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Exploring Organizational Dynamics for Adaptive Success

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Abstract: The landscape of business intelligence (BI) is marked by rapid growth, extensive research, and practical implementations, reflecting its sustained relevance in modern business strategies. This paper delves into the dynamics of BI, particularly focusing on the interplay between maturity and agility. While BI maturity emphasizes optimization and predefined goals, BI agility prioritizes adaptability and response to change. The paper highlights the contradictions between these concepts, emphasizing the need for a balanced approach in BI strategy formulation. The role of organizational culture in fostering BI agility is explored through literature review and interviews with BI professionals. Key insights include the necessity of an open culture for effective BI utilization, clear strategic vision, decision delegation, information sharing, business-IT cooperation, and a learning-oriented mindset. These cultural factors contribute significantly to BI effectiveness and the ability to navigate dynamic business landscapes. The paper proposes pillars of agile maturity supported by an open organizational culture, including efficient communication, information integration, creative problem-solving, and close collaboration between business and IT. These pillars underscore the importance of a flexible and open mindset in navigating BI challenges and ensuring sustained value. Empirical validation and further research are suggested to deepen our understanding of the impact of organizational culture on BI agility and effectiveness.

Keywords: BI maturity; BI agility; organizational dynamics

Introduction

The landscape of business intelligence (BI) has traversed through various phases of innovation, witnessing rapid growth, heightened interest, extensive research, and practical implementations. Despite these cycles of evolution, BI remains a vital component in modern business strategies, continually adapting to meet the dynamic needs of organizations (Bani-Hani et al., 2018). With advancements in BI systems, such as self-service reporting and decision support tools, the scope and user base of BI have expanded significantly, indicating a sustained relevance in contemporary business environments.

The dynamism of BI operations is intricately linked to its ability to navigate the ever-changing landscape of business and technology. This entails not only adapting to ongoing developments but also maintaining the core functionality of providing actionable insights and data-driven decision support (Bani-Hani et al., 2018). This dual mandate presents a nuanced challenge, wherein BI must evolve without compromising its foundational role in facilitating informed decision-making.

The current discourse surrounding BI's status reflects a spectrum of perspectives, ranging from views that perceive BI as a matured and well-defined set of activities akin to traditional reporting functions (Zimmer et al., 2012) to notions that highlight BI's continuous evolution through advanced analytics and emerging technologies (Suša Vugec et al., 2020). This diversity of opinions underscores the multifaceted nature of BI, encompassing both established practices and cutting-edge innovations.

One key aspect of understanding BI's dynamics lies in reconciling these differing perspectives within a cohesive framework. While some advocate for a consolidated and standardized approach to BI operations (Arnott et al., 2019), others emphasize the need for adaptability and comprehensive

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information coverage (Philips-Wren et al., 2020). This dichotomy reflects the ongoing debate within the BI community regarding the balance between maturity and agility in BI strategies.

As BI continues to evolve, it is essential to delve deeper into the interplay between maturity and agility, acknowledging that BI's maturity should not lead to stagnation but rather foster a culture of continuous improvement and adaptability (Olszak, 2013). This paper seeks to contribute to this discourse by exploring how BI's dynamic nature influences organizational decision-making processes and strategic outcomes.

Business Intelligence Dynamics

The evolution and adaptation of business intelligence (BI) systems have sparked various research inquiries into BI dynamics, with a particular focus on BI maturity and agility. It is important to note that while many studies discuss maturity or agility in the broader context of business analytics or information systems (Cosic et al., 2012; Elliott, 2014; Knabke and Olbrich, 2016; Sambamurthy and Zmud, 1997; Van Oosterhout, 2006; Seo and LaPaz, 2008; Lu and Ramamurthy, 2011; Vejseli et al., 2020), these concepts intersect significantly with BI activities, often referred to as "Business Intelligence & Analytics" (BI&A).

The distinction between BI maturity and agility lies in their respective targets and developmental dynamics. While maturity typically emphasizes achieving predefined goals and optimizing processes, agility focuses on the ability to adapt and respond swiftly to changing circumstances (Sambamurthy and Zmud, 1997). Despite these nuanced differences, it is essential to recognize that BI, as a well-defined function of advanced informing, is inherently entangled in the ongoing discourse between efficiency and flexibility.

The coexistence of maturity and agility within the BI landscape raises questions about their compatibility and applicability to the same domain. However, it is evident that both concepts are integral to enhancing BI's effectiveness in generating quality insights and navigating the complexities of modern business environments. Although agility is less frequently discussed alongside maturity, their interrelation is undeniable, reflecting the dual imperatives of stability and adaptability that BI endeavors to balance.

BI Maturity

The integration or upgrade of a Business Intelligence (BI) system within an enterprise is a gradual process that unfolds over time, involving stages of acceptance, maturation, and recognition of its value. This journey of implementing and adopting BI systems has become standardized, characterized by distinct phases that contribute to the development of the BI maturity concept and various BI maturity models. This process is structured around value enhancement at each step, incorporating past experiences, current assessments, and future projections.

Maturity, as defined by Cosic et al. (2012), signifies the level of advancement in organizational capabilities, processes, or resources. BI maturity models have been formulated to provide a framework for understanding the dynamics of BI system development and adoption (Hribar Rajteric, 2010). These models offer a structured perspective on BI systems, aiming to guide their evolution and management effectively (Raber et al., 2013). However, a consensus regarding what constitutes a mature BI system or the ultimate level of BI maturity remains somewhat ambiguous. This ambiguity necessitates a closer examination of potential contradictions, especially within an evolving context.

BI systems must evolve within organizational boundaries to gain acceptance and deliver anticipated value, all while adapting to a changing business environment (thus, developing BI agility). Cosic et al. (2012) highlight the need for flexibility in their proposal of a business analytics maturity model, acknowledging the evolutionary and dispersed nature of business analytics innovations within organizations.

In essence, BI maturity models encapsulate the dynamics of BI implementation and adoption, reflecting the growth in BI value and aiming for an optimal state. However, the constant shifts in the business landscape and BI technology introduce a tension between maturity objectives and the

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readiness for transformative changes. This tension underscores the ongoing need for organizations to strike a balance between stability and adaptability in their BI strategies.

BI Agility

For years, there has been a consensus among both researchers and practitioners regarding the significant value that a well-implemented Business Intelligence (BI) system can bring to business operations. However, this value is not static; it is contingent upon the evolving nature of the business environment and the ongoing mutations within BI functions. The adaptability of Information Technology (IT) plays a crucial role, either facilitating or hindering information-related activities within organizations (van Oosterhout, 2006). Despite advancements in technology, rapid changes in the business landscape often lead to dissatisfaction and confusion among business users (Elliott, 2014).

Support for the necessity of BI agility stems from various factors such as volatile environments, evolving data sources and models, and the imperative to support organizational agility (Knabke, Olbrich, 2013; Baars & Hütter, 2015; Zimmer et al., 2012). In response to environmental shifts, BI systems can assume different roles: as a valuable sensing asset providing predictive insights, as a functional tool for current information needs, or as a stagnant system that fails to adapt and becomes a liability.

The emergence of "shadow BI" applications often occurs when the pace of change surpasses the capabilities of established BI systems. While these ad-hoc solutions may offer agility in the short term, they lack structure and oversight, leading to inconsistencies and inefficiencies (Kretzer & Maedche, 2014). Self-service BI is another concept that emphasizes agility, but it also requires governance and oversight to be effective (Lennerholt, 2022; Passlick et al., 2020; Schlesinger & Rahman, 2016).

Maintaining a BI system's value and relevance over time necessitates agility—simultaneously enhancing capabilities and adapting to external changes. The Dynamic Capabilities Approach provides a theoretical foundation for understanding agility as the ability to deploy resources and processes efficiently to enhance value creation (Teece et al., 2016; Pinho et al., 2022). In BI, agility translates to the capacity to manage and reconfigure BI assets to derive greater value from changing business landscapes (Knabke & Olbrich, 2016).

The dynamic nature of the BI domain challenges traditional views of BI maturity, highlighting the need for readiness to embrace transformations. To achieve true maturity in BI value development, organizations must cultivate agility, preparing themselves for ongoing changes and disruptions in the business and technological spheres.

Contradictions between Maturity and Agility

Both BI maturity and agility are oriented towards creating and sustaining value from BI operations, yet they approach this goal from distinct perspectives. Maturity in BI signifies the growth in value over time, reflecting the progression and optimization of BI capabilities within an organization. On the other hand, agile BI focuses on preserving and enhancing this value by cultivating flexible competencies that can adapt to ongoing transformations in the business landscape. The fundamental contradiction between BI maturity and agility arises from their divergent focal points. Maturity emphasizes extracting maximum value from the existing BI platform, leveraging established processes and resources to achieve efficiency and effectiveness. In contrast, agility prioritizes the development of adaptable competencies that can navigate disruptions and changes in the environment, ensuring sustained relevance and value creation. From a longitudinal perspective, the tension between BI maturity and agility becomes more pronounced. Optimal levels of maturity, as defined by maturity models, may not be sustainable over extended periods due to the evolving nature of business requirements and technological advancements. Agility, on the other hand, aims to cultivate resilience and flexibility, allowing organizations to respond effectively to emerging challenges and opportunities over time. The controversy between BI maturity and agility underscores the need for a balanced approach in BI strategy formulation. While maturity ensures the efficient utilization of existing BI capabilities, agility prepares organizations to

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embrace continuous transformation and innovation. Ultimately, harmonizing these concepts is crucial for organizations seeking long-term success and value realization from their BI initiatives.

Several common features to compare the two concepts are presented in the Table 1.

Table 1. A comparison of features of BI maturity and agility.

BI maturity	***BI agility***
Has a finite point as its goal, developing towards alignment and optimization	*Does not have a finite point; instead maintains flexibility and preparation for change*
Criteria of efficiency and utilization	*Criteria of resilience and competence preservation*
One path or alternative; one set of activities in its current version to be developed and optimized	*Many paths, alternatives or versions without aiming at optimization*
Maturity reflects a single instance of coupling between BI and organization	*Agility seeks to cover a larger context (includes external factors) and longer time window (covering possible future changes)*

Many maturity models present a rosy picture of the final stage, assuming that what is mature today will remain so in the future. However, as Mettler and Pinto (2018) argue, this is not always the case; what works now may not work later. Existing BI maturity models, as analyzed by Hribar-Rajteric (2010), often depict a linear progression towards an ideal and optimized BI state. Yet, exceptions such as the Gartner, TDWI, and AMR models emphasize a flexible ultimate stage that acknowledges the importance of culture and avoids rigid optimization. This suggests that true maturity in BI lies in the ability to adapt to future changes rather than achieving a static, optimized state. This paper introduces the notion that BI maturity needs to redefine its objectives. Realistically, mature BI models should focus on developing sustainable competencies to navigate a dynamic future. This contrasts with the rigid, fragile processes often associated with the "optimized" last stage of some maturity models. In essence, flexible maturity should embrace a degree of immaturity according to traditional maturity standards, signaling a need for a broader understanding of maturity concepts. Transitioning between maturity stages in BI models reveals several key insights. Firstly, it assumes a stable BI system throughout the maturity cycle, which may not align with the dynamic nature of BI activities. Secondly, governance plays a crucial role, with advancements in defining value sources and improving organizational processes. Thirdly, underlying these transitions is a shift in values, behaviors, and attitudes, particularly related to organizational culture, including information and BI culture. This paper delves deeper into the pivotal role of cultural factors in fostering flexible maturity within BI frameworks.

The Role of Cultural Factors for BI Agility

Organizational culture is one of under-researched factors of BI agility, as well as of BI success in general. However, it is a factor present in many publications, as well as interviews with BI practitioners and business analysts. To the author's opinion, the support of organizational culture for BI agility is an interesting fresh research avenue. One of possible assumptions may be presented here: a certain type of organizational culture may strengthen or impair BI agility ability to change while maintaining its competencies.

Relation of Organizational Culture and BI Agility in Published Works

Numerous studies emphasize the pivotal role of cultural factors in the relationship between BI agility, organizational culture, and overall organizational agility. Tallon et al. (2019) highlight the significance of fostering a culture that embraces change rather than resists it, placing cultural transformation on par with IT advancements. Maurer (2010) proposes an IS agility construct that includes human characteristics such as interpersonal skills and social capital, acknowledging the vital role of personnel attributes in promoting agility. Vejseli et al. (2020) outline management actions that

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support agility, with a strong emphasis on organizational and information culture through initiatives like cross-boundary committees and enhanced communication.

Seo and LaPaz (2008) emphasize how organizational culture is instrumental in enabling IS to support organizational agility effectively. Youssif and Pessi (2016) posit that IT agility contributes to business agility, reinforcing the interconnectedness of technological and cultural aspects. Bieda (2020) underscores the importance of a collaborative culture, spanning formal and informal interactions to gain diverse insights. Elliott (2014) stresses the need for a cohesive community between business and IT, leveraging "soft power" to optimize information utilization across functional boundaries.

An intriguing perspective from McKinsey consultancy (Aghina et al., 2015) challenges the binary view of agile versus rigid approaches, suggesting that companies should strive for both stability and dynamic capability. Culture emerges as a critical factor that requires considerable time and effort to develop or influence its evolution, highlighting its foundational role in fostering organizational agility and BI effectiveness.

Relation of Organizational Culture and BI Agility in Interviews

The conducted set of 15 interviews with BI professionals from medium and large companies in Lithuania serves as a valuable complement to existing research on cultural factors influencing BI agility. The choice of interview method was deliberate, as it allows for the extraction of genuine expert opinions and nuances that may be missed in survey-based studies (Jarvenpaa and Lang, 2005; Torkzadeh et al., 2006).

Here are some key insights gleaned from the interview excerpts:

(A) General issues on organization culture and agility:

- *There is a contradiction between agility and rigidity in organizations, highlighting the challenge of fostering agility in inherently rigid structures (8).*
- *Stakeholders' ability to ask insightful questions precedes intelligence and analytics maturity, indicating a crucial aspect of organizational maturity (8).*
- *Context and storytelling are emphasized in information delivery, contrasting with a mere data-centric approach, reflecting the importance of effective communication (8).*
- *While agile principles emphasize teamwork, individual rewards can create conflicts, showcasing a tension between collective success and individual recognition (10).*
- *Organizational agility is more about management and culture than company size, with leadership playing a pivotal role in fostering innovation and adopting new practices (12).*

(B) Value added by shared insights:

- *Collaboration with professionals from diverse backgrounds yields valuable insights without divulging confidential information, highlighting the benefits of knowledge exchange (7).*
- *Overcoming communication barriers between introverted analysts requires creating spaces for open dialogue (7).*
- *Cultural differences between business and IT can hinder agility, with differing priorities and approaches to change and stability (9).*
- *Lack of horizontal communication and unclear processes impede BI effectiveness, emphasizing the importance of streamlined information flow (15).*

(C) Stepping out of your comfort zone / embracing trial-and-error:

- *Analysts' focus on internal data often overlooks external market factors, highlighting the need for a broader perspective (7).*
- *Learning and adapting are essential competencies for navigating dynamic environments (7).*
- *Ineffective BI tools or usage can be attributed to a lack of intelligence culture and failure to see the bigger picture (13, 15).*

These insights underscore the intricate relationship between organizational culture, communication dynamics, and agility in leveraging BI effectively within modern enterprises.

A set of cultural factors, In part based on author's earlier work (Skyrius et al, 2018), has served in projecting the interview findings into issues distilled from publications, and noting several common points. This grouping is reflected in Table 2.

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Table 2. Role of culture in developing agility: Summarization of literature review and interview responses by features of organizational culture.

Features of organizational culture, impacting BI agility	*Literature sources*	*Interview responses*
Organizational culture type	*Gregory and Taylor (2019) specify the levels of agile culture by dimensions purpose, leadership, people feel, collaboration, trust, change acceptance, innovation and failures.* *Seo and LaPaz (2008) stress the importance of organizational culture for informing function to sup- port organizational agility.* *Newell et al (2007), discussing mechanistic and organistic organization types, define the former as clumsy and impairing agility.*	*(8) If a rigid organization wants to be agile, a contradiction emerges.* *(10) Agile principles need teamwork success, but rewards are individual – a controversy* *(12) Organizational culture is a defining factor for BI culture.*
Clear strategy, goals, metrics	*Vejseli et al (2020): Bench- marking between programs and projects.* *Gregory and Taylor (2019): Organizational purpose is clear and compelling.*	*(8) A feature of organization maturity is the ability of stake- holders to ask well-pointed questions that is ahead of intelligence & analytics maturity.* *(10) The strategic direction is too wide, lacks clarity, and risks of different interpretation emerge.* *(12) The existence of BI strategy sets ground for BI culture development. Clear strategic vision provides focus regarding goals and resources for their fulfilment.*
Decision delegation to lower levels	*Youssif & Pessi (2016): Decision making and hier- archies.* *Aghina et al (2015): Decisions made both for stability and dynamic capability.*	*(9) Decision delegation to lower levels.*
Information sharing, analytical communities	*Vejseli et al (2020): Cross boundary committees to integrate all stakeholders; sharing information and success.* *Youssif & Pessi (2016): In- formation management and sharing.*	*(7) In a new organization I deal with independent colleagues from non-competing organizations in the same areas – BI architects, data scientists. I talk to healthcare BI architects from Switzerland, search engine data analysts from other places, and essentially it is a win-win, because in fact we do not mention confidential stuff once, and instead ask: "How's your data model? And yours?"*

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	Bieda (2020): Culture of collaboration from formal to informal to gain insights from multiple and deeper perspectives. *Gregory and Taylor (2019): cross-functional collaboration.* *Maurer (2010): stresses interpersonal and social skills in proposed IS agility construct.*	*(7) A frequent topic among analysts in terms of figures is: everyone is looking at their data, and very few consider the market situation. This part is neglected, and no one thinks about it: only internal data matter, when almost no one cares about external data to benchmark against market, competition or other external factors.* *(8) Removal of cultural barriers.* *(9) Collaboration and information sharing are essential for the development of BI culture.* *(15) Information sharing and cooperation processes could be better defined. Lack of horizontal informing-commerce/sales do not care about delivery costs from logistics.*
Business and IT cooperation; barrier removal	*Elliott (2014): The im- portance of community of business and IT across functional silos.* *Bieda (2020): stresses the culture of collaboration to gain insights into deeper perspectives.*	*[8] A feature of organization maturity is the ability of stake- holders to ask well-pointed questions that are ahead of intelligence & analytics maturity…. Context and storytelling are of prime importance when delivering information.* *[9] Cultural differences between business and IT: business culture works towards frequent and fast changes; IT/engineering culture – towards stable operating systems.* *[11] BI receives no feedback from business on how data are used for decisions.*
Learning, experimenting, expertise preservation; mistake tolerance	*Majchrzak et al (2006): Build a mental map of other's expertise.* *Elliott (2014): Sandboxes as specific BI service.* *Tallon et al (2019): Promotion of culture of calculated risk taking and idea testing.*	*[7] The ability to learn and get out of the comfort zone is a valuable competence.* *[8] Most important human feature for flexibility is the will to learn and unlearn.* *[10] In some places, we do not have a "speak-up" culture.* *[13] The data shown by BI tool were so embarrassing that the system had been left to die.* *[15] During change implementation, volumes of valuable experience have been recorded and are currently in use. Human competences need to be non-static.*

The Information in Table 2 summarizes the role of organizational culture in building BI agility. The most prominent features of organizational culture in the leftmost column are supported by both published research and interviews with IT/BI practitioners. This set of features indicates the possible directions to make appropriate decisions on organizational weaknesses and strengths, and may serve as a basis for further research. The presented findings largely suggest that BI requires an open

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organizational culture to match its maturity and agility. Open organizational culture, and especially its part regarding sharing of information and insights, is regarded as a key motivation factor for effective use of technology potential.

Conclusions

This paper puts forward significant findings concerning the relationship between BI maturity and agility. Through literature review and interviews with BI professionals, it is evident that a key aspect of maturing BI is avoiding rigidity. Rather than striving for a static, optimized state, maturing BI should focus on developing competencies and skills that facilitate necessary changes while preserving core strengths. This approach advocates for an ultimate BI maturity stage that remains open to change and possesses resilience to manage change stress effectively. The central question then becomes: what universal competencies can be cultivated to extract value from the current BI landscape while preparing for future changes?

A McKinsey consultancy paper (Aghina et al., 2015) highlights the concept of stability and dynamism coexisting through a "fixed backbone" approach, which aligns well with BI agility principles. The identified features of organizational agility, particularly rooted in organizational culture, can serve as stable elements in this context. This paper also emphasizes the role of organizational culture in balancing BI maturity with agility. As mature BI systems are expected to adapt without losing potency, identifying sustainable competencies and strengths becomes crucial.

The proposed pillars of agile maturity, supported by an open organizational culture, include efficient communication, information integration, creative problem-solving, and close collaboration between business and IT. These pillars underscore the importance of a flexible and open mindset in navigating BI challenges. While organizational culture emerges as a critical factor for BI agility, empirical testing and comprehensive research are needed to validate its impact conclusively. This research direction, albeit challenging, is vital for ensuring the sustained value and relevance of BI developments for both researchers and practitioners.

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