Chapter 26
Software Engineering for Technological Ecosystems

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ABSTRACT

Software engineering for technological ecosystems also referred as Software Ecosystems (SECOs) focuses on the concept of software engineering field. The study of SECOs started in early 90s under business schools, mainly focused on software engineering based on the software product lines approach that aimed to allow external designers and developers to contribute to hitherto closed platforms. The chapter gives background, various dimensions, framework, architectural challenges of SECOs, and explains various limitations and different recommendations and solutions to provide a better and conclusive platform for the technology ecosystems.

INTRODUCTION

Software engineering for technological ecosystems referred as software ecosystems (SECOs) focuses on the concept of software engineering field. The study of software engineering for technology ecosystems started in early 90s under business schools. These studies mainly focused on software engineering based on the software product lines approach that aimed to allow external designers and developers to contribute to hitherto closed platforms. Various research directions developed by industrial and literature cases provides a lot of relevant perspectives to be examined such as architecture, business considerations, modeling, social networks, organizational based management, and mobile platforms (Urban, Bakshi, Grubb, Baral, & Mitsch, 2010). Besides that, software ecosystems require a multidisciplinary treatment that includes law, business, economy, communication, as well as sociology. The studies are motivated through the software vendor's routine for there is no longer function that is independent and has the potential to deliver separate products.

These products have become dependent on other software vendors for relevant software infrastructures and components, for instance, platforms, component stores, libraries, operating systems, and other important and needed software elements. Over the past years, most institutions and firms have established

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Free Software and open source developments that cover technological needs, for the internal processes management and the public facing visibility. Universities, large firms, and SMSs generates a large amount of data when carrying out their operations. In order to support their emerging needs and improve the type of information systems they are using, companies search technological solutions. There are several of open source solutions that cover the basic ICT needs of business platforms, from decision-making tools to content management systems or project management software. Most of these solutions are referred to as technological ecosystems and allows focusing on information as well as knowledge to put aside the underlying technology concepts (Adomavicius, Bockstedt, Gupta, & Kauffman, 2012).

BACKGROUND

Software ecosystems give a phenomenon in the field of software engineering based on the rapid and ever evolution in the present times. The software product lines approach motivated the study of SECOs in the software engineering community. Focus was aiming on the acceptance of external developers so as to contribute to hitherto enclosed platforms. Various research activities contributed by industrial cases and literature reinforce a lot of relevant perspectives that need to be explored, like mobile platforms, modeling, social networks, and business considerations. On top of these, software ecosystems require a multidisciplinary treatment that comprises law, business, economy, communication, and sociology. Most of the above studies are motivated by the existing software vendors' routine, for they no longer operate in independent manner that has the potential to deliver different products. Study show that they have become more dependent on other software vendors for key software components plus infrastructures. For instance, they include platforms, libraries, operating systems, and component stores (Dos Santos & Werner, 2011).

In other words, software vendors do resort to virtual integration that comes through alliances to establish and keep networks of interoperability and influence factors responsible in generating SECOs. There certain challenges that emerges from the direction taken making it technical for the realization of ideal results. One thing is that software vendors in the software engineering field should be have skills and knowledge on the materials that they are using. With that, they will be in a better position to develop and create a better platform that focuses on all the needs and strategies to carry out all related concepts. Most develops have always focused and need to use the same notion, something that ensures right measures are used at all times. In the software engineering field, it is essential to operate with well-defined standards that will help get desirable results. To get these true, software vendors need to know all concepts that relates to the SECOs (Still, Huhtamäki, Russell, & Rubens, 2014).

Operating on the SECO scope is not easy and calls for ideal activities something approved by various studies. Vendors should have an overview of possible ways towards opening up the firm's platform without the exposure of intellectual property at all cases. Most cases of SECO have failed simply because it has become difficult for vendors to ensure that the concept of intellectual property has been maintained and protected in the required manner. In that way, challenges that prevents proper and ideal way of completing set projects becomes manageable at all costs. More than that, vendors wants also to be aware of the key strategies on survival that are in the SECO's stakeholders' platform. Survival strategies in all areas of technology development help designers to engage in suitable operations. Within software engineering for technology ecosystems, software vendors need to have clear survival strategies on what they are required to carry on when they conduct their projects (Bosch, 2009).