Stimulating Everyday Creativity: Harnessing the Potential of Customizable UIs

Sampada S. Marathe
Media Effects Research Lab
The Pennsylvania State University
115 Carnegie Bldg.,
University Park, PA 16802
sampada@psu.edu

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Abstract
Customizability makes an interactive interface an ideal venue for users to participate in the content creation and consumption process, thereby offering possibilities for creative pursuits. In this paper I describe research that has been designed to investigate the creativity enhancing potential of such customizable user interfaces (UIs).

Keywords
Customization, everyday creativity, cosmetic, functional.

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI), J.4 Social and behavioral sciences.

General Terms
Design, Human factors.

Introduction
The distinctive features of digital information and communication technologies (ICTs) such as provisionality (modifiability), interactivity, capacity, range, speed and automatic functions [13] open up the possibility for creative activity. With easy access to

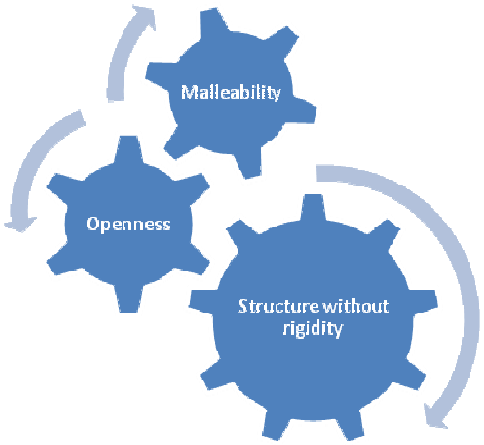
digital technology such as cell phones, computers, internet, digital cameras and video games, users are becoming information producers rather than mere consumers. Cameras in mobile phones and access to Twitter have made us into news reporters, YouTube has allowed us to become content producers, and blogs along with various social networks have opened up possibilities for us to reach out to our own set of audiences that consume content produced by us, thereby making us information sources [19]. Use of such ICTs to promote creativity among users and the study of ICTs as fertile grounds for fostering creative pursuits have been the focus of study in HCI for some time. To be able to build interfaces that support and foster creativity, interface and interaction designers need to understand the creative process as well as user interactions with existing new media technology devices.

Creativity

Creativity has been defined as anything from a spiritual and mysterious paradoxical process [4, 16] to a very complex and rigorously planned activity. For the purpose of this paper, however, I principally refer to the concept of *everyday creativity*, an experiential process by which users create experiences that are meaningful to themselves rather than creating pieces of art [2]. Such creativity is different from genius or sublime creativity which signals a genuine breakthrough of some sort or a paradigm shift in thought or action. Also referred to as 'Little c creativity' [6], these everyday creative actions focus on personal agency and the unique interactions created by each person.

A creative act can simply be defined as "the process of generating unique products by transforming existing products" [12]. E. P. Torrance has suggested that the creative process generally has one or more of the following attributes - original ideas, a different point of view, breaking out of the mould, recombining ideas or seeing new relationship among existing ideas. The study of creativity has spanned many different domains such as design of systems that support co-operative work [e.g. 8], that support learning and problem solving activities [e.g. 20], and design of video games [e.g. 11] among many others.

While one faction of creativity researchers believe creativity to be an enduring trait and hence situated within an individual, external factors such as the environment of the task have also been accepted as significant antecedents to the creative process. Extant research on creativity and creative practices in different domains suggests that an individual's level of creativity can be improved [17] and is fostered in environments that allow exploration and invoke play [1, 2, 7, 10, 18]. In her framework describing creativity, Craft [6] acknowledges that having agency over the environment and being able to make and act on choices is an inherent aspect of being creative. The opportunity for play within an interaction is known to create a sense of flow and hence provide fertile ground for creativity. And yet, we have strived to build products that are efficient and usable, rather than playful. In other words, the focus of interface design has been on removing obstacles rather than providing engaging and fun products [2]. I believe that such an imbalance in design stems from the assumption that efficiency and usability cannot coexist with play.



Characteristics of customizable systems

While new media technology devices themselves seem to promote creative input from the user, are there any specific attributes of today's digital interfaces that foster creativity?

Customization

In an era of active user participation in media consumption, the allure of customization is undeniable. Most UIs are designed to offer some sort of customizable options to their users. Most customizable systems are designed to allow task-based (functional) and presentation-based (cosmetic) changes [14] that a user can initiate. Customization is a primarily user-initiated and user-driven process whereby users are able to influence the functionality, interface, information content or distinctiveness of a system [3]. Unlike personalization, where the system tracks user data and provides personalized/ tailored information to fit user needs, customization places the control in the hands of the user. Changing colors and fonts on websites, phone covers and ring tones, speed dial numbers and avatars in video games are only a few different ways in which different systems solicit user input. Every user, in theory, is able to configure the system properties to fit his or her work practices and needs. By letting users have a say in how a system functions (task-based changes), designers offer the possibility of making a system more efficient for a particular user. Similarly, by letting users change how the system looks (presentation-based changes), a system can offer a sense of agency and play to its user.

Customizable systems have the innate quality of being structured (without being rigid) as well as unstructured at the same time. On the one hand they allow users to make changes to the system configuration according to their preferences and hence provide the freedom users might want in appropriating the device to their own set of tasks and preferences. On the other hand, they also limit the number of choices a user has, automatically offering structure to ensure that a user is not carried away in their pursuit. Hence such systems are, theoretically, well suited to give direction as well as freedom to a task at hand.

By their very nature, customizable systems allow users to explore and experiment and to reconstruct existing components into novel combinations. The thesis of my argument in this paper is that user-initiated and user-controlled customization can prove to be a link between efficiency and play and thereby serve as a vehicle for creativity. However, it remains to be seen if engaging in customization improves the user experiences that are considered precursors to any creative activity (e.g. sense of freedom in exploration, flow, play, enjoyment, agency over environmental factors etc.).

Research Questions

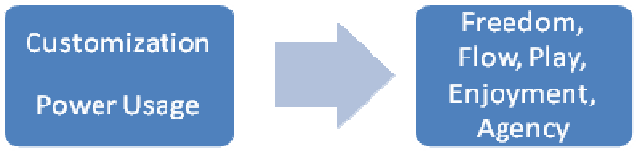
1. Do customization activities create an environment that can support creativity?

2. What is the relationship between user-initiated customization and creativity?

3. What design implications can we draw from the study of creativity in customizable systems?

Study Design

1) Part I: An exploratory study that investigates the sense of freedom in exploration, flow, play, enjoyment and agency after a customization task



2) Part II: Performance on a task requiring creative input after allowing users to customize aspects of the UI

Progress Thus Far

Part I

77 participants (68% female, mean age = 19.53 years) came to a lab to participate in the study for extra credit. All of them reported not being familiar with the stimulus website/ portal (www.netvibes.com) before starting the study. Once seated, they were asked to fill out a brief questionnaire that contained questions related to power usage (highly evolved use) of technology [15], need for cognition and amount and type of tech/ gadget usage in everyday life.

They were then introduced to the portal which is highly customizable, given brief information about the different types of customization options available and then asked to customize it according to their preferences and tastes. Some of the presentation-based cosmetic changes that one could initiate are choosing a theme, background, title for homepage, moving widgets around, and changing the color of the widgets. Some functional changes are adding new widgets, changing the source for search and news channels and editing task-related features for each widget as well as the portal itself.

At the end of this activity, participants were asked to fill out another questionnaire that asked them about their general impressions about the portal, sense of control within the environment, sense of identity, flow, freedom of exploration, play, intrinsic motivation, and ease of use. The final screens of customized portals were saved once the participants left the lab.

Primary analyses show that those who demonstrate highly evolved technology usage report being in control (F (1, 75) = 4.92, $p<0.05$) and experiencing the freedom to explore the interface (F (1, 74) = 18.72, $p<0.001$) more so than those who fall on the lower end of the technology usage spectrum. Similarly, as tech usage evolves, the less users think of the interface as being rigid and inflexible to interact with (F (1, 73) = 6.02, $p<0.05$). While user feeling of ownership toward the interface approached significance (F (1, 74) = 3.07, $p=0.08$), power users reported wanting to keep browsing the interface once they had started (F (1, 74) = 10.27, $p<0.01$) and reported having enjoyed the activity (F (1, 75) = 4.41, $p<0.05$). Those participants that reported high levels of media consumption (regular use of laptops, cell phones, digital cameras, video cameras, mp3 players/iPods, etc) and exhibited strong motivation to read blogs, keep up with latest news, podcasts, online shopping, sharing photos, and creating online content, also reported enjoying the activity (F (1, 75) = 5.29, $p<0.05$) and freedom to explore the

interface (F (1, 75) = 3.96, $p<0.05$) compared to those who were on the low end of the scale.

These preliminary results show that interaction with a customizable interface is correlated with a sense of freedom, flow, play, enjoyment and agency among evolved users compared to novices. However, until further data analyses are conducted, nothing can be said in particular about those specific users who did not engage in customization during this activity. I am in the process of analyzing the saved customized pages for each user. Once that process is complete, I will be able to correlate each user's customized portal and his or her self-report on the above dependent variables.

Part II

I am in the process of brainstorming ideas about stimulus interfaces for the second part of the study. For this task, one such interface needs to be identified that will let users make cosmetic and functional customization changes as well as offer a venue for the problem-solving task at the end. To that effect, a game (video game or game on a cell phone) might prove useful. However, rigorous pretesting is required before a decision can be made.

Although being investigated for many decades, the concept of creativity has been elusive to measurement. For the purpose of this study, I will use the Abbreviated Torrance Test for Adults (ATTA) by Goff & Torrance [9].

The Creativity Support Index (CSI) [5], designed to help evaluate the level of creativity support provided by various interfaces will also be included. Creativity support is judged based on the following factors: are results worth the effort, expressiveness, exploration, immersion, enjoyment, and collaboration (where applicable).

The exploratory nature of the first study and the absence of a manipulated control condition disallow claims to generalization of the results. However, subsequent studies designed to account for these deficiencies will provide actionable data.

Implications for HCI

Interfaces that enable new forms of engagement enhance user experience [11], thereby influencing ICT adoption and usage. This work will help improve our theoretical understanding of the creativity enhancing potential and the user psychology surrounding customizable UIs. The design implications derived from these user studies will enable us to better design, develop, and evaluate customizable UIs.

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