

Research Opportunities for Mobile Software Ecosystems

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Abstract. *Software solutions are collaboratively built within a dynamic and global market, often requiring adaptation of software development processes. This trend has been broadly studied as Software Ecosystem (SECO); in the mobile platform domain, named Mobile Software Ecosystem (MSECO). In this paper, we pointed out research opportunities extracted from 28 papers. The research opportunities were grouped into three dimensions (Business, Technical and Social) as an answer for the research question “What are the main research opportunities for a Mobile Software Ecosystem?”. The contribution is a research agenda to help the Software Engineering community to understand and research on MSECO.*

1. Introduction

A Mobile Software Ecosystem (MSECO) is a set of a collaborative systems, users and developers that creates complex relationships driven by competition and cooperation within niches, similar to biological ecosystems [Lin and Ye 2009]. In this context, we performed a systematic mapping study, published in [Fontão et al. 2015], in order to map existing technical literature regarding MSECO, in which a total of 28 papers were analyzed. As concluded in this study, it is necessary to analyze research opportunities in MSECO and classify it to a better understanding, since they still remain unclear. In this paper, we then answer an additional research question: “*What are the main research opportunities for a Mobile Software Ecosystem?*”. As a result, we identified research opportunities on MSECO grouped into 3 dimensions (*Business* – focuses on the ecosystem management, *Technical* – focuses on the ecosystem platform, and *Social* – focuses on ecosystem stakeholders) suggested by [Santos and Werner 2011].

2. Research Opportunities for Mobile Software Ecosystems

Business: 1) what are the strategies for development and/or identification of niches within the ecosystem based on publishing, advertising and selling of mobile apps (including successful mobile apps)? 2) how does the ecosystem support developers with approaches, methodologies and tools for software engineering activities, e.g., design, development, publishing, follow-up of mobile apps and interactions among MSECO elements in the development process? 3) how should the management activity benefit from the characterization and modeling of interactions among MSECO elements and factors that affect platform adoption by developers and software reuse/opening mechanisms for developers? 4) how does the quality assurance (QA) strategies depend on the orchestration of the ecosystem and on the specific solutions to each MSECO

(e.g., practices to help in producing successful software in a complex environment, guidelines to develop mobile apps and a certification process that helps to preserve the ecosystem quality)? 5) how to cope with different types of requirements for mobile apps considering market change, competitors and users, and also how to support packaging requirements (app description, title, keywords, screenshots and marketing artifacts)? 6) how can maturity levels and value creation in ecosystems help to leverage an MSECO?

Technical: 1) how to model an MSECO architecture taking into account extensions and existing conflicts and/or dependencies among them (e.g., registration process, technical support, testing and distributing privileges)? 2) which factors influence and promote the adoption of APIs and design decisions (e.g., restricted access to libraries, and effects on how developers sell, buy and reuse apps)? 3) which factors should be considered when an MSECO is pursuing strategies for taking care of the platform evolution (e.g., business, communication, knowledge management, development/design techniques)? 4) how to ensure that the integration of an extension preserves the quality characteristics of the ecosystem platform? 5) how should the keystone define quality practices and techniques based on user requirements and quality policies? 6) how to construct tools to help developers to migrate their apps to new ecosystems?

Social: 1) how do developers think and feel about their activities within an MSECO, for example, assuming that an improvement on the Developer eXperience (DX) use to have a positive impact on software development and on developer engagement? 2) Regarding DX and UX (User eXperience), which factors influence attraction and retention of community members (users and developers)? 3) how to define reuse strategies for end-users based on analysis of factors that influence the number of new users and the user retention using prediction models? 4) how to communicate requirements and user feedback to developers, and also how could this information influence the development of a mobile app? 5) how to classify different types of ecosystem communities? 6) how can these communities identify strengths and weaknesses of MSECO documentation and then evolve supporting materials?

3. Future Work

As future work, we intend to analyze our results and related work in order to identify similarities and differences between the research opportunities in SECO and MSECO. This analysis is important to make MSECO domain clear.

References

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