A "New" View of Proof-of-Concept Practices Through the Lenses of Activity Theory and Hermeneutics

Antonio Jose Rodrigues Neto, University of Coimbra, Coimbra, Portugal

 https://orcid.org/0000-0003-2364-0927

Maria Manuel Borges, University of Coimbra, Coimbra, Portugal

 https://orcid.org/0000-0002-7755-6168

Licinio Roque, University of Coimbra, Coimbra, Portugal

 https://orcid.org/0000-0002-1911-2788

ABSTRACT

In this study, the authors acknowledge Proof-of-Concept (PoC) as an activity with a set of practices performed by its practitioners and consumed by organizations that aim to explore new products or technologies and achieve knowledge production and consumption. PoC practices are poorly explored and characterized in the scientific literature. The motivation of this research is the clarification of an approach to PoC. This article introduces a "new" and different view of PoC practices using Activity Theory and Hermeneutics. The authors debate that it is not possible to understand the whole PoC until its constituent parts and context have been understood. Therefore, the process of appropriation of knowledge in PoC occurs in social interaction between one practitioner and another, through an activity that is mediated in the relations between those practitioners, and an activity between the triad—subject (practitioner), object of learning (outcome), and mediating artifacts—with the aim of improving PoC practices.

KEYWORDS

Activity, Activity Theory, Hermeneutics, Knowledge Management, Mediating Artifacts, PoC, Practices, Practitioners, Proof-of-Concept

INTRODUCTION

In the present day, the use of Information Technology (IT) is inevitable and organizations depend upon IT to increase their efficiency thus ensuring their survival and sustainability. However, IT cannot be seen and understood as an instrument that is solely reserved for organizations, since IT also promotes many changes and plays an increasingly important role for individuals, markets, and the society as a whole (Sjöström, 2010). The exponential growth of data, information, and connectivity (Leonhard, 2016, p. 78) can provoke significant changes in our world, affecting both people and organizations.

In the continuous search for technological innovation and knowledge, a common practice used by organizations and their constituent individuals is the Proof-of-Concept (PoC). This activity serves as an instrument for building knowledge in the experimental study and understanding of certain objects (i.e., artifacts and phenomena) such as components and technologies. In other words, PoC includes a set of practices performed by its practitioners for the purpose of evaluation, understanding, validation and exploration thus enhancing the learning experience with respect to the object(s) under study (Neto et al., 2018, 2019).

Barnes et al. (2009) present the PoC as a 'system' in order to demonstrate and validate concepts of a product or technology, among others, for organizations. The same authors present a model that is based on the execution of PoC using a block diagram. However, we question the tenet that a PoC can be framed as a systematic process based on a set of definitions and procedures, or as solely a sequence of steps, as defined by those authors. In addition, we question whether PoC practitioners are really aware of the importance of PoC in building knowledge for organizations.

According to Gradhvohl (2005), the PoC is usually an incomplete realization of an idea in order to prove what is feasible, but in reality the PoC is a tool based on constructivism theory that is utilized for learning management (Andrade et al., 2006). Further, according to Kendig (2016), the notion of PoC research is constructed in terms of a particular type of research that provides substantiation in practice of the potential portability of knowledge acquired through the experimental test case. However, Teles (2017) notes that a PoC is to be used to prove a concept through a practical model, whereby such a model can be proven by the development of a prototype as a tool for the practical demonstration of the methodology.

We identify that the Proof-of-Concept (PoC) has several interpretations and terminological definitions in the scientific literature, therefore, the term PoC is not presenting a consensus in its definition.

The scientific literature, specifically regarding Information Systems (IS), now highlights popularized terms such as Minimum Viable Product (MVP) and prototyping as sibling terms of the PoC. The main idea is that a PoC prototype is not restricted, with the implication that the PoC is only created during the early stages of systems development or a design project, that is, the PoC will be used for concepts that are to be tested (Horton & Radcliffe, 1995).

Münch et al. (2013, p. 1) define an MVP as "an artefact that may be incomplete in functionality or quality of display that allows for determining its customer value", i.e., a version of the product with a minimum quantity of effort and a lesser amount of development time. Smith (1991) presents prototyping as a draft or a model (partial or complete) before a full commitment is made to develop a product, where the definition of the term 'develop' refers to the construction of the final product.

Therefore, one can assume that prototypes are all products that are designed before the final product is constructed and fully implemented in practice. That is, "prototypes are made and discussed to feed the discussion and to shape ideas as a basis for revision decisions. The repertoire of the developers based on their state-of-the-art knowledge and practical knowledge and experience, functions as a starting point for the development" (Visscher-Voerman, Gustafson, & Plomp, 1999, p. 19).

We understand that prototyping refers to an experimental activity when a product is in its initial phase of development. According to Sommerville (2010, p. 45), prototyping is based on the "initial version of a software system that is used to demonstrate concepts, try out design options, and find out more about the problem and its possible solutions. Rapid, iterative development of the prototype is essential so that costs are controlled, and system stakeholders can experiment with the early prototype in the software process".

MVP, according to Trimi & Berbegal-Mirabent (2012, p. 460), is an experimental activity when a prototype implements "only the most necessary features of the product to test fundamental business hypotheses and get customer feedback in early stages. MVP allows entrepreneurs to focus more on knowing who their customers are, what habits they have, and how to attract and retain them".

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