There is More to Intelligent Business Than Business Intelligence

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Abstract — **Business Intelligence (BI) purports to support decision-making with better insights into the organization's environment and sophisticated analysis techniques of 'Big Data' help make more effective use of the vast data for competitive advantage. Given adequate sponsorship, approval, and funding from the top level, business intelligence and analytics (BI/A) technologies are also purported to help in organizational transformations. However, BI/A come with a number of inherent limitations. The amount of organized data is relatively small and these technologies do not adequately account for the social and psychological aspects of the transformation. They provide decision-makers only with lagging indicators – view on past and present performance – and inform strategy with extrapolations of trends, at best. However, organizational transformation calls for forward-looking transformational thinking and human discretion that can be assisted with technology only to a limited extent. In this paper, we posit the potential consequences of not taking these limitations into account. We will also discuss how the business intelligence and analytics technologies on one hand, and the social technology of 'presencing,' on the other, could be synergistically combined to support integrated organizational transformation.**

Keywords — business intelligence; analytics; big data; organizational transformation; Theory U; change management.

I. INTRODUCTION

Information on the operational environment is a fundamental need for human beings and organizations alike [1]. The capability that enables monitoring changes in an organization's environment is called Business Intelligence (BI). The term usually refers to technologies and techniques for gathering, aggregating, storing, accessing, analyzing and utilizing data to support decision-making, but it can also be seen as an overall process that provides the business with better insights into the environment [2].

However, the lack of relevant information appears to be less of a critical issue for managers than an over-abundance of irrelevant information [3]. Six out of ten respondents in a global executive study [4] agreed that their organization has more data than it can use effectively. Recently, Big Data – "large pools of data that can be captured, communicated, aggregated, stored, and analyzed" [5] – has been seen as a way to cope with the growing data deluge and to harness computational power to productivity improvements and innovation. It is seen as the next source of competitive differentiation and advantage [6][7], and, indeed, top-performing organizations use analytics five times more than lower performers [4].

Business Intelligence and Analytics (BI/A) technology alone is not the silver bullet that would enable requisite strategic agility. The value of information technology (IT) stems increasingly from the capability, skills and motivation of people to leverage the technology. However, many companies pay only marginal managerial attention to this human capital, which, as a result, is misused, wasted or lost [8]. Consequently, "today's managers are trying to implement third-generation strategies through second-generation organizations with first-generation management" [8].

Sustainable organizations balance public interest with financial returns and place society and people at the core of organizational purpose [9]. As per this institutional logic, leaders need to persuade and motivate others in their organizations to make transformation a reality. High performing leaders do this by combining external data on competitive environment and industry as well as internal data in the form of gut feeling derived from experience and wisdom. Using gut feelings combined with strong systems thinking, self-awareness of their own blind spots and limitations [10], and emotional awareness of others, enlarges and enriches how leaders set and execute competitive strategy.

A social technology is "a replicable set of procedures that is designed to produce an effect upon socially important behaviours of relevant participants under a variety of real life conditions" [11]. Social technologies may be used to enable the development of skills to facilitate 'participatory competence' [12].

Turbulence is a relative condition [13]: different organizations experience threatening environmental conditions differently, depending on the amount and variety of resources and skills they have available – their adaptive capacity – for managing those conditions. Theory U [14] is a social technology that, in our view, will help recognize and navigate turbulence – misalignment between the system's adaptive capacity and complexity of its environment.

In this paper, we set out to answer the following research questions:

1. What is the role of BI/A capability in organizational change and transformation?

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2. What are the limits of BI/A technologies in supporting organizational change and transformation?
3. How can these limits be mitigated or overcome through the application of an integrative social technology, in general, and Theory U, in particular?

Our paper is conceptual and exploratory in nature. It is intended to provide a step towards deeper understanding of the nature of BI/A capability, its socio-technical underpinnings, and its role in organizational change and transformation. The contribution of our paper lies primarily in the insights into the potentially consequential role of integrative social technologies such as Theory U in complementing the use of BI/A technologies to the ends of organizational change and transformation.

The structure of the paper is as follows: In Section II, we present three progressively more advanced capabilities of using BI/A technologies. In Section III, we discuss Theory U as a social technology for transformational change: process and communication tools that help translate strategy to implementation. In Section IV, we review Babüroðlu's [25] framework of maladaptive responses to turbulence. Drawing on the prior sections and some further literature, Sections V through VII address our three research questions, respectively. Finally, in Section VIII we briefly draw conclusions, discuss the implications of our conjectures, and call for further research.

II. LEVELS OF BI/A CAPABILITY

LaValle and his colleagues [4] report the results of IBM Institute for Business Value survey of nearly 3,000 executives, managers and analysts working across more than 30 industries and 100 countries, in which they identified three distinctive levels of capability in organizations' analytics prowess:

1) Aspirational. These organizations are focusing on efficiency or automation of existing processes. The primary driver is that of cutting costs.

2) Experienced. These organizations look beyond cost management. With some analytic experience under the belt, they are developing better analytics practices and beginning to optimize their organizations.

3) Transformed. These organizations are the analytics competitors [6] that use analytics as a competitive differentiator. Having learnt to organize the necessary elements – people, processes, and tools – these organizations are focused on driving customer profitability.

Relatedly, Watson [15][16] identifies three typical 'targets' of BI initiatives, differing in "their focus; scope; level of sponsorship, commitment, and required resources; technical architecture; impact on personnel and business processes; and benefits" [16]:

1) The development of independent BI applications, each with its own users, software and data sources. These point solutions are often data marts that cater for a specific departmental need, and their sponsorship, approval, funding, and governance also occur at the departmental level.

2) The creation of enterprise-wide infrastructure that provides more consistent decision-support data and supports current and future BI needs. A critical component in this infrastructure is a data warehouse that has impact and creates benefits throughout the organization. Accordingly, senior business management provides sponsorship, approval, and funding for the initiative.

3) Organizational transformation, where the data warehouse is leveraged to the business strategy and to transform how the business competes in the marketplace. Accordingly, sponsorship, approval, and funding of the initiative originate at the highest executive levels.

We view that the type of capability developed and targets of business intelligence selected in an organization, whether by accident or intention, will strongly impact its transformational outcomes.

III. THEORY U: SOCIAL TECHNOLOGY FOR ORGANIZATIONAL TRANSFORMATION

Scharmer's [14] Theory U, as the social technology of presencing, is about profound transformation: personal, social and global, and is therefore our social technology of choice. The deep focus of Theory U is on self-awareness of personal blind spots and the building of empathy combined with the practical development of sensing. This focus sits inside a framework that takes into account levels of attention paid to the exterior (fields of attention), levels of learning and change, and the reduction and elimination of pathological anti-practice. This approach provides a far more comprehensive and integrated model for change than other popular organizational transformational models such as Appreciative Inquiry [17]. In our view, Theory U is also inexpensive, effective, decentralized, flexible, sustainable, simple and compatible with existing customs, beliefs and values. As such, it is particularly useful as a social technology [11].

Originally developed by Friedrich Glasl and Dirk Lemson as the U-procedure [18], Theory U, in its current form, has come to be understood in three ways: as a framework, as a method for leading and embedding profound organizational co-creative change and as a way of being, connecting to the more authentic aspects of our higher self [19].

Theory U is based on the premise that we cannot transform the behavior of systems unless we transform the quality of awareness and attention that people apply to their actions within these systems, both individually and collectively. Scharmer [14] maintains that through 'presencing' – being in touch with the inner place or source from which attention and intention originate – individuals, teams, organizations and global systems alike are able to raise to a higher level of operation to seize the highest future possibilities that 'want to emerge.' The deepest level of transformation not only reflects on what has happened in the past, but draws from a more generative and more authentic presence in the moment linked with the individual's or organization's highest future potential.

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A. Field structures of attention

Theory U is based on seven field structures of attention in an U-shape (Figure 1; [14]):

1) Downloading. Attention is guided by habitual patterns that go unquestioned. Existing patterns of behavior are collectively reproduced. Stopping downloading is the precondition for entering the U process.

2) Seeing. Attention moves from the center of organization (i.e., the system of habits and routines) to the periphery, i.e. to the edge of the organizational boundary, which allows the observer to become aware of what is happening outside.

3) Sensing. Attention moves from inside the organization – looking *at* the field – to outside the organizational boundaries, where perception begins to happen 'from the whole field.' The system being observed is no longer seen as something external 'out there,' but it also includes the observer as part of the system.

4) Presencing. Attention shifts to the source of the highest future possibility that is seeking to emerge. The boundaries between the presence of the past (current field) and the presence of the future (the emerging field of the future) collapse.

5) Crystallizing. Attention is sustained in the source and one starts to operate from it. Crystallizing denotes the first step in the presencing journey (connecting and operating from source): clarifying vision and intention from the highest future possibility. "We put into specific language what it is that we want to create." (p. 192).

6) Prototyping. The future is explored by doing and experimenting. The field structure of attention deepens, as the holding space advances the letting come process from envisioning to enacting.

7) Performing. Attention is focused on how presencing embodies itself into everyday practices within the larger institutional ecology. The new pattern that started to shape at the bottom of the U is now fully unfolded.

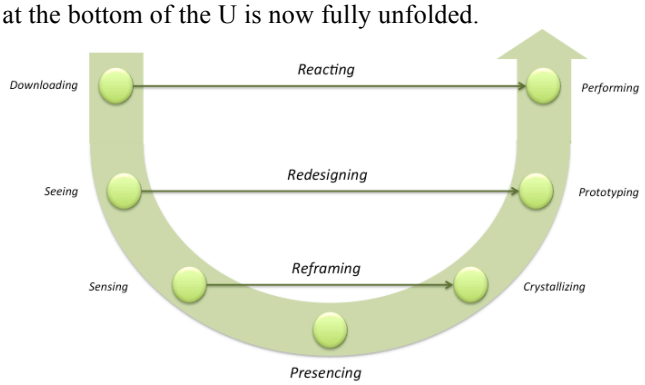

Figure 1. The U Process [14]

B. Four levels of learning and change

Figure 1 depicts the four levels of (organizational) learning and change [14].

1) *Reacting*. Response to change happens in the context of existing habits and routines [14]. This is essentially *developmental change* [20], which represents improvement of what is already known or practiced: an existing skill, method, or performance standard. The new state is an enhancement of the old state rather than a radically new one. The required decisions are likely to be 'programmed' [21] – repetitive and routine – and can hence be relatively readily supported by technology.

2) *Redesigning*. At this level, the underlying structure and processes are changed [14]. Change is *transitional* [20]: the old state of the system must be dismantled and emotionally let go of and the new state clearly created to replace the old one. However, the transition between as-is and to-be states is not as straightforward as in developmental change and should be managed [22]. These types of changes are typically required in repositioning the organization to the changing environment. Decisions tend to be non-programmed [21]: novel, unstructured, and consequential. Middle management uses its judgment and general capacity for intelligent, adaptive, problem-oriented action.

3) *Reframing*. Changing the underlying pattern of thought [14] is about the target of *transformational change* [20]. It calls for rethinking the very identity, purpose or business model of the organization, which is reflected in change of individual and collective mindsets, beliefs and values.

4) *Presencing*. "Leading from the future as it emerges" [14] can be seen as changing the context, whose content will subsequently be filled [23]. Moving from "not knowing that you don't know" to "knowing that you don't know," (cf., [23]) this transformation of the context raises more questions than it answers. Such change cannot be addressed adequately by reflecting only on the past [14].

C. Inverse U: Pathological anti-practices

If the systemic complexity of the exterior surpasses the interior capacity to access the deeper streams of emergence, the system may go off track and resort to the following anti-practices (Figure 2; [14]):

1) Downloading. The anti-space also starts with downloading: reproducing existing patterns of behavior. However, these perpetuated patterns grow increasingly disconnected from the embedding field.

2) Not seeing. This stage of 'anti-emergence' means rendering increasingly blind and unable to recognize anything new. The system is stuck in the ideology of a single truth and isolated from the parts of reality that are not congruent therewith.

3) De-sensing. This stage pertains to the inability to be in touch with the emerging social fields external to the system. The individual or collective is stuck inside its boundaries.

4) Absencing. This is the opposite of presencing: incapacity to relate to the future that wants to emerge. The space is that of self-delusional hubris, not conducive to co-evolution with the embedding social field.

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5) Self-deluding. This stage represents a total disconnect between the reality and one's image of the unfolding future.

6) Aborting. Just as prototyping is about experimenting with the future, aborting is about killing the chances of the future altogether.

7) Destroying. The last stage of anti-emergence brings the system to its inexorable end of destruction.

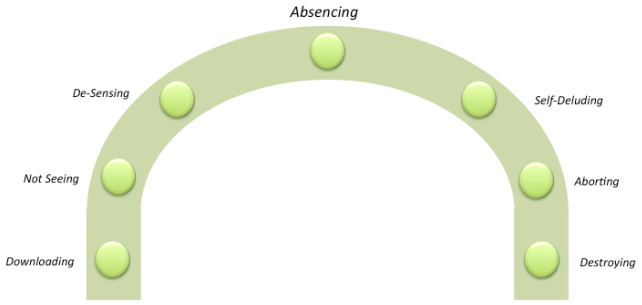

Figure 2. The anti-space of social pathology [14]

A move away from best-practice models that tend to keep organizations abreast of current trends towards an integrated approach gives rise to the possibility of innovation or industry disruption. The scope of a transformational model is therefore crucial, and should include addressing the anti-space of social pathology. Theory U provides such a framework for learning and change, allowing analysis and process in an integrated way, as well as systemic, collective, cultural and individual aspects necessary in transformational organizational change.

IV. MALADAPTIVE RESPONSES TO TURBULENCE

If the organization experiences turbulence (relatively higher external complexity than its internal adaptive capacity) for a prolonged period of time and fails to develop active adaptive strategies, its members will produce maladaptive responses [24].

Babüroðlu [24] provides a three-dimensional classification of these maladaptive responses based on Angyal's [25] dimensions of the structure of dynamic wholes:

1) The vertical dimension. The two poles of this dimension are the depth and the surface. The depth is more enduring and permanent, while the surface is more changeable. The depth is not subject to direct observation, but needs to be inferred from the surface manifestations.

2) The dimension of progression. This dimension begets a teleological means–end structure, in which each phase is the end for the preceding phase and the means for the following one.

3) The transverse dimension. This is the dimension of breadth, along which the parts exist side by side to organize into a whole.

First order maladaptive responses aim to reduce the complexity of the social field. These come in three different forms, respectively:

- *Superficiality* refers to "indifference to what needs or demands are taken as a starting point for one's behavioral responses."
- *Segmentation* pertains to separation of means and ends, wherein the social field is transformed into segments, each of which is integrated within itself but poorly with other segments.
- *Dissociation* is manifested by a lack of coordination between the parts in the whole.

Each of these three passive responses also has a respective, active correlate aimed at reducing the uncertainty and complexity of the turbulent environment ([26], cited in [24]):

- *Synoptic idealism*: an attempt to comprehensively cover all relevant information to control and to reduce the causal texture of the environment to a lower level.
- *Authoritarianism*: an attempt to impose a very rigid structure to prevent the means-ends or part-whole relationships from breaking down.
- *Evangelism*: an attempt to coordinate the field through notions such as 'all pulling together.'

While first order maladaptive responses attempt to reduce the causal texture, the second order responses crystallize it. Whereas the first order disintegrative disturbance of *segregation* would lead to fragmentation, the second order disintegrative disturbance implodes the whole into parts that can no longer be reintegrated [24]. The first order passive and active maladaptive responses will convert to the following second order maladaptive responses, respectively:

- *Monothematic dogmatism*: Dogma replaces the relevant uncertainty by 'crystal clear truth.' It becomes the normative base of the monothematic society, which is committed to the same theme (e.g., theocracy) and cannot transcend it.
- *Stalemate*: The means and ends are separated to the extent of nearly rendering the social system purposeless. The parts of the whole, in pursuit of their own agenda, do not contribute toward the common goal and may even oppose each other. As a result, the whole system is unable to pursue its ends.
- *Polarization*: The parts of the social field are polarized to cohesive and well-integrated social enclaves and sub-optimally functioning and declining social vortices [13], resulting in destructive in-group–out-group dynamic.

The development of active strategies is therefore essential to counter the development of maladaptive responses to turbulence that tend towards increased internal dogma, stalemates and polarizations.

V. THE ROLE OF BI/A CAPABILITY IN ORGANIZATIONAL CHANGE AND TRANSFORMATION

Theory U as framework for change, consists of four levels of organizational learning and change: developmental (*reacting*), changing underlying structure and processes (*redesigning*), changing the underlying pattern of thought

(*reframing*), and leading from the future as it emerges (*presencing*) (Figure 1) [14]. In the following, we will discuss the role of BI/A technologies at each level of depth:

1) *Reacting*. Independent BI applications such as departmental data marts (cf., [15]) are helpful in diagnosing current systems and identifying opportunities for improvement. Focus on efficiency suffices.

In this stage, unless a journey through the U is implemented, a very likely outcome in terms of Scharmer's anti-practices is downloading same-old-same-old responses to challenges, reduced 'seeing' and becoming stuck with outcomes that nobody really wants.

2) *Redesigning*. At this level, tactical BI solutions can greatly support the decision-making in 'experienced' [4] organizations. These types of changes would typically fit with the BI target of creating an enterprise-wide infrastructure target [15]. Theory U would provide a framework to guide transitional change through uncovering common intent, seeing the system-in-transition with fresh eyes, and co-creating a new system.

3) *Reframing*. While 'transformed' [4] organizations leverage strategic business intelligence and big data analytics to elicit insights into external influences – technical advances, market shifts, environmental factors, or competition – developing long-term business goals, decisions at this level relies heavily on personal judgment and executive intuition. Theory U would help in 'sensing from the field,' in reflecting on the deep, taken-for-granted assumptions, and in enacting a new frame of thinking and way of being.

4) *Presencing*. Big data analytics may have a role in uncovering what is not known – the uncharted 'blue oceans' (cf., [27]) of uncontested market space amenable to new value creation – but at the end of the day, it is the intuition, judgment, and embodied experience of decision makers that underlie context-shifting strategic commitments like these. Theory U would help "connect to inner Source" to unleash the highest future potential accessible this way.

The BI/A strategy is therefore very largely dependent on the level of sophistication and integration achieved by organizations. Level 3 (reframing) may be regarded as transformative, while level 4 (presencing) is seen as essential in the formation of innovative and disruptive industry strategies.

VI. Limits of Business Intelligence and Analytics

We view that there are inherent limitations for the use of BI/A in organizational transformation along the afore-mentioned 'dimensions of dynamic wholes' ([24], recasting [25]). Specifically:

- The BI/A technologies tend to focus on directly observable and measurable surface features, such as computer records. Decision-making in enterprise transformations, however, entails deeply embedded considerations of the social context and psychological undercurrents that cannot be addressed by these technologies. (The vertical dimension.)
- The BI/A provide insights into past and present performance and, at best, into how to project trends to the future. Confined to linear, closed system thinking, it cannot inform on highly complex full-system organizational transformations that are ultimately unpredictable. In other words, the means of the BI/A are not in sync with the ends (i.e., insights into the future). (The dimension of progression.)
- The BI/A technologies are of great help in supporting decision-makers with relevant and timely information. At the end of the day, however, it is human judgment and discretion as to how to integrate and make sense of the information (the transverse dimension) that is brought to bear in decision-making. (The transversal dimension.)

In the following, we will discuss these limitations of the use of BI/A in the context of organizational transformation.

A. Transformations entail social and psychological considerations

"There's no map / to human behavior," sings Björk, referring to the fact that human beings vary from person to person and from time to time. As purposeful beings that exhibit will [28], people observe, learn, change their goals, choose their behavior and communicate with each other, making social situations inherently uncertain, indeterminate and ambiguous.

A typical, but superficial, response to the wicked complexity [29], arising from this reflexivity, intentionality and evolution of human systems and institutions [30], is to make blanket assumptions about the mix of motive patterns [31]: to what extent employee behavior is driven by fear of punishment, external rewards, or intrinsic motivation. The organizational decisions are then based on these coarse, approximate generalizations.

While Big Data can give more detailed insights into collective human behavior and even anticipate future actions [32], social media and other digital footprints provide decision-makers with markedly different kinds of data points than social data that is based on personal interactions [33]. We would argue that the leader's 'gut feeling' of the big picture integrating people and social dynamics with commercial and technical considerations continues to be an important source of insight.

B. Transformations are inherently unpredictable

BI/A technologies tend to provide decision-makers with lagging indicators – view on past and present performance – and to inform strategy with extrapolations of trends, at best.

However, transformational organizational change [20] cannot be predicted with logical thinking that relies on lagging (past-oriented) indicators, as transformation is a developmental movement across time that "explodes any closed system in its entirety" [34]. According to Laske [34], formal logical thinking is confined to closed systems that

cannot size up non-physical moving targets. Open, living systems always include contradictions and things 'other' than what the system in its present form openly manifests.

Davis [23] suggests that organizational transformations are shifts in context: from (1) not knowing that you don't know to (2) knowing that you don't know. The effective organization, he argues, starts from the context that it has already succeeded as opposed to the context of disparity between 'as-is' and 'to-be.' By redrawing the boundaries, what is inside the boundary of inquiry becomes what we know that we don't know. This focuses attention to create the content, a new reality that derives from this 'ground of being.' Rather than being pulled along by the strategy, organization can be used to push the strategy toward its realization [23].

C. *Ultimately, it is people who make decisions*

In The Form of Time, Jaques [35] identifies two sides of 'the human equation:' 1) the surface part of mental activity – preconscious awareness on which we consciously draw and conscious knowledge that provides context for behavior; and 2) unconscious sensing – the "continuously shifting direction of intentionality" [35].

Jaques [35] also revives the ancient Greek distinction of two dimensions of time: *chronos* and *kairos*. At each point of chronological or sequential time, a person's internal experience is framed in kairos, in which the immediacy of the present, memories of the past, and hopes for the future are intertwined [36]. This unconscious, unverbalized protomental experience:

> *comprises the psychological world of desires, of passion, of goals and intentions and will. It is the world of primally fused memory, perception, desire, and intention (the unified field which exist before we consciously differentiate the parts), combined into what might be termed the moving present, a present which is felt as moving from out of the past and into the future. It is this unconscious phenomena which give us the notion of time as having a direction which expresses goal-directedness of intentional behavior. ([35], p. 53).*

To Jaques [37], the effort experienced in decision-making pertains to giving energy and direction to this non-verbal mental processing and bringing its outcomes into verbalizable awareness to be integrated with knowledge and used in conscious problem solving. Human work can never be exclusively knowledge-based, for when all non-verbal judgment is taken out of a decision, it becomes a calculation, not a decision [37].

A recent TechAmerica study [38] tells us that 15 % of the information today is structured and 85 % is still unstructured. That means there is still a huge amount of information that has to be sifted and analyzed by human contact or discussion.

The huge amount of unsifted and unstructured information places immediate potential limitations on the value and scope of BI/A inside any transformational change initiative. Some of this data may be extremely critical. However, transformation still depends largely on the social and psychological considerations of contextual human judgment.

VII. NEGLECT SOCIAL TECHNOLOGY – AT YOUR PERIL

Business intelligence and analytics technologies have an important role in informing strategy and organizational change. However, we view that, due to the limitations outlined in Section VI, these technologies, in and of themselves, are inherently inadequate in this respect and should be complemented with appropriate change management practices and social technologies.

While BI/A technologies may help the organization deal with greater complexity and change, without the requisite capability of individuals to use these systems properly they may also prove ineffective (cf., [13]). If the organization's analytics capability falls short of the requirements of its context, maladaptive responses can be expected.

We find that an integrative social technology helps mitigate or overcome the limitations outlined in Section VI by providing a framework in which to investigate and make sense of the big picture provided by BI/A. Theory U, in particular, is a useful meta-level framework in guiding how to deliberately shift attention from the present state of the organization to its future one, and providing the practice and process tools to achieve this shift, Theory U helps midwife organizational change and transformation in a conscious way.

For instance, the efficiency focus of an 'aspirational' user of analytics and resulting deployment of independent BI solutions is too superficial, segmented and dissociated for redesigning the type of change which calls for higher awareness of the external developments in order to make valid choices among the tactical options to realign properly the business. Relying too much on partial, partitioned, and uncoordinated information at the expense of understanding the social dynamics, appreciation of the common purpose, and coordination between parties is bound to fail, as are attempts to rein in the organization through synoptic control, authoritarian leadership regime, or evangelic proclamations. 'Not seeing' the trajectories of the embedding field, technology may just deepen the rut the organization is in.

The development of analytics capability is a long process and truly adaptive strategies cannot be implemented expeditiously. Furthermore, the emergence of a higher order capability may be impeded by the current system in place (cf., [24]). Continued denial of turbulence and resort to quick fixes in terms of passive or active maladaptive strategies (de-sensing) is likely to beget second order maladaptive responses. Unless the analytics capability succeeds to outgrow its efficiency focus, the organization runs the risk of monothematic dogmatism – "This is the way things are done around here." Going unchecked, business intelligence and analytics may become self-serving and self-perpetuating, growing increasingly apart from their sensing and sense-making purpose. Individual core areas may remain pockets of performance, but the periphery erodes to a 'social vortex' [13] of limited success.

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VIII. DISCUSSION AND CONCLUSIONS

There is more to intelligent business than business intelligence. In our view, business intelligence and analytics (BI/A) technologies bear the potential to benefit organizational transformations, but in order for transformation to be successful will need to be accompanied by appropriate attention-focusing, integrative social technology such as Theory U. Whereas BI/A technologies provide a clue to possible areas in a system that may be leveraged for organizational transformation, Theory U provides a framework and process model in which to place, examine and integrate those leverage points, taking account of the context, the system and people involved in transformation initiatives.

In this conceptual paper, we have argued why it is important to integrate BI/A with a social technology, in general, and Theory U, in particular, and suggested what may happen, if the social and psychological aspects of organizational transformation are downplayed.

We have explored the following research questions:

1. What is the role of BI/A capability in organizational change and transformation?
2. What are the limits of BI/A technologies in supporting organizational change and transformation?
3. How can these limits be mitigated or overcome through the application of a social technology, in general, and Theory U, in particular?

In conclusion:

1) The deeper the organizational change, the more mature level of BI/A is required and the more pronouncedly important it is to use integrative social technologies such as Theory U.

2) BI/A technologies, per se, are not adequate to support organizational transformations due to social complexity, the non-linear nature of transformation, and the need for human judgment.

3) An integrative social technology, such as Theory U, complements BI/A technologies by directing conscious attention to the required adaptive capacity in the face of encountered environmental conditions.

Due to the explorative nature of our inquiry, our literature review was rather initial and tentative. To further develop the initial insights of this paper, we would like to construct a conceptual framework that would elaborate on the posited relationships between the theoretical elements. To this end, a more detailed and comprehensive literature review would be required. Finally, we call for empirical research to investigate the initial conjectures presented herein and in any follow-on conceptual inquiry.

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