

RESEARCH ARTICLE

Metrics champions: navigating challenges and driving change in software measurement program implementation

Nataliya Berbyuk Lindström

Department of Applied IT, Software Center, SCDI, University of Gothenburg, Box 200, 405 30, Gothenburg, Sweden, nataliya.berbyuk.lindstrom@ait.gu.se

Yixin Zhang

Department of Applied IT, Software Center, SCDI, University of Gothenburg, Box 200, 405 30, Gothenburg, Sweden, yixin.zhang@ait.gu.se

Abstract

Research has been focused on technical approaches, leaving the behavioral and organizational aspects of metrics implementation underexplored. This study addresses this gap by adopting a job crafting perspective to examine challenges in metrics program implementation and how champions perceive and shape their roles to mitigate them. Based on a qualitative case study, we show that many difficulties arise from “soft factors,” including unclear or conflicting objectives, misaligned expectations across teams, and weak communication channels. Without a shared understanding of metrics and their use, stakeholders interpret results inconsistently, undermining decision-making and engagement. Metrics champions actively craft their roles to address these barriers, taking on responsibilities such as educator, interpreter, and evaluator of data and tools. They also act as bridge builders and conflict mitigators, fostering collaboration and easing tensions among diverse stakeholder groups. These tasks, cognitive, and relational forms of crafting interact, enabling champions to move from passive adopters of metrics to active agents shaping the effectiveness of metrics initiatives. By combining job crafting theory and championing, we offer a human-centered view of software metrics implementation and emphasize the need for training and organizational support.

Keywords

software metrics; champions; job crafting; communication; blame game.

Received: 28 March 2025 | Accepted: 19 January 2026

1. Introduction

In today's data-driven and competitive environment, organizations increasingly rely on structured software measurement programs, defined as a socio-technical system composed of interconnected measurement systems (Staron & Meding, 2018). A measurement system, in turn, is "a tool used to collect, calculate, and report quantitative data to track and evaluate performance" (Staron et al., 2009). These systems operate as software-based mechanisms that gather data on various attributes (e.g., program size, product quality) and present it to stakeholders responsible for monitoring trends and making informed decisions. Building on this foundation, software metrics represent the core outputs of these measurement systems. A software metric can be understood as a function that takes software-related data as input and produces a quantitative value as output. This value reflects how a specific attribute influences the software product or process, thereby enabling consistent evaluation, comparison, and improvement efforts (IEEE, 1998).

Metrics are indispensable in the software development process for evaluating the progress of development teams (Kerzner, 2014), tracking performance and measuring success (Klein, 2022), and planning upcoming work (Székely & Knirsch, 2005). Metrics contribute to transparency and accountability by keeping track of issues that need to be resolved, encouraging productive and efficient behaviors for decreasing risks in software development (Spagnuolo et al., 2016). Despite the abundance of studies concentrating on the technical facets of metrics, such as their development (Kupainen et al., 2015; Mitre-Hernández et al., 2014), reliability and use (Meding et al., 2021), the human aspects and social dynamics entailed in metrics implementation in organizations have not received the warranted attention (Berbyuk Lindström et al., 2025; Berbyuk Lindström et al., 2021; Matook & Maruping, 2014; Philipp et al., 2022).

Metrics as project management tools should be carefully selected to facilitate stakeholders' collaboration rather than hinder it (Rankinen & Haapasalo, 2025). Behind every number and dashboard, there's a human element that often gets overlooked. Metrics are more than just data points; they play a crucial role in helping people understand, trust, and use information effectively. To create real value with metrics, organizations must carefully consider *what* they measure, *why* they measure it, and *how* they do it and communicate those insights. When metrics are misinterpreted or poorly communicated, productivity and the overall work environment can suffer, leading to inefficiencies, resistance, stress and distrust (Suh et al., 2023).

Given the profound organizational changes that measurement programs often bring, successfully implementing them requires careful consideration of both technical and human dimensions (Goethert & Hayes, 2001; Hall & Fenton, 1994; Niessink & Van Vliet, 2001). In this context, individual actors often play a critical role in bridging strategic intentions and practical execution (Araújo et al., 2025). One such role is that of the champion. Champions are the individuals who take creative ideas (which they may or may not have generated) and bring them to life (Howell & Higgins, 1990). Champions make a decisive contribution to innovation by energetically promoting the idea, building support, overcoming resistance, and ensuring successful implementation. Typically, champions emerge spontaneously and informally within an organization (Schon, 1963), passionately identifying with the idea and its advancement to a degree that far exceeds formal job expectations. Over time, however, many organizations formalize the champion role through assigning explicit responsibilities, providing resources or authority, and integrating champions into structured innovation processes to harness their influence more systematically (Howell, 2005).

Extant research shows that involving change champions can be a highly effective strategy for rapidly implementing changes within an organization (Fernandez & Rainey, 2017; Miech et al., 2018; Renken & Heeks, 2019). Champions promote and facilitate the adoption of innovations or changes (Miech et al., 2018), helping their organizations in facilitating and moving through transformation (Drechsler et al., 2021). They typically possess strong interpersonal skills, leadership qualities (Nandan Prasad, 2024), and a deep understanding of the proposed changes, allowing them to effectively communicate the benefits, address concerns, and overcome resistance among their peers and stakeholders (Howell, 2005). Despite the plethora of studies concentrating on champions in different contexts, empirical research on champions is scarce in

general (Shea, 2021), and in the context of measurement program implementation in particular (Korpivaara et al., 2021; Philipp et al., 2022). To address this gap, this study poses the following research question:

What are the challenges in metrics program implementation, and how do metrics champions perceive and shape their roles in mitigating them?

We address the question by analyzing data from interviews and workshops conducted over four years in a large energy sector company. Our study identifies key challenges in implementing software measurement programs, offering insights into the barriers organizations face when integrating measurement initiatives effectively. Further, using the theoretical lens of job crafting (Berg et al., 2013; Lazazzara et al., 2020; Wrzesniewski & Dutton, 2001), we explore how software champions perceive and shape their roles in mitigating these challenges. By connecting job crafting with championing, we contribute to the theoretical understanding of individual agency in measurement initiatives. This work lays the foundation for future research on the intersection of individual agency and organizational change in software development and beyond.

The remainder of the paper is structured as follows: We first provide an overview of relevant research and the theoretical framework guiding our study. We then present our research method and findings, followed by a discussion that informs both theoretical and practical contributions.

2. Previous research

This study is informed by several key literature streams: software measurement programs, job crafting, and champions in organizational change. Rather than viewing software metrics tools merely as instruments for data-driven management, they are understood as catalysts for organizational transformation. The success of this transformation depends on effective communication and employee engagement. In our research context, software champions play a critical role in this process, actively encouraging their peers to adopt metrics and adapt their work practices. Accordingly, our literature review explores software measurement programs, rooted in software engineering, job crafting, drawn from organizational behavior and management studies, and champions in organizational change, originating from information systems and communication research.

2.1. Software measurement program implementation

A software measure can be defined as “any tool that provides a quantitative assessment of the degree to which a software product or process possesses a given attribute, such as size, complexity, or quality” (Wallace & Sheetz, 2014, p.249). Organizations implement software measurement programs to oversee the software development process, uphold product quality, adhere to project timelines, and manage costs effectively (Nicolette, 2015). With this understanding, organizations can subsequently enhance both their processes and products.

There is a substantial body of research on software metrics (Fenton & Neil, 2000; Kupiainen et al., 2015), such as the development of software measurements, design of different types of software metrics, ensuring data quality and data accuracy (Fenton & Bieman, 2014) as well as various validation criteria (Meneely et al., 2013). Although some scholars argue that metrics enhance objectivity in management decision-making (Hall & Fenton, 1994), implementing metrics within organizations remains challenging (Berbyuk Lindström et al., 2021; Staron & Meding, 2018). These challenges stem from difficulties in defining clear objectives and purposes for metrics (Philipp et al., 2022), selecting appropriate metrics that align with organizational goals (Staron, 2012), and hurdles with choosing the right measurement tools (Boehm & Turner, 2005). Organizational resistance, resource constraints, and the need for skilled personnel further complicate the implementation of software measurement programs (Berbyuk Lindström et al., 2025; Sheffield & Lemétayer, 2013). Additionally, accurately interpreting data to generate actionable insights and ensuring the program’s long-term sustainability require ongoing effort. Managing ethical concerns and mitigating potential negative impacts on employee morale are also critical considerations (Cugueró-Escofet & Rosanas, 2017). These challenges extend beyond simply

developing metrics for measuring code complexity, quality, and defect density; such complexities are fundamentally about people, their communication and collaboration (Lenberg et al., 2015), these soft aspects are especially relevant in teamwork, IT project management and adoption context (Assalaarachchi et al., 2025; Behn & Silvius, 2025; Ngereja et al., 2024).

In this study, we explore the implementation of software measurement programs within organizations, recognizing that such initiatives often encounter challenges related to “soft factors” like employee motivation and organizational culture. Resistance can arise when employees perceive metrics as unclear in purpose, disruptive to their roles, or misaligned with the company’s values, potentially leading to decreased morale (Cameron, 2011). To address these conflicts, it is crucial to understand the challenges and balance both “hard” and “soft” performance measures and incorporate employee feedback in the development of metrics (Berbyuk Lindstrom, 2023; Berbyuk Lindström et al., 2025; Kaplan & Norton, 2005).

2.2. Theoretical framework - Job crafting

Introducing software metrics into an organization and integrating them into management practices can lead to substantial organizational transformation. During these periods of change, change agents play a crucial role in promoting behaviors among employees that align with the organization’s goals and objectives (Petrou et al., 2018). However, during this process, change agents themselves also need to make sense of the changes and adapt their roles or job tasks accordingly.

Job crafting is defined as “the physical and cognitive changes individuals make in the task or relational boundaries of their work” (Wrzesniewski & Dutton, 2001, p. 179). The underlying assumption of job crafting is that employees are active agents who shape their work; through job crafting, they enhance the meaningfulness of their jobs and strengthen their work identities (Zhang & Parker, 2019). Wrzesniewski and Dutton (2001) identify three forms of job crafting: task, relational, and cognitive crafting. Task crafting occurs when employees modify their job by adjusting the number, scope, or type of tasks they perform, allowing them to reshape their responsibilities to better align with their skills or interests. Relational crafting involves altering the quantity or quality of workplace interactions, enabling employees to influence how often they engage with colleagues and the nature of those interactions, fostering stronger collaboration or reducing unnecessary exchanges. Finally, cognitive crafting refers to how employees redefine their perception of their work, whether seeing it as a series of disconnected tasks or as an integrated whole. Shifting this perspective can significantly impact how they approach their role and find meaning in their work.

Various factors can motivate job crafting, such as suboptimal job conditions or role ambiguity. Employees may engage in job crafting to gain greater control over their work tasks, enhance job autonomy, and improve job satisfaction (Grant & Parker, 2009; Griffin et al., 2007). Employees often undertake in job crafting during organizational change, as such transitions bring uncertainties. Rather than fixed duties, employees are typically given goals, which can create both challenges and opportunities. In navigating these changes, employees proactively shape their work environment to better align with the evolving demands, as well as their own values and interests (Walk & Handy, 2018). This proactive behavior helps them adapt to new job expectations (Berg et al., 2010; Wrzesniewski & Dutton, 2001).

2.3. Champions in organizational change

Extensive research in software engineering and information systems highlights the critical role of champions in driving innovation (Negoita et al., 2022), facilitating technology adoption (Chakrabarti, 1974; Heng et al., 1999), and ensuring project success (Beath, 1991; Cusumano & Selby, 1998). Beyond technical advancements, champions are instrumental in shaping organizational culture (Dong et al., 2007), influencing mindsets, and fostering change within their teams (Liker, 2004). Existing research also emphasizes the necessity of supporting these individuals through organizational resources (Reibenspiess et al., 2018), leadership development, and structural flexibility (Beath, 1991; De Clercq & Pereira, 2024) to maximize their impact.

Despite the recognized importance of champions in software engineering, empirical research on their role within software measurement initiatives remains limited. The field has historically focused more on technical and process-related aspects, with behavioral and human-centered dimensions receiving comparatively less attention (Lenberg et al., 2015). While research on software project leaders is well established (Shastri et al., 2021; Tabaka, 2006), examining the specific role of champions in software measurement is particularly valuable, as such initiatives often drive significant organizational change.

In our study, we adopt the perspective of job crafting in the context of organizational change, recognizing that champions do not merely participate in change: they actively promote and shape it (Bindl et al., 2019; Petrou et al., 2018). As proactive agents of transformation, champions must not only navigate evolving responsibilities but also redefine their tasks, interactions, and influence within the organization. Understanding how these individuals craft their roles can offer deeper insights into the behavioral dynamics of software measurement adoption and its broader implications for organizational success.

3. Participants and method

3.1. Setting and data collection

This exploratory case study was conducted between 2020 and 2024 through a combination of on-site visits and online sessions via Zoom and Microsoft Teams. The study focuses on a large international company in the energy sector, which develops both physical devices for sustainable energy generation and software systems for monitoring, regulation, and optimization. The company's software development teams are distributed across multiple countries in Europe and Asia.

We followed the implementation of the measurement program through continuous engagement with both management and developers. To support a smoother and more efficient implementation process, the organization in collaboration with the research team launched the "Metrics Champions Initiative." Drawing on prior research on championing (Negoita et al., 2022; Negoita et al., 2012) and in close collaboration with company representatives involved in the metrics program, we designed a step-by-step process for engaging metrics champions (Figure 1). The initiative began with the development of guidelines that defined the champions' roles, tasks, and responsibilities. These included supporting teams by providing guidance on metric interpretation, clarifying expected time commitments, facilitating communication among stakeholders to enable scalability, and embedding the use of metrics into daily organizational practices. The champion role was defined as part-time, accounting for approximately 20–30% of an individual's work time, allowing champions to integrate these responsibilities with their existing roles (e.g., product owner, business analyst, domain expert, or reporting specialist). Champions were recruited by managers leading the measurement program, who identified individuals demonstrating both interest in and expertise with metrics.

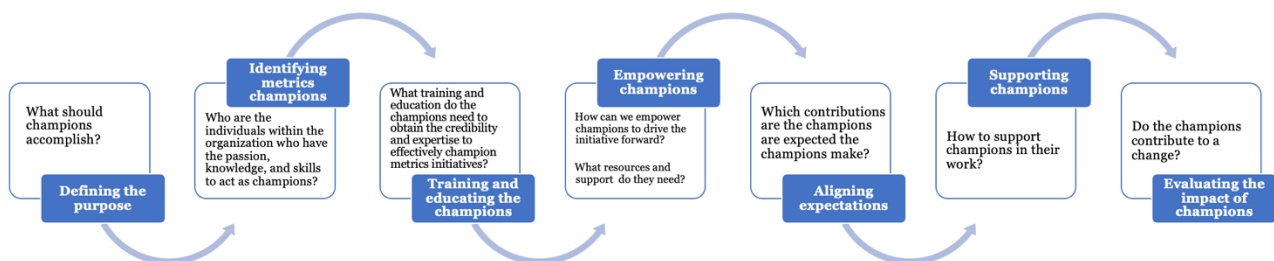


Fig. 1. Step-by-step process of metrics champions' involvement.

In total, 20 individuals were invited to participate in the championing process. The champions were not assigned ownership of specific metrics. Instead, they acted as part-time facilitators supporting multiple teams across the organization. Their role was intentionally cross-cutting: rather than maintaining or being accountable for particular metrics, champions assisted teams in interpreting measurement results, clarifying metric definitions, and providing feedback to improve data quality and tool development. Champions were selected from diverse departments and domains, ensuring broad organizational coverage without duplicating responsibility for the same metrics.

Champions primarily interacted with three groups: development teams, with whom they discussed measurement results and day-to-day challenges; managers, to whom they translated technical insights into decision-relevant information; and data and tool specialists, with whom they collaborated to address data quality issues and propose enhancements. This structure positioned champions as distributed connectors rather than metric owners, emphasizing communication, alignment, and organizational learning over formal authority or decision-making power. At the time of the initiative, both the organization and the champions focused primarily on software quality metrics, rather than on process performance or operational metrics.

The study draws on data from two 2.5-hour interactive workshops and 17 semi-structured interviews with managers and developers working with metrics (10 male, 7 female), as well as eight additional interviews with metrics champions (4 male, 4 female), including product owners, lead developers, release train engineers, quality managers, and domain experts. Participants were based in Germany, India, and Denmark and had between 1.5 and 22 years of professional experience. Each interview lasted approximately 45 minutes. The workshops and interviews with managers and developers focused on challenges encountered during the implementation of measurement programs. The interviews with metrics champions explored organizational understandings of metrics, implementation challenges, communication dynamics, and practices for mitigating these challenges. The champions were also encouraged to reflect on their experiences in their role. To ensure confidentiality, anonymity was emphasized, and participants were free to withdraw or reschedule their interviews at any time.

3.2. Data analysis

Descriptive field notes and anonymized transcripts from audio-recorded interviews and workshops were systematically collected and analyzed to ensure a robust examination of the empirical material. The research team collaboratively reviewed and discussed these materials to refine interpretations and enhance analytical rigor.

For data analysis, we employed a two-step, theory-informed approach using Atlas.ti software. In the first step, we engaged in open coding (Gioia et al., 2013), but not as a purely inductive exercise. Instead, our coding was guided by sensitizing concepts drawn from the literature, particularly research on metrics implementation, championing, and job crafting while still allowing the empirical material to shape how these concepts manifested in this context. This approach enabled us to identify salient themes and develop first-order codes that captured participants' experiences and practices. See Figure 2 for a data coding example.

In the second step, we iteratively linked the emergent themes to relevant theoretical frameworks, most prominently job crafting theory, to interpret the roles champions take and the challenges they address during metrics program implementation. This abductive movement between data and theory allowed us to refine our aggregated dimensions of task, relational, and cognitive crafting in ways that reflected both the empirical patterns and their theoretical underpinnings. Ongoing discussions among the researchers throughout the process ensured consistency in coding, interpretation, and theoretical integration, thereby strengthening the credibility and validity of our findings.

And so, um being a champion, it's definitely something that empowers you to have more responsibilities you to, to act and to to dry things forward. And usually you are. You are giving given a certain rules and... Ohh, an area to champion about so you are provide a lot of information you are probably already proficient in that area and it's a good chance that you can then pass this proficiency onwards and try to to lead the way. Ohh so that others can can adopt a certain principles. Certain ways of working, it all depends on what exactly you are championing about, but definitely a a guide, a guiding light. A person is a very much useful to to help you in in the process, so being a champion is a very, very good thing. It facilitates access to information. It facilitates access to community, to practises and. Ohh basically a hand that will keep you always in the loop and with big organisations where information is very easily diluted and hard to find there is pounds of documentation and of meetings and it's very difficult to navigate and a person a champion is always a very good idea to. Uh to provide the the to to connect the dots to to guide you to to where you need to to go and. Sometimes.

7:1 n...	empowerment being a champion
7:2 hh, a...	passing proficiency to other people
7:3 certain wa...	champion as a guide
...	facilitate access to information
7:6 hh basic...	being a guide in access ... in a large organization

Fig. 2. Data coding example.

Because we had collaborated with the case company for four years, we entered the study with a strong understanding of its organizational context, its concerns about potential conflicts arising from software metrics, and its intent to position champions as facilitators of change. This background allowed us to focus the semi-structured interviews on the roles of champions without beginning from predefined hypotheses. Rather than starting with job crafting theory and testing it against the field, we let the data guide our theoretical engagement. As the interviews progressed, our iterative analysis revealed job crafting theory as a particularly fitting lens for understanding how champions shape their roles. The three forms of crafting, task, relational, and cognitive, proved especially useful for structuring and deepening our analysis of how champions navigate and mitigate challenges in the measurement program.

4. Results

First, we present a brief overview of the identified challenges, which the developers and managers experience in the process of measurement program implementation, followed by the analysis of how these challenges are mitigated by the champions taking specific roles.

Starting with the challenges, our analysis generated a total of 13 first-level concepts, which were further classified and aggregated into five second-level themes corresponding to the main challenges such as (i) an unclear purpose with undefined metrics; (ii) difficulties in interpreting measurement results; (iii) limited feedback about measurement and tool development; (iv) lack of alignment among teams and management across the organization; and (v) conflicts in metrics communication.

Turning to champions' roles in mitigating challenges, 14 first-level concepts were identified, then categorized and consolidated into five second-level themes, each representing a distinct role champions assume: (i) "metrics educators," focused on information sharing and educating others about metrics; (ii) "metrics interpreters," responsible for interpreting measurement results, facilitating feedback, and enhancing tool development; (iii) "metrics data and tool evaluators," dedicated to improving data and tool development; (iv) "bridge builders," bridging the gap between teams and management across organizations; and (v) "conflict mitigators," engaged in conflict prevention and resolution. Finally, we connected these five roles to core job crafting tasks, including task, cognitive, and relational crafting.

Figure 3 presents the analytical coding process used in the study.

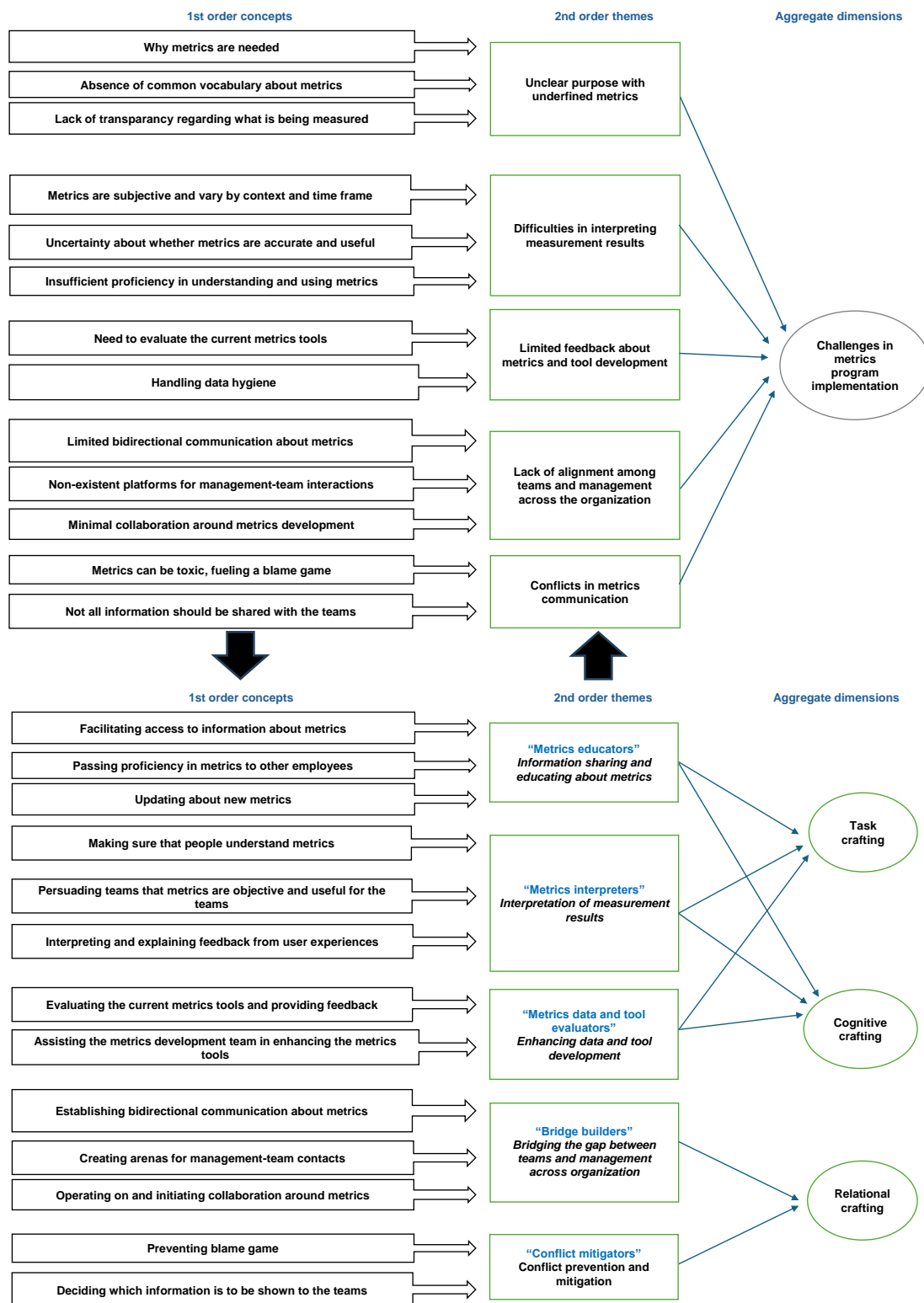


Fig. 3. Analytical coding process

4.1. Challenges in metrics program implementation

4.1.1. Unclear purpose with undefined metrics

Although developers and managers had a basic understanding of metrics, they emphasized the importance and urgent need to raise awareness about their purpose and the role they play in driving improvements and decisions:

“Why are we having the metrics? How do they help us in our overall value chain?” (Manager 1)

Further, there was a lack of shared terminology and a common vocabulary, which created confusion and inefficiencies across teams. Different teams were using different terms to refer to similar concepts, leading to misunderstandings and misalignment in how data and metrics were interpreted:

“Different teams seem to name stuff differently. In some cases, there is not even a name for stuff in which case we have to put a name on it, and we must put a name on it!” (Developer 3)

Transparency regarding what should be measured, how measurements are conducted, and why they are undertaken was identified as a critical issue in fostering a data-driven culture. Without transparency, teams struggled to understand the underlying motivations behind the metrics being tracked, leading to confusion, skepticism, and disengagement. When there is a lack of clarity about what is being measured, team members feel disconnected from the broader goals or uncertain about how their contributions fit into the larger organizational strategy. This transparency issue creates an environment where measurement feels arbitrary or disconnected from real value:

“We need to make sure that we are very careful on what we measure. Because if there’s nothing wrong with measuring failed pipelines, but what does that tell you? So, we REALLY need to be very critical to ourselves on what is it not just take whatever cool things we can and just make it up.” (Manager 5)

While respondents highlighted the importance of transparency, they also emphasized the need to carefully evaluate how much information to share, which information is most relevant, and how it should be presented to different stakeholders. Although managers rely on metrics to inform decision-making, they do not always have in-depth knowledge of metrics or the willingness to engage with the finer details. Therefore, ensuring that management gains meaningful insights without feeling overwhelmed by excessive information is crucial:

“Transparency should be good foundation, but it’s also should be simple and not information overflow. And then maybe the trick is how developers can communicate it to management in a transparent way. That’s exactly the challenge - how do you find a good balance?” (Developer 1)

4.1.2. Difficulties in interpreting measurement results

Interpreting metrics is not always straightforward, as it requires a deep understanding of both the data itself and the context in which it is being applied. Metrics may appear simple on the surface, but they often require nuanced analysis to uncover the insights they truly offer:

“We have our truth. And we have all our alternative truths, which are often represented through metrics. Information is well hidden in our dashboards.” (Manager 4)

This statement highlights the challenge of navigating varying interpretations of data. Metrics can sometimes provide a fragmented or incomplete picture, making it crucial to be mindful while interpreting measurement results. Further, measuring alone is insufficient; one must not only capture the numbers but also interpret them within different contexts and at the appropriate time:

“The metrics will not have a value until associated with time. And importantly, the context of what, who and what they’re looking at any given point in time. So that’s the reason I try to see

subjectively and not objectively on the metrics because the actions that we want to take up on based on the metrics are time dependent. We also need to understand what those numbers mean. A number like 100% doesn't necessarily mean that everything is good. It never tries to say that whether it was done with quality, whether it was done on time, and for that I'll have to go back and try to look at how many open defects are there in that area of etcetera, etcetera." (Manager 4)

4.1.3. Limited feedback about metrics and tool development

Limited feedback about metrics tool development often leads to confusion and inefficiencies within an organization. While various tools were developed and implemented to track and analyze metrics, a significant issue arose from the lack of coherence and communication about which tools were being used and the rationale behind their selection:

"We need feedback. This is legitimate especially when we are working on developing new measurements. We need to constantly check: Does it work?" (Developer 9)

This statement highlights the importance of feedback loops to ensure the relevance and effectiveness of the tools being utilized. The absence of regular feedback also contributed to a fragmented ecosystem of software and systems across different teams. Many departments and teams developed own set of tools based on specific needs and priorities, which, while appropriate for their immediate tasks, led to a disjointed approach when looking at the organization as a whole. This fragmentation created significant challenges, as tools did not integrate well with one another, leading to inefficiencies in data sharing and communication between teams. Moreover, the lack of a unified strategy for tool development and implementation resulted in inconsistent data collection and analysis practices, undermining the quality of decision-making and the reliability of metrics across the organization. This issue was exacerbated by a lack of coordination between teams (see 4.1.4), which further complicated the alignment of tools with organizational objectives. Without a structured and ongoing process for gathering feedback, teams could not adjust or optimize tools as the organization's needs evolved, leading to outdated or underutilized systems. Furthermore, employees felt disconnected from the broader goals and vision of the company, as they could not fully understand the rationale behind the adoption of specific tools or how their work connects to organizational performance metrics.

4.1.4. Lack of alignment among teams and management across the organization

The respondents observed that the lack of alignment between teams and leadership was a significant barrier to achieving efficiency and fostering collaboration across departments:

"We can deliver something more innovative if we can get more information regarding how the metrics are used. We need to have additional discussions to go that extra mile to see what else we can get out of the data. We could cater for needs beyond what we can see, but it requires that we work more and better together!" (Developer 1)

This statement illustrates how the absence of a clear, shared understanding of how metrics are utilized limits innovation and prevents teams from fully leveraging data to meet organizational needs. When cross-departmental communication is lacking, as in our case, the potential for innovation diminishes, as teams are unable to explore alternative solutions or tap into a broader pool of insights that could help them achieve their goals. This misalignment was also evident in the strategic direction and day-to-day execution of tasks, particularly with respect to unrealistic expectations set by management:

"There is a need from 'above' [management] to show a clear plan forward, and I think this is not the way to go, since there are so many uncertain dimensions to consider. It comes with unrealistic expectations. Why make grand roadmaps on [metrics] that are impossible to plan out all the way?" (Manager 2)

This highlights the tension between top-down management directives and the reality of operational uncertainty. By imposing rigid roadmaps and expectations that do not account for the unpredictable nature of metrics development, leadership risks creating frustration and burnout within teams who feel constrained by unrealistic deadlines or objectives. Additionally, while individual teams focused on their specific goals and metrics, these objectives often failed to align with the broader organizational vision or the priorities set by leadership. This disconnect between departmental goals and overarching strategic objectives created inefficiencies, as teams operated in silos, working toward different outcomes without a shared understanding of how their efforts contributed to the company's larger mission. In such an environment, collaboration became challenging, and decisions could be made in isolation without considering the broader context or implications for other teams. As a result, the organization's ability to innovate, respond to feedback, or even simply execute tasks effectively became compromised.

4.1.5. Conflicts in metrics communication

While all participants agreed that metrics were indispensable for ensuring efficiency and product quality, there was a recognition of the need for balance in their application. One developer explained *"We don't want to ruin development time on something that isn't right"* (Developer 7), emphasizing the importance of using metrics effectively without disrupting the development process. At the same time, it was crucial to remember that metrics should not be used as a tool for blame:

"Efficiency measurement is not something you use to blame someone. It is something that we all need to have a close look at on a regular basis to fine-tune and adjust our plans and ways of working to get better." (Developer 5)

This reflects a shared understanding that metrics should foster improvement rather than contribute to a toxic, punitive environment. Despite this consensus, several developers and managers pointed out challenges in the way metrics are communicated and perceived within the team. One developer noted that *"people are afraid to measure stuff. We don't show the good news as much as we show the bad news!"* (Developer 8), highlighting a tendency to focus on negative aspects, which creates a discouraging atmosphere. Another developer recounted their experience of quitting a task related to performance metrics, saying:

"Since I was forced to do this type of measures [performance metrics], I just quit. Yes, start doing something else. Because I don't want to play a police officer. It's not OK!" (Developer 9)

This sentiment points to the potential emotional and professional toll that a strict focus on metrics can have on individuals, especially when they feel compelled to enforce them in a punitive way. A manager, reflecting on this dynamic, emphasized the importance of trusting developers and avoiding micromanagement:

"Developers do not like to be pushed, micromanaged. We, management, need to trust them to do the right thing. They should not feel like management is hindering them to do a bad thing rather than allowing them to do the right thing!" (Manager 9)

This trust was considered vital for fostering a positive work environment, where developers felt empowered rather than controlled by metrics. When providing negative feedback based on measurement results, it was noted that it is essential to avoid making the feedback "too personal." People become defensive when metrics are interpreted as personal criticisms, which can lead to unnecessary rivalry. This was particularly evident in situations where defect-related data or burndown charts were openly compared, potentially creating tensions within and among teams. Ignoring the context or failing to consider individual team dynamics could harm relationships, lower morale, and even result in talent loss.

Metrics, if not handled carefully, could shift from being a supportive tool into a source of dysfunction, turning into a mechanism for blame rather than improvement:

"Metrics shouldn't be pressing; they should be 'un-pressing.' We shouldn't end up in people fading out and saying, okay, they are just judging me, right?" (Manager 1)

4.2. Champions' roles in mitigating challenges

4.2.1. Task and cognitive crafting

Distinguishing between task and cognitive crafting roles in our data was challenging, as champions adjusted their perceptions of work while taking on new tasks to address challenges in the metrics program implementation. They reported adopting roles such as 'metrics educators' to focus on information sharing and education about metrics, 'metrics interpreters' to assist in the interpretation of measurement results, and 'metrics data and tool evaluators' to facilitate relevant processes.

Information sharing and educating about metrics

The champions played a crucial role in ensuring that the organization understood and effectively utilized metrics by taking a role of "metrics educators." They changed their perceptions from simply being involved in metrics development and passive delivery figures into the ones who were the ambassadors informing about metrics in the organization. Taking the task of "metrics educators" encompassed facilitating communication across various levels and departments, helping to "demystify" the purpose of metrics:

"I think one of the things that champions do is explain what metrics are used for, what is the purpose of the metrics to improve quality, information dissemination, and information collection." (Champion 1)

This role was essential in creating a shared understanding of the metrics, ensuring that all team members were aligned in their approach to using data to improve operations and decision-making. The "educator" role was particularly critical in the early stages of the metrics program implementation, where knowledge about the tools and methodologies was still limited. During this phase, champions provided essential guidelines on how to work with the metrics, how to create new ones, and how to apply them effectively:

"In the beginning, we provided generic metrics guidelines on how to work with them, how to create new metrics and so on." (Champion 3)

These efforts were vital for helping both managers and employees navigate the complexities of the new systems, ensuring that everyone could engage with and make use of the metrics to their full potential.

As educators, champions went beyond merely sharing knowledge. They actively contributed to raising proficiency across the organization. As one champion explained:

"As a champion, one is already proficient in that area, and it's a good chance that you can then pass this proficiency onwards and try to lead the way." (Champion 1)

This leadership in knowledge transfer helped others improve their understanding and use of metrics. Beyond the technical instruction, champions were also able to inspire enthusiasm and foster a culture of continuous learning:

"I was enthusiastic to propagate this knowledge and to make sure that everybody gets the same level as I am." (Champion 4)

This passion for sharing knowledge was not only about improving the team's technical abilities but also about instilling a sense of collective progress and ensuring that everyone had the tools and understanding necessary to succeed.

The champions' role was also integral in fostering an environment where information about metrics was accessible and everyone had the opportunity to develop their skills. By acting as educators, but even advocates for the metrics program, the champions helped with bridging the gaps in understanding and facilitated collaboration across departments. As the organization continued to grow and evolve, this culture of shared knowledge, enthusiasm for learning, and commitment to transparency created a solid foundation for the effective use of metrics in driving business success.

Interpretation of measurement results

Champions played a pivotal role in ensuring the accurate interpretation of measurement results, taking on the role as "metrics interpreters." This role was essential for fostering strategic alignment, enhancing accountability, promoting transparency, and ensuring that metrics were aligned with broader organizational goals. As one champion noted:

"I need to convince people in my surrounding that this were good metric, and we need to make sure that everyone understands the metric and that we do the same interpretation." (Champion 2)

This responsibility underscored the champions' critical function in bridging the gap between raw data and actionable insights. Their work not only involved explaining metrics but also aligning diverse teams around a common understanding, ensuring that everyone interpreted the results consistently and correctly. Such transparency was essential to sustain confidence in the metrics and to ensure that decisions informed by data were both well-founded and strategic.

The champions recognized that the way metrics were interpreted and presented significantly influenced their impact on the organization: *"Who interprets matters the most and how it is presented by the interpreter also matters the most!"* (Champion 6). This highlighted the importance of the champions' role in not only providing data but also framing it in a way that was both accessible and meaningful to various stakeholders. Champions' task was to uncover valuable insights from metrics while enhancing overall understanding and trust within the organization. As another champion explained, part of their role was to *"work on the mindset of people,"* helping them to understand *"how to present things [measurement results] that they are really usable for the end users and easy to follow and understand!"* (Champion 1). This shift in mindset was key to transforming metrics from abstract data points into practical tools that could drive decision-making and foster a culture of continuous improvement.

Beyond improving understanding, champions played an essential role in guiding managers in the proper interpretation of measurement results, supporting fact-based decision-making. One champion remarked, *"We need to work very hard on creating definitions and good instructions to whoever uses these numbers at a high level!"* (Champion 4). This focus on creating clear definitions and providing contextual instructions ensured that managers and decision-makers had the tools to use metrics effectively and make informed choices aligned with the organization's goals. The champions acted as navigators, helping management understand the full story behind the data and interpret it in ways that were relevant to the organization's evolving needs. Moreover, the need for interpretation extended beyond management to teams as well. A champion noted:

"Just showing numbers, e.g., checking a dashboard, is not enough! The managers check the dashboard to get a general picture, but for the team, I need to interpret what the data shows!" (Champion 5)

This distinction emphasized the importance of champions in translating complex data into actionable insights that could be understood and acted upon at all levels of the organization. Without this critical interpretive role, taken by champions, teams might struggle to understand the significance of the metrics, leading to confusion and potentially misaligned actions.

To address the challenges of interpreting metrics, it was crucial for champions to possess not only a solid foundation of technical knowledge and experience with metrics but also access to a diverse array of real-world use cases. Knowledge and experience provided the technical understanding necessary to analyze and interpret data accurately, while use cases offered practical examples that contextualized the data, demonstrating how it was applied in real-world scenarios. These use cases highlighted best practices, common pitfalls, and strategies for success, helping to make more informed and

relevant interpretations. By incorporating these examples, champions were able to bridge the gap between abstract concepts and the practical application of metrics across the organization, ensuring that their interpretations were both grounded in reality and aligned with the company's objectives.

Finally, managers recognized the importance of carefully assigning champions with the appropriate backgrounds to ensure they could effectively interpret metrics and facilitate understanding across the organization. One manager noted:

"If you have a champion who is very technical and maybe an architect or something of a solution, they can bring in completely different perspectives than having maybe a champion that is an RTE and is focusing on some other things." (Manager 4)

This highlighted the need for diversity in the champions' backgrounds to ensure they could meet the various needs of different teams. Similarly, champions themselves acknowledged that translating metrics often required a solid understanding of the specific use case behind them:

"Some translation [of metrics] needs to happen, specifically when you talk to people who have a different background. If you want to translate that into a metrics requirement, you need to have a solid understanding of the actual use case behind it!" (Champion 5)

Thus, having champions from diverse backgrounds was not just a preference but a necessity to ensure that the metrics could be interpreted correctly and applied effectively across the organization.

Facilitating feedback for enhancing data and tool development

The champions crafted an essential role as "metrics data and tool evaluators." Instead of being passive users and consumers of metrics, they took a proactive approach by examining the needs of various teams *"looking into our different scrum teams and trying to understand what [tools] are missing"* (Champion 4). One of the key insights shared by the champions was that incorporating data from multiple sources could provide a more comprehensive understanding of software quality *"a source of data is not enough. We need [other] sources of data as well to learn something about the quality of software!"* (Champion 2). By broadening the range of data sources, they aimed to ensure that the metrics offered a holistic view of the software's health, making them more reliable and effective.

Data hygiene was also a significant area of focus for the champions. One champion emphasized, *"If hygiene of data is not maintained, then whatever metrics is being projected might never be real"* (Champion 6). They understood that the accuracy and reliability of metrics were directly tied to the quality of the underlying data. The champions often worked closely with other teams to ensure that the data used for metrics remained clean and accurate:

"I don't prepare the data directly, but there are people in the organization who prepare and present the data. But the data comes from other people. The data is dependent on cleanliness and health. So, we work with [name of a system], if information in [name of the system] is true, if we keep hygiene, then obviously that reflects into the metrics." (Champion 5)

The champions also found themselves engaged in discussions about balancing the efficiency of using tools with the necessity of regularly updating data to maintain its accuracy. While management made efforts to streamline the process, the champions recognized the cultural challenges surrounding data hygiene practices. There was a growing concern about whether the tools were simplifying tasks or becoming burdensome. One issue raised was the frustration among developers who felt that the constant need to update data detracted from their core responsibilities. As one champion noted, part of their role was to contribute to finding the right balance between the ease of using tools and the requirement to maintain them. This tension required ongoing attention to ensure that the tools remained efficient and did not become an additional burden on the developers.

In addition to providing feedback on how metrics should be used, champions also stressed the importance of clarifying what metrics should *not* be used for. One champion highlighted the potential risks of using metrics in ways that could encourage undesirable behavior, such as tying them directly to KPIs that could lead to gaming the system:

"I think in the first place we do not use them [metrics] directly in the KPI's for people, that is super dangerous. So, people will not report the defects if they know that they can have some kind of bonus. You should be careful about that game!" (Champion 2)

This caution reflected a deeper understanding of the potential for metrics to be misused if not carefully managed.

4.2.2. Relational crafting

Relational crafting role is related to crafting the boundaries of relationships in the work environment. The interviews revealed that two roles of "bridge builders" and "conflict mitigators" fall belong to relational crafting.

Bringing the gap between teams and teams and management across organization

In large organizations, such as the one studied, obtaining relevant information can be especially challenging due to the overwhelming volume of documentation and meetings. As a result, information can become lost, difficult to access, or diluted, making it hard to navigate and find the necessary data for informed decision-making. This is where the champions played a critical role as "bridge builders":

"Basically, [a champion is] a hand that will keep you always in the loop, and with big organizations where information [around metrics] is very easily diluted." (Champion 2)

The champions served as key connectors, ensuring that relevant information did not get lost in the maze of internal communications and processes. By offering a clear point of contact, champions helped bridge the gaps in information flow, making it more manageable for individuals to access the data they needed.

To create a more collaborative environment, champions also initiated informal forums for the teams to meet to collectively discuss the metrics they were using. These forums provided a space for open dialogue about what statistics were most useful and where the teams were lacking in terms of data: *"We tried to see [together with the teams] what stats we are looking for and what can help us identify where we are lacking"* (Champion 6). By fostering these open discussions, the champions encouraged the free flow of information and feedback, which was crucial for identifying gaps, refining metrics, and ensuring that everyone understood the purpose and limitations of the data being used. These forums helped build trust in the metrics and created a culture of transparency, collaboration, and continuous improvement. As one champion expressed, this initiative helped to *"let the information flow"* (Champion 1), ensuring that the teams were always aligned and working toward the same goals.

Some champions also saw their role as a vital opportunity to facilitate connections across teams and management, regardless of their position in the organization: *"An opportunity to extend, to reach out, to connect people, to connect the areas, and get things moving"* (Champion 1). This bridging role was essential for ensuring that a shared understanding of metrics existed across the organization. By fostering alignment in how metrics were interpreted, champions helped drive informed decision-making, improve performance, and support the achievement of organizational goals. They believed that ensuring consistency in metrics interpretation was crucial for achieving broader objectives and maximizing organizational efficiency. As one champion noted, aligning metrics was not just about understanding them horizontally across departments, but also vertically, to ensure that the needs of different roles were met *"because you can have different needs for different profiles depending on what role the people have"* (Champion 7). With champions across various organizational levels, each offering unique value depending on their area of expertise, a shared language and understanding of metrics became possible.

To ensure that this shared understanding was achieved, champions emphasized the need for direct communication channels between those who needed the metrics and those who developed them. These champions saw themselves as the “*mold that makes things glue*” (Champion 1) and as an “*extended arm*” (Champion 8) of both teams and management, ensuring continuous, bi-directional communication and timely feedback. By actively fostering open lines of communication, champions helped keep the process fluid and responsive, addressing any concerns or discrepancies quickly. As a champion pointed out, a critical element of their role was “*demonstrating that we’re listening*” (Champion 7). This collaborative spirit was essential for identifying common ground and facilitating smoother connections between various parts of the organization. Success hinged on eliminating barriers caused by siloed thinking and encouraging collaboration across teams:

“The key to success is bringing people together to collaborate and eliminating blockers caused by silo thinking, where each person focuses solely on their own tasks!” (Champion 5)

This holistic approach also allowed champions to foster an environment where the flow of information was continuous, collaboration was prioritized, and organizational goals were clearly aligned and pursued efficiently across all levels.

Conflict prevention and mitigation

Another crucial social role of champions was mitigating the potential negative impacts of metrics, i.e. “conflict mitigators” recognizing that “*metrics can become toxic, so we want to avoid that*” (Champion 2). The delivery of critical feedback, particularly in a high-stakes environment, requires careful handling to avoid misunderstandings and conflict. Champions played an important role in preventing and mitigating conflicts related to the communication of measurement results. They did this by creating safe spaces for dialogue—arenas where team members could openly discuss concerns, ask questions, and address misunderstandings early on. By fostering a supportive environment, champions helped ensure that communication about metrics did not escalate into confrontations or resistance. As one champion explained, unsuccessful communication around negative results could lead to “*knee-jerk reactions which nobody wants*” (Champion 8), which further underscores the need for champions to manage the flow of feedback with care and diplomacy.

Conflicts often arise in the software development process when metrics, such as test results, reveal issues that affect multiple teams. A manager highlighted an example of how such conflicts could unfold:

“In software development, if you see tests as metrics, [conflict situations happen] because different teams have tests, and in many cases, different teams together build a software block. Each team has its own tests, and often one team’s actions break something that another team is working on. Usually, the thing that detects this is the test. So, when a test fails, it can quickly turn into a blame game: ‘Ah no, it was not US, it was THEM.’ Then the other team says, ‘No, it was not US, it was YOU. Ah no, it must be the TEST!’ And sometimes, the people try to not only blame each other, but they even start blaming the METRICS.” (Manager 7)

This highlights the champions’ role in establishing a “*culture of no blame, even though someone is making an error*” (Champion 8). The champions’ approach focused on separating personal emotions from work-related issues, creating a space where feedback was about process and improvement, not individual performance. Another champion shared a method of handling conflict:

“I try to go to the facts and make it clear... I’m not questioning the work they’ve done because I think that what they’ve done is bad. I try to separate the personal from the work. The first thing is, ‘Okay, this is not personal; I respect your work.’ Then, I try to analyze if the metric is speaking the truth. If we both agree that it’s accurate, the next step is to figure out what we need to do to move forward. I’m sorry, but if you accept the result, then it means that something you did caused the metric to show this number, and we need to address it. But the key is always to start by

determining whether the test or metric is truthful and use that as the foundation for a constructive conversation where we remove the personal element and avoid blame.” (Champion 3)

By creating a foundation of fact-based discussions and fostering an environment of trust, champions helped diffuse tension and focused the conversation on problem-solving rather than blame. Their role of conflict mitigators could guide teams through challenging feedback and encourage collaboration, being vital in maintaining a productive, non-toxic culture around metrics.

5. Discussion

This paper identifies the challenges in metrics program implementation and, by adopting the theoretical perspective of job crafting (Wrzesniewski & Dutton, 2001), explores the roles that “metrics champions” play in mitigating these challenges. While existing literature has extensively examined software metrics and championing in isolation, there remains a notable scarcity of empirical research that focuses on the intersection of these areas, particularly in relation to the role of champions in metrics implementation within organizations (Berbyuk Lindström et al., 2025; Meding et al., 2021). By discussing the “soft side” of software metrics, this study contributes to the growing body of research on the non-technical aspects of software project management (Mtsweni et al., 2016; Zaman et al., 2019). Implementing software metrics and integrating them into organizational management practices can trigger substantial changes within an organization (Moran & Brightman, 2000). A critical strategy in such transformations is the involvement of change agents, such as champions, who advocate for and facilitate the adoption of new practices that benefit the organization (Negoita et al., 2022; Petrou et al., 2018).

Starting with challenges in measurement program implementation, our findings indicate that they are often related to “soft factors” such as lack of shared understanding of the purpose of metrics, their objectives, and usage, lack of communication between teams and management, and presenting measurement results in a non-blaming manner. These factors have been overlooked in software metrics research (Hall & Fenton, 1994). Yet they are essential for driving organizational change and fostering a culture of accountability (Provera et al., 2010). One of the key challenges identified in the literature is the lack of clarity in defining the purpose and scope of metrics (Baroni, 2002; Berbyuk Lindström et al., 2021; Kerzner, 2023), without which stakeholders may be uncertain about what the metrics are meant to measure and how they align with the organization’s broader goals, resulting in confusion, impeding effective decision-making and accurate progress assessment (Cokins, 2004). Our findings show that difficulties often arise in interpreting measurement results, especially when data is complex or not immediately actionable. Without clear guidelines on interpreting the results, stakeholders may struggle to make informed decisions, potentially leading to frustration and diminishing trust in the measurement system. Moreover, the absence of continuous feedback on the measurement process and the tools used for data collection can render these tools obsolete, reducing their relevance over time and contributing to disengagement among employees (Fenton & Bieman, 2014). This also echoes the recent research about the importance of feedback and mutual understanding between IT side and business side (de Araújo et al., 2025). Another challenge is the misalignment of goals and interpretations across different teams and levels of the organization. When different departments or teams operate in silos or have competing priorities, it can lead to confusion and inconsistencies in how metrics are applied and interpreted. This misalignment can hinder the effectiveness of the metrics, as it undermines the development of a unified approach to measurement. Furthermore, poor communication of the metrics and their results can exacerbate these issues, particularly when stakeholders interpret the data in conflicting ways (de Waal et al., 2019).

Turning to the metrics champions, we explore the connection between job crafting and champion theories, both of which emphasize self-initiated, transformative behaviors that shape work experiences and organizational outcomes. Our metrics champions tackled identified challenges by actively creating new roles and taking on initiatives to reinterpret and reframe the purpose of metrics, guiding their colleagues and ensuring alignment with organizational goals (Philipp et al., 2022).

Our findings highlight the roles champions developed during the measurement program implementation such as “metrics educator,” “metrics interpreter,” and “metrics data and tool evaluator,” all essential for addressing key challenges. Additionally, we observe the intertwined nature of task, cognitive and even relational crafting. While Wrzesniewski and Dutton (2001) distinguish between task, cognitive, and relational crafting, we note task crafting and cognitive crafting often co-occur in practice. Champions not only modified tasks but also shifted their perceptions of their roles at the meantime. They view themselves not as passive adopters of metrics, but proactive ambassadors of change. This cognitive view influences how they craft the tasks and relationships they engage in.

Furthermore, we identify two distinct relational crafting roles within the metrics context: “bridge builders” and “conflict mitigators.” The role of champions as conflict mitigators remains underexplored in the literature, yet our findings suggest it is crucial for preventing tensions (Husain, 2013) and fostering collaboration during metrics implementation (Hauschildt, 1999). Both roles emphasize the importance of communication and networking across teams, particularly in resolving conflicts arising from competing stakeholder interests or differing metric interpretations (Moran & Brightman, 2000). In our study, we also observe that relational crafting intersects with task and cognitive crafting, as building relationships and facilitating communication are central to both educating stakeholders and interpreting metrics effectively. Champions who educate and interpret metrics must also build relationships and mitigate conflicts, demonstrating that effective job crafting requires a holistic approach where different roles dynamically interact to drive meaningful organizational change (Husain, 2013). Here, we witness the intersection of job crafting and championing theories. While job crafting primarily focuses on an individual’s task and cognitive crafting, as well as forming relationships for personal benefit, championing is centered on building connections with others to achieve a specific goal, in this case, driving organizational change through the implementation of a measurement program. Given this distinction, it is unsurprising that relational crafting plays a more pronounced role in championing compared to other job crafting dimensions. Change is fundamentally about people, and metrics champions must influence them. Consequently, all champion roles inherently involve relational crafting elements, which are essential for effectively driving organizational transformation.

6. Conclusions

This study contributes to software measurement research by examining the multifaceted and evolving roles of metrics champions in navigating the human, organizational, and interpretive challenges of measurement program implementation. Our findings show that champions bridge technical and managerial perspectives, advocate best practices, and promote organizational learning by engaging in task, cognitive, and relational crafting. Rather than occupying fixed roles, champions continually negotiate and adapt their responsibilities—educating stakeholders, interpreting results, evaluating tools, building bridges across teams, and mitigating conflicts. Through these activities, they help shape shared meaning around metrics and ensure their constructive use in decision-making.

Our study contributes to the theoretical understanding of software metrics implementation by integrating job crafting theory with the concept of championing. Our findings highlight the interconnected, dynamic, and evolving nature of champion roles, offering a human-centered perspective on software metrics implementation that has often been dominated by technical considerations. Unlike prior quantitative research on job crafting, our study emphasizes the significance of individual agency and communication (Wawak, 2024) in driving the success of measurement programs.

For practitioners, our findings underscore the importance of empowering metrics champions to act as bridges between technical teams and management. Organizations should provide champions with clear mandates, time, training, and support to effectively promote best practices and foster a shared understanding of metrics. Furthermore, successful measurement programs require cultural alignment and establishing communication channels, not just technical implementation. Encouraging open dialogue and feedback can help prevent resistance and misinterpretation of metrics. Finally, improving data hygiene and reducing the burden of metric-related tasks on developers can enhance engagement, making measurement programs more effective and sustainable in the long term.

7. Limitations and future research

Despite these contributions, several limitations must be acknowledged. First, the study is based on a single case within a large energy-sector organization. While the context provides rich insights into distributed software development and measurement transformation, organizational culture and industry-specific practices may limit generalizability. Second, the findings rely primarily on qualitative interviews and workshops, which are susceptible to self-reporting biases and selective recall. Although perspectives were triangulated across developers, managers, and champions, subjective interpretation cannot be fully eliminated. Third, the study captures the implementation process at a specific moment in time. Metrics work and championing are dynamic and evolving, and a longitudinal design would offer deeper insight into how roles develop, stabilize, or change as measurement programs mature. Fourth, much of the analysis relies on champions' own perceptions of their role, while employees and managers may experience or interpret the champions' influence and activities quite differently. Fifth, the study does not systematically account for differences among types of metrics used within the case organization. Distinctions between process performance metrics (e.g., features delivered, cycle time), software quality metrics (e.g., maintainability, security, complexity), and operational metrics (e.g., response time, error rate) may shape how champions promote, communicate, and legitimize measurement practices. Because the analysis did not explicitly compare employee attitudes or championing behaviors across these categories, the findings may overlook important nuances in how different metrics are received, utilized, or supported. Finally, although job crafting theory framed the analysis, day-to-day work practices, interactions, and communication patterns were not observed directly.

Future research should employ longitudinal and more granular designs to explore how different job crafting roles emerge at various stages of a metrics initiative, how champions' influence evolves, and how organizational structures support or constrain their work. Combining qualitative methods with observational or quantitative data could further illuminate how metrics are interpreted, communicated, and enacted in practice, strengthening understanding of the human dynamics that underpin sustainable measurement programs.

Acknowledgments

This project has been funded by Software Center <https://www.software-center.se>. We thank all participants for their valuable contributions to this research.

References

- Araújo, M. V. M., Dornelas, J. S., & da Silva, R. B. (2025). Perceptual mapping of the association between it project success and factors promoting strategic alignment. *International Journal of Information Systems and Project Management*, 13(2), 1-21. <https://doi.org/10.12821/ijispm130203>
- Assalaarachchi, L., Liyanage, M., & Hewagamage, C. (2025). A framework of critical success factors of cloud-based project management software adoption. *International Journal of Information Systems and Project Management*, 13(2), 1-20. <https://doi.org/10.12821/ijispm130204>
- Baroni, A. L. (2002). Formal definition of object-oriented design metrics. Master of Science in Computer Science Thesis, Vrije Universiteit Brussel, Belgium.
- Beath, C. M. (1991). Supporting the information technology champion. *MIS Quarterly*, 15(3), 355-372. <https://doi.org/10.2307/249647>
- Behn, M., & Silviu, G. (2025). Measuring and predicting teamwork quality in virtual project teams. *International Journal of Information Systems and Project Management*, 13(1), 1-24. <https://doi.org/10.12821/ijispm130104>

- Berbyuk Lindstrom, N. (2023). It is no blame game! Challenges and best practices in communicating metrics in software development organizations. ICIS (International conference on Information systems), International Research Workshop on IT Project Management., Hyderabad, India. <https://aisel.aisnet.org/irwitpm2023/1>
- Berbyuk Lindström, N., Asatiani, A., Mankevich, V., & Zhang, Y. (2025). The soft side of hard metrics: Lessons from software development in multinational organizations. *Business Horizons*. In press. <https://doi.org/10.1016/j.bushor.2025.11.003>
- Berbyuk Lindström, N., Koutsikouri, D., Staron, M., Meding, W., & Söder, O. (2021). Understanding metrics team-stakeholder communication in agile metrics service delivery. 28th Asia-Pacific Software Engineering Conference (APSEC), IEEE, Taipei, Taiwan. <https://doi.org/10.1109/APSEC53868.2021.00047>
- Berg, J. M., Dutton, J. E., & Wrzesniewski, A. (2013). Job crafting and meaningful work. In B. J. Dik, Z. S. Byrne, & M. F. Steger (Eds.), *Purpose and meaning in the workplace* (pp. 81–104). American Psychological Association.
- Berg, J. M., Wrzesniewski, A., & Dutton, J. E. (2010). Perceiving and responding to challenges in job crafting at different ranks: When proactivity requires adaptivity. *Journal of organizational behavior*, 31(2 - 3), 158-186. <https://doi.org/10.1002/job.645>
- Bindl, U. K., Unsworth, K. L., Gibson, C. B., & Stride, C. B. (2019). Job crafting revisited: Implications of an extended framework for active changes at work. *Journal of Applied Psychology*, 104(5), 605–628. <https://doi.org/10.1037/apl0000362>
- Boehm, B., & Turner, R. (2005). Management challenges to implementing agile processes in traditional development organizations. *IEEE software*, 22(5), 30-39. <https://doi.org/10.1109/MS.2005.129>
- Cameron, K. S. (2011). *Diagnosing and changing organizational culture: Based on the competing values framework*. John Wiley & Sons.
- Chakrabarti, A. K. (1974). The role of champion in product innovation. *California Management Review*, 17(2), 58-62. <https://doi.org/10.2307/4116456>
- Cokins, G. (2004). *Performance management: Finding the missing pieces (to close the intelligence gap)*. John Wiley & Sons.
- Cugueró-Escofet, N., & Rosanas, J. M. (2017). The ethics of metrics: Overcoming the dysfunctional effects of performance measurements through justice. *Journal of Business Ethics*, 140, 615-631. <http://doi.org/10.1007/s10551-016-3049-2>
- Cusumano, M. A., & Selby, R. W. (1998). *Microsoft secrets: How the world's most powerful software company creates technology, shapes markets, and manages people*. Simon and Schuster.
- De Clercq, D., & Pereira, R. (2024). Violated contracts, inadequate career support, but still forgiveness: Key organizational factors that determine championing behaviors. *European Management Review*, 21(1), 118-133. <https://doi.org/10.1111/emre.12560>
- de Waal, A., Weaver, M., Day, T., & van der Heijden, B. (2019). Silo-busting: Overcoming the greatest threat to organizational performance. *Sustainability*, 11(23), 6860. <https://doi.org/10.3390/su11236860>
- Dong, L., Sun, H., & Fang, Y. (2007). Do perceived leadership behaviors affect user technology beliefs? An examination of the impact of project champions and direct managers. *Communications of the Association for Information Systems*, 19(1), 31. <https://doi.org/10.17705/1CAIS.01931>

- Drechsler, K., Reibenspiess, V., Eckhardt, A., & Wagner, H.-T. (2021). Innovation champions' activities and influences in organizations—a literature review. *International Journal of Innovation Management*, 25(06), 2150066. <https://doi.org/10.1142/S1363919621500663>
- Fenton, N., & Bieman, J. (2014). *Software metrics: A rigorous and practical approach*. CRC press.
- Fenton, N. E., & Neil, M. (2000). *Software metrics: Roadmap*. ICSE '00: Proceedings of the Conference on The Future of Software Engineering, Limerick Ireland
- Fernandez, S., & Rainey, H. G. (2017). Managing successful organizational change in the public sector. In *Debating public administration* (pp. 7-26). Routledge.
- Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research: Notes on the gioia methodology. *Organizational research methods*, 16(1), 15-31. <https://doi.org/10.1177/10944281124521>
- Goethert, W., & Hayes, W. (2001). Experiences in implementing measurement programs. <https://doi.org/10.21236/ADA399165>
- Grant, A. M., & Parker, S. K. (2009). 7 redesigning work design theories: The rise of relational and proactive perspectives. *Academy of Management Annals*, 3(1), 317-375. <https://doi.org/10.5465/19416520903047327>
- Griffin, M. A., Neal, A., & Parker, S. K. (2007). A new model of work role performance: Positive behavior in uncertain and interdependent contexts. *Academy of Management Journal*, 50(2), 327-347. <https://doi.org/10.5465/amj.2007.24634438>
- Hall, T., & Fenton, N. (1994). Implementing software metrics—the critical success factors. *Software Quality Journal*, 3, 195-208. <https://doi.org/10.1007/BF00403557>
- Heng, M. S., Trauth, E. M., & Fischer, S. J. (1999). Organisational champions of it innovation. *Accounting, Management and Information Technologies*, 9(3), 193-222. [https://doi.org/10.1016/S0959-8022\(99\)00008-9](https://doi.org/10.1016/S0959-8022(99)00008-9)
- Howell, J. M. (2005). The right stuff: Identifying and developing effective champions of innovation. *Academy of Management Perspectives*, 19(2), 108-119. <https://doi.org/10.1016/j.jbusvent.2004.06.001>
- Howell, J. M., & Higgins, C. A. (1990). Champions of change: Identifying, understanding, and supporting champions of technological innovations. *Organizational dynamics*, 19(1), 40-55. [https://doi.org/10.1016/0090-2616\(90\)90047-S](https://doi.org/10.1016/0090-2616(90)90047-S)
- Husain, Z. (2013). Effective communication brings successful organizational change. *The Business & Management Review*, 3(2), 43.
- IEEE. (1998). *IEEE standard for a software quality metrics methodology (IEEE Std 1061-1998)*. <https://doi.org/10.1109/IEEESTD.1998.243394>
- Kaplan, R. S., & Norton, D. P. (2005). *The balanced scorecard: Measures that drive performance (Vol. 70)*. Harvard Business Review Boston, MA, USA.
- Kerzner, H. (2014). *Project management 2.0: Leveraging tools, distributed collaboration, and metrics for project success*. John Wiley & Sons.
- Kerzner, H. (2023). *Project management metrics, KPIs, and dashboards: A guide to measuring and monitoring project performance*. John Wiley & Sons.
- Klein, J. A. (2022). Effectively use metrics as part of process safety feedback and learning systems to monitor and improve performance. *Process Safety Progress*, 41(3), 507-511. <https://doi.org/10.1002/prs.12358>

- Korpivaara, I., Tuunanen, T., & Seppänen, V. (2021). Performance measurement in scaled agile organizations. Proceedings of 54th Annual Hawaii International Conference on System Sciences, University of Hawai'i at Manoa.
- Kupiainen, E., Mäntylä, M. V., & Itkonen, J. (2015). Using metrics in agile and lean software development—a systematic literature review of industrial studies. *Information and Software Technology*, 62, 143-163. <https://doi.org/10.1016/j.infsof.2015.02.005>
- Lazazzara, A., Tims, M., & De Gennaro, D. (2020). The process of reinventing a job: A meta-synthesis of qualitative job crafting research. *Journal of Vocational Behavior*, 116, 103267. <https://doi.org/10.1016/j.jvb.2019.01.001>
- Lenberg, P., Feldt, R., & Wallgren, L. G. (2015). Behavioral software engineering: A definition and systematic literature review. *Journal of Systems and Software*, 107, 15-37. <https://doi.org/10.1016/j.jss.2015.04.084>
- Liker, J. K. (2004). *The toyota way: 14 management principles from the world's greatest manufacturer* (2 ed.). McGraw-Hill Education.
- Matook, S., & Maruping, L. M. (2014). A competency model for customer representatives in agile software development projects. *MIS Quarterly Executive*, 13(2), 77-95.
- Meding, W., Staron, M., & Söder, O. (2021). Meteam—a method for characterizing mature software metrics teams. *Journal of Systems and Software*, 180, 111006. <https://doi.org/10.1016/j.jss.2021.111006>
- Meneely, A., Smith, B., & Williams, L. (2013). Validating software metrics: A spectrum of philosophies. *ACM Transactions on Software Engineering and Methodology (TOSEM)*, 21(4), 1-28. <https://doi.org/10.1145/2377656.2377661>
- Miech, E. J., Rattray, N. A., Flanagan, M. E., Damschroder, L., Schmid, A. A., & Damush, T. M. (2018). Inside help: An integrative review of champions in healthcare-related implementation. *SAGE Open Medicine*, 6. <https://doi.org/10.1177/2050312118773261>
- Mitre-Hernández, H. A., Javier, G.-G., Antonio, D. A.-S., & Perla, V.-E. (2014). Designing a strategic measurement program for software engineering organizations: Discovering difficulties and problems. *Ingeniería, investigación y tecnología*, 15(2), 253-269. [https://doi.org/10.1016/S1405-7743\(14\)72215-2](https://doi.org/10.1016/S1405-7743(14)72215-2)
- Moran, J. W., & Brightman, B. K. (2000). Leading organizational change. *Journal of workplace learning*, 12(2), 66-74. <https://doi.org/10.1108/13665620010316226>
- Mtsweni, E. S., Hörne, T., & van der Poll, J. A. (2016). Soft skills for software project team members. *International Journal of Computer Theory and Engineering*, 8(2), 150-155. <https://doi.org/10.7763/IJCTE.2016.V8.1035>
- Nandan Prasad, A. (2024). Organizational culture and change management. In *Introduction to data governance for machine learning systems* (pp. 625-678). Springer.
- Negoita, B., Rahrovani, Y., Lapointe, L., & Pinsonneault, A. (2022). Distributed it championing: A process theory. *Journal of Information Technology*, 37(1), 2-30. <https://doi.org/10.1177/02683962211019406>
- Negoita, B., Rahrovani, Y., Lapointe, L., Pinsonneault, A., & Mirza, M. (2012). It champions as agents of change: A social capital perspective ICIS 2012 Proceedings. 15, <https://aisel.aisnet.org/icis2012/proceedings/ResearchInProgress/15>
- Ngereja, B. J., Hussein, B., & Wolff, C. (2024). A comparison of soft factors in the implementation and adoption of digitalization projects: A systematic literature review. *International Journal of Information Systems and Project Management*, 12(2), 70-86. <https://doi.org/10.12821/ijispm120204>
- Nicolette, D. (2015). *Software development metrics*. Simon and Schuster.

- Niessink, F., & Van Vliet, H. (2001). Measurement program success factors revisited. *Information and Software Technology*, 43(10), 617-628. [https://doi.org/10.1016/S0950-5849\(01\)00168-9](https://doi.org/10.1016/S0950-5849(01)00168-9)
- Petrou, P., Demerouti, E., & Schaufeli, W. B. (2018). Crafting the change: The role of employee job crafting behaviors for successful organizational change. *Journal of Management*, 44(5), 1766-1792. <https://doi.org/10.1177/01492063156249>
- Philipp, P., Tobisch, F., & Matthes, F. (2022). Challenges and success factors for metrics in large-scale agile development. *AMCIS 2022 Proceedings*. 2. https://aisel.aisnet.org/amcis2022/sig_itpm/sig_itpm/2
- Provera, B., Montefusco, A., & Canato, A. (2010). A 'no blame' approach to organizational learning. *British Journal of Management*, 21(4), 1057-1074. <https://doi.org/10.1111/j.1467-8551.2008.00599.x>
- Rankinen, J.-A., & Haapasalo, H. (2025). Sources of project tool misalignment in multistakeholder projects. *Journal of Information Systems and Project Management*, 13(3), 1–19. <https://doi.org/10.12821/ijispm130303>
- Reibenspiess, V., Drechsler, K., Eckhardt, A., & Wagner, H.-T. (2018). Enabling innovation champions in organizations—results of a systematic literature analysis the 51st Hawaii International Conference on System Sciences, Hilton Waikoloa Village, Hawaii
- Renken, J., & Heeks, R. (2019). Champions of is innovations. *Communications of the Association for Information Systems*, 44(1), 38. <https://doi.org/10.17705/1CAIS.04438>
- Schon, D. A. (1963). Champions for radical new inventions. *Harvard business review*, 41, 77-86.
- Shastri, Y., Hoda, R., & Amor, R. (2021). The role of the project manager in agile software development projects. *Journal of Systems and Software*, 173, 110871. <https://doi.org/10.1016/j.jss.2020.110871>
- Shea, C. M. (2021). A conceptual model to guide research on the activities and effects of innovation champions. *Implementation research and practice*, 2. <https://doi.org/10.1177/263348952199044>
- Sheffield, J., & Lemétayer, J. (2013). Factors associated with the software development agility of successful projects. *International Journal of Project Management*, 31(3), 459-472. <https://doi.org/10.1016/j.ijproman.2012.09.011>
- Spagnuolo, D., Bartolini, C., & Lenzini, G. (2016). Metrics for transparency Data Privacy Management and Security Assurance: 11th International Workshop, DPM 2016 and 5th International Workshop, QASA 2016, Heraklion, Crete, Greece
- Staron, M. (2012). Critical role of measures in decision processes: Managerial and technical measures in the context of large software development organizations. *Information and Software Technology*, 54(8), 887-899. <https://doi.org/10.1016/j.infsof.2012.02.003>
- Staron, M., & Meding, W. (2018). *Software development measurement programs: Development, management and evolution*. Cham: Springer International Publishing AG. <https://doi.org/10.1007/978-3-319-91836-5>
- Staron, M., Meding, W., & Nilsson, C. (2009). A framework for developing measurement systems and its industrial evaluation. *Information and Software Technology*, 51(4), 721-737. <https://doi.org/10.1016/j.infsof.2008.10.001>
- Suh, A., Appleby, G., Anderson, E. W., Finelli, L., Chang, R., & Cashman, D. (2023). Are metrics enough? Guidelines for communicating and visualizing predictive models to subject matter experts. *IEEE Transactions on Visualization and Computer Graphics*, 30(7), 4137-4153. <https://doi.org/10.1109/TVCG.2023.3259341>
- Székely, F., & Knirsch, M. (2005). Responsible leadership and corporate social responsibility: Metrics for sustainable performance. *European Management Journal*, 23(6), 628-647. <https://doi.org/10.1016/j.emj.2005.10.009>

- Tabaka, J. (2006). *Collaboration explained: Facilitation skills for software project leaders*. Pearson Education
- Walk, M., & Handy, F. (2018). Job crafting as reaction to organizational change. *The Journal of Applied Behavioral Science*, 54(3), 349-370. <https://doi.org/10.1177/0021886318777227>
- Wallace, L. G., & Sheetz, S. D. (2014). The adoption of software measures: A technology acceptance model (tam) perspective. *Information & Management*, 51(2), 249-259. <https://doi.org/10.1016/j.im.2013.12.003>
- Wawak, S. (2024). Enhancing project quality through effective team management. *International Journal of Information Systems and Project Management*, 12(2), 50-67. <https://doi.org/10.12821/ijispm120203>
- Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of management review*, 26(2), 179-201. <https://doi.org/10.5465/amr.2001.4378011>
- Zaman, U., Jabbar, Z., Nawaz, S., & Abbas, M. (2019). Understanding the soft side of software projects: An empirical study on the interactive effects of social skills and political skills on complexity–performance relationship. *International Journal of Project Management*, 37(3), 444-460. <https://doi.org/10.1016/j.ijproman.2019.01.015>
- Zhang, F., & Parker, S. K. (2019). Reorienting job crafting research: A hierarchical structure of job crafting concepts and integrative review. *Journal of organizational behavior*, 40(2), 126-146. <https://doi.org/10.1002/job.2332>

Biographical notes



Nataliya Berbyuk Lindström is an Associate Professor of Communication with specialization in Applied Communication Technology at the Division of Information Systems, Department of Applied Information Technology, University of Gothenburg. She is affiliated with the Swedish Centre for Digital Innovation (SCDI) and Software Center. Her research focuses on digital transformation in software-intensive organizations, with particular emphasis on software metrics, organizational change, communication, and leadership. Her work examines the human and behavioral aspects of data-driven decision-making, including stakeholder communication, governance, and the role of change agents in large-scale software development and measurement initiatives.

ORCID: 0000-0002-4701-7884



Yixin Zhang is an Associate Professor at Department of Applied IT, University of Gothenburg in Sweden. She is also a member of Swedish Center for Digital Innovation. She holds a PhD degree in information systems from Hong Kong University of Science and Technology. Her research interests include digital governance in the public sector, green consumption, social media, online communities, and human–computer interaction. Her work has been published in *Information Systems Journal*, *Information and Management*, *International Journal of Information Management*, *Journal of Service Research* and others.

ORCID: 0000-0001-8261-656X