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DESIGNING FOR AMBIENT UX

DESIGN FRAMEWORK FOR MANAGING USER EXPERIENCE WITHIN CYBER-PHYSICAL SYSTEMS

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DESIGNING FOR AMBIENT UX
Design Framework for Managing User Experience within
Cyber-Physical Systems

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ABSTRACT

Cyber-physical systems are stimulating the rise of novel design applications that can support variety of everyday human activities and chores in diverse environments as domestic, transportation, office, retail, hospital, and others. These systems are observed as connected spaces enhanced by digitized services, and their complexity imposes numerous challenges for approaching design practices from a point of view of designing for holistic user experiences. The approach for designing for user experiences (UX) within such system is observed as a suitable one, as comprehending desirable experiences could foster sustainable long-term user engagements.

Research aims to contribute the field of User Interaction and Experience Design, by providing a discussion on a potential design strategy and toolset to be applied within the emerging projects for spaces enhanced by digitized services, i.e. cyber-physical systems. Peculiar nature of the design field deals with projects of high complexity imposed towards users' experience, that appears not to be addressed accordingly with current tools employed in practices. Therefore, the research has identified a necessity for expanding current practices in the UX field by supporting them with the set of tools to be used as a backbone for structured design processes. Design tools, in this case, facilitate creation of a common language between all the parties and stakeholders involved in the design project, for identifying and communicating user values.

The research methodology consists of three extensive steps, that have as an outcome: (1) proposal for a design framework for Ambient UX, (2) verification of the Ambient UX framework, (3) identification of gaps between the proposed framework and design tools currently employed in practices, as well as identification of main upgrade issues for the design tools. The Ambient UX

framework is based on the definition of Design Domains and levels of User Values within a project, and according to these aspects the design tools are analysed and discussed. Main methods employed throughout the research path are literature reviews, research-through-design within design case studies that took part, as well as qualitative analysis of gathered tools.

Two main outcomes of the research are: (1) definition of the Ambient UX design strategy, and (2) definition of contents and concepts for building up a novel design tool platform for supporting the design processes. The research provides a support for structured processes for designing cyber-physical systems focusing on users' experience, and it strives for creation of a common language within the field among designer and non-designer professionals. Future steps for the research are development of the actual software platform and its testing throughout diverse design projects of correspondent nature.

KEYWORDS

User Experience
Ambient UX
Cyber-Physical Systems
Design Strategy
Design Tools

ABSTRACT

I sistemi cyber-fisici (Cyber-Physical) stimolano la generazione di nuovi concetti di design a supporto di una moltitudine di attività quotidiane in diversi ambiti come, ad esempio, il contesto domestico, i trasporti, gli ambienti lavorativi e per il retail, il mondo ospedaliero e altri. Questi sistemi possono essere considerati come spazi connessi e aumentati dai servizi digitali; la loro complessità pone diverse sfide in un approccio al design olistico e focalizzato sull'esperienza utente. La progettazione orientata alla esperienza di questi sistemi è volta a generare un coinvolgimento degli utenti sostenibile e gratificante a lungo termine.

L'obiettivo della ricerca è di fornire un contributo nel campo di progetto indicato come User Interaction e User Experience (UX) Design, e propone una discussione su una strategia di design e un insieme di strumenti progettuali da applicare nel design degli spazi aumentati attraverso la realizzazione di servizi digitali, i.e. sistemi Cyber-Physical. Il focus è sul progetto di sistemi di complessità elevata dal punto di vista della esperienza utente, che non possono essere affrontati in maniera adeguata con gli strumenti attualmente disponibili. La ricerca presenta la necessità di espandere le pratiche di design esistenti nell'ambito di UX con l'introduzione di nuovi strumenti da usare come base per strutturare i processi di progettazione. Gli strumenti facilitano la creazione di un linguaggio comune tra tutte le parti coinvolte nel progetto, destinato a identificare e comunicare gli elementi di valore dal punto di vista degli utenti finali - User Values.

La metodologia di ricerca include tre fasi che presentano come risultato: (1) una proposta di schema concettuale di inquadramento: Ambient UX design framework, (2) la relazione sulla validazione dello schema concettuale, i.e. Ambient UX design framework, (3) l'analisi del divario oggi esistente tra il framework proposto e gli strumenti di design attualmente in uso nelle pratiche di design, e alcune proposte per migliorare tali strumenti. L'Ambient UX design

framework è basato sulla definizione delle dimensioni in cui si articola il progetto-Design Domains, e livelli di valore visti dal punto di vista degli utenti finali - User Values attorno cui si articola il progetto. Coerentemente con questi aspetti, gli strumenti di design sono discussi e analizzati. I principali metodi di ricerca utilizzati sono: ricerca bibliografica, ricerca tramite esperienze di progettazione (research-through-design) applicato ai vari casi studio, e l'analisi qualitativa di una collezione di strumenti progettuali esistenti.

I principali risultati della ricerca possono essere identificati in due punti principali: (1) la definizione della strategia per Ambient UX Design, e (2) l'individuazione di nodi progettuali su cui costruire nuovi strumenti da utilizzare durante le fasi di progettazione. La ricerca fornisce quindi un supporto per progettare sistemi Cyber-Physical in maniera strutturata, focalizzandosi sull'esperienza utente e creando un linguaggio comune tra designer e non-designer. Possibili sviluppi futuri della ricerca possono essere identificati nella creazione della piattaforma software che raccoglie i casi di studio e nella sua validazione attraverso la progettazione di questi sistemi.

PAROLE CHIAVE

Esperienza utente (User Experience)
Esperienza ambientale (Ambient UX)
Sistemi cyber-fisici (Cyber-Physical)
Strategia di Design
Strumenti di Design

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