When Designers Don’t Know

Collective Intelligence in Participatory Design for Development

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Abstract: Design is in the midst of undergoing momentous changes as mass citizen engagement enabled by networked technologies is positioned to fundamentally alter participation in design processes. With design's increasingly prominent role in human development, it must address how to best engage existing diverse knowledge and evolve beyond traditional approaches in order to solve non-traditional and highly complex problems. The notion of leveraging collective intelligence using networked technologies in participatory processes represents great promise, yet its potential must be better understood in an emerging design landscape.

This paper will explore the emergence of participatory approaches in design and development**,** as well as leading theory on collective intelligence as a viable concept to strengthen design processes in human development initiatives. It will also shed light on the resulting impact on individual designers, and their role within a new design landscape where networked technologies are eroding barriers to participation. The result of which will be a greater awareness and appreciation for the potential impending changes networked technologies will bring to design research, and development.

Key words: Participatory Design, Collective Intelligence, Crowdsourcing, International Development

1. Introduction

Design is currently expanding its interdisciplinary breadth while becoming tasked with playing a larger role in occupying “the space between the world that is, and the world that could be” [14]. While the world’s issues become increasingly complex, designers are poised to use their abilities to become part of the solution, as it is within design’s genetic code to improve the quality of the world [13]. While design is becoming recognized as a valuable resource with which to address large-scale development challenges, our traditional design processes have difficulty addressing the scale or complexity of these challenges [20]. In order for design to make progressive steps towards contributing to addressing complex and ‘wicked problems’, it must focus on leveraging the knowledge and abilities that exist within society, while recalibrating its expertise towards creating the conditions for mass collaboration within its processes. Within these emerging collaborative processes, designers must cede influence to locals who live and experience the challenges daily, rather than interpreting their conditions through their own biased perspectives. The design process becomes as much about creating the conditions for participatory engagement, as it is about creating an artifact or solution.

Participatory design and research are lauded for their ability to better engage local communities in design initiatives. They incorporate mutually reinforcing elements that are vital for successful human-centred design programs: insight, observation, and empathy [7]. These methods call for designers to become much more engaged with a community they are designing *with* (as opposed to *for*) while involving different non-designers and non-experts in various co-design activities throughout the design process [3]. They serve to empower the beneficiaries of a design project as a richer alternative to superficial attempts at remote research that are often plagued by a lack of true cultural and contextual understanding [17]. While the call for designers to become more engaged with local communities is not new, today the profession is in a position to evolve the culturally sensitive 'ethnographic' model it has relied on and is moving towards approaches driven by new concepts and technologies [7].

The notion of collective intelligence – that a group of diverse, independent and reasonably informed people might outperform even the best individual estimate or decision [5] – represents a concept with powerful potential in participatory design initiatives. It is enabled by the internet, which provides a perfect technological platform that is capable of aggregating millions of independent ideas [6], and can enable the necessary steps to dramatically reshape the way participatory design is conducted. While it is appreciated that participatory design and collective intelligence stand to dramatically alter the way society approaches problem solving, there still remains much to understand on the topics and their implications on design in development initiatives. As groups of networked people become increasingly intelligent and exhibit the phenomenon of 'the wisdom of the crowds', how can that collective intelligence be leveraged in order to unleash the full power of design thinking [7]?

2. Why Participate? The Emergence of Participatory Approaches in Design and Development

In both design and development, there is a significant shift towards participatory approaches that engage a local community in order to better cope with complex challenges. In design, an evolution occurred from treating the "user" as a passive consumer and subject of study towards treating individuals as "co-designers" in a project. In development, there is growing appreciation for the role of participatory rural appraisals (PRA) that empower and engage a local community as vital for project success. While participatory approaches have accomplished successes and offer great potential moving forward, it is worthwhile to develop an understanding for why this is a relatively new phenomenon given its seemingly obvious benefits.

2.1 A Flawed 'Expert'

Design - like much of society - tends to operate in an 'expert' mindset due to its close affiliation with the business world. This mindset is representative of existing power structures that are built on hierarchy and control [20]. The notion of relinquishing influence to outsiders runs counter to long established basic intuitions about intelligence and business [24]. The business world is caught up in the idea that a few well-trained experts can make the difference between excellence and mediocrity, yet in many contexts it has been found that this value of expertise tends to be overrated. The notion that a large group of diverse individuals can come up with better forecasts and intelligent decisions is very threatening to an established method of doing business and establishing a power hierarchy [24].

In the development community, the same condition exists where it has taken time to embrace the richness of locals' knowledge, creative and analytical abilities [9]. Similarly to the world of design and business, the delay in embracing a participatory approach to appraisal had much to do with overcoming arrogance, naivety and overconfidence of individual external experts. Scientists, medical staff, teachers, and officials all over the world had long believed that their knowledge was somehow superior to the knowledge of locals in appraising, and analyzing conditions [9]. These outsider 'experts' tended to look down on the influence and knowledge of local "poor people" and this demeanor, behaviour and attitude ultimately became self-validating. Locals who were treated as being incapable began behaving that way in reflecting the beliefs of the powerful outside 'experts', and as a result they hid their unique capabilities, at times even from themselves [9]. Not only were outsiders in ignorance of the abilities of locals, but they were also not aware of how to enable them to actually express, share, and extend the knowledge they had towards development challenges they were tasked in addressing. The perception of locals being ignorant and unable was not just an illusion, but emerged as an artefact from the behaviour and attitude of arrogant and ignorant outsiders' interaction with them [9].

British economist Schumacher (1973) identified the value of empowering ordinary people forty years ago, with his recognition that "ordinary people are often able to take a wider view, and a more 'humanistic' view, than is normally being taken by experts" [22]. Schumacher's (1973) call for "production by the masses instead of mass production" was one of the earlier perspectives on knowledge needing to emerge from the people who are the subjects of development and technological interventions aimed at improving their quality of life. Nigel Cross (2007) further builds on the value that ordinary non-designers can offer the design process. Designing is something that all people do, and that the ability to design is part of human intelligence, which is a natural ability widespread among the population. An important perspective is the notion of an expert-designer is society-specific, as in other non-industrial societies such a clear distinction between professional and amateur design abilities does not exist [10]. As a result, the professional designer may not exist either.

2.2 Participatory Development

Current approaches that are employed in development work find their origin in two families of methods that emerged in the 1980's and 1990's: Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA) [9].

The focus of a Rapid Rural Appraisal is for an outsider to extract information from a community in the most efficient ways to then take it away and analyze it [8]. It is an approach that often consists of survey questionnaires and attempts at extracting the most valuable information in the most timely and cost effective manners. The principles of this approach found traction, since for decision-makers, it is critical to have information that is not only relevant, timely, and accurate, but usable as well. Unfortunately in the world of development, much of the information extracted is often unusable due to a host of factors such as it being irrelevant, late, wrong, costly to obtain, process, analyse and ultimately digest [8]. While RRA focuses on efficient engagement, it became apparent that a need exists for richer, more meaningful information, which motivated a shift from extractive survey questionnaires towards new participatory approaches and the birth of the many 'ethnographic' techniques popular today.

In PRA, the emphasis is on enabling local people to share, enhance and ultimately analyze their domestic knowledge of life and conditions resulting in the ability to plan and then act to address their own problems [9]. According to Chambers (1994) it has been called “an approach and methods for learning about rural life and conditions from, with and by rural people”, with outsiders acting as catalysts and facilitators in the process [9]. In terms of development success, approaches that are participatory and engage a local community have proven to be quite successful. These successes are the result of self-reliant, exploratory efforts combined with the borrowing of ideas, institutions, and technology from the Western world when it suits those in the developing world [11].

2.3 Participatory Design

Viewpoints began to emerge in the early 1970’s about the role of design in underdeveloped and emergent countries, which began to lay the groundwork for a more participatory, engaged approach to design in the development work. Much like Schumacher’s (1973) early perspectives on ordinarily people having a more ‘humanistic’ view than experts, Victor Papanek (1972) critiqued ‘instant experts’, who conducted research in a fly-over manner resulting in their ‘solutions’ leading to twenty or thirty new problems. These early critiques were a significant step towards appreciating the value of local knowledge and talent. After all, these are individuals who live and experience the problems daily, and in many cases have an enormous amount of design and technological expertise [17].

When dealing with complex human development challenges, design began to evolve from the ‘user-centered’ approach that proved to be most useful in the design and development of consumer products [20], towards participatory approaches. The traditional ‘expert perspective’ where trained researchers interviewed or observed largely passive users only to relay their opinions and experiences to others had difficulty addressing the scale or the complexity of modern challenges [20]. Furthermore, by involving individuals and communities into the design of a solution, the likelihood of creating a longer lasting and more meaningful solution that stimulates a sense of ownership and attachment increases as the user in this case is an integral piece of the puzzle [18].

Participatory Design is a “design practice that involves different non-designers in various co-design activities throughout the design process” [3] and this field is growing rapidly where now for over two decades non-designers have been involved in various participatory design projects throughout the world [3]. The process calls for the person who is ultimately the beneficiary of the design process be given the role of ‘expert of his/her experience’ and as a result plays a significant role in knowledge development, idea generation, and concept development [20].

The popular participatory viewpoints explored in development and design have been acknowledged to hold the potential to dramatically change the way design approaches complex problems facing society [20]. By leveraging knowledge that exists within society, and relying less on individual expertise, the designer’s role itself changes as well. Within this participatory landscape, it is no longer sufficient to act as an anthropologist who is attempting to

understand people and culture in order to impose his interpretation of a successful intervention for development. As Tim Brown (2009), founder of IDEO says:

"…we need to invent a new and radical form of collaboration that blurs the boundaries between creators and consumers. It's not about 'us versus them' or even 'us on behalf of them'. For the design thinker, it has to be 'us with them'."[7]

For this 'us with them' mindset to genuinely contribute towards addressing development problems, the first critical step for designers is to humbly acknowledge the deficiencies and gaps in their own 'expert' knowledge, as well as the difficulty in understanding the needs of those in extremely different cultures due to social biases. The second step is to recognize that the necessary knowledge likely exists, and the application of networked social technologies towards participatory design holds the promise for the "radical form of collaboration" that Brown (2009) refers to. Already, the emergent collective intelligence from within these participatory endeavors has been found to be partly responsible for favorable outcomes in participatory design initiatives [21].

3. Collective Intelligence by Participation

While participatory initiatives in design and development are being hailed as the ways in which a community generates rich, meaningful, and empowered knowledge, it is the effective harnessing of collective intelligence that stands to dramatically strengthen these participatory initiatives in unprecedented ways. With design now tasked with playing a larger role in human development, if it is to meaningfully tackle these significant challenges, it must first overcome the deficiencies and characteristics of designers themselves. Designers frequently exhibit tendencies – such as a noted fixation effect – that inherently counteract the benefits arising from participatory initiatives. This fixation effect could hinder design by preventing the designer from considering all relevant knowledge and experience that should contribute to a problem [10]. Also, designers often readily re-use existing designs rather than explore the problem in great depth and can become attached to early solutions and concepts [10]. When dealing with significant challenges where leveraging local knowledge is of the utmost importance for project success, these are traits that must be overcome by the greater understanding of collective, rather than individual intelligence.

The concept of collective intelligence operates in the spirit of participatory design and development, by empowering individuals to harness their collective community wisdom to address the problems and challenges they experience daily, while external designers and agencies use their expertise to act as facilitators and catalysts in the process.

The promise of collective intelligence stems from the notion that "a group of diverse, independent and reasonably informed people might outperform even the best individual estimate or decision" [5]. The dated notion of "chasing the expert" [24] and the observable benefits of participatory approaches have shown that individual intelligence is not enough [1]. If society stands to successfully deal with the various pressing social and

environmental challenges, it needs to develop and learn to harness far more collective intelligence as a society and global civilization [2].

The key, and challenge in harnessing this collective intelligence is in creating the right conditions for communities to collectively reflect on their problems and possibilities in order to create solutions. Collective intelligence has been seen by some as a "holy grail of social change and social creativity" [2] yet before collective intelligence can dramatically change the way design solves problems, it is critical to better understand how to support it, increase it, and facilitate it in order to co-create a better world [2].

3.1 The Conditions for Collective Intelligence

Now that the significance has been established for the potential collective intelligence holds to dramatically reshape our participatory processes towards development outcomes, one must understand the appropriate circumstances within which it can succeed. The key to implementing collective intelligence effectively lies in understanding what type of collective intelligence is possible, desirable, and affordable, and under what conditions it can be implemented [5]. Under these appropriate circumstances is where groups can become more intelligent than the smartest people within them, and need not be dominated by the exceptionally intelligent in order to be smart. The crux of collective intelligence is that group members do not themselves need to be especially well-informed or rational, as it relies on the aggregation of imperfect judgments [24].

As James Surowiecki (2005) – who coined the term "wisdom of the crowds" – discovered, the necessary conditions for the crowd to be wise are: diversity, independence, and a certain kind of decentralization. Members of the crowd need to be of a diverse enough representation that they bring their different perspectives and experiences to the forefront. It is in the aggregation of diverse – yet not necessarily expert – knowledge that is critical. Furthermore, participants in the group need sufficient independence of thought to not fall subject to documented mob deficiencies such as 'groupthink', which seeks conformity and harmony within a group even at the cost of making the right decisions. However, while participants need sufficient independence of thought and decision making, it is necessary for a group of participants to have a shared vision strong enough to find the group together, geared towards collective action [23]. Ultimately, of greatest significance to design, is the need for decentralization, where power does not stem from one central location, and many decisions are made by individuals with their own local and specific knowledge rather than an external omniscient planner (or designer) [24].

This decentralization is critical for leveraging the tacit knowledge within a community, which is the knowledge that is difficult to convey to others because of its specificity to a place, or job, or experience [24]. It is this type of knowledge that is incredibly difficult for an outsider to interpret and employ in development work given the challenge in conveying it, yet is critically important as the closer a person is to a problem the more likely they are to have a good solution to it [24].

Much like participatory design, the notion of collective intelligence itself isn't new, however the conditions that currently exist with advancements in information communication technology have finally made the

intersection of these approaches incredibly viable. It is these networks that are enabling new forms of collective action, and the creation of collaborative groups that are larger and more distributed than at any other time in history. Due to technological and social reasons, forming these groups has become a lot easier, and the costs incurred by creating or joining a group of others have collapsed in terms of money, time, effort and attention [23]. The scope of meaningful work that can now be done by non-institutional groups is a profound challenge to the status quo within development and design [23], and is an affront on the tried and tested (yet not necessarily successful) ways of the past.

For design 'experts' themselves, these approaches mean a repositioning of effort towards creating the conditions for employing the intelligence of others, and recognizing where one's expertise is relevant. It does not mean that well-informed and practised designers are of no use, however, it does mean that their advice and predictions should be pooled with others to get the most of them [24]. It represents an effective means of removing one's ego from the decision making process. The challenge for designers becomes how to mediate these new processes, and how to best employ technological advances to diversify and distribute components of their work to an engaged and intelligent crowd.

3.2 The Technology

The internet represents the opportunity to harness the intelligence of a large group of people, connected in very different ways, and on different scales than has ever been possible before. This perfect technological platform is capable of aggregating millions of independent ideas [6], and as a result offers a potential to magnify the design cognition of ordinary people in ways that are analogous to a functioning brain which draws upon many different neurons [15]. While connectivity is the key, dependence on internet technology can result in a significantly skewed demographic of participants. If reliance on Internet access exists, collective intelligence becomes susceptible to falling into the trap of the 'digital divide' whereby those without access are not able to engage or participate. Studies have shown that typical web users are likely to be white, middle- or upper-class, English speakers with higher education and high-speed internet connections [6]. Ultimately this can result in a dramatic lack of diversity of opinion and identity in the crowd, which runs counter to what was determined by Surowiecki (2005) as being critical to the effective implementation of collective intelligence [6].

In order for collective intelligence to ignite participatory initiatives to play a significant role in helping address the human development challenges that exist, reliance on internet technology represents a significant barrier to access, and can ultimately result in the exclusion of the very people it can help [6]. For collective intelligence to be appropriately employed, it must be enabled by more pervasive technologies and platforms than the internet.

The types of technologies that must be employed need to be more 'intermediate' in nature, and fit more smoothly into the relatively unsophisticated environments in which they are to be used [22]; technologies that are much more adaptable to local needs, and are already a part of participants' lifestyles. Along with computers, these technologies are the phone, email, instant messages and web pages. They are manifestations of a more fundamental shift in communication norms where we now have the communication tools that are flexible enough to match social capabilities [23] and enable 'social media' or 'social computing'. The ability to share, and act

collectively outside of traditional organizations on a large scale is due to the application of these technologies, and of particular relevancy in the context of development is the mobile phone.

3.3 The Mobile Revolution

While the Internet, and open-source design make more design solutions available to more people [18], it is mobile phones (particularly in the developing world) that hold the greatest potential for expanding the reach of design engagement. According to the International Telecommunication Union (ITU), there are an estimated 3.3 billion mobile phone subscribers (a number that has surely increased significantly since 2009) and 1.3 billion Internet users [19]. In developing countries, mobile telephony is the predominant mode of communication, and has helped reduce the gaping digital divide that once existed [19]. Recent estimates have shown that 30% of people in Africa are mobile subscribers, compared to 6.5% who are Internet users [19]. Seeing as many African countries hardly embraced the physical telephone landline, the mobile phone could be seen as the first modern telecommunications infrastructure on the continent. It holds great potential in its ability to connect the developing world by catalyzing development, and helping to eradicate rural poverty. In the field, it has been observed that accessibility to mobile phones is allowing marginalised groups to take a more active part in the economic and social spheres of their communities [19]; a requirement for the participatory initiatives spoken of earlier.

3.4 The Future of Collective Intelligence by Participation

As society is faced with unprecedented challenges, design must play a role in addressing and healing these global social issues by tapping into its inherent “build-and-fix instincts” [18]. Within the field of design for human development, more participatory approaches are being embraced that emphasize a shift from a “user-centred” design approach towards a participatory approach. This participatory approach to design and appraisal draws inspiration, knowledge, innovation, and abilities from locals – who are experts on their environment and conditions – in an effort to empower them to address their own challenges. While it is accepted that locals are often best suited to addressing their own problems, challenges exist in how to structure and encourage these participatory design initiatives. Many aid and development initiatives are born in the West, yet for participatory design, and collective intelligence to be truly significant and influential factors in addressing global issues, motivation needs to begin to come from within a community itself that is faced with challenges. Furthermore, while collective intelligence holds great potential for tapping into the shared wisdom of a massive amount of individuals, it is still an emerging field that remains to be entirely understood in terms of its potential and appropriate applications. The concept is very dependent on a technological communications infrastructure, which can create barriers for acceptance and uptake. While the proliferation of mobile phones in the developing world seeks to alleviate some of these barriers for implementation, one must consider the richness of information that can actually be communicated using different mediums, and what the implications are on participatory initiatives.

4. Conclusion

This paper sought to explore the growing significance of participatory practices in design and development, while demonstrating the potential collective intelligence holds for significantly strengthening these approaches. In order for society to attempt to address the significant challenges it faces, a shift towards more empowering

participatory approaches to design and development needs to occur. These methods stand to gain significantly from the harnessing of collective intelligence by using current and emerging information communication technologies. While collective intelligence in combination with participatory approaches in design stands to significantly influence design and development initiatives moving forward, it is still a field that requires further exploration. The potential, applications, and limitations of harnessing collective intelligence needs to be understood – particularly in a low-technology context – in order for it to truly become the implementable force that many foresee it to be. Designers themselves need to accept and employ these processes into their work, and this requires a significant shift in the perception of their contributions to the design process from an 'expert' top-down approach, towards an inclusive bottom-up approach that values participants as experts of their own environments. It is by recognizing the changing landscape of design, and leveraging the capacity of networked technologies towards the aggregation of our intelligence that we will be able to begin to address the highly complex societal challenges that design is now faced with, for conventional design approaches are only suitable for conventional design problems.

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