

Past and future of software architectures for context-aware systems: A systematic mapping study

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Resumen(Abstract). There is a growing interest on context-aware systems in recent years. Context-aware systems are able to change their behaviour depending on new conditions regarding the user, the platform and the environment. These systems are evolving towards interacting with the user in a transparent and ubiquitous manner, especially by means of different types of sensors, which can gather a wide range of data from the user, the platform the user is interacting with, and the environment where such interaction is taking place. It is worth noting that the software architecture of a system is a key artefact during its development and its adaptation process. Hence, the definition of the software architecture becomes essential while developing context-aware systems since it should reflect how the context is tackled for adaptation purposes. With the aim of studying this issue, we have designed and conducted a systematic mapping study to provide an overview about the different architectural approaches used in context-aware systems. One of the main findings of this study is that there are not many software architecture proposals that deal with context-awareness in an explicit way during the adaptation process. It was also detected that there are Human Computer Interaction (HCI) works that focus on context-aware adaptations but neglect partially or completely any possible change in the system architecture during the adaptation process. Due to this, we perceived a need to analyse what research works highlight the use of context and its relationship to the software architecture in existing context-aware systems. Therefore, this mapping study attempts to bridge the gap between Software Architecture and HCI in order to align the adaptation at the architectural level (changes in the configuration of architectural components) and at the HCI level (changes in the interaction modality or the user interface in general).