks, and fixed hours
Reward Structure	• Peer recognition based on the quality of solutions	• Corporate recognition based on the bottom line

Source: Compiled and adapted from David Dunne and Roger Martin. 2006. Design Thinking and How It Will Change Management Education: An Interview and Discussion. *Academy of Management Learning and Education*. Vol. 5, No. 4, pp. 512–523; and LukeW Ideation + Design. 2010. Available: www.lukew.com/

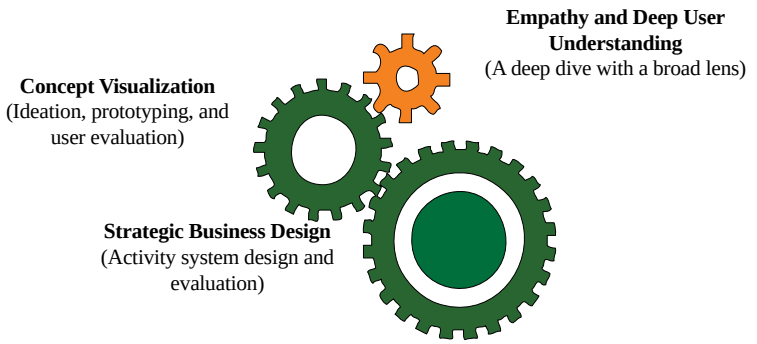
Designing Business

To Heather Fraser, the greatest payout of design thinking lies in the design of strategies and business models for organizational performance that creates both economic and human value. Broadening the definition of design, she argues that it can be the path to understanding stakeholder needs, the tool for visualizing new solutions, and the process for translating cutting-edge ideas into effective strategies.[11] Heather Fraser, from whose work the following draws, sees three iterative gears in business design. Anchored in the needs of stakeholders, they apply deep user understanding to stimulate high-value conceptual visualizations and extract from these the strategic intent needed to reform business models.

> *Design is not just what it looks like and feels like. Design is how it works.*
>
> —Steve Jobs

- **Gear One: Deep User Understanding.** The first step is to turn the telescope around to reframe the organization and view its business entirely through the eyes of the customer (and, of course, other critical stakeholders). It is necessary to look beyond the direct use of an organization's products or services to the contexts in which they are located, in terms of the activities surrounding their utilization, to gain deeper insight and broader behavioral and psychographic perspectives. It is also critical to understand the ''whole person'' engaged in any given activity—not just what they do, but how they feel and how their needs surrounding their activities link to other parts of their lives.
- **Gear Two: Concept Visualization.** With renewed empathy and a broader set of criteria for innovation serving as springboard, creativity can be unleashed and move through multiple-prototyping and concept enrichment, ideally with users. It is vital to look beyond what is to what could be, using imagination to generate altogether new-to-the-world solutions. At this stage, there are no constraints, only possibilities. Engaging all functions and disciplines on the team infuses ideas into the process, fortifies team alignment, and prepares the traction that will lock down strategies and activate them later.
- **Gear Three: Strategic Business Design.** With well-defined, user-inspired solutions at hand the third gear aligns broad concepts with future reality. This entails prototyping business models to integrate their parts and assess the impact of the activity system as a whole. It is imperative to identify what will drive the success of the solutions; prioritize what activities an organization must undertake to deliver related strategies; define relationships strategically, operationally, and economically; and determine what net impacts the new business models will have.

Figure 3: The Gears of Business Design



Source: Heather Fraser. 2009. Designing Business: New Models for Success. *Design Management Review*. Vol. 20, No. 2, pp. 55–65.

[11] Heather Fraser. 2009. Designing Business: New Models for Success. *Design Management Review*. Vol. 20; No. 2; pp. 55–65.

Knowledge Solutions

Further Reading

ADB. 2009. *Harnessing Creativity and Innovation in the Workplace*. Manila. Available: www.adb.org/documents/information/knowledge-solutions/harnessing-creativity-and-innovation-in-the-workplace.pdf

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Roger Martin. 2009. *The Design of Business: Why Design Thinking is the Next Competitive Advantage*. Harvard Business School Publishing. Rotman Designworks. 2010. Available: www.rotmandesignworks.ca/business_design.html

For further information

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Asian Development Bank

ADB's vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries reduce poverty and improve the quality of life of their people. Despite the region's many successes, it remains home to two thirds of the world's poor: 1.8 billion people who live on less than $2 a day, with 903 million struggling on less than $1.25 a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

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CARNEGIE COUNCIL *for Ethics in International Affairs*

Can Human-Centered Design "Fix" Humanitarian Aid?

Impact: Where Business and Ethics Meet

Debbie Aung Din Taylor, **Bruce Nussbaum**, **Susan Eve Oguya**, **Jocelyn Wyatt**, **Julia Taylor Kennedy**

Audio

Design thinking has emerged as a new tool in humanitarianism. Proponents of the trend believe it can solve the problem long plaguing the aid community: that great ideas fail to be adopted in poor communities because they don't always take context into account. But are design's more inclusive methods still a kind of neo-imperialism? Is there a different way?

Transcript

JULIA TAYLOR KENNEDY: You're listening to *Impact* from Carnegie Council. I'm Julia Taylor Kennedy.

With the rise of social enterprise and corporate social responsibility in the business world, and more efficiency and impact measurements in the non-profit world, one of the trends we're tracking on the podcast is how global business and global society borrow ideas and methods from one another. This week, we're looking at an approach that was developed in the business world that's proving hugely effective in humanitarian work. It's called human-centered design. And some say it might work even better in the social sector than it did in large corporations. We'll get back to that later.

But first, let's start with a definition.

JOCELYN WYATT: What we mean when we say "human-centered design" is really that it's an approach to creative problem solving.

My name is Jocelyn Wyatt. I'm the co-lead and executive director of IDEO.org.

JULIA TAYLOR KENNEDY: When it comes to human-centered design, IDEO is the gold standard. The consulting firm popularized the methodology by designing products in a new way for large corporations. Among its claims to fame: designing the first-ever Apple mouse. In 2011, the firm founded its non-profit arm, IDEO.org, the organization that Jocelyn Wyatt runs today.

JOCELYN WYATT: We started with the objective to apply human-centered design to tackle poverty-related challenges around the world.

JULIA TAYLOR KENNEDY: For example, IDEO.org recently worked with the global health organization Marie Stopes International. They wanted to design a better solution that would encourage teenaged girls to use contraception in order to decrease unplanned teen pregnancies.

JOCELYN WYATT: We started off doing this work in Zambia, and spent a lot of time with teenagers trying to understand their wants and needs and aspirations and desires; and really figure out what they were hearing about contraception, who they were learning it from, what were some of the things that they were scared of, or what some of the barriers that were preventing them from seeking birth control options. We also spoke with their boyfriends and their parents and teachers and community leaders to really understand what the community's perceptions were around sex and around birth control.

JULIA TAYLOR KENNEDY: IDEO discovered health clinics weren't geared towards teenage girls.

JOCELYN WYATT: The clinics were called family planning clinics. If you're a 17-year-old girl who's having sex, you're not thinking about planning your family. Oftentimes, even if the girl would go into the clinic, she would be treated with sort of disdain by the health care workers, saying "You shouldn't be having sex. You're not married yet. You're not old enough to be having sex." Then that would make the girl never really want to return to the clinic again. It was also really challenging for the girls.

When they heard about the contraceptives, the health care providers would oftentimes focus on some of the side effects. Instead of talking about some of the benefits of the different types of contraceptives, they would talk about all the challenging elements to them.

JULIA TAYLOR KENNEDY: After gathering all of this research, IDEO.org's team set about designing a solution. First, they decided girls needed to be able to learn from one another to better communicate with their peers about reproductive health and contraception.

JOCELYN WYATT: We designed a whole communications campaign called the Divine Divas, which was really about making contraception aspirational and helping girls make the right choices about the type of birth control that would be most suitable for them.

JULIA TAYLOR KENNEDY: IDEO.org also re-vamped the look of the clinics themselves.

JOECLYN WYATT: We use playful language. We use bright colors that are really attractive to young girls.We use girls to connect with other girls. We have younger nurses who really are excited about working with younger girls and are trained to do so. It was just a whole flip in terms of the orientation. Instead of this being for mothers who are looking at birth-spacing or contraceptives to stop having children, we really focused on young, sexually active girls who weren't yet ready to start families.

JULIA TAYLOR KENNEDY: In this first clinic they worked with, IDEO.org is seeing significant results. Before they came in, the clinic really had no teenaged patients.

JOCELYN WYATT: We're now seeing between 12 and 15 a day enter the clinic. That's been going on for the last nine months or so. Of those, we're seeing about 82 percent are actually leaving with contraceptives.

JULIA TAYLOR KENNEDY: The steps IDEO.org followed in this Zambia project were guided by its parent company's methodology for human-centered design. The methodology starts with ethnography in the field.

JOCELYN WYATT: We do observations and interviews. We meet with people in groups and spend time following them around in their daily lives. We do this to really get a great sense of what their real wants and needs are.

JULIA TAYLOR KENNEDY: This helps IDEO's researchers come up with opportunities for new designs and solutions, once they've identified unmet needs.

JOCELYN WYATT: We then go through a process of ideation where we brainstorm and come up with many different solutions to the particular challenge that we have identified.

JULIA TAYLOR KENNEDY: After they have a challenge to solve, they come up with the rough prototype of a solution and test it in the field.

JOCELYN WYATT: From there we then bring them back out to the communities, get their feedback on those prototypes, and then work to refine and resolve some of those issues with them to get those prototypes into concepts that are ready to be pilot-tested and rolled out with those communities.

JULIA TAYLOR KENNEDY: The idea of human-centered design is to understand points of pain, and then tweak a given solution to find something appropriate for the community IDEO.org aims to help.

JOCELYN WYATT: It really is about co-designing with communities. Instead of a process where we sit in the U.S. or Europe or wherever we are and design solutions or programs for people in other countries, this is an approach which embraces them and makes them creative problem-solvers along with us.

With the human-centered design approach, what we're doing is trying to figure out what are solutions that people really own and embrace so that those solutions will then be sustained and carried forward by those communities, rather than seeing that in so much of development work that after the project is funded for a few years it no longer continues because it was never really implemented by the local community.

JULIA TAYLOR KENNEDY: If human-centered design works as well as Wyatt says it does, it could solve an enormous problem that has long plagued the global development community. Every few months, it seems, there's an article that exposes a poverty-alleviating solution that's gone wrong: a cheap new cook-stove that no one likes to cook on, a more sanitary toilet that no one uses, or a water pump that is harder to work than the original. Often, the reason these well-meaning solutions fail is lack of contextual knowledge

by the organizations trying to implement them in the developing world—or a lack of buy-in from the communities where they're trying to put these solutions in place.

BRUCE NUSSBAUM: The core of design and, I would say creativity to a large degree, is really empathy. It's understanding what's meaningful to people. I'm not really talking about what their needs are, I'm talking about something deeper.

My name is Bruce Nussbaum, and my title these days is mentor-in-residence at NEW INC, which is New Museum's new incubator.

JULIA TAYLOR KENNEDY: Nussbaum has written and thought about human-centered design for more than a decade, first as an editor for *BusinessWeek*, later as an author and professor at Parsons School of Design. He hasn't always had a rosy view of design thinking—mostly because he saw it applied poorly in large corporations a few years ago.

BRUCE NUSSBAUM: Design firms really focused a lot of their efforts on large corporations, and large corporations are focused on efficiencies. They get their values not so much from creating new things, but from pulling cost out of older things.

JULIA TAYLOR KENNEDY: Nussbaum saw the design methodology's openness to new ideas, trying and failing and tweaking, and deep research that is at the root of design thinking, start to fall away in the corporate context.

BRUCE NUSSBAUM: And instead of being playful and exploratory and focused on discovery and empathy, it had become a step-by-step process that business people thought they could simply apply and generate the creativity and innovation that they really wanted, that would give them great value.

It didn't work out. It really hit a wall and companies like Procter & Gamble that had been great design thinking champions began to move away from it, because it wasn't delivering the kind of really powerful changing innovation that it had promised.

JULIA TAYLOR KENNEDY: As Nussbaum reported on design consulting and design in large corporations, he found the efforts falling flat.

BRUCE NUSSBAUM: Designers began telling me the truth about success rates. It boggled my mind. The success rates were, in fact, extremely low. Companies were hiring them to do things and it wasn't really working out.

JULIA TAYLOR KENNEDY: And so when human-centered design methods started entering the humanitarian sphere, Nussbaum warned his industry colleagues to proceed with caution. He had worked in the Peace Corps early in his career, and had seen how tone-deaf solutions can be when they come from a Western perspective.

BRUCE NUSSBAUM: The risks are, you don't know what's meaningful. We're all creatures of our own culture, our own demographics.

JULIA TAYLOR KENNEDY: Nussbaum thinks one example of a Western idea gone awry in the developing world was the initiative One Laptop per Child. It sought to bring low-cost laptops to children in developing countries.

BRUCE NUSSBAUM: In the realm of non-profits, it was a really great idea, and beautiful aesthetics, a great interface, the best people I know in terms of good hearts were involved in it, but it was a complete disaster. Not only was it not meaningful to people in India and China and elsewhere, it threatened them.

The whole concept of dropping millions of laptops directly into the laps of children, bypassing the school system, bypassing the teachers, bypassing the governments basically, bypassing the parents, was crazy, you know? It was probably crazy in our culture, certainly crazy in countries that are very sensitive to Western imperialism.

JULIA TAYLOR KENNEDY: With that backdrop, Nussbaum worried that design thinking in humanitarian work would also be seen as a new kind of Western imperialism. And he had early evidence to back up his fears.

BRUCE NUSSBAUM: I was out in Asia at a design conference and people were talking about how harnessing design for humanitarian purposes was a really good thing, and the people in the audience—it was an Asian audience, I think it was in Singapore—were grumbling about, "Who's this person to tell us what to do? Does this person even know what our problems are?" There was a lot of grumbling, and most design conferences are full of goodwill. They're full of people feeling they can do good things and they're all in together, and I was really struck by that.

JULIA TAYLOR KENNEDY: A couple of months later, Nussbaum heard something similar at a presentation at Parsons, where a mix of experts were discussing the possibilities of human-centered design in the developing world. Participating in the discussion was an Indian businessman who invested in an Indian design firm.

BRUCE NUSSBAUM: A woman got up—I can't remember who she was working for, but it was something like Acumen and IDEO and Ashoka—she got up at the end of it and said, with a great deal of enthusiasm, "We're all going to get together, we're going to solve this problem, and I'm working on a project with all three of these wonderful organizations and we're going to get this job done."

There was a little American enthusiasm, and it was fine with me, but the Indian businessman got really angry and he said something to the effect of, "You know, there might be an Indian solution to this problem, and you ought to think about that." And it just stopped the whole audience.

I thought what's going on here? Did he just get pissed off because he's sensitive to India's whole imperial history?

JULIA TAYLOR KENNEDY: And so Nussbaum wrote a column for *Fast Company* in 2010 to raise his concerns about neo-imperialism and how it could creep into humanitarian design. He wanted to warn his colleagues that a new methodology and optimism aren't sufficient to solving the tough problems facing the world.

BRUCE NUSSBAUM: You really have to understand that your physical presence may alienate people because of history in culture, and so I wrote this warning, basically: "Be careful." Good intention is not enough. Youthful intention is not enough. You have to be very careful about the sensitivities of people and also spend a lot of time knowing what's meaningful to them. Don't assume that you do know what's meaningful to them.

The warning about humanitarian design being perceived as the new imperialism shouldn't stop anyone from doing humanitarian design and trying to do the good stuff, it should just—you know, take a moment and make sure you know what's meaningful, you're partnering up with the right people, that things are in alignment as much as possible before jumping in.

JULIA TAYLOR KENNEDY: The column set off a firestorm of responses from proponents of humanitarian design. Nussbaum took a lot of heat for criticizing a methodology that does seek to be more inclusive, to more deeply research the population that will be using a new product.

JOCELYN WYATT: I would say I don't think that's fair criticism. I think that our approach is really about being integrated and working with communities.

JULIA TAYLOR KENNEDY: At IDEO.org, Jocelyn Wyatt and her team work with local community members during early research phases and as they test out different prototypes in the market. They also seek on-the-ground supporters when they roll out new products, to serve as evangelists and encourage others to adopt these products. And yet . . . Wyatt says there is one piece of Nussbaum's fear of excluding local ideas and expertise that continues to be a struggle.

JOCELYN WYATT: I think one of the real challenges, especially in Africa, is there's been a lack of design education. And so what that's meant is that it really hasn't been possible to hire local designers in order to engage on these challenges. One of the things that we're really taking on at IDEO.org is, "How do we really build a cadre of trained African designers to really tackle these challenges in their local communities and with these local organizations?"

JULIA TAYLOR KENNEDY: Other humanitarian design organizations are also working to hire local talent onto their teams.

SUSAN OGUYA: I am Susan Oguya, a designer at Dalberg Design Impact Group.

JULIA TAYLOR KENNEDY: Dalberg Design Impact Group, or DIG, is a New York-based social enterprise that works with global non-profits to design solutions that take cultural context into account. Susan Oguya is one of a few designers the firm has hired in the countries it's working to help. She's based in Nairobi, Kenya.

SUSAN OGUYA: Especially in Nairobi we've seen an increase of foreigners coming in trying to incorporate the locals because they believe that they understand the market better. I have seen design companies actually having local offices within Nairobi, so for example as DIG opening an office in Nairobi so that we could actually understand what is happening on the ground so that we can understand clearly what are the particular needs for this business and what are the particular needs for the user.

JULIA TAYLOR KENNEDY: Oguya initially thought her career would be about inventing cool new tech products in a lab, and then bringing them to market. But after she started her own company about five years ago to develop better solutions for rural farmers in Kenya, she attended a seminar in a tech incubator that completely changed her approach.

SUSAN OGUYA: We realized it's not about coming up with cool products, but it's about users actually implementing this product in their day-to-day activities. That's when you had to change our whole strategy, instead of sitting behind the desk and coming up with products we had to interface with those users, face to face, and actually understand their needs or their pain points, and see how we could actually create products for their needs.

JULIA TAYLOR KENNEDY: After dabbling in more user research, Oguya went back to school in Italy to become further educated in human-centered design. Now, at DIG, she is excited to work alongside designers both in Kenya and in the developed world to make products more user-friendly.

SUSAN OGUYA: When I came back I met a colleague of mine now at DIG, and what I realized is that they had the same vision and mission that I had for this community, which is to help organizations or even individuals who are building products, to actually come up with a better innovation or strategy on scaling that product or innovating that product.

DEBBIE AUNG DIN TAYLOR: You just can't helicopter in and bring in design thinking. If you're not rooted in the culture and the context, and you don't have proximity, it's really hard to design, no matter how much empathy you have.

My name is Debbie Aung Din Taylor, and I'm co-founder of Proximity Designs.

About 98 percent of our staff are Burmese, so we're a very, very local organization in that respect. We're a hybrid and we tap about 10 foreigners working with us, but we have international networks and partners, so we tap international expertise and are tied to the outside world.

You need both. I think you can't be just local these days, and you can't just be international these days. I think you need to be hybrid in order to be effective.

JULIA TAYLOR KENNEDY: Taylor is originally from Myanmar, but before founding Proximity Designs, she had many years' experience with organizations like the World Bank and UN Development Programme, in other countries and in Myanmar itself. She also lived for several years in the United States. But in 2008, Taylor was in Myanmar, looking for a new way to really drive impact with rural communities in her very remote, insular country.

DEBBIE AUNG DIN TAYLOR: I was doing more policy-related work and looking at the economy and saw that villages were very isolated and using—farmers had ancient technologies; backbreaking drudgery every day, and just because they didn't have access to basic products and services.We needed an approach that was not the traditional aid model, because that wasn't an option. I also knew that we wanted to have a different relationship with the people we were trying to help—rural people—and not one of a charity recipient or an aid beneficiary, but a more equal relationship with a customer, where you pay attention to their needs and aspirations and are held accountable by them.

JULIA TAYLOR KENNEDY: So, she started experimenting with human-centered design, and eventually founded Proximity Designs. It's a social enterprise that develops new tools for farmers. The firm is truly integrated into its community.

DEBBIE AUNG DIN TAYLOR: We have a salesforce of about 120 people who are travelling to villages all the time and they're doing road shows, introducing the product, so they're face to face with our rural customers, and they get a lot of feedback there. We have a distribution system that includes mom and pop dealer shops, about 150 dealer shops throughout the country who carry our products. We get feedback from them, and then we also have a network of several hundred agents who are product users themselves, and they're like your Tupperware agents or your Avon ladies. They have used the product themselves and benefitted from it, so they work in their own locale of five to six villages in promoting the products themselves. It's a very intimate kind of relationship with customers that we try to foster among our staff.

But at the same time, we very much have our eye on the macro picture, because we work at scale. For any given year, we have 75,000 new households that are adopting and buying our products.

JULIA TAYLOR KENNEDY: Proximity Designs has introduced some life-changing solutions to farmers in Myanmar. One of the biggest challenges these farmers face is the time-consuming prospect of watering their crops.

DEBBIE AUNG DIN TAYLOR: A farmer might have been watering their half acre plot of vegetables by hand, and by buckets, hauling 200 times a day these 40-pound buckets of water on each shoulder. That's hours of drudgery a day.

JULIA TAYLOR KENNEDY: To help with water distribution, Taylor and her team first designed a treadle water pump, which looks a little bit like a stairmaster. It's way more efficient than using buckets because it employs leg strength to more quickly distribute water throughout a field. But Proximity needed to design this pump in a way that would work for farmers and that they would quickly adopt. On this first project, Proximity partnered with Stanford University's design program to learn the right methodology for working closely with end users. Tweaking their model after the product had initially launched proved really important.

DEBBIE AUNG DIN TAYLOR: So we had these metal pumps originally and saw that farmers liked them to be more portable, and easy to install, and so we worked on a model that was more like an IKEA snap-and-go model that had this bamboo and was very easy to transport and set up. That was one model we came up with, and that sold very well.

JULIA TAYLOR KENNEDY: But Taylor and her team kept hearing from their customers that a $40 metal pump was a little too expensive.

DEBBIE AUNG DIN TAYLOR: We all thought metal treadle pumps were what farmers wanted, because farmers wanted durability, but they want affordability also. It was all based on feedback, and that's how we came up with a plastic one, and said well, let's just try a plastic one, and we developed a $20 plastic foot pump, which is pretty radical. It's our bestseller right now.

JULIA TAYLOR KENNEDY: After introducing the treadle pump, Proximity Designs got more ambitious, bringing drip irrigation to Myanmar for the first time.

DEBBIE AUNG DIN TAYLOR: People in North America use it, companies use it—advanced companies—but they have running water and motorized pumps, but in Myanmar people are off-grid in the rural areas, so we had to design a drip system that would operate with no electricity, just very low pressure, and so we designed a 250 gallon water storage tank that would work with our drip irrigation, and that's been, also, a huge breakthrough.

JULIA TAYLOR KENNEDY: At her social enterprise, Taylor sees results she never saw in her years as a development consultant.

DEBBIE AUNG DIN TAYLOR: They can double their incomes easily by growing more and by having better water control and better crops—yields—and have time to do other things around the house or generate income in other ways. It's pretty dramatic, and each family is unique, and each family has a different story of how their particular circumstances changed as a result of better income, and so that never gets old.

JULIA TAYLOR KENNEDY: She sees these irrigation systems truly changing the lives of her customers.

DEBBIE AUNG DIN TAYLOR: Think of your own life: You can think of a product you can't live without and that has dramatically increased your efficiency, daily, and I think that's the same thing. With a lot of our products, customers have an attachment to it, which is what we want to see.

JULIA TAYLOR KENNEDY: Taylor isn't sure how quickly design thinking might be adopted in some of the bigger aid organizations globally. She thinks they might put up process roadblocks similar to the ones Nussbaum saw in big corporations when they tried to implement human-centered design. But as things stand, Nussbaum is back on the design bandwagon.

BRUCE NUSSBAUM: I think design and all the things that go with design are much better suited to start-ups and to smaller non-profits and to the solving of specific challenges. I just see it all the time when people bring the power of design to both starting up a company or starting up an NGO or utilizing the power of design within these organizations. And I think those are the spheres, the start-ups and non-profits, where I think design is really everywhere. The rate of success, which is so low in corporations, is much higher. It's like 20, 30, 40 percent, maybe 50 percent, as opposed to 3, 4, 5 percent.

The lines between business and non-profit are evaporating. I would say within the start-up community, the tech community and the non-profits, that's absolutely true, and you see people moving back and forth all the time.

All of this is a good thing. I think design is in fact what lubricates it, brings people back and forth. It's the same methodology and same approach. Many of the same values that you find in the start-up, small business community that you find in non-profits, so this is all a very good thing.

Design got stuck for a year or two in its focus and its methodology and now it's just blooming. And it's wonderful. This moment—I've written this several times, in the' 90s especially—this is the moment of design. This is yet another moment of design and what design can bring to the world.

JULIA TAYLOR KENNEDY: Thanks for listening to *Impact* from the Carnegie Council. A special thanks to our production team, Amber Kiwan, Terence Hurley, Deborah Carroll, Alex Woodson, Anna Sophia Young, and Matthew Sacco.

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