THE DYNAMICS AND AGILITY OF BUSINESS INTELLIGENCE: THE MATURITY OF BEING IMMATURE

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ABSTRACT

Aim/Purpose	The paper addresses the two important dynamic features of business intelligence (BI) – maturity and agility – and the interrelation between the two, projected into support for BI agility.
Background	An analysis of published research sources, together with interviews with BI professionals, resulted in defining important traits of BI environment that support its ability to change and renew.
Methodology	The research used a literature analysis to confirm contradictory issues between the ultimate stages of known BI maturity models and the need to develop BI agility. The most important issues have been projected against similar issues from interviews with BI professionals.
Contribution	This paper attempts to define possible "pillars" of BI agility that have to develop together with growing BI maturity.
Findings	The interviews, combined with previous research and literature sources, have shown that the ultimate goal of BI maturity journey is an optimized system encompassing the entire organization. Such approach often introduces rigidity and limits BI ability to change and adapt. On the other hand, this ability seems to be supported by certain managerial and human factors, where organizational culture appears to play a key role.
Recommendations for Practitioners	There are certain types of organizational culture that are supportive for BI agility and contradict optimized and rigid maturity.

Recommendations for Researchers	The presented conclusions are to an extent based on assumptions and should be tested by quantitative analysis, where possible. Further research models might include related and under-researched sets of issues like BI resilience and informing resilience in general.
Impact on Society	Against wider context, value creation by advanced IT does not guarantee success by itself if human and especially cultural factors are neglected.
Future Research	Testing of assumptions and hypotheses based on the findings of this paper. Expansion of research ideas to wider network of research partners to test assumptions against different backgrounds.
Keywords	business intelligence maturity, business intelligence agility, organizational culture

INTRODUCTION

The concept of business intelligence (BI) has been in use for several decades, undergoing the life cycle phases of an important informing innovation – fast rise, explosive interest, significant efforts in research, and practical issues. Such phases are often followed by subsequent stabilization and cooling of public interest, and mutations into related approaches. However, in the case of BI we deal with advanced business informing activities that are not much likely to fade away with loss of their initial spark.

There are multiple ways to define the role of BI in contemporary business, and for this reason some clarifications are presented below in this paragraph. However, to project this role into a fast-changing environment, the dimension of time and dynamics is introduced. BI systems are continuously advancing, the user base is expanding, and capabilities are enhanced beyond customized data access to flexible self-service reporting and decision support tools (Bani-Hani et al., 2018). Operating in a permanent flux of business environment drives the need for organizational agility (Nicoletti, 2023; Vejseli et al., 2022). For organizational agility, the ability to sense and respond is largely dependent on the quality of informing activities, and BI in particular (Levallet & Chan, 2022; Pinho et al., 2022; Pulakos et al., 2019). The value extraction from BI applications largely depends upon analytical capability development, growing sophistication, and maturity (Korsten et al., 2022; Su & Cardoso, 2021). Being a digital technology-enabled function, BI keeps changing in response to IT advances. At the same time, the business community expects BI to develop its capability to sense and respond, maintain its informing power regardless of changes, and provide valuable insights of stable quality. This somewhat contradictory relation calls for better understanding of issues related to dynamics of changes. Therefore, the purpose of this paper is to investigate relations between BI maturity and agility as important concepts of BI dynamics, based on literature research and interviews with BI professionals.

The current positioning of BI is rather wide, if not vague, due to its evolution over the last few decades that has initiated different opinions on its current state and positioning. This is easy to explain: since naming BI the "umbrella term" to join together technologies and processes for decision support and general awareness, many new developments in business informing, intelligence and analytical technologies have moved under the same umbrella. The evaluation of current interest in BI points to several streams of opinions regarding the current positioning of BI:

a) First – **BI has settled** – opinions of BI having matured into clearly positioned set of informing activities – some sources even equal it to reporting, which for decades has been the typical function of ERP-level systems (Zimmer et al., 2012); other sources state internal BI orientation as an inward looking function (Negash & Gray, 2003); a survey by Arnott et al. (2019) provides many examples of this strain of BI positioning;

b) Second – **BI keeps evolving with** the current wave of sophisticated analytics utilizing artificial intelligence and machine learning (Suša Vugec et al., 2020) or **expanding,** pointing out to the overarching nature of BI activities (the authors of this paper consider themselves belonging to this group as well). In this case, the principal goal of BI is seen as complete coverage of information on environment (Arnott et al., 2019; Phillips-Wren et al., 2021). One of the more balanced BI definitions is suggested by Olszak (2013): BI may be seen as a collection of technologies, applications, and processes to help users make better decisions or to provide better insights into the company and its and its chain of actions. Under this approach, all instances of BI potential from the above streams of opinions are utilized to provide informing for as complete coverage as possible.

An important feature of this approach is time dimension that reflects the dynamic environment of BI operation, where changes are driven by technology and organizational forces, and originating internally and externally. The rest of the paper discusses the issues of BI dynamics and is organized as follows: the first section discusses the issues of BI dynamics, namely, maturity and agility; the following section focuses on contradictions between the two. In the next section, a role of cultural factors for BI agility is discussed, based on published research and performed interviews. The paper concludes with the aggregated findings.

BUSINESS INTELLIGENCE DYNAMICS

The dynamics of BI – development, changes, and mutations of BI systems and activities – have initiated several research directions regarding BI dynamics, among which BI maturity and BI agility are quite prominent. It would be correct to note here that many published sources on maturity or agility in business informing do not necessarily concentrate specifically on BI field. Some sources (Cosic et al., 2012; Elliott, 2014; Knabke & Olbrich, 2016) discuss the maturity or agility of business analytics, which, to author's opinion, largely intersects with BI activities, and a term "Business intelligence & analytics" (BI&A) is often used. Yet other sources (Lu & Ramamurthy, 2011; Seo & LaPaz, 2008; Van Oosterhout et al., 2006; Vejseli et al., 2020) focus on maturity or agility in the area of information systems (IS) or information technology (IT). The view of the authors is that maturity and agility issues in the wider field of IT and IS largely intersect with those of BI&A, the difference being in the greater required flexibility of BI&A.

The targets of BI maturity and agility are different in (a) a sense of goals to be achieved and (b) the dynamics of their development. Because of these differences, a question might arise whether maturity and agility apply to the same object. However, it can be stated that, at least in the case of BI, we are talking about the same object – a well-defined function of advanced informing to produce quality insights – finding itself in a middle of an old debate between efficiency and flexibility. It may also be noted that agility is seldom discussed together with maturity. This can, at least in part, be explained by the different dimensions that maturity and agility reflect, but we here point out the obvious relation between the two.

BI MATURITY

The adoption or renewal of a BI system in an enterprise is a process that takes some time until the system is accepted, matures, and its value is recognized. The implementation and adoption of BI systems in businesses has settled into a process with several common phases, initiating BI maturity concept and a set of BI maturity models as a result. The structure of such a process is ordered by value growth in each step, and usually encompasses past experience, current state of things, and foreseeable future. A generic BI model, distilled from several known models and containing a generic set of maturity levels, is presented in Figure 1.

Figure 1. A generic BI maturity model with maturity levels

Despite the attention of researchers for maturity in the field of informing and information systems, there seem to be no agreed definitions of IS or BI maturity. Mettler and Ballester (2021) present maturity as the extent to which a specific process is explicitly defined, managed, measured, controlled, and effective. According to Cosic et al. (2012), maturity is intended to reflect the level of development of organizational capabilities, processes, or resources. A set of BI maturity models has been developed with an intent to provide structure for the dynamics of BI development and adoption (Rajteric, 2010). Maturity models provide "a consistent design and management view on the subject at hand" (Raber et al., 2013) – in this case, a BI system. However, a common understanding of what is understood as mature BI, or an ultimate BI maturity level, seems to be lacking. In the authors' opinion, it requires clarification in an evolving context to have a look at several possible contradictions. BI has to evolve in the boundaries of an organization to gain required acceptance and extract expected value, at the same time keeping up with changing environment (development of BI agility). A similar point is made by Cosic et al. (2012), where the authors, while proposing a business analytics maturity model, point out to its required flexibility and reflection of the evolutionary and distributed nature of BA innovations within organizations.

Summarizing the above, BI maturity models reflect the dynamics of BI implementation and adoption in businesses, reflecting BI value growth and a certain desirable ultimate state. However, changes in the business environment and in BI technology itself are inevitable, and this creates a contradiction between maturity goals and readiness for transformation.

BI AGILITY

For a number of years there has been a strong agreement among researchers and practitioners that a well-pointed BI system creates substantial value for business activities. However, this value is not a given in itself – as business environment experiences constant change, BI function has been evolving and will experience changes and mutations. Depending on its ability to adapt, IT has either an enabling or impeding effect on informing activities (Van Oosterhout et al., 2006). Despite the technology being more capable, fast environment changes often lead to discontent and confusion among business users (Elliott, 2014). Sources supporting the need for BI agility point out to factors like volatile and turbulent environments (Knabke & Olbrich, 2016), changing business with changing data

sources, data models, and functionality (Baars & Hütter, 2015), and the need to support organizational agility (Zimmer et al., 2012). In the context of environment changes, BI as a sensory system may find itself in three roles:

- A valuable sensing asset providing advanced environment information and predictive power,
- A business accessory providing adequate current informing functions, or
- A rigid and obsolete system that becomes a liability by failing to provide proper informing in a changing environment.

When changes in the informing environment outpace a once-efficient BI system, an emergence of so-called "shadow BI" applications often happens. Although for quick and agile solutions some of these applications may prove valuable (Kretzer & Maedche, 2014), such approaches are inconsistent and inefficient, lacking structure, oversight, and control over growth. A related concept is self-service BI (Lennerholt, 2022; Passlick et al., 2020; Schlesinger & Rahman, 2016), but it also requires consistency and oversight to be valuable.

BI is expected to provide sensing and responding capabilities to support organizational agility (Lee & Liu, 2022; Tallon et al., 2019). Obviously, to maintain a required level of informing over time and stay valuable, a BI system has to be agile by simultaneously developing its competences and adapting to changes from outside the system. An often-refereed theoretical foundation for agility is Dynamic Capabilities Approach (Teece et al., 2016). Under the lens of dynamic capabilities, agility is considered as the firm's ability to quickly, efficiently, and effectively deploy its resources and business processes to enhance value creation (Pinho et al., 2022; Teece et al., 2016). The reflection of the dynamic capabilities approach in BI activities is seen as the ability to cope with changing business environments by building, reconfiguring and managing BI assets to transform them into greater value (Knabke & Olbrich, 2016).

As stated above, changes in the business environment and in BI technology itself are inevitable, leading to a contradiction between maturity goals and readiness for transformation. A concept of BI agility targets the readiness for such changes and BI ability to maintain its potential through changes. The evident dynamism of the innovation-rich BI domain has impacted the understanding of BI maturity, challenging it against upcoming changes. Here we can make an assumption that to become truly mature in terms of developing and maintaining BI value, an organization needs to develop readiness for future changes.

CONTRADICTIONS BETWEEN MATURITY AND AGILITY

Both concepts of BI maturity and agility seek to create and maintain value from BI operations. While the concept of maturity reflects value growth, the concept of agile BI concentrates on preservation of this value. A contradiction emerges between the ultimate state of maturity and the never-ending transformation requiring agility. The contradictions between BI maturity and agility seem to come up from different concentration focuses. For maturity, it is the value extraction from the current platform, while for agility, it is the ability to grow flexible competences that would hold against changes. The controversy also comes from longitudinal perspective: optimized target levels of maturity models cannot last for longer time and are easier to disrupt; agility aims exactly at developing and maintaining competencies for as long as possible.

Several common features to compare the two concepts are presented in 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)

Most maturity models show overly optimistic and vague expectations regarding the last stage, especially the ones claiming aligned and optimized activities. Mettler and Pinto (2018) state, "what is mature today must not necessarily be mature tomorrow; or what works in one context, must not necessarily work in another." The analysis of a set of existing BI maturity models (Rajteric, 2010) has shown that many of them reflect a sequence of phases towards some ideal and optimized BI instance. The exceptions are several models that declare flexible ultimate stage, important role of culture, and avoid optimization (Gartner, TDWI, and AMR models). In such cases, maturity would point to an ability to embrace future changes more easily. For BI being a fluid and dynamic set of activities, aligned and optimized activity is not considered to last for long. Eventually, BI is doomed to be immature because its agility requires keeping extra elements of freedom – e.g., alternative approaches and processes, search for solutions outside existing boundaries, to name a few.

An emerging idea raised in this paper is that BI maturity has to be redefined in its goals. The more realistic, in the authors' opinion, models of BI maturity in their ultimate stages present exactly this – development of sustainable competencies and capabilities to deal with the dynamic future. Such competencies should be the opposite of what is declared in the "optimized" last stage of some maturity models – rigid, and therefore fragile, processes. In other words, flexible maturity has to stay immature by the standards of maturity models, or the concept of maturity has to undergo significant expansion.

The movement between maturity stages in BI maturity models suggests several things.

> **Firstly**, it is often assumed that a certain BI system – the technical or systemic foundations of BI activities – is already in place and will stay stable during the entire maturity cycle.

> **Secondly**, important developments along the maturity stages lie in the area of governance of BI activities – sources of value are recognized and defined; processes are better organized and managed.

> **Thirdly**, although this is not always obvious, the facilitation of future flexibility requires important changes to take place in values, people behaviors ,and attitudes. Such foundation points, or "pillars" of flexible maturity often are attributed to the area of organizational culture, of which information culture and BI culture is an important part. For this reason, the role of cultural factors is discussed more widely in this paper.

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. In the authors' 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

In published research on relations between BI agility, organizational culture, and organizational agility in general, many sources point out to the importance of cultural factors. The promotion of culture that is not averse of changes, but welcomes them instead, and is no less important than IT, has been pointed out by Tallon et al. (2019). Proposing an IS agility construct, Maurer (2010) stressed a "human characteristics" component including interpersonal skills and social capital of IS personnel. Defining management actions to support agility, Vejseli et al. (2020) presented a set of such actions, where the majority of them relate directly to organizational and information culture: cross-boundary committees, communication, and information sharing. Seo and LaPaz (2008) stressed the importance of organizational culture for IS to support organizational agility. Yousif and Pessi (2016), based on literature review, posit that business agility can be supported through IT agility. Bieda (2020) stresses the culture of collaboration from formal to informal to gain insights from multiple and deeper perspectives. Elliott (2014) has pointed to the importance of community of business and IT across functional silos, utilizing "soft power" for the best use of information.

An interesting point raised in a paper by McKinsey consultancy (Aghina et al., 2015) is that agile versus rigid is a common dimension, but many companies just look at it and try to find their position on this spectrum. Instead, they should be trying to be both – go for stability and dynamic capability – and one of the key indicated factors is culture that takes a long time to build or change.

RELATION OF ORGANIZATIONAL CULTURE AND BI AGILITY IN INTERVIEWS

In order to complement the published research findings about cultural factors for BI agility, a set of 15 interviews has been performed with BI professionals from medium and large companies operating in Lithuania. The interview method has been chosen for several reasons – frequent use for exploratory studies in information systems research, extraction of genuine expert opinions from prominent participants either by seniority or professional excellence, and ability to detect nuances that disappear between questions in surveys (Jarvenpaa & Lang, 2005; Torkzadeh et al., 2006). The interview excerpts provided below point to the need for an open, flexible culture (a number at the end of a quotation indicates a certain respondee).

(A) General issues on organization culture and agility:

- If a rigid organization wants to be agile, a contradiction emerges (8).
- A feature of organization maturity is the ability of stakeholders to ask well-pointed questions that is ahead of intelligence & analytics maturity (8).
- Context and storytelling are of prime importance when delivering information, as opposed to analysts' stance: "I have delivered information; now you do whatever you want with it" (8).
- Agile principles need teamwork success, but rewards are individual – a controversy (10).
- Organizational agility does not depend upon company size – it is more an issue of management and culture. … Good examples – management and culture support interest in innovations and new good practices. Very much depends upon leaders (12).

(B) Value added by shared insights:

- 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?" (7)
- Statistically, analysts are introverts and not inclined to communicate, so you have to get them into one room to start talking (7).
- Cultural differences between business and IT emerge: business culture works towards frequent and fast changes; IT and engineering culture – towards normally operating stable systems (9).
- Lack of horizontal informing – commerce/sales do not care about delivery costs from logistics; explained by low level of BI culture. … Organizational culture and community had not been a reason for BI changes (15).
- There is a lack of communication between departments. But the blame is not on the employees, and comes from undefined processes instead. It is unclear who has to be notified if some information changes, and how this would affect the entire organization (15).

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

- 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 (7).
- The ability to learn and get out of the comfort zone is a valuable competence (7).
- The data shown by BI tool were so embarrassing that the system had been left to die (13).
- Growing and permanently developing personnel competencies – a need to see wider picture and context (13).
- The inability to see the larger picture seriously impairs organizational agility. BI tools are available, but factors like everyday workloads and lack of intelligence culture prevent their use (15).
- BI tools had been created, but management did not use them. Reason: lack of intelligence culture; workload prevents from seeing the wider picture (15).

A set of cultural factors, in part based on one 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.

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 support 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): Benchmarking between programs and projects. Gregory and Taylor (2019): Organizational purpose is clear and compelling.	(8) A feature of organization maturity is the ability of stakeholders 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	Yousif and Pessi (2016): Decision making and hierarchies. 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. Yousif and Pessi (2016): Information 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?"

Features of organizational culture, impacting BI agility	Literature sources	Interview responses
	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 importance 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 stakeholders 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 organiza-

tional 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 proposes several findings regarding the relation between BI maturity and agility. Firstly, the results of literature review and interviews with BI professionals show that an important direction for maturing BI to follow is to avoid becoming strained and rigid. What should matter for maturing BI in the face of upcoming changes is a set of competencies and skills to assure required changes with as little disruption as possible, and maintaining core competences at that. According to this approach, the targeted ultimate BI maturity stage should be open for change and possess the necessary strengths to withstand the inevitable change stress. In other words, growing BI maturity should develop agility pillars to accommodate future changes. The important question here is, "What universal and change-independent competences should be nurtured that would support future BI agility in two ways?" Firstly, such competences would allow value extraction from current system or platform by maintaining and pushing forward visibility and awareness. Secondly, they would amortize or minimize the stress of future changes. A McKinsey consultancy paper (Aghina et al., 2015) pointed out that truly agile organizations learn to be both stable and dynamic by having an unchanging set of stable elements – "a fixed backbone". To the authors' opinion, this approach projects well into BI agility context, and the identified features of organizational agility, largely based on organizational culture, may serve as such stable elements.

In addition, this paper proposes a clarification of the role of organizational culture in balancing BI maturity with BI agility. If mature systems are expected to change and adapt without significantly reducing their potential, it becomes important to discover what are the key features, sustainable competences, and strengths that remain throughout changes. The candidate pillars of agile maturity, supported by open organizational culture, could be:

- efficient communication and information exchange;
- information integration, strongly supported by sharing and cross-silo accessibility;
- outside-the-box alternatives that require creative approaches; ability to learn and unlearn; tolerate trial-and-error; drop outdated and obsolete rules;
- Close cooperation and partnership between business and IT.

Such suggested pillars of BI agility center around the flexible and open mentality. In terms of practical application, several potentially important issues come up. Firstly, horizontal collaboration across functional borders should be facilitated, especially for business analysts whose area is inquiry and insight. Secondly, functional information silos should be opened to facilitate insight exchange and integration. Thirdly, feedback between business and IT, especially business feedback on IT innovations, should be a commonplace requirement.

While presented research shows organizational culture emerging as an important BI agility factor, this importance has to be tested empirically in a comprehensive manner. This research direction is going to be unclear and vague, and much more difficult to perceive and manage than technology or system parameters. However, it requires significant attention and effort of both BI researchers and practitioners concerned about sustained value of their findings and developments.

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