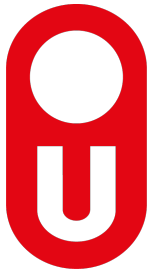

Open Universiteit

What Do Critical Success Factors of Collaboration Really Mean in the Context of DevOps?

Michiel van Belzen, Jos Trienekens, Rob Kusters

Faculty of Science, Open University Heerlen, The Netherlands

Presenter: Michiel van Belzen, michiel.vanbelzen@ou.nl, PhD candidate, Open University

SHORT RESUME OF THE PRESENTER

Michiel is an external PhD candidate at the Open University in The Netherlands. His interest lies in agile phenomena emerged in IT service providers, such as DevOps and continuous practices.

Open Universiteit

TABLE OF CONTENTS

COLLABORATION: AN IMPORTANT ASPECT OF DEVOPS

DevOps is an interaction between development and operations personnel (Erich et al., 2017).

DevOps is a set of practices that advocate the collaboration between software developers and IT operations (Claps et al., 2015; Ebert et al., 2016; Hüttermann, 2012; Wiedemann, 2018).

IT'S NOT EASY TO COLLABORATE IN A COMPLEX ENVIRONMENT

- Poor communication (Iden et al., 2012; Lwakatare et al., 2015).
- Cultural and organizational gaps (Wettinger et al., 2017).
- Knowledge boundaries (Colomo-Palacios et al., 2018; Nielsen et al., 2017).
- Dev versus Ops mentality (Ghantous & Gill, 2017).
- Dev and Ops toolset clashes (Ghantous & Gill, 2017).

TOWARD MEANINGFUL CSFS IN THE CONTEXT OF DEVOPS

We developed and validated an approach that generally applicable CSFs[1] can be made meaningful in a DevOps context.

1. Systematic Literature Review (SLR) -> generally applicable CSFs.
2. Multiple case study -> recognition of CSFs and real-life examples.
3. Classification of CSFs based on examples.

Main contribution to theory: a list of CSFs meaningful for the DevOps profession.

1 A Critical Success Factor (CSF) is considered as a factor leading to successful outcome.

STEP 1 (SLR) - WHAT DO WE KNOW ON CSFS OF COLLABORATION IN GENERAL?

Table 1 - Some examples of CSFs found in literature

CSF	Operational definition based on examples found in literature
Concrete attainable goals and objectives	Setting of clear goals (at the planning stage), supplementary purposes (Patel et al., 2012; Yoon et al., 2017) and feasible (Mattessich & Monsey, 1992), based on key community issues, agreed upon (Marek et al., 2015).
Clear roles and responsibilities	The need for roles and responsibilities in order to structure collaboration (Marek et al., 2015; Patel et al., 2012). Main agents and strategies about role-setting of collaboration (Yoon et al., 2017).
Mutual respect, understanding, and trust (social ties). Conflict.	Understanding and respect for each other and their respective organizations: how they operate, their cultural norms and values, limitations, and expectations (Kolfschoten et al., 2010; Mattessich & Monsey, 1992), confidence (Mohr & Spekman, 1994), professionals trust each other, respect (De Feijter et al., 2018; Tsanos et al., 2014) and human-related issues (Kotlarsky & Oshri, 2005). Conflict (Patel et al., 2012).
Members share a stake in both process and outcome	Members feel 'ownership' of the way the group works and the results or product of its work (Mattessich & Monsey, 1992). Devotion (Mohr & Spekman, 1994). Incentives which emphasize team goals rather than individual goals (Patel et al., 2012).
History	Exists in the community, offers partners an understanding of, and trust in, the collaboration process (Mattessich & Monsey, 1992).

STEP 2 (MULTIPLE CASE STUDY) - HOW ARE GENERALLY APPLICABLE CSFS OF COLLABORATION GROUNDED IN DEVOPS PRACTICE?

Table 2 – Some real-life examples found in DevOps practice

CSF	Operational definition	Real-life examples found in DevOps practice
Knowledge Management	The sharing of knowledge (as a resource). Training, learning, skills and team building.	Knowledge is partially shared by a shared platform.
Clear rules and procedures	The need for clear rules and procedures in order to structure collaboration. The methods of solving common problems. Error management: the procedures to identify and manage errors and violations. Refrain from using harsh methods such as persuasion, domination and arbitration to solve conflicts.	Reviewing new code before merging as a rule.
Mutual respect, understanding, and trust (social ties). Conflict.	Understanding and respect for each other and their respective organizations: how they operate, their cultural norms and values, limitations, and expectations, confidence, professionals trust each other, respect and human-related issues. Conflict.	Developers are higher educated, the perception of developers on Ops is that they only execute and maintain. There is still a large gap between operations and development.
Members see collaboration as in their self-interest	Mindset where collaboration is seen as contribution to the quality of tasks and outcomes. Commitment, i.e. the belief of a partner that the exchange is so important it merits the maximum effort to maintain it.	Lack of social skills, mindset and background are obstacles as well as hesitation of older employees.
History	Exists in the community, offers partners an understanding of, and trust in, the collaboration process.	Feedback received by the software integration team is more useful and detailed.

Open Universiteit

STEP 3 (CLASSIFICATION) – MAIN CONTRIBUTION TO THEORY: A LIST OF CSFS MEANINGFUL FOR THE DEVOPS PROFESSION

TABLE I. CSFs OF COLLABORATION IN A DEVOPS CONTEXT

CSF	Clarification to make the CSF meaningful in a DevOps context
Goals and vision	Concrete, attainable and unique goals derived from a shared vision, which are mutual understood and agreed by the whole team and supported by stakeholders.
Procedures and responsibilities	Clear procedures, rules and responsibilities to structure collaboration.
Performance measurement	The performance of collaboration is measured by quantitative and qualitative measurement methods.
History	The length of time for which team members have known each other.
Workload	Feasible balance between available resources, time and required output.
Knowledge Management	Distinct but interdependent processes of knowledge creation, knowledge storage and retrieval, knowledge transfer, and knowledge application [34].
Communication	A synthesis of a selection of information, the utterance of this information and a selective understanding or misunderstanding of this utterance and its information [35].
Leadership	The ability to build and maintain a group that performs well relative to its competition [36].
Tools	Technological support for collaboration and communication.
Task characteristics	Recognizing relevant task characteristics.
Perceived benefits of collaboration	Collaboration is seen as valuable for the individual, team and the organization.
Team recognition	The team is perceived as a leader, at least related to the goals and activities it intends to accomplish.
Resilience	The ability to deal with changing conditions.
Team composition	Make-up of team membership.

IMPLICATIONS OF THE FINDINGS

1. Generally generally applicable CSFs of collaboration found in literature can be recognized in a DevOps context.
2. Our approach[1] enables the operationalization of the CSFs in a DevOps context and may be useful to other contexts as well.
3. The real-life examples illustrate how the CSFs are anchored in the way team members work together. This shows that collaboration is indeed an important aspect of the adoption of DevOps.
4. The findings discover additional evidence to confirm the importance of each factor previously found.
5. The CSFs could aid practitioners to better understand the concept of collaboration in a DevOps context in order to have a necessarily impact on the success of collaboration.
6. The implications challenge the general view on DevOps as just an interaction between development and operations personnel. Organizations should take into account many CSFs of collaboration.

1 We developed and validated an approach that generally applicable CSFs can be made meaningful in a DevOps context.

Open Universiteit

Any questions?