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How Culturally Scattered COINs are Reinventing the Design Process

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Abstract

As our world's economies continue to overlap and intertwine, designers are increasingly being called upon to re-invent their process in order to develop products, services and other things that are internationally relevant. Collaborative Innovation Networks (COINs) operating within a democratic, virtual environment are, by their very natures, forerunners in this transformation. It can even be argued that multicultural COINs are more effective at tackling design challenges with global import, than design teams whose members work in each other's physical presence.

This paper examines necessary modifications to a Western construct of the Design Process uncovered by geographically and culturally scattered COINs working on projects together. The new precepts that govern this updated process will be discussed, from research and product definition through ideation, concept generation, design refinement and prototyping.

Several current case studies illustrating the central role that COINs play in defining a contemporary design process will be discussed:

**Appendix A.** How new medical devices appropriate for use in African hospitals are being designed by collaborative innovation networks with members in Uganda, the United States and Israel.

**Appendix B.** How communities of blind users in Mexico, South Africa, Malawi, the United States and India helped define product specifications for a Braille writer using a process moderated by industrial designers.

How collaborative innovation networks of design students in Mumbai, and Chicago were able to design culturally relevant products and services for each other's communities.

Keywords: Collaborative innovation networks; human-centered; design

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1. Introduction

As our world's economies continue to overlap and intertwine, designers are increasingly being called upon to re-invent their process in order to develop products, services and other things that are internationally relevant. COINs operating within a democratic, virtual environment are, by their very natures, forerunners in this transformation. One of the reasons for this is that multicultural COINs, by virtue of their diversity, can be more effective at tackling design challenges with global import than design teams whose members work in each other's physical presence. The latter groups are geographically homogeneous, thus restricting the collective ability of the team to experience more than one context simultaneously and to have a global presence.

2. The Human-Centered Design Process

The version of the Design Process discussed in this paper is a human-centered creative methodology, commonly used in professional practice by design teams operating in industrialized environments. The goal of the process is to produce a physical or interactive product, or a graphic design for mass production. The Human-Centered Design Process is by no means universally adopted, and its essence conforms to a Western construct of the practice of Design. This process can be characterized broadly by sequential stages of research, concept generation, refinement and prototyping aimed at narrowing down numerous possibilities of what could be made to a single, resolved design. It is important to note that although this process can be visually represented as a linear sequence, each step is an amalgam of activities including: investigation, idea generation, visualization, prototyping and refinement.

3.1 How COINs Modify the Human-Centered Design Process

As today's design teams develop products, graphic designs, services and other things that are internationally relevant, the scope of their process continues to expand. Global projects can become expensive and time-consuming when design teams, whose members are situated in the same location, are required to travel in order to investigate distant markets. While these exchanges are vital in terms of giving designers first-hand knowledge of the people, situations and environments they are designing for, the realities of a competitive marketplace dictate that their creative process be pared somewhat to meet short-term deadlines. Geographically and culturally diverse collaborative innovation networks (COINs) are by their natures well suited to tackling these types of challenges, and have reengineered the Human-Centered Design Process to reflect the realities of their scattered work environments.

A number of modifications to the Human-Centered Design Process naturally emerge when COINs undertake the design effort. The precepts that govern each step of these will be discussed within the context of 3 projects:

a) How new medical devices appropriate for use in African hospitals are being designed by COINs with members in Uganda, the United States and Israel.
b) How communities of blind users in Mexico, South Africa, Malawi, the United States and India helped define product specifications for a Braille writer using a process moderated by industrial designers.
c) How COINs of design students in Mumbai, and Chicago were able to design culturally relevant products and services for each other's communities.

3.2 Multifaceted Membership

A culturally and geographically scattered COIN's working environment is naturally multifaceted, and gives its members an immediate global presence. Membership in COINs can be extended beyond practitioners (designers and engineers) to include other stakeholders such as users, local field researchers, buyers, administrators and retailers. In this way, COINs promote a design process that is inclusive and thus informed by multiple viewpoints.

Bao Design Lab is a non-profit organization that develops appropriate, low-cost medical devices specifically for hospitals and clinics in the developing world. In creating new designs, it has been vital for Bao Design Lab to consider the input of physicians working in Ugandan hospitals at all stages of their process. By including doctors in their COIN, the design team is able to incorporate a medical perspective at all stages of the design process. And
because virtual COINs are characterized by episodic, active membership, an individual doctor can actively contribute to the design effort when necessary, and (passively) monitor the process at other times. This level of direct involvement by over-taxed professionals such as physicians would be virtually impossible within a collocated design team.

3.3 Co-creation and Remote Participatory Design

Modern technology affords scattered COINs the opportunity to create designs incorporating collective input from a myriad of geographical, socio-economic, political and cultural sources. This is most thoroughly achieved when all research, design and testing instruments are co-created, incorporating the points of view of numerous COIN members.

Users may also participate in the design process remotely by working within the COIN construct. Designers at PDT (Chicago) engaged a community of blind users in several countries to contribute to the process of designing the Next Generation™ Perkins/APH Brailler, by participating in observation sessions and prototype testing. This participatory design process resulted in a truly user-centered product, whose features correspond directly to the needs of blind people worldwide. Without the contributions of the larger COIN, these needs would not have been identified by designers, none of whom were blind, working in isolation in Chicago.

3.4 Efficient Refinement Process

Mediated by technology, a COIN's design refinement process can be drastically compressed. This contraction is not a result of a less thorough refinement process spread thin across a COIN. Rather, when managed efficiently, COINs can undertake concurrent rounds of prototype testing and can evaluate designs against (local) manufacturing, usage, marketing and sometimes legal constraints. The net effect of this efficiency is that the scope of validation testing at the end of the design process is reduced.

As Bao Design Lab's design team is constantly receiving feedback on its work from COIN members, it is more able to move quickly through the refinement phase. A medical product currently being co-designed by the group and members of their COIN in Uganda, is passing through the refinement phase quite rapidly. This is because testing of the final device under local conditions will probably not result in it being drastically redesigned, as local manufacturing, environmental, usage, marketing and legal constraints have been accounted for through the input of Ugandan COIN members.

3.5 Negotiating a Common Design Practice

The definition of design and the way in which it is realized varies dramatically. This variety is particularly pronounced on global projects where establishing a common approach to design can be quite challenging. For this reason, scattered COINs focused on a project need to be creative as they negotiate a universally accepted design process.

As part of a collaboration sponsored by Honeywell Technology Solutions, design students from the Indian Institute of Technology (Mumbai) and the Illinois Institute of Technology (Chicago), worked together on a global design project. Students from both classes formed a COIN, employing a human-centered design process to develop and prototype products, services and business models for small businesses in two neighborhoods - Pilsen/Little Village in Chicago and Powai in Mumbai. IIT Chicago students conducted research in the Mexican neighborhoods of Pilsen and Little Village, while IIT Mumbai students did research in a slum area in Powai, adjacent to the university.

Students then exchanged research, with the result that Indian students ultimately designed products for four small businesses in Chicago, and Chicago students created designs targeted at small businesses in the Powai slum.

The COIN was successful in designing for people on opposite ends of the globe by constantly negotiating a common design practice. Coordination of deliverables and schedules was something that students at both universities had to confront. In addition, communication and cultural differences had to be overcome in order to drive the design process forward.
One particularly successful technique that facilitated consensus among the student teams was exchanging prototypes. Whether physical, graphic or interactive, prototypes embody a design team's collective thought process. The act of exchanging them with other designers within the same COIN, allowed the two groups to essentially exchange ideas based on those embodied in their prototypes. Very generally, the prototypes created by the IIT Mumbai students focused on physical processes and less on behaviors and perceptions than their Chicago counterparts. This brought to light the difference in the design approaches taught at the two universities, something that the students had to manage throughout the course of the collaboration.

4. Challenges

The cultural diversity that is a COIN's strength, can also create unique challenges. For instance, confidentiality is dealt with quite differently across cultures, which can affect the design process, particularly during the research phase. For example, the direct, legal language in standard American consent forms can have a negative effect on the intended audience outside of the U.S., despite the fact that these documents were designed to ensure the ethical treatment of research participants. Areas of inquiry deemed benign in one culture, might prove difficult to investigate because they are perceived to be too private in another culture. For these reasons, it is important to balance cultural diversity with a universal process, consistently negotiated by COIN members.

As communication technologies are central to functioning COINs, technical issues that constrain these need to be taken into account. A conference call between 40 participants – half of whom are participating as a group via speakerphone can be productive, only if it is well moderated. Designers working on all of the projects cited in this paper resolved technical issues by using a variety of technologies, in an effort not to rely on a single one. For instance, Bao Design Lab's COIN convenes online in a discussion group, as well as over the phone to overcome the technical problems involved in making a 6-way conference call involving several mobile phones in Uganda.

One significant challenge for COINs whose members design together, is that they run the risk of narrowing down the possibilities in the concept generation phase too quickly, in an effort to maintain consensus within the COIN. The efficiency of COINs discussed earlier, combined with the need to manage complexity while working within a multifaceted team propels the team quickly (perhaps too quickly) to focus in on a single design.

5. Conclusions

As Design's focus becomes increasingly international, the advantages of working within a COIN will compel designers working within these networks to adapt their collective process. Culturally and geographically scattered COINs are naturally cosmopolitan and multifaceted. For this reason, they need to creatively negotiate a universally accepted design process in order to facilitate consensus.

Mediated by technology, a COIN's design refinement process can be drastically reduced. This can be regarded as both a benefit and a challenge as the COIN's efficiency reduces the number of design concepts it generates.

Modern technology affords scattered COINs the opportunity to create designs co-creatively, incorporating the input of a vast range of stakeholders. This advantage offers the opportunity to produce designs that cater to a wider range of needs.

References


at the Sustainable Development to Save the Earth conference, Bangkok, Thailand.