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Leading Small and Medium-Sized Enterprise (SME) IT with Agility

CAPSTONE REPORT

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Abstract

Aligning IT strategy with organizational strategy is a key contributor to success. IT governance has historically been used to maintain this alignment. More recently, agile methods have been used to remain competitive in rapidly changing environments. By reviewing literature from the past decade, this annotated bibliography seeks to apply the established IT governance frameworks to small and medium-sized enterprises (SMEs) pursuing agility and provide direction for IT leaders attempting to integrate these ideas.

Keywords: business-IT alignment, IT governance, agile, SME

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Introduction

Problem

Most strategic decisions made by organizations depend on information technology (IT) projects for delivery (Rahrovani, Kermanshah, & Pinsonneault, 2014). Projects are a means by which organizational strategy is implemented (Project Management Institute, 2017, p. 12). Organizations often struggle to keep IT projects and project spending aligned with their strategies because of the increasing complexity of organizations and shifts in market pressures (Ullah & Lai, 2013). Organizational complexity increases with the demand for more IT services (Ullah & Lai, 2013). Competitor innovations quickly shift market pressures (Ullah & Lai, 2013). The lack of a shared domain knowledge between the business and IT also contributes to misalignment (Ullah & Lai, 2013).

Aligning IT strategy with organizational strategy is a critical contributor to an organization's success (Ullah & Lai, 2013). The benefits of alignment include higher profits, decreased costs, increased trust in the organization (Saetang & Haider, 2011), and increased productivity (Tallon & Pinsonneault, 2011). An organization experiences higher profits when IT strategy and organizational strategy are in alignment because the organization can effectively use IT to capitalize on opportunities (Gerow, Grover, Thatcher, & Roth, 2014). Costs are decreased with alignment because of improved operational efficiency (Gerow, Grover, Thatcher, & Roth, 2014). Trust within the organization is increased because of the enhanced perception of IT (Saetang & Haider, 2011). Finally, productivity of the organization is increased by providing direction in volatile situations (Tallon & Pinsonneault, 2011).

Stemming from the field of corporate governance, IT governance (ITG) emerged as a way to ensure IT is properly aligned with organizational strategy (Bergeron, Croteau,

Uwizeyemungu, & Raymond, 2015). Meyer (2004) defines governance as "processes that coordinate and control an organization's resources and actions" (p. 24). Olutoyin and Flowerday (2016) provide the narrower definition of ITG as "the processes that ensure the effective and efficient use of IT for enabling [organizations] to meet their business goals" (p. 3). ITG has traditionally focused on a plan-driven approach that requires the creation of a comprehensive plan before implementation of a project begins (Houston, 2014; Schwartz, 2017). Bergeron et al. (2015) note that ITG literature also emphasizes a command and control approach to decision-making where formal organizational hierarchy directs the work being done and ensures completeness.

ITG frameworks such as Control Objectives for Information and related Technology (COBIT) were originally developed to define governance processes for IT departments (Montenegro & Arévalo, 2018). However, these frameworks were designed to address the needs of large enterprises (Bergeron et al., 2015). Often, their application to small and medium-sized enterprises (SMEs) does not address the specific issues and IT governance needs of these organizations (Ayat, Masrom, Sahibuddin, & Sharifi, 2011). For example, many of the formalized mechanisms in ITG do not work in SMEs, which typically have a more organic structure and rely on a single owner or manager for leadership (Bergeron et al., 2015). Business and IT employees are also more likely to be co-located and work together regularly in an SME, so formal collaborative processes are less important (Bergeron et al., 2015).

The command and control focus of ITG is counter to the agile principles which have led to success in many IT teams (Schwartz, 2017). Agile principles were originally applied to software development and were compiled into the *Manifesto for Agile Software Development* in 2001 by leaders from this industry (Houston, 2014). The key tenets of agile software

development as defined by this manifesto are people over processes, functional software over complete documentation, collaboration over negotiation, and adaptability over plan adherence (Beck et al., 2001).

Though agile methods began as a software development practitioner movement, the methods have now become a set of values, principles, and practices (Houston, 2014). Agile methods provide an alternative to the plan-driven approach to managing projects by recognizing change is inevitable and many decisions should not be made up front (Houston, 2014). By delaying decisions until their 'optimal' moments, a team can leave additional options available and rely on newly gathered information to make decisions that best support the strategy of the organization (Schwartz, 2017).

An agile approach enables an organization "to make strategic commitments while staying nimble and flexible and is considered to be a means by which [organizations] transform and reinvent themselves, adapt and ultimately survive" (Arbussa, Bikfalvi, & Marquè, 2017, p. 271). While agile methodologies often speak to specific practices, agility can also be a characteristic of groups across an organization (Luna et. al., 2014). Kruchten (2013) defines agility as "the ability of an organization to react to changes in its environment faster than the rate of these changes" (p. 351). An organization's performance has been linked to its agility because of the adaptability it enables by involving users in the continuous delivery of products (Marhraoui & Manouar, 2017).

Small and medium-sized enterprises wishing to pursue agility face challenges that larger organizations do not (Arbussa, Bikfalvi, & Marquè, 2017). One challenge SMEs face is a lack of resources, such as qualified employees capable of leading a large cultural change (Arbussa, Bikfalvi, & Marquè, 2017). Another challenge is that a project leader in a SME may have many other responsibilities, which can hinder the leader's ability to promote agility (O'Sheedy, 2014).

Despite the challenges SMEs face in applying traditional IT governance frameworks and adopting agile methods in their organizations, the unique challenges faced by these enterprises point to potential benefits from the pursuit of both IT Governance (Bergeron et al., 2015) and agile approaches (Buglione, 2011).

Purpose

The purpose of this research is to identify IT governance approaches for small and medium-sized enterprises pursuing agility that promote alignment between IT strategy and the strategy of the organization.

Research Questions

Main question. How do small and medium-sized enterprises that employ agile practices approach IT governance to align information technology strategy with organizational strategy?

Sub-questions. How do IT governance frameworks suit the needs of SMEs? How can IT governance frameworks support teams pursuing agility?

Audience

This study will be most useful for IT leaders (managers, directors, and Chief Information Officers) in small and medium-sized organizations that want to align IT strategy with organizational strategy. These leaders direct resource-constrained teams that must support the technology needs of their entire organizations. The study will help these leaders identify new approaches to IT governance that will promote the alignment of IT strategy with organizational strategy while preserving agile approaches. Organizational leaders outside of IT (Chief Executive Officers, Chief Financial Officers, and Chief Operating Officers) may also find the results useful, as they demonstrate how an organization can effectively use IT resources to

support organizational strategies. They may be particularly interested in the way agile practices promote continuous improvement and the elimination of inefficiencies.

Search Report

      Search strategy. My initial searches were made in databases focused on software development such as the Association for Computing Machinery (ACM) Digital Library and Institute of Electrical and Electronics Engineers (IEEE) Xplore. I used search terms like *IT governance*, *SMEs*, and *agile*. From the useful results I selected additional keywords to use in my searches. Later I expanded my searches to information management journals. I also searched Google Scholar using very specific queries like *"IT governance" AND agile AND SME*. When trying to locate the full text of a reference, I used the University of Oregon LibrarySearch and Oregon State University 1Search. When full text articles were not available, I made requests for the articles through the InterLibrary Loan (ILLiad) service.

      Key terms. I conducted searches for three categories of references: IT governance in SMEs, agility in SMEs, governance with agility, and organizational agility. I used various combinations of keywords for searches:

- information technology governance or IT governance.
- information technology management or IT management.
- corporate governance.
- nonprofit governance.
- small and medium-sized enterprise or SME.
- agile practices.
- agile governance.
- agile methodologies.

- agility.

- organizational agility.

- lean methodologies.

- software development governance.

- business value.

- business-IT alignment.

Search engines and databases. I relied on a number of databases for this study. The ACM Digital Library and IEEE Xplore provided the foundational references. These databases are focused on the software development area of information technology and were useful in identifying resources on agile methodologies. Browsing information science journals like the Management Information Systems Quarterly, Journal of Management Information Systems, and Electronic Journal of Information Systems Evaluation revealed new keywords to broaden the searches. Business-specific database Business Source Complete supported searches related to corporate governance. I also used general databases like Academic Search Premier, JSTOR, and EBSCOHost. Google Scholar identified new resources outside of these databases. Once articles were identified in Google Scholar, I used the University of Oregon library search to find the full text.

Documentation method. Throughout the research I tracked and categorized the references to support analysis. I used the BibDesk application to manage citation details, abstracts, reference categories, and full text files. I tagged references with keywords like *IT governance*, *agile governance*, *agile practice*, *small and medium-sized enterprises (SME),* and *annotated bibliography*. This approach allowed me to use smart groups to browse the references

I collected. I stored these files in Dropbox to provide access on multiple devices and data redundancy.

        Reference evaluation criteria. The Center for Public Issues Education (n.d.) at the University of Florida provides a guide for evaluating references. The *Evaluating Information Sources* document outlines five areas to consider.

- The *authority* of the author should be examined. Authority speaks to the author's credentials for writing on the topic. For this research I have relied primarily on sources I found in academic databases through the University of Oregon Library. This approach resulted in references primarily from peer-reviewed journals, which have been vetted through a rigorous review process.

- The *timeliness* of a reference also needs to be considered. This paper is examining an emerging topic, so only references from the past decade were used, with an emphasis on the past five years.

- The *quality* of references was considered in resource selection. Works with significant grammatical errors and unprofessional formatting were not included. These mistakes suggest a less rigorous review of content.

- The *relevancy* of references was considered based on the primary purpose of the source. Sources were only used to cite statements which were core to the purpose of the work.

- Lack of *bias* was considered by ensuring opposing ideas were addressed. Sources published by vendors who sell products or services or other authors with clear bias concerns were not selected.

Annotated Bibliography

This annotated bibliography provides annotations of references that help answer the research questions presented in this paper. Annotations are grouped into four categories: IT governance in SMEs, agility in SMEs, governance with agility, and organizational agility. Categorization is based on the main point presented in the reference. Each annotation consists of a bibliographic citation, published abstract, and summary highlighting the relevance of the reference to this study. The summaries present the ideas of the original authors and not the author of this paper.

IT Governance in SMEs

Bergeron, F., Croteau, A.-M., Uwizeyemungu, S., & Raymond, L. (2015). IT governance theories and the reality of SMEs: Bridging the gap. In *2015 48th Hawaii International Conference on System Sciences* (pp. 4544–4553). https://doi.org/10.1109/HICSS.2015.542

Abstract. The need to effectively manage IT resources such that they enhance the business value of firms makes IT governance (ITG) an important issue for both IS researchers and practitioners. The purpose of this paper is to build a conceptual framework for ITG in small and medium-sized enterprises (SMEs). We first analyze the main theories applied in ITG research, and confront them with the specificities of SMEs. We then highlight the limits of those theories in SMEs context and discuss adaptations needed or alternative theories in such context. The resulting framework is then applied to generate a set of six research propositions on ITG in SMEs.

Summary. Researchers from Quebec universities review the literature of theories surrounding corporate and IT governance. Specifically, they describe the theories normally associated with this research and note the applicability of each to the SME context. For instance, agency theory is one of the main theories typically applied to this area. This theory describes the issues which result when ownership and control are separated. However, this theory is much less applicable to most SMEs, where a single owner-manager controls IT decision making. Other theories, like the upper echelon theory (the theory that top managers and key employees have a more significant influence on strategy in smaller organizations) and the resource dependence theory (the theory that smaller organizations depend more on outside expertise) are more applicable to SMEs.

This article provides a thorough review of almost 70 references on IT governance in SMEs. The authors are aware their propositions do not apply to all SMEs and warn readers to consider the particular context when applying their propositions. Their work helps further this research project by providing a framework of governance theories and their applicability to SMEs. This framework focuses on the characteristics of three areas within SMEs: the owner-manager, key employees, and external links to expertise. The competencies and values of the owner-manager were found to have a dramatic influence on the success of ITG in the organization. Likewise, key employees were found to have a similar strong impact. The authors note that external links to expertise will also drive the success of ITG in the organization. Finally, the authors assert that how these areas influence the ITG mechanisms in the organization determines the business value generated.

Devos, J., Van Landeghem, H. & Deschoolmeester, D. (2012). Rethinking IT governance for

  SMEs. *Industrial Management & Data Systems, 112*(2), 206-223.

  https://doi.org/10.1108/02635571211204263

Abstract. Purpose: The purpose of this paper is to critically rethink the concepts and the

theoretical foundations of IT governance in small- and medium-sized enterprises (SMEs).

Design/methodology/approach: The paper is based on multiple case studies. In total,

eight cases of outsourced information system projects where failures occurred were

selected. An outsourced information system failure (OISF) is suggested as a failure of

governance of the IT in a SME environment. A structure for stating propositions derived

from two competing theories is proposed (Agency Theory and Theory of Trust).

Findings: The results reveal that trust is slightly more important than control issues such

as output-based contracts and structured controls in the governance of IT in SMEs.

Practical implications: The world of SMEs is significantly different from that of large

companies, and therefore, the concept of IT governance in SMEs needs reconsideration.

For researchers and practitioners, it would be more meaningful to focus on actual,

working SMEs instead of on a version of their activities derived from those of large

companies. Originality/value: The paper offers two contributions. First, it elaborates the

limited research on IT in SMEs and second, it brings theoretical foundations for their IT

governance. The value of IT governance in SMEs is explained.

Summary. In this paper, three Belgian university professors and industry experts

examine IT governance failures in case studies of SMEs with outsourced IT and provide

a closer look at one approach SMEs take in managing IT. However, observations in this

paper on the differences between large enterprises and SMEs are applicable to SMEs in

general. They conclude trust is more important than control in the IT governance of

SMEs. Traditionally, agency theory, which explores the circumstances where one entity

acts on behalf of another, and its derivative, control theory, or an understanding of the

factors surrounding organizational mechanisms like a hierarchy (Schaarschmidt, M.,

Walsh, G., & von Kortzfleisch, H. F. O., 2015), have been used to frame IT governance.

However, they found IT governance in SMEs is different than in large organizations. IT

governance in SMEs requires informal control structures, just enough reporting on

project status, and more of a focus on the people involved. The Chief Executive Officer

(CEO) also plays a critical role in IT project success within SMEs. The authors found

CEOs often do not have the commitment, time, and knowledge to provide the support

these projects need.

The authors suggest the best approach for developing IT governance in SMEs is to start

with an understanding of the organization and its characteristics. The authors assert that

simply using the frameworks developed for large enterprises does not work. Their work

supports this study by arguing the importance of trust over control and the requirements

for IT governance success in SMEs.

Olutoyin, O., & Flowerday, S. (2016). Successful IT governance in SMEs: An application of the

technology–organisation–environment theory. *SA Journal of Information Management,*

18(1), 1-8. Retrieved from http: //www.sajim.co.za/index.php/SAJIM/article/view/696

Abstract. Background: Small and medium-sized enterprises (SMEs) are the bedrock of

most economies of the world. Due to global competition, SMEs are making significant

investments in information technology (IT) to improve their business processes.

However, a study of extant literature on the subject of IT governance in SMEs has

highlighted the fact that the implementation of structural controls to enable effective IT

governance is often difficult, resulting in project failures and loss of income. Objectives:

This paper seeks to examine ways by which SMEs can successfully adapt a suitable IT

governance framework to manage its IT investments. Method: A content analysis of

extant literature was done in this paper. The Technology-Organisation-Environment

theory forms the theoretical basis of the proposed key pillars for an SME to evaluate its

capability to embark on an IT governance initiative in order to obtain the desired results.

Results: From the content analysis of relevant literature, the paper proposed three key

pillars which should be in place before an SME adapts any IT governance framework to

manage its IT investments. The key pillars are considered an important link between

strategic IT governance plans and measurable successful outcomes. Conclusion: It was

concluded that an SME would be better positioned for successful IT governance if it were

to conduct a careful analysis of the components of these key pillars before embarking on

the implementation of any IT governance framework.

Summary. This article is a postgraduate research project from the University of Fort

Hare, South Africa. The authors' aim is to determine the practices that result in the

successful adoption of an ITG framework by an SME. After reviewing and analyzing the

literature on SME organizational structure, ITG, and ITG in SMEs, the authors determine

the technology-organization-environment theory provides a complete understanding of

the foundation required for ITG structures. This theory suggests these three areas

influence the successful implementation of an information system. The authors

recommend an analysis of specific characteristics such as the financial health of the

organization, the presence of skilled personnel, and environmental supports that may

enable ITG implementation. Strong financial health ensures the necessary resources exist

to implement ITG processes. The presence of skilled personnel ensures the ITG processes

are correctly implemented and maintained. In environments with financial, infrastructure,

and other supports for SMEs, these supports ensure the stability necessary for ITG

implementation. At this stage, the authors note that the results of the research are

theoretical and untested. For this annotated bibliography, the paper introduces a balanced

look at the variety of characteristics which must exist in a SME to support proper IT

governance.

Wilkin, C. (2012). The role of IT governance practices in creating business value in SMEs.

Journal of Organizational and End User Computing, 24(2), 1-17.

http://dx.doi.org/10.4018/joeuc.2012040101

Abstract. Much has been written about information technology governance (ITG) in

larger organizations, wherein control of information technology (IT) is addressed with

attention to three core elements, namely structures, processes, and relational mechanisms.

These elements focus on governing the size of IT investment, the ubiquity of IT

functionality to business processes and the demonstrated value from IT investment. For

Small-to-Medium Enterprises (SMEs) it is less apparent how IT is or should be governed,

how these core elements may contribute to ITG, and how this all contributes to the

creation of business value. Through a survey of small SMEs in the Australian tourist

accommodation industry regarding their use of and planning for IT investment to deliver

business value, this paper delivers new understanding about SME practices related to

governing IT. Findings revealed evidence of some sound practices but the opportunity to achieve greater strategic business value beyond the largely operational value already acquired. The paper concludes by proposing a redefined framework of the core elements of structures, processes, and relational mechanisms that is tailored to an SME context.

Summary. As an Australian professor in accounting information systems, Wilkin pays particular attention to the value IT governance in an SME can provide. For her study, Wilkin surveyed 156 tourism agencies in Australia, which limits the applicability of the results to SMEs in other industries. However, some results from her research can be applied to SMEs more generally. For instance, the study shows SMEs tend to be more operationally than strategically focused. This focus presents a challenge when attempting to implement ITG in SMEs. For SMEs planning to adopt ITG, Wilkin recommends scaling down frameworks developed for larger organizations. She suggests focusing on three key areas: structures, processes, and relational mechanisms.

In the structural area, SMEs should rely on IT champions in the organization and external consultants instead of strategy and steering committees. In the area of processes, SMEs should take a flexible approach to IT usage and focus on strategic imperatives instead of using service level agreements and strategic information system planning. In the area of relational mechanisms, SMEs should focus on collaboration between stakeholders and incentivizing IT innovation, similar to the approach in larger enterprises.

This study is valuable for this research because it presents an alternative approach for implementing ITG in a SME. While other references recommend starting with the organizational context and developing a tailored framework, this author argues

frameworks developed for larger organizations can be scaled down to meet the needs of SMEs.

Agility in SMEs

Arbussa, A., Bikfalvi, A., Marquè, P. (2017). Strategic agility-driven business model renewal: The case of an SME. *Management Decision, 55*(2)*,* 271-293. https://doi.org/10.1108/MD-05-2016-0355

Abstract. Purpose: The purpose of this paper is twofold: to connect strategic agility and business model (BM) innovation, and to explore how capabilities underlying strategic agility fit the SME context. Design/methodology/approach: Qualitative in approach, the paper develops a longitudinal, in-depth, single case study focusing on how BM renewal occurs in the dynamic and increasingly important sector of temporary work agencies. Findings: The findings suggest a partial fit of the existing strategic agility framework for SMEs. Two of the proposed meta-capabilities (leadership unity and resource fluidity) seem inherent to SMEs because they apply easily to this context, although they need to be downscaled. One meta-capability (strategic sensitivity) is less natural and therefore more critical for an SME. An additional meta-capability (resourcefulness) arises as very important for SMEs to be able to overcome some of their size-caused limitations. Research limitations/implications: The contribution is limited by using a single case study from a specific sector and should be considered as exploratory and theory-grounding research in the field of SMEs' strategic agility and BM renewal. Originality/value: The originality of this paper is that it looks at the SME context in an

industry with intensive change and dynamism, which is ideal for illustrating the

objective. The authors contribute a model of strategic agility for SMEs.

Summary. University professors in Spain examined strategic agility in SMEs; they claim

in this 2017 study they are the first to specifically address this topic. Their approach was

to consider the capabilities enabling strategic agility and compare them with the

capabilities of SMEs. They use Doz and Kosonen's (2010) concept of three capabilities

that shape strategic agility: strategic sensitivity, leadership unity, and resource fluidity. Of

these three capabilities, the authors note that leadership unity, or "the ability of the top

team to make bold, fast decisions, without being bogged down in top-level 'win-lose'

politics" (p. 273) and resource fluidity, or "the internal capability to reconfigure

capabilities and redeploy resources rapidly," (p. 273) come naturally to SMEs. Strategic

sensitivity (an awareness of strategic opportunities) is more difficult for SMEs to exhibit

because of their lack of specialized staff and slack time.

This source is important for this study because it notes capabilities within an SME which

enable strategic agility. It also highlights strategic sensitivity as a potential weakness for

SMEs pursuing strategic agility.

O'Sheedy, D. G. (2014). Can action research improve project results? Results from a study of an

agile project management framework for an SME IT environment. *Action Learning and

Action Research Journal, 20*(2), 42-70. Retrieved from

https://search.informit.com.au/documentSummary;dn=345124024060111;res=IELHSS

Abstract. Project Management methods have reached maturity in large organisations,

and these methods have been successfully deployed for many decades, especially in

connection with IT projects. However, despite these advances, small software teams have

often found these project methods too bureaucratic and unwieldy. This has therefore led

to the style of software development methods known collectively as 'Agile' development.

This paper presents the research findings of a study undertaken using an Action Research

methodology. The research investigated the effects of putting into practice a framework

of Agile development concepts combined with traditional project management

techniques, for the management of IT projects in an SME (Small and Medium-sized

Enterprise) environment. An Agile project management framework was developed to

improve the implementation of IT projects, using core concepts adapted from the

PMBOK (Project Management Book of Knowledge), in addition to concepts derived

from Action Research and Agile software development. This framework was then

critically tested and refined over a period of eighteen months. The resulting Agile project

management framework was shown to assist project participants working in a fast-paced

environment, where there is a need to respond quickly to changing requirements. This

paper also provides a basis for further academic research into the future potential for

combining Agile methods with other established techniques for a business environment.

Summary. The author of this reference is an IT manager in an SME who conducted

action research in his organization. The author examined how agile methods can be

combined in a SME environment with traditional project management practices. The

author found success in adapting the formality of processes used to the type of project

being executed. He started with many of the suggested processes in the Project

Management Institute's *Project Management Body of Knowledge (PMBOK)*, then

incrementally replaced mechanisms with more agile alternatives. For example, he

replaced detailed requirements documents with a prioritized backlog of tasks. For some

projects he also used a shared task board as a mechanism to control and assign work,

which resulted in success for projects with a high likelihood for change.

The author identified characteristics of SMEs that favor an agile project management

approach, such as team members fulfilling multiple roles and project managers being

technical contributors to the implementation. The author also concluded this mixture of

approaches increased responsiveness to project requirement changes, was adaptable to

different styles of projects and organizations, and met the needs of small teams of

approximately four members, which are typical in SMEs. This work demonstrates how

agile practices build on some of the characteristics of SMEs and can produce successful

outcomes in this environment.

Governance with Agility

Gregory, P., Barroca, L., Sharp, H., Deshpande, A., and Taylor, K. (2016). The challenges that

challenge: Engaging with agile practitioners' concerns. *Information and Software*

Technology, 77, 92–104. https://doi.org/10.1016/j.infsof.2016.04.006

Abstract. Context: There continues to be concern that research is not addressing the

challenges that practice faces. For the benefit of academia and industry, researchers need

to be aware of practitioners' challenges and their context so that relevant and applicable

research is undertaken. Objective: This paper investigates two research questions: what

challenges do agile practitioners face? and, how do practitioner challenges manifest

themselves in an organisational setting? It aims to map the practitioner challenge

landscape, explore challenge characteristics, compare findings with previous literature

and identify implications for research that is relevant to practice. Method: A combination of methods was used: elicitation of practitioner challenges collected using a Challenge Wall at a series of practitioner events; organisational case study using interviews, document analysis and observation; and online survey. Findings were then compared to previous publications. Results: Challenges collected from the Challenge Wall were grouped under 27 subthemes and seven themes: claims and limitations, organisation, sustainability, culture, teams, scale, and value. Investigating one challenge in the case study uncovered a set of new challenges, which were inter-related. Over 50% of survey respondents experienced challenges highlighted in the case study. Conclusion: The landscape of agile practitioner challenges is complex and intertwined. Some challenges, such as doing agile in a non-agile environment, are multi-dimensional, affect many aspects of practice, and may be experienced simultaneously as business, organisational, social and adaptation problems. Some challenges, such as understanding cultural change or measuring agile value, persist and are hard to address, while others, such as adoption, change focus over time. Some challenges, such as governance and contracts, are under-researched, while others, such as business and IT transformation, have been researched but findings have not had the expected impact. Researchers wishing to address practitioner challenges need to treat them in context rather than in isolation and improve knowledge transfer.

Summary. Researchers from the United Kingdom used three approaches to better understand the challenges agile practitioners experience: collecting challenges at agile conferences, a case study of an agile team, and a survey of agile community members. These approaches were taken to ensure their research remains relevant to practice. The

focus of their study was on exploring the breadth of challenges versus the depth of any

particular challenge. One challenge the authors identified was governance of an agile

team in a traditional governance setting. Specific difficulties identified by the researchers

include skepticism of the approach by leadership and inability of the team to provide the

expected status updates. Organizational leadership valued projects being on-time and on-

budget and fulfilling the initially defined scope; however, the team valued

experimentation and quick delivery of business results. The authors also note the lack of

existing research literature examining this challenge. This source is important for this

study because it reveals challenges agile teams in SMEs are likely to encounter when

working in an environment accustomed to traditional governance.

Kruchten, P. (2013). Contextualizing agile software development. *Journal of Software:*

Evolution and Process, 25(4), 351-361. https://doi.org/10.1002/smr.572

Abstract. This paper presents a contextual model for software-intensive systems

development to guide the adoption and adaptation of agile software development

practices. This model was found especially useful when the project context departs

significantly from the "agile sweet spot", that is, the ideal conditions in which agile

software development practices originated from, and where they are most likely to

succeed, "out of the box". This is the case for large systems, distributed development

environment, safety-critical systems, system requiring a novel architecture, or systems

with an unorthodox business model or governance model.

Summary. This article was authored by a 30-year veteran of the software industry who

was involved in the development of a well-known software development framework, the

Rationale Unified Process, which was later acquired by IBM. The focus of this paper is

on adapting agile software development practices to atypical contexts. The author

examined the context of a team and the factors which impact the formation of processes.

The author notes that by defining the "agile sweet spot," a team is able to identify in what

areas they fall outside of the sweet spot to aid in identifying the challenges they are likely

to face when adapting agile. Of particular interest to this annotated bibliography is the

discussion of attempts to adapt agile in organizations with traditional governance models,

which the author identified as one of the greatest risks potentially impairing an agile

project. Specific challenges the author identified in this context include deciding how

projects begin and end, how project issues are addressed, and what defines a successful

project.

Luna, A. J. d. O., Kruchten, P., Pedrosa, M. L. d. E., Neto, H. R., & Moura, H. P. d. (2014). State

of the art of agile governance: A systematic review. *International Journal of Computer

Science & Information Technolog*y, 6(5), 121-141.

https://doi.org/10.5121/ijcsit.2014.6510

Abstract. Context: Agility at the business level requires Information Technology (IT)

environment flexible and customizable, as well as effective and responsive governance in

order to deliver value faster, better, and cheaper to the business. Objective: To understand

better this context, our paper seeks to investigate how the domain of agile governance has

evolved, as well as to derive implications for research and practice. Method: We

conducted a systematic review about the state of art of the agile governance up to and

including 2013. Our search strategy identified 1992 studies in 10 databases, of which 167

had the potential to answer our research questions. Results: We organized the studies into four major groups: software engineering, enterprise, manufacturing and multidisciplinary; classifying them into 16 emerging categories. As a result, the review provides a convergent definition for agile governance, six meta- principles, and a map of findings organized by topic and classified by relevance and convergence. Conclusion: The found evidence lead us to believe that agile governance is a relatively new, wide and multidisciplinary area focused on organizational performance and competitiveness that needs to be more intensively studied. Finally, we made improvements and additions to the methodological approach for systematic reviews and qualitative studies.

Summary. The authors made a systematic review of the literature on agile governance through the collaboration of students and professors from Brazil and Canada. They looked at over 100 studies with the potential to support their research question: understanding the current state of agile governance and how it has evolved. This review led to the development of six principles for guiding the development of agile governance:

- Good enough governance, or adapting governance to suit the organizational context.
- Business-driven, or ensuring all decisions take into account the business strategy.
- Human-focused, or focusing on helping people feel valued.
- Based on quick wins, or relying on small successes to drive increased results.
- Systematic and adaptive approach, or designed to manage changes.
- Simple design and continuous refinement, or delivering fast and then always improving.

These principles will be used in this annotated bibliography to frame the development of an agile governance approach for SMEs.

Luna, A. J. H. d. O., Kruchten, P., & Moura, H. P. d. (2015). Agile governance theory: Conceptual development. In *12th International Conference on Management of Technology and Information Systems* (pp. 1-22). Retrieved from https://arxiv.org/abs/1505.06701

Abstract. Context: Competitiveness is the key to a sustainable development and it demands agility at the business and organizational levels, which in turn requires a flexible and customizable IT environment and effective and responsive governance in order to deliver value to the business. Objective: This paper describes the conceptual development of a theory for analyze and describe agile governance in order to increasing the success rate of their practice, achieving organizational performance and business competitiveness. Method: We adopt a multi-method research, framing the theory conceptual development using Dubin's method of theory building. Results: We have developed a conceptual framework of the theory encompassing its constructs, laws of interaction, boundaries and system states. Conclusion: This theory can provide a better understanding of the nature of agile governance, by mapping of its constructs, mediators, moderators and disturbing factors, in order to help organizations reach better results.

Summary. Building on the principles established in their previous work, the authors introduce agile governance values and develop a complete theory. For the purposes of this bibliography, the values will be most useful; the values emphasize four areas and are contrasted against conventional governance. Agile governance values behavior and

practice over process and procedures; sustainability and competitiveness over auditability and compliance; transparency and engagement over monitoring and controlling; and sensing, adapting, and responding over following a plan. These values will help direct the application of governance structures by helping to determine which practices will succeed in an agile context and which will need to be adapted.

Schwartz, M. (2017). Governance and oversight. In *A seat at the table: IT leadership in the age of agility* (pp. 161-195). Portland, OR: IT Revolution.

Abstract. Our traditional way of thinking about governance is thoroughly bound up with the waterfall and contractor-control models of IT. In an Agile world, we have to see governance and oversight of projects as a continuum, where governance decisions are constantly adjusted based on what we learn during execution.

From governance by a Star Chamber that pronounces judgments to governance by committed leaders who organize investment themes to produce strategic outcomes. From risky upfront governance decisions to decisions that are continuously revisited and adjusted through oversight mechanisms. From governance as a check and balance on a project team to governance that is aligned and supportive and removes impediments.

Summary. In this chapter, the author, a CIO and industry leader on agile approaches, suggests a dramatically different picture of IT governance compared to traditional IT governance. In his view, projects are not the right level of granularity for making governance decisions, as projects contain too many unknowns. He recommends breaking work into smaller tasks and increasing the frequency of feedback and decision making, enabling continued resource assignments only to initiatives which produce value.

Following this approach, organization leadership sets strategic objectives and IT teams experiment to find the best ways to meet those objectives.

A top concern of the traditional IT governance approach is controlling the project budget. The author suggests agile is the only approach that will allow organizations to regularly complete projects on budget because agile projects deliver functionality as soon as possible and in prioritized order. Project execution can stop when the budget has been exhausted and project sponsors can be assured resources were spent on the most promising capabilities.

Another concern of traditional IT governance is accountability for the project team. If the project timeline is not defined, the project team could end up delivering capabilities at a less than optimal rate. The author suggests it is the role of IT leadership to be narrowly focused on removing all obstacles for the team. The more obstacles that are removed, the higher performance the team will demonstrate.

Traditional IT governance is also concerned with controlling scope. Typically, this involves insuring needless work is not added to the project. Agile practices not only limit the addition of unneeded scope, but also push to remove scope which is unlikely to result in significant value.

Finally, traditional IT governance approaches have used timelines to create a sense of urgency to motivate the project team. In agile projects team members experience the urgency around completing all tasks each sprint. This creates urgency at many, smaller intervals instead of a large milestone looming in the distance. This results in sustained performance from the project team.

This chapter contributes to this study by suggesting ways to improve the prioritization of IT, manage budgets, provide accountability, ensure the right scope is completed, and maintain urgency within this approach.

Tallon, P. P., & Pinsonneault, A. (2011). Competing perspectives on the link between strategic information technology alignment and organizational agility: Insights from a mediation model. *MIS Quarterly, 35*(2), 463-486. https://doi.org/10.2307/23044052

Abstract. Strategic information technology alignment remains a top priority for business and IT executives. Yet with a recent rise in environmental volatility, firms are asking how to be more agile in identifying and responding to market-based threats and opportunities. Whether alignment helps or hurts agility is an unresolved issue. This paper presents a variety of arguments from the literature that alternately predict a positive or negative relationship between alignment and agility. This relationship is then tested using a model in which agility mediates the link between alignment and firm performance under varying conditions of IT infrastructure flexibility and environmental volatility. Using data from a matched survey of IT and business executives in 241 firms, we uncover a positive and significant link between alignment and agility and between agility and firm performance. We also show that the effect of alignment on performance is fully mediated by agility, that environmental volatility positively moderates the link between agility and firm performance, and that agility has a greater impact on firm performance in more volatile markets. While IT infrastructure flexibility does not moderate the link between alignment and agility, except in a volatile environment, we reveal that IT infrastructure flexibility has a positive and significant main effect on agility. In fact, the effect of IT infrastructure

flexibility on agility is as strong as the effect of alignment on agility. This research

extends and integrates the literature on strategic IT alignment and organizational agility at

a time when both alignment and agility are recognized as critical and concurrent

organizational goals.

Summary. The authors are university professors who have published numerous articles

on IT strategic alignment and business value. In this article, the authors note that even

though organizations see the benefits of strategic alignment and agility, the research

literature has not examined the integration of the two. Their main question is whether

business-IT alignment helps or hinders agility. Their study finds that business-IT

alignment overall enables further agility. The authors note that past research has linked

alignment to organization performance and assert that agility creates this link. The

authors note that the link between business-IT alignment and organization performance is

more likely to be present in stable organizational environments. The research is important

to this annotated bibliography because it confirms pursuit of agility is a way to take

advantage of the alignment created by IT governance.

Organizational Agility

Bunyakiati, P. & Surachaikulwattana, P. (2016). Fit between agile practices and organizational

cultures. In *2016 13th International Joint Conference on Computer Science and Software

Engineering* (pp. 1-6). https://doi.org/10.1109/JCSSE.2016.7748915

Abstract. Software engineering methodology such as Agile, establishes the governance

of software development. Over the years, a number of Agile practices have been

invented. These practices are built on the same Agile principles but emphasise on

different rationales and values, and thus associated with various approaches, activities

and artefacts. Given this variety, and necessity for organizations to incorporate Agile,

many studies have attempted to examine the relationship between organizational

attributes, particularly organizational culture, and Agile practices, which in

configurations result in effective outcomes of software development. In this paper, we

propose a theoretical framework that deals with an alternative way in which organizations

identify their cultural types, and understand underlying principles of each Agile practice

in order to form the fit between organizational culture and Agile. In other words,

organizations do not necessarily change their current culture in order to use Agile

effectively, as existing studies suggested. Rather, they select the Agile practice that fits

with their cultural type. This framework is based on interpretation of existing literature

and systematic qualitative approaches.

Summary. Thai researchers developed a model that fits agile practices to organizational

cultures. Rather than adapting cultures to adopt a particular agile practice, the authors

suggest using their model to find the practices which best fit the culture. Their model

considers the strategic focus of the organization and the environmental needs. These

characteristics place an organization into one of four cultural quadrants: adaptability

(focused on adjusting to environment or customer needs), mission (focused on serving

specific customers), involvement (focused on the participation of organization members),

and consistency (focused on creating a stable environment). These quadrants are then

connected with a principal agile value such as working software (prioritizing functioning

capabilities), problem-domain (prioritizing alignment of projects with business goals),

people and interaction (prioritizing frequent interactions between people), or flow and

capacity (prioritizing the steady completion of work). These values were then linked with the agile practice that provides the best fit, such as behavior-driven development, dynamic systems development method, scrum, or lean production. This model is helpful to this research because it provides a means of analyzing the cultural distinctiveness of an SME to determine the agile practices which will best fit that context.

Houston, D. X. (2014). Agility beyond software development. In *2014 International Conference on Software and System Process* (pp. 65-69). https://doi.org/10.1145/2600821.2600837

Abstract. Agile software development grew out of a variety of alternative software development methods that shared a common set of values and principles. After two decades, agile software development remains loosely defined, but has been widely accepted. This acceptance has gained the attention of other fields with discussions of applying agile to their work, for example agile systems engineering and agile program management. However, agile was defined in terms of software development, both in practice and in principle. Therefore, translation into other fields has been challenging. This paper derives a set of agile characteristics and discusses two benefits of accepting such a set of characteristics for (a) application of agile to other fields beyond software development and (b) for measurement of agility.

Summary. In this article, an employee at an aerospace company investigates the application of the agile ideas from software development to other fields. He argues this application is possible because agile is more of a mindset than a set of processes. His investigation results in a set of agile characteristics which can then be used to measure the agility of an organization:

- Interpersonal interaction.

- Working product or service.

- Customer/user collaboration.

- Responsiveness to change.

- Continual delivery of customer value.

- Self-organizing, multifunctional collaboration.

- Leadership by the motivated.

- Technical excellence and simplicity.

The concept of measuring agility is significant because it shifts the idea of an organization from either being or not being agile to a continuum of agility. This helps reframe the idea of what makes an organization agile for this annotated bibliography.

Marhraoui, M. A. and El Manouar, A. (2017). IT innovation and firm's sustainable performance: The mediating role of organizational agility. In *9th International Conference on Information Management and Engineering* (pp. 150-156). https://doi.org/10.1145/3149572.3149578

Abstract. During the last ten years, the business environment has become complex and turbulent. Companies should thus innovate in order to gain competitive advantage. By proposing new IT innovations or adopting new ways to use existing IT innovations, firms are able to sense customers' needs and to design rapidly new products and services. In this article, an original framework is proposed. It links IT innovations and company's sustainable performance and highlights the intermediary role of firm's organizational agility. An inductive/deductive methodology was adopted by formulating general

findings and a research question based on observations of both large corporate and SMEs in banking and telecommunications sectors.

Summary. A Moroccan PhD candidate and a professor hypothesize on the connections between IT innovation, organizational agility, and sustainable performance. They suggest agile organizations see sustained, increased performance. This includes economic performance through quickly taking advantage of market opportunities, social performance through increased employee collaboration, and environmental performance through an ability to adapt to changes. The authors plan future research to test their hypotheses. The significance of this hypothesis for this annotated bibliography is the possible connection between organizational agility and performance.

Conclusion

The references selected for this annotated bibliography confirm IT governance and agile

approaches are beneficial pursuits for SMEs. This conclusion was confirmed through an

examination of literature on IT governance in SMEs, agility in SMEs, governance with agility,

and organizational agility. The traditional approach for creating business-IT alignment through

IT governance can be achieved in SMEs when properly applied to this context. Agile approaches

can strengthen this alignment by enabling IT project teams to quickly adapt to shifting business

strategies, which can lead to increased agility, not just in IT, but in the entire organization.

IT Governance in SMEs

Traditional approaches to IT governance have relied on governance theories like agency

theory, or the idea that separating ownership and control leads to challenges, and control theory,

or an understanding of the issues surrounding organizational mechanisms like a hierarchy, to

frame implementation (Bergeron et al., 2015; Devos, Van Landeghem, & Deschoolmeester,

2012; Schaarschmidt, M., Walsh, G., & von Kortzfleisch, H. F. O., 2015). However, these

theories do not accurately represent most SMEs where the upper echelon and resource

dependence theories are more applicable (Bergeron et al., 2015). The upper echelon theory

suggests the owner-manager and key employees have a significant influence on strategy in SMEs

(Bergeron et al., 2015). The resource dependence theory suggest SMEs rely more on external

expertise than larger enterprises (Bergeron et al., 2015). These theories suggest the values and

beliefs of the owner-manager, key employees, and external expertise of a SME have significant

impacts on the success of the organization (Bergeron et al., 2015). Similarly, ITG

implementation becomes more difficult when the owner-manager lacks the commitment or skills

to support the process (Devos, Van Landeghem, & Deschoolmeester, 2012). Any attempt to

implement ITG in a SME should start with an understanding of the values of the owner-manager,

key-employees, and external expertise (Bergeron et al., 2015; Devos, Van Landeghem, &

Deschoolmeester, 2012).

A number of organizational prerequisites were identified that lead to the successful

implementation of ITG in SMEs (Devos, Van Landeghem, & Deschoolmeester, 2012; Olutoyin

& Flowerday, 2016). Informal control structures, the ability to provide just-enough reporting on

project status, and a focus on the people involved help SMEs introduce ITG (Devos, Van

Landeghem, & Deschoolmeester, 2012). Informal control structures are more appropriate for

SMEs because trust in these organizations mitigate the need for complex controls (Devos, Van

Landeghem, & Deschoolmeester, 2012). Just-enough reporting capability is also sufficient in

SMEs because of the reduced complexity created through trust, resulting in a lower need for

frequent and detailed status reporting (Devos, Van Landeghem, & Deschoolmeester, 2012).

Finally, focusing on the people involved results in less reliance on processes, which enables

organizations to adapt more quickly to environmental changes (Devos, Van Landeghem, &

Deschoolmeester, 2012).

The financial health of the organization, the presence of skilled personnel and the

existence of environmental supports all impact the success of an ITG implementation in a SME

(Olutoyin & Flowerday, 2016). Organizations that are financially healthy are better able to

support the implementation of ITG because they are not preoccupied with pursuing

organizational viability (Olutoyin & Flowerday, 2016). Skilled personnel ensure the correct ITG

is implemented and maintained (Olutoyin & Flowerday, 2016). Environmental supports such as

enabling infrastructure help to ensure organizational stability for ITG implementations (Olutoyin

& Flowerday, 2016). Before implementing ITG, SMEs should analyze the organization for the existence of these prerequisites (Devos, Van Landeghem, & Deschoolmeester, 2012; Olutoyin & Flowerday, 2016).

According to Wilkin (2012), implementation of ITG in a SME should ensure the proper structures, processes, and relational mechanisms exist within the organization. Structures are important because they are used to manage the costs, risks, and results of IT work (Wilkin, 2012). Processes are important because they help manage the flow of projects (Wilkin, 2012). Relational mechanisms are important because they help ensure effective communication and collaboration (Wilkin, 2012). Keeping these areas in view, Wilkins (2012) asserts that ITG frameworks developed for larger organizations can be adapted to support SMEs. He notes that structurally, a SME is less likely to rely on a steering committee; instead, IT champions or external consultants are more likely to provide strategic direction to IT. ITG in SMEs should take a more flexible approach in process orientation and processes should focus work on strategic imperatives instead of maintaining service level agreements to ensure IT work is not limited to operational work (Wilkin, 2010). Finally, governance in these organizations should focus on relational mechanisms like collaboration between stakeholders and incentivizing innovation because many IT investments do not take full advantage of the potential capabilities of the investments (Wilkin, 2012). By considering these areas, the ITG approach resulting from implementation may look very different from ITG in large enterprises; however, it will be tailored to the specific needs of a SME (Wilkin, 2012).

Agility in SMEs

SMEs possess a number of enablers which support the success of agility within the organization (Arbussa, Bikfalvi, & Marquè, 2017). One enabler is leadership unity, which refers to the ability of organizational leadership to make bold decisions without being encumbered by politics (Arbussa, Bikfalvi, & Marquè, 2017). This allows the organization to make changes faster than larger organizations and could help the organization survive in a competitive environment (Arbussa, Bikfalvi, & Marquè, 2017). Another enabler of agility in SMEs is resource fluidity, which allows an organization to adjust the application of resources quickly (Arbussa, Bikfalvi, & Marquè, 2017). This ability complements the previous enabler; the first allows for quick decisions to be made, and the second enables those decisions to be implemented quickly (Arbussa, Bikfalvi, & Marquè, 2017).

A similar enabler is the tendency for members of SME teams to fulfill multiple roles (O'Sheedy, 2014). For example, a project manager may also be a technical contributor, a system administrator may provide database administration, or a software developer may be responsible for user interface design (O'Sheedy, 2014). This consolidation of roles in SMEs simplifies the number of interactions needed within the team and can streamline the implementation of agile practices (O'Sheedy, 2014).

The distinctive characteristics of a SME can also be a limiting factor for the organization (Arbussa, Bikfalvi, & Marquè, 2017). Arbussa, Bikfalvi, and Marquè (2017) found strategic sensitivity, or an awareness of strategic opportunities, can be one of these limiting factors because it requires time away from daily operations and workers in SMEs have less slack time (Arbussa, Bikfalvi, & Marquè, 2017) Smaller organizations are typically not able to hire specialized staff for every area, which means members must take on responsibility outside of

their core capabilities. This spreading of resources can hinder the organization's ability to anticipate strategic opportunities (Arbussa, Bikfalvi, & Marquè, 2017). The mixing of roles increases context switching and limits the slack time available to members, thus increasing the possibility that the organization will miss an opportunity (Arbussa, Bikfalvi, & Marquè, 2017). SMEs pursuing agility must recognize this potential weakness and take steps to strengthen their strategic sensitivity through approaches like relying on external experts who can advise the organization of strategic opportunities (Arbussa, Bikfalvi, & Marquè, 2017; Bergeron et al., 2015).

O'Sheedy (2014) found benefits of using agile approaches in a SME. He was able to successfully adapt agile approaches to address the needs of specific organizations and projects; adaptations include informal task management in one organization and a more structured, phased task management approach in another. These successes suggest O'Sheedy's (2014) approach could be successful in various types of organizations. He also found the approach met the needs of small teams, which are typical in SMEs. Finally, the agile approach allowed teams in SMEs to be responsive to changes in the project requirements (O'Sheedy, 2014).

Governance with Agility

IT governance and agile methods are in many ways vastly different approaches (Luna et al., 2014). IT governance has traditionally been used in large enterprises to create business-IT alignment through control (Bergeron et al., 2015). Agile methods have traditionally been used in small teams to provide IT responsiveness to changing requirements (O'Sheedy, 2014). Schwartz (2017) argues the goals of IT governance can only be achieved through agile methods and suggests the level at which governance decisions are made needs to be adjusted. Schwartz (2017)

asserts that instead of prioritizing IT work at the project level, these initiatives should be broken down into smaller tasks. Only initiatives that continue to deliver valuable capabilities should have their tasks prioritized, which allows for IT work to be in closer alignment with business strategy than was possible through ITG (Schwartz, 2017).

Schwartz (2017) found the use of agile methods is the only approach that can consistently result in the on-time, within-budget completion of projects. He notes that work stops on an initiative when the budget no longer exists to support it. Schwartz (2017) also sees agile approaches as superior for controlling project scope, as these approaches regularly remove initial scope which is later found to not provide significant value. In an agile environment, Schwartz (2017) argues an IT leader should become laser-focused on removing team obstacles. Using an approach like Scrum, the regular rhythm of sprints creates consistent levels of urgency, which leads to regular results (Schwartz, 2017). Governance with agility means addressing the concerns of traditional ITG using different, agile methods (Schwartz, 2017).

Governing with agility should be driven by guiding principles and values (Luna et al., 2014). Luna et al. (2014) developed six principles for developing agile governance:

- Good enough governance, or adapting governance to suit the organizational context.

- Business-driven, or ensuring all decisions take into account the business strategy.

- Human-focused, or focusing on helping people feel valued.

- Based on quick wins, or relying on small successes to drive increased results.

- Systematic and adaptive approach, or designed to manage changes.

- Simple design and continuous refinement, or delivering fast and then always improving.

  Luna et al. (2015) later noted four values of agile governance:

- Behavior and practice over process and procedures.

- Sustainability and competitiveness over auditability and compliance.

- Transparency and engagement over monitoring and controlling.

- Sensing, adapting, and responding over following a plan.

Using these values and principles, traditional ITG processes can be selectively applied to support agility (Luna et al., 2014).

In applying agility to governance processes, a SME will also encounter several challenges (Gregory et al., 2016). When implemented in a traditional governance setting, agile approaches are likely to be met with skepticism by leadership (Gregory et al., 2016). Frustration in the agile team's inability to provide the expected status updates is another common challenge, as agile teams often prefer face-to-face communication (Gregory et al., 2016). Additionally, typical governance issues like deciding how projects begin and end, how project issues are addressed, and what defines a successful project will continue to be challenges (Kruchten, 2013). However, overcoming these challenges and increasing business-IT alignment enables further agility within the entire organization (Tallon & Pinsonneault 2011).

Organizational Agility

Organizational agility is a critical characteristic for organizations to develop in order to survive (Arbussa, Bikfalvi, & Marquè, 2017). Bunyakiati and Surachaikulwattana (2016) suggest specific agile practices can be tied with organizational cultures. They developed a framework that can help SMEs determine which agile practices best support their organizational contexts. The framework categorizes organizations into four categories, which align with a specific agile value and practice:

- *Adaptability* is focused on adjusting to environment or customer needs. These organizations demonstrate the agile value of working software, which prioritizes functioning capabilities. Bunyakiati and Surachaikulwattana (2016) suggest that behavior-driven development best supports these organizations.

- *Mission* is focused on serving specific customers. These organizations value problem-domain thinking, which prioritizes alignment of projects with business goals. Bunyakiati and Surachaikulwattana (2016) suggest the dynamic systems development method will best support these organizations.

- *Involvement* is focused on the participation of organization members. These organizations value people and interaction, which prioritizes frequent interactions between people. Bunyakiati and Surachaikulwattana (2016) suggest the Scrum method will best support these organizations.

- *Consistency* is focused on creating a stable environment. These organizations value flow and capacity, which prioritizes the steady completion of work. Bunyakiati and Surachaikulwattana (2016) suggest the lean production method will best support these organizations.

By matching agile practices with organizational culture, SMEs increase the likelihood of success when implementing these practices (Bunyakiati & Surachaikulwattana, 2016).

Being an agile organization is not a binary proposition (Houston, 2014). Houston (2014) found the following agile characteristics can be used to measure the agility of an organization:

- Interpersonal interaction.

- Working product or service.

- Customer/user collaboration.

- Responsiveness to change.

- Continual delivery of customer value.

- Self-organizing, multifunctional collaboration.

- Leadership by the motivated.

- Technical excellence and simplicity.

SMEs do not need to immediately arrive at a certain stage of agility (Houston, 2014). Instead, they can take the approach of incrementally increasing their competency in the areas noted above (Houston, 2014). There are indications that the payoff for this effort may be significant: Marhraoui and Manouar (2017) believe that organizational agility will create sustained, increased organizational performance.

Summary

This annotated bibliography focused on the review of recent, academic literature to inform the research questions of: (a) how small and medium-sized enterprises that employ agile practices should approach IT governance to align information technology strategy with organizational strategy, (b) how IT governance frameworks suit the needs of SMEs, and (c) how IT governance frameworks can support teams pursuing agility. Though they come from vastly different backgrounds, IT governance and agile methods can work together in SMEs (Luna et al., 2014). This study paid particular attention to identifying how ITG and agile methods fit into SMEs and understanding the challenges these organizations are likely to face in applying these frameworks and methods (Arbussa, Bikfalvi, & Marquè, 2017; Bergeron et al., 2015; Bunyakiati & Surachaikulwattana, 2016; Devos, Van Landeghem, & Deschoolmeester, 2012; Gregory et al., 2016; Luna et al., 2014; Olutoyin & Flowerday, 2016; O'Sheedy, 2014; Schwartz, 2017; Wilkin,

2012). The implementation of ITG in a SME will be different from a large enterprise (Wilkin, 2012), and agile methods build on many of the characteristics of these organizations (Arbussa, Bikfalvi, & Marquè, 2017; O'Sheedy, 2014). Combining IT governance with agile methods has the potential to transform not just IT, but the SME organization as a whole towards increased agility (Tallon & Pinsonneault 2011). Increased agility shows great promise of supporting sustained performance throughout the organization as IT strategy is aligned with rapidly changing organizational strategy (Marhraoui & Manouar, 2017).

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