



# Scrum Team Competencies in Information Technology Professionals in the Global Software Development Environment

Anita Hidayati, Universitas Indonesia, Indonesia

 <https://orcid.org/0000-0002-6114-0459>

Eko K. Budiardjo, Universitas Indonesia, Indonesia\*

Betty Purwandari, Universitas Indonesia, Indonesia

 <https://orcid.org/0000-0003-0409-3745>

## ABSTRACT

The product owner and scrum master are members of the scrum team that play an essential role in global software development. They must have some competencies that can overcome challenges in the global environment. This study aims to develop the competencies of these two roles and explore issues of global competencies. Researchers conducted a literature study to produce a list of competencies and in-depth interviews to explore the issues. Data processing uses content analysis and descriptive statistics. The author compiled questionnaires and generated three issues, then held a focus group discussion for validation. Without reducing the nature of scrum, the consensus of experts had approved 31 competencies for the product owner while 34 for the scrum master. This research enriches scrum.org and has a global impact on improving scrum and global software development human capital and IT professionals.

## KEYWORDS

Competencies, global Software Development, Human Capitalit Professionals, Product Owner, Scrum, Scrum Master, Scrum Team

## INTRODUCTION

The globalization of the world economy in the 21<sup>st</sup> century has made Global Software Development (GSD) a trend in the software industries (Britto et al., 2014). Agile Software Development (ASD) is widely used in GSD projects because it is a solution to overcome its challenges (Hidayati et al., 2020). The use of agile methods in GSD promises many advantages for both the company and the client (Sriram & Mathew, 2012). Among various Agile methodologies, the authors chose Scrum in consideration of current trends. Based on the 14<sup>th</sup> Annual State of Agile Report in 2020, Scrum got the most votes (58%) as the most common Agile methodologies used by respondents' organizations. It is followed by ScrumBan (10%), Other/Hybrid/ Multiple Methodologies (9%), and other methodologies (Scrum/XP hybrid, Kanban, Iterative Development, Lean Startup, XP) (Digital.ai Software Inc., 2020). Another study also mentioned that Scrum is the best known for agile development (Gellweiler, 2019).

Research on Scrum has emphasized the need to improve the Scrum method by developing or modifying its practice to suit the GSD environment (Vallon et al., 2018). The collocated implementation

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\*Corresponding Author

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of Scrum is very different from when Scrum is implemented in a global context. There is an adjustment of Scrum practices to overcome the challenges in this environment (Hossain et al., 2011). So, the competencies required by the Scrum Team at GSD are more numerous and complex than in traditional Scrum. Building up competencies for teams that support Scrum practices in a GSD environment is necessary to support the success of their work. With the provision of mature competency mastery, they will be able to drive the success of the GSD project.

A few kinds of research have discussed human resources as Information Technology (IT) professionals in this context. While social factors are at the core of the Scrum methodology, Human Resource Management (HRM) is a crucial challenge in GSD projects (Colomo-palacios et al., 2012). In this research, Human Capital Management (HCM) is more appropriate than HRM. It is because Scrum is a methodology that focuses on people and views human resources as human capital. In Scrum GSD, it is also necessary to apply Scrum values that follow the HCM focus not found in HRM.

Scrum.org is the official reference that becomes the general reference when someone wants to know everything about Scrum. The existing competencies at Scrum.org are still not sufficient to accommodate the application of Scrum in GSD; further, development is still needed. GSD professional Scrum competencies are required by the Scrum team and stakeholders involved and interested in it. This research aimed to develop competencies in the GSD context by using Scrum.org as a primary reference. These competencies are expected to be a guide for preparing the Scrum project team at GSD.

The researchers have explored the reasons, benefits, constraints, and other issues related to prepare a list of competencies to justify this research's importance. In this study, the authors only explored two roles of the Scrum team that play an essential role in maintaining software quality globally. The Product Owner and Scrum Master must have the competence to support the GSD environment. Therefore, the research question in this study is, "What is the competency list needed for Scrum Masters and Product Owners in a GSD environment?"

There are no previous studies that specifically discuss the competencies of Product Owners and Scrum Masters in the context of GSD. So, this research contributes to the Scrum GSD body of knowledge. This research is very relevant to the current conditions where globalization occurs in the business environment—coupled with the Covid-19 pandemic that has swept across the world, forcing business people, including the software industry, to develop software globally. Team virtualization will become a greater need in the future. A Scrum company has a great chance of success in this situation if it has a valuable asset in the form of a Product Owner and a Scrum Master competent in the GSD environment.

The steps for compiling this research refer to the guidelines from (S. Misra, 2021). The structure of this article is organized as follows: The background section contains Scrum's reasons for appropriate GSD methodology. The methodology section describes the research steps taken to answer the research questions in the Introduction. Then, there are four sub-sections (identifying, analyzing, preparing, validating) that contain the methods and results obtained to clarify the stages of research. Next, the research results are presented and discussed in the Results and Discussion section. The last section includes conclusions from the study and future research directions.

## **LITERATURE REVIEW**

Human capital is all the workforce capabilities that develop into valuable talents or features when combined with investment (Schultz, 1961). Human capital combines intelligence, skills, experienced, competence, formal and non-formal education, and expertise. Human Capital Management (HCM) is a human development philosophy that focuses on human value creation (Afiouni, 2013). The purpose of HCM is to manage IT professionals as a company asset effectively and develop it continuously, so its value will increase that it can contribute to the company's performance.

Human capital is essential for survival and competitive advantage in a changing environment (Wujarso & Dameria, 2013). GSD has such an environment. GSD was established in the early 1990s

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