



# Model-Driven Adaptive User Interface based on Context and User Experience Evaluation

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**Abstract**— Personalized services have greater impact on user experience to effect the level of user satisfaction. Many approaches provide personalized services in the form of an adaptive user interface. The focus of these approaches is limited to specific domains rather than a generalized approach applicable to every domain. In this paper, we proposed a domain and device-independent model-driven adaptive user interfacing methodology. Unlike state-of-the-art approaches, the proposed methodology dependent on the evaluation of user context and user experience (UX). The proposed methodology is capable of adapting user interface based on the utilization of contextual factors at runtime using the adaptation rules.

**Keywords**— Human Computer Interaction, Personalized user interface, Adaptive user interface, User Experience, Context-aware user interfaces

## I. INTRODUCTION

With the advancement of technology, Human Computer Interaction (HCI) plays very important role. Among other, user interface (UI) is a dominant part of interactive systems. End user applications provide many functionalities, which increases the complexities of UIs. Most of the users use a small portion of the offered functionality and major part goes underutilized. Additionally, the UI element usage are differ among users.

The personalization in the user interface can be introduced in two ways: adaptable and adaptive. Both ways can improve the positive user experience in terms of usability and user satisfaction as compared to a default user interface. In the adaptable approach, the personalization made by the user, while in the adaptive approach, the personalization is achieved by system. Nevertheless, the adaptable approach requires frequent customizations according to the user's skills. Many of the users are not able to personalize the UIs according to their preferences due to their skills. Additionally, the adaptive personalization extends the system lifespan, enable the users to achieve their goal, and increases the operational accuracy and speed.

In this paper, we propose an adaptive UI methodology that tailors the UI on the basis of evaluation of user context and user experience. The main objective of the proposed methodology is to deal with the personalized approach towards building and managing the user interfaces.

## II. ADAPTIVE UI GENERATION METHODOLOGY

The real adaptive behavior in an adaptive user interface process is shown in Figure. 1, which starts from user interaction with the system. The monitoring module is responsible for data collection while user is interacting with the system through different sensors and trackers (e.g., facial, vocal, eye, and analytics). We also consider the user feedback as self-reported data. The evaluator component evaluates the acquired information and decides whether adaption is required on UI using adaptation rules or not. It also evaluates the user experience on periodic bases depend on the configuration. The user experience is measured using UX metrics such as performance, self-reported, and physiological metrics based on the collected data (explicit and implicit) through the monitoring modules. If any adaptation is needed, UI is adapted accordingly, otherwise ignored.

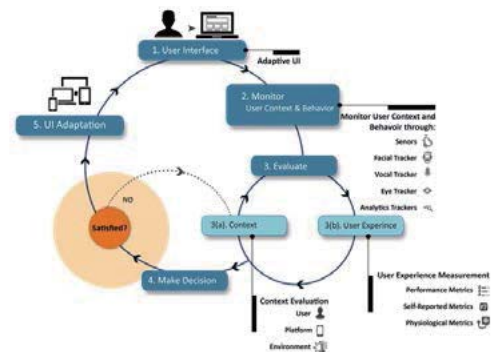


Figure 1. Adaptive Behavior Data Flow

## III. CONCLUSION

In this paper, we present the Adaptive UI methodology that adapts the user interface using model-driven approach based on user preferences and their experience. The proposed approach considers the dynamics of the UI associated with the user in the form of context-of-use. It helps in improving the information accessibility, usability, and user experience of system.

## ACKNOWLEDGMENT

This work was supported by the Industrial Core Technology Development Program (10049079, Develop of mining core technology exploiting personal big data) funded by the Ministry of Trade, Industry and Energy (MOTIE, Korea).