

# Towards Culturally Empowered Design: Addressing African-American Health Disparities through Notification Interfaces

Woodrow W. Winchester, III  
and D. Scott McCrickard

Center for Human-Computer Interaction (CHCI)  
Virginia Tech  
Blacksburg, VA 24061  
wwwinche@vt.edu; mccricks@vt.edu

Felicia Doswell

Department of Computer Science  
Norfolk State University  
Norfolk, VA 23504  
fdoswell@nsu.edu

## ABSTRACT

This paper seeks to introduce a novel usability design method, *culturally empowered design*. We describe how this design approach will enable the creation not only of useful notification interfaces but also of a software infrastructure for the creation and modification of socio-culturally responsive and tailored interfaces to promote wellness and healthy living among African Americans. This is accomplished through offering the tenets of culturally empowered design along with describing the anticipated outcomes of the development of this design paradigm.

## ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## INTRODUCTION

### The Opportunity Space

A convergence of trends is occurring that could enable closing the gap on key health disparities that exist within the African-American community. These trends are:

- 1. A philosophical shift in health care from cure to prevention with emphasis on empowering individuals to make healthier lifestyle choices:** Diseases and conditions like asthma, diabetes, obesity, and heart disease disproportionately affect African-Americans, and all are exacerbated by poor lifestyle conditions and choices. Significant amounts of information (*content*) are available to help make good health and wellness choices, and the technology exists to deliver it, but there exists gaps in timeliness, presentation, access and/or delivery: the *socio-cultural imperative*.

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- 2. The emergence of evidence suggesting the efficacy of notification interfaces in wellness promotion:**

Notification interfaces are showing strong potential as enablers of health related behavior change. For example, results from preliminary field studies of Intel Research's UbiFit Garden application, an application designed to foster more regular physical activity through the use of mobile displays, have demonstrated the potential of notification interfaces in helping people maintain a more physically active lifestyle [1].

- 3. The growing prominence of smart, green, and sustainable house technologies—as exemplified by the Lumenhaus, Virginia Tech's entry into the Solar Decathlon, and a move to leverage their interactivity and responsiveness in home-based health:** Under the premise that "*life would be better if the people had smarter homes*", researchers at Case Western are embarking on an effort, in which it plans to transform 104 homes in the impoverished neighborhoods near its campus into "smart homes". The research program has specific goals among which are the better identification of chronic health conditions and the reduction of the deleterious impacts of such diseases.

This work explores the opportunity space availed by this convergence of trends to advance technology enabled wellness through exploring more holistic technological design approaches.

### Culturally Empowered Design Defined

Through exploring notification interfaces in addressing African-American health disparities in wellness promotion, we seek to introduce a novel usability design method, *culturally empowered design (CED)*. In the spirit of the end-user development movement and grounded in socio-cultural traditions, CED represents an approach for creating notification interfaces using readily available technologies via the input of constituents who are personally vested (*engaged*) in the needs and requirements of the target user population. In this forum, we intend to describe how this design approach will enable the creation not only of useful interfaces but also of software infrastructures for the creation and modification of *tailored interfaces* to promote wellness and healthy living among African Americans.

Culturally empowered design extends and formally defines Marsden's notion of empowered design [2] for culturally connected groups; with specific focus on African Americans. Using the exemplar case of technology-enabled health promotion within a design context that is steeped in salient socio-cultural considerations and constructs, this effort will further elucidate and refine the tenets suggested but not formally defined by [2] to provide a more actionable design blueprint for deploying a tailorable technology design. It is our hope that this design blueprint will support design problem solving that is constituent-centric (e.g. designed "for us by us"), socio-culturally responsive, and change resilient.

Culturally empowered design stems from a number of theories of design:

- **empowered design:** This approach to design, first identified by Marsden, is presented as an outgrowth of pragmatic design, positioning the "user as designer" in "creating solutions that do not require adding more technology or infrastructure to a situation" [2].
- **meta-design:** Meta design, philosophically, encapsulates objectives, techniques, and processes for creating new media and environments allowing the "owners of problems" to act as designers [4].
- **Tailorable technology design:** Tailorable technologies are a class of information systems designed with the intention that users modify and redesign the technology in the context of use [5].
- **participatory design:** This approach includes methods for actively involving stakeholders in design, reasoning that this will help ensure greater utility and usability for the target populations. Culturally empowered design will adapt and adopt many methods from participatory design, with a focus on engaging continued impact with temporal sensitivity through long-term engagement with future community leaders, extended family, and friends.
- **value-sensitive design:** This approach encourages consideration of values in the design process through conceptual, empirical, and technical investigations.
- **agile usability:** This approach streamlines the traditional build-test development cycle, relying on frequent prototypes and evaluations to ensure that working prototypes are in the hands of target user representatives as much as possible.
- **activity-centered design:** This approach leverages an overarching activity-centered design rooted in socio-cultural traditions.

#### The Tenets of Culturally Empowered Design

Building on these theories of design, we have assembled a preliminary set of tenets for CED. The tenets, and the rationale for including them, are:

- **active end-user involvement:** As in techniques like empowered design, participatory design, and value-sensitive design, active end-user involvement seems essential in encouraging adoption of the end product by the targeted users.

- **leveraging of readily-available technologies:** Borrowing again from empowered design [2], as in the developing world there is the need to use existing technology suites to minimize costs and facilitate adoption.
- **rapid prototype development:** As seen in approaches like agile usability, rapid prototype development facilitates project meetings with users and stakeholders by providing a point of reference for conversations—a working artifact representing key aspects of the targeted design.
- **development by people aware of issues first-hand:** There is a subtle but important difference between this tenet and the first, in that this tenet leverages the strong sense of family and community common among African Americans.

#### Anticipated Contributions

In summary, we envision significant contributions in four areas from the proposed work:

- **Notification interface development.** As embodied by the proposed design context, the HCI opportunities in addressing public health disparities are rich; however researchers have noted that significant work is needed in offering technological design approaches that adequately account for the relationship between culture and health [3]. This effort seeks to respond to that pressing call.
- **Interfaces for Lumenhaus technologies.** Using the Lumenhaus as a testbed, this effort seeks to provide ways that African Americans can take a leading role in defining how the technologies from Lumenhaus can be integrated into our healthy lifestyle interface paradigm.
- **Culturally empowered design.** Our novel approach to design will be exercised early and often in our effort, to explore how the core defining design theories can meld together.
- **Infrastructure design and development framework.** While our development of notification interfaces has great value, we expect that far greater value will come from our application design framework, *CED*—providing a backbone for the empowered design and tailoring of healthy living interfaces for the African American community.

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