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DIGITAL LEADERSHIP: COMPETENCIES AND CHARACTER DIMENSIONS FOR PUBLIC-SECTOR IT LEADERS

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Dedication

To my son Don-Pierre Burnett, who has kept me focused and motivated. Your love, strength, and belief in me got me through to the end. I love you Don-Pierre.

To my mother Maudline Grant and my sister Florence Miller, thank you for your patience with me, for listening and most of all for simply being there when I needed you.

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Abstract

Digitalization has changed the leadership paradigm for public-sector information technology (IT) leaders, requiring them to shift from being back-office managers to becoming effective C-suite strategic leaders. As the Ontario Government addresses the impact of the Covid-19 pandemic, IT capabilities are key levers to improve service effectiveness and to maximize value for money. The purpose of this quantitative correlational study is to investigate the leadership competencies and character dimensions that improve the effectiveness of public-sector IT leaders in today's digital environment. The competencies are the ability to *Anticipate* environmental changes, the willingness to *Challenge* status quo, the ability *Decide* on investment strategies, the ability to *Align* with stakeholder values and the willingness to build a *Learning* culture. The character dimensions are *Judgement*, *Accountability* and *Collaboration*. Using a combination of strategic leadership and character dimension questions, a survey of 2,554 IT staff was completed from January to March of 2021. An exclusive data collection strategy using convenient and random sampling was used and 475 usable surveys were obtained. CFA and PLS-SEM were used for data analysis, and it was found that only the independent variables *Decide*, *Align*, *Collaboration*, *Accountability* and *Judgement* have significant impact on the dependent variable *Effective Leadership* in a digital environment. No statistical evidence was found to suggest that *Anticipate*, *Challenge* and *Learn* significantly impacted *Effective Leadership*. Additionality, the results suggest that during times of emergency management, character dimensions are more valued than leadership competencies for effective IT leadership. The findings have practical implications to support the recruitment and development of public-sector IT leaders through more deliberate emphasis on character dimensions and context-based emphasis on competences. The study is

therefore a contribution to the body of knowledge on the integration of leadership competencies and character dimensions for effective IT leadership in a digital environment.

Keywords: leadership, character dimensions, competence, digitalization

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Chapter 1. Introduction

Background

The global shift towards digital technologies has created a need for leaders who are adept at working horizontally across their organization and for IT leaders who are more business oriented (Levallet & Chan, 2018). Therefore, organizations are now looking for social alignment between their IT and business leaders as they move into the digital era (Moon, Choi & Armstrong, 2018; Gierlich-Joas, Hess & Neuberger, 2020). In preparing for a digital future, public-sector organizations rely heavily on their IT capabilities to improve their processes, products and services for a better citizen experience (Weill & Woerner, 2018). Digitalization refers to the integration of business and IT capabilities to implement digital technologies that improve goods, services and customer experience (Singh & Hess, 2017; Brunner, Gonzalez-Castane & Ravesteijn, 2021). Governments that have not adapted to digitalization will have dissatisfied citizens and outdated policies (Ehrlich, 2017; IMF, 2018).

As the world demographics changes, there is increased public interest in government innovation and a lower tolerance for large bureaucracies (Tate, Bongiovanni, Kowalkiewicz & Townson, 2018). The digital evolution has created a society that has become technology dependent, socially integrated and with higher levels of expectation for immediate access to services provided by the government (van Laar, van Deursen, van Dijk & de Haan, 2017; Leong, Pan, Leidner & Huang, 2019). Leaders of large organizations such as governments are therefore being forced to find more integrated methods of operating and to coach their staff to adapt to the digital shift (Ready & Mulally, 2017; Dewi & Sjabadhyni, 2021). Ongoing digital transformation spurs economic growth, creates new job opportunities, and enables governments to deliver better services (The World Bank, 2016; IMF, 2018).

The operating environment for public-sector organizations has changed significantly in recent times (Katsonis & Botros, 2015; Pittenger, Berente & Gaskin, 2022). The pace at which this change is occurring requires adaptive leaders who can work with stakeholders to assess the situation and determine the most appropriate course of action (The World Bank 2016; Bass, Avolio, Jung & Berson, 2003). Leaders in the public sector continue to contend with pressures to compete for funding and to deliver short-term success while working with processes that have not fully adapted to current trends (Byrne, Crossan & Seijts, 2018). The public sector must deal with cyclical changes in leadership, increased consumer awareness, access to public officials via social media, greater public scrutiny of major projects and more emphasis on transparency in spending taxpayers' money (Holgate, Mendonsa & Mello, 2018). To adapt, public-sector organizations such as the Ontario Government need to be more focused on creating citizen-centric services that can be accessed digitally by incorporating design input from the public (Kosorukov, 2017). Digitizing business operations protect the value of organizations as they remain aligned with their stakeholder requirements (Li, Liu, Belitsky, Ghobadian & O'Regan, 2016; Dewi & Sjabadhyni, 2021).

Public-sector leaders act as trustees for the citizens they serve and therefore have a fiduciary responsibility to put in place effective policies, systems and teams to deliver reliable services to the public (Paroski, Konjovic, Surla & Popovic, 2015; Lim & Moon, 2021). In the government, IT plays a key role in delivering critical services such as health care, education and community safety (OPS Learning Strategy, 2017; Wang, Medaglia & Zheng, 2018). As a result, IT leaders in the public sector are facing the same expectational shift as their private sector counterparts to become effective digital leaders (Hooper & Bunker, 2013; Pittenger et al., 2022). Effective IT leadership is therefore needed to ensure that the province is maximizing the return

on its investment in IT and adapting well to digitalization (Ernst & Yonge & The Conference Board, 2018). Effective IT leadership is shaped by character dimensions and demonstrated through natural behaviours and displayed attitudes such as self-control, assertiveness, and openness (Seijts et al., 2018; Trivellas & Drimoussis, 2013). At different stages of the digital transformation process, behavioural flexibility is needed to adapt the leadership style to the needs of the organization at that point in time, for example, reverting to directive, transformational or transactional leadership styles (Avolio et al., 2014; Van Ee, El Attoti, Ravesteyn & De Waal, 2020). To meet this demand, public-sector IT leaders should encourage a culture of experiential development where employees are free to try new ideas and learn from failures, since a learning culture acts an incubator for the development of new digital leaders who are more confident and accepting of environmental changes (Cole, Stavros & Herath, 2018; Ernst & Yonge & The Conference Board, 2018). Strong digital leadership in turn shapes the strategic direction of the organization to include advanced IT as a driver for competitive advantage and service excellence (Avolio, Sosik, Kahia & Baker, 2014; Bican & Brem, 2020).

Public-sector business divisions are becoming more closely integrated with their IT counterparts through digital leadership (Kosorukov, 2017; Dewi & Sjabadhyni, 2021). This allows ministries to become more agile and to easily adapt to citizens' expectations, budget reductions and technology obsolescence by moving to a more integrated and knowledge-based digital operations (Hooper & Bunker, 2013; Claassen, dos Anjos, Kettschau & Broding, 2021). In a digital environment, IT leaders need to drive, navigate, connect, relate and think differently to support the transformation of their organizations (Ernst & Yong & The Conference Board, 2018). Information technology leaders therefore need to align purpose, performance and principles in order to promote high levels of organizational performance (Ready & Mulally,

2017). For organizational success, today's IT leaders must demonstrate strategic leadership in helping their organizations to leverage technology in order to deliver better products and services (Colony, 2017). Technological shifts have changed the leadership dynamics and created an expectation gap where IT leaders are being asked to become more like corporate strategic leaders (Seijts, De Clercy & Nguyen, 2018; Purchase, 2017). Business leaders are also being asked to be more technology savvy in order to leverage digital technologies to improve business outcomes (Purchase, 2017; Gierlich-Joas et al., 2020).

The governance of IT in the public sector is now under extra scrutiny as projects become larger, more costly and citizens become more vociferous about service quality and public sector transparency (Tonelli, de Souza Bermejo, dos Santos, Zuppo & Zambalde, 2017). To adapt, public-sector IT leaders are therefore encouraged to emphasize their personal development, promote better executive engagements, and elevate their focus to deliver digital services that are aligned with business priorities (Holgate et al., 2018). Although researchers have focused on different aspects of the expectation gap, there is consensus that IT leaders need to play a more business-oriented and strategic role in their organizations (Tonelli et al., 2017; Holgate et al., 2018). This research study was less focused on individual leaders and more on effective leadership in a digital environment where leadership is diffused across various IT projects (Adams & Gaetane, 2011; Rudramuniyaiah, Joshi, Shah, & Ramanujan, 2020). Therefore, rather than the normative approach for researching leadership, a descriptive approach was used in this study and the research was focused on the leadership competencies and character dimensions that are thought to positively influence effective leadership in a digital environment (Eisenbeiss, 2012; Ha-Vikstrom & Takala, 2018; Crossan, Byrne, Seijts, Reno, Monzani & Gandz, 2017; Schoemaker, et al., 2013).

To address some of these issues, the Ontario Government has published the OPS Learning Strategy 2017-2021, which highlighted the need to focus general training over the next four years on new complexities in the work environment, greater accountability being demanded by citizens, changing demographics in the workplace with multiple generations working together, economic restraint, digital technology, and process innovation. The Ontario Government has also embraced the digital challenge and responded with the introduction of the Ontario Digital Action Plan (2018). The Ontario Digital Action Plan (2018) challenged the leaders within the government to breakdown siloed organizations and hierarchies, as well as to work horizontally to deliver more people-centric services to the citizens of Ontario. The Ontario Digital Action Plan (2018) also advocated for a change in processes and competencies as the government moves towards barrier-free, high-quality services, designed with the inclusive lens that citizens are demanding. Improving leadership competencies and enhancing leader character dimensions have been found to positively impact leadership effectiveness in the workplace and contributing to higher levels of organizational performance (Byrne et al., 2018). In addition to this, common characteristics among effective digital leaders include the ability to be visionary, collaborative, agile, to problem solve, being results-oriented and strong negotiators (Claassen et al., 2021; Haselberger, 2016).

Working in today's disruptive digital environment, the entire leadership team needs to collaboratively to address complex problem and to stimulate and energize the employees to deliver better goods and services to citizens (Dewi & Sjabadhyni, 2021; Lam, 2016). Information technology leaders in today's fluid digital environment are therefore expected to have a plethora of competencies that support their ability to influence a more diverse group of stakeholders with different expectations (Pidgeon, 2017). The IT leaders in demand today are those who are able

harness their competencies and use their character dimensions to influence transformation in their organizations (Lam, 2016; Rupcic, 2021). To implement integrated digital business concepts and help their organizations thrive in a digital environment, IT leaders today need to develop a 'different kind of people mindset and skill set' (El Sawy, Kraemmergaard, Amsinck & Vinther, 2016, p. 142). The Ontario Government has therefore embarked on a corporate initiative to develop and retain leaders with these abilities (OPS Learning Strategy 2017-2021, 2017).

Structure of Dissertation

This dissertation starts with Chapter 1 that explains the research purpose and the problem statement that was addressed. It outlines the challenges facing public-sector leaders as they seek to embrace the digital future. It also highlights the leadership competencies and character dimensions required to develop effective IT leaders in a digital environment. Chapter 2 provides a detailed literature review of prior research in the areas of digitization, leadership effectiveness and public-sector challenges. Chapter 3 explains the theoretical framework that shaped this research and then elaborated on the leadership competencies and character dimensions independent variables used to assess effective leadership. Chapter 4 covers the research design methodology, which includes the research design, site selection, sampling frame, questionnaire design, data collection approach and ethical assurances. Chapter 5 presents the findings of the research including the research model assessment and test of each hypothesis. Chapter 6 discusses the research including conclusion, limitations, research contributions as well as opportunities for future research.

Problem Statement

The Ontario Government is a large diverse organization spending billions of dollars to provide governance as well as numerous products and services to its citizens (Ontario Budget,

2018). The Ontario Budget (2018) highlighted the focus on the adoption of new technology with funding earmarked for a new centre of excellence for artificial intelligence. In a digital workspace, this level of investment requires good oversight and a close coupling of business areas and IT to manage the change (Purchase, 2017). Sub-par leadership wastes resources, negatively impacts citizens and can derail the economy (Seijts, Gandz, Crossan, Mercer & Stevenson, 2014). In addition, the government is accountable to the public for its performance and its leaders are expected to be good stewards for the people (Hooper & Bunker, 2013; Lim & Moon, 2021). To meet these expectations today, the government should be deliberate in developing its IT leaders (Adnans & Nunno, 2017; Purchase, 2017). Good authentic leadership practices are learned through modelling and then honed by situational awareness (Adnans & Nunno, 2017; Ferrero, Rocchi, Pellegrini & Reichert, 2019). The advent of the Covid-19 pandemic created an urgent need for digital innovation in the Ministry of Health to track and reduce the spread of the disease, as well as to quickly provide health services and supplies to the citizens of Ontario (Bozzato, 2020; Ontario Onwards Action Plan 2020).

The Ontario Government has introduced a new Digital Action Plan that will modernize many services currently offered by the government (Ontario Digital Action Plan, 2018). This is supported by funding announcements in the 2018 Ontario Provincial Budget. With this strategic shift towards digital technologies, Purchase (2017) observed that although the business areas should be championing the digital change, the supporting IT organizations must keep pace to lead the various business transformation initiatives. Investments in win-win opportunities are facilitated through both business and IT leaders managing their behavioural biases and collaborating in the best interest of their organization (Lyneis & Sterman, 2016; Pittenger et al., 2022).

The Auditor General of Ontario (AGO) has identified several major public-sector IT projects that have failed or have been executed poorly due to poor leadership (AGO Report 2015; AGO Report 2016). There is a trade-off between working harder and worker smarter, and therefore leaders should be cognizant of when and where to balance capabilities with manpower to minimize the number of large projects that fail (Lyneis & Sterman, 2016). The Ontario Public Service (OPS) Learning Strategy 2017-2021 (2017) outlined a general four-year plan to develop provincial employees with the knowledge and competencies required to be successful in a digital environment. As the Ontario Government moves toward the implementation of the OPS Learning Strategy 2017-2021, there is a need to clearly identify the specific competencies and character dimensions that should be developed to enable effective IT leadership. Developing these competencies and character dimensions will indeed help to ensure that IT leaders are well equipped to support and properly manage the major projects that were developed to achieve to the goals and objectives outlined in the Ontario Digital Plan (Kane, Phillips, Copulsky & Andrus, 2019; Hooper & Bunker, 2013).

Currently, there are several factors creating an urgency for additional public-sector IT leadership development. Firstly, with the recent public declaration of a commitment to migrate to a digital service model in the Ontario Digital Plan (2018), the time is conducive for more focused attention on the training and development of business savvy public-sector IT leaders. The Covid-19 pandemic has created a more urgent need for new digital technologies to support the efforts of the Ontario Health sector and therefore, the Ministry of Economic Development, Job Creation and Trade has partnered with Med-Tech Innovation Hub to provide new technologies to accelerate the delivery of medical products and services (Bozzato, 2020; Dewi & Sjabadhyni, 2021). The advancement of IT enjoys a symbiotic relationship with organizational leadership,

and dynamically alters the leadership competencies needed to harness the emerging opportunities (Avolio et al., 2014; Neumeyer & Liu, 2021).

Secondly, in the past, IT leaders have not typically played the part of strategic leaders, favouring back-office operations and project management (Patanakul, Kwak, Zwikael & Liu, 2016; Pittenger et al., 2022). With the rapid advancement of technology and the shift towards business and IT alignment using digital platforms, IT leaders must therefore be retooled to meet these new expectations as strategic business leaders (Colella, Mac Dorman, Tyler & Cox, 2018). Building new competencies and enhancing character dimensions are two ways that IT and business leaders can improve their corporate performance (Byrne et al., 2018). Information technology leaders, with accountability for managing the introduction of digitalization, should have the appropriate levels of experience and expertise in business transformation to enhance their performance rating (Matt, Hess & Benlian, 2015; Bartsch, Weber, Buttgen & Huber, 2020). Prior research done by Seijts, Gandz, Crossan and Reno (2015) found that people, organizational, business and strategic competencies coupled with eleven character dimensions plus commitment, contribute to greater leadership effectiveness. The OPS Learning Strategy 2017-2021 (2017) highlighted similar developmental opportunities. This research study is intended to extend the findings by including the complexities of a public-sector organization adapting to a digital shift with a specific focus on IT leaders.

The ability to make dynamic and effective decisions based on incomplete information and intuitiveness reflects the synergistic effects of each character dimension (Byrne et al., 2018). Therefore, the dimensions of good character are co-dependent and include drive, transcendence, accountability, justice, integrity, humanity, temperance, humility, judgement, courage and collaboration (Seijts, Gandz, Byrne & Crossan, 2015; Rupcic, 2021). This study is focused on

the character dimensions J*udgement, Collaboration* and Accountability because they reflect the areas identified by Ernst & Young and The Conference Board (2018) as priority areas of development for digital leaders. They are also aligned with the OPS Learning Strategy 2017-2021 and are considered critical to public-sector leadership (OPS Learning Strategy 2017-2021, 2017). In an era of digital disruption, many cross-functional projects are initiated to implement changes (Gilchrist, Burton-Jones & Green, 2018). To successfully manage and implement these projects require: key digital-era leadership capabilities such as the drive to use technology as an agent of change; the acuity to navigate the social and political environment and make appropriate decisions; the charisma to connect with all stakeholders from diverse backgrounds and different locations; the human touch to relate and make everyone around you feel included and that their opinions matter; and the ability to think holistically, envision new technological possibilities and look ahead to innovative ways to improve their organizations (Ernst & Yonge & The Conference Board, 2018). The role of leadership in IT is at critical mass as both citizens and public-sector organizations recognize the need for more effective IT leadership (Hooper & Bunker, 2013; Pittenger et al., 2022).

Thirdly, governments are normally very bureaucratic, IT is typically underfunded, and change occurs very slowly (Holgate et al, 2018). Government services impact large groups of citizens and public-sector change initiatives will involve several stakeholders as well as public consultations, requiring strong consultative and communications skills (Katsonis & Botros, 2015; Dewi & Sjabadhyni, 2021). Information technology is of great strategic value to governments, enabling ministries to communicate and consult with dispersed groups of citizens and deliver services digitally to the public (Kosorukov, 2017). These additional accountabilities demand new

IT leader competencies and character dimensions to perform more effectively (Colony, 2017; OPS Learning Strategy 2017-2021, 2017).

Fourthly, public funding has a short shelf life and therefore should be used promptly in collaboration with business partners (Cannon & Neilson, 2016). Collaboration and joint accountability from both business and IT leaders in consultation with multiple stakeholders are therefore required to get business cases approved expeditiously to initiate major transformational projects (Patanakul et al., 2015; Seijts, De Clercy & Mohan, 2021). Well-developed character dimensions balance each other and help to create stakeholder trust, engender cooperation, and promote collaboration when needed (Seijts, Gandz, Crossan & Reno, 2015; Rupcic, 2021). Holgate, Mendonsa and Alvaro (2018) asserted that IT leaders in the public sector need to assume a strategic position and attitude as they strive to provide better citizen-oriented services while working across diverse stakeholders in the public and private sectors.

Finally, Seijts, Crossan, Mercer and Stevenson (2014) argued that all stakeholders should be committed to the effort to improve leadership and further contended that good leadership is built from commitment, competence and character. Given the critical role IT plays in delivering public services, leadership in this area must evolve and keep pace with changes, as critical public services such as health, education, community safety and the welfare of minors could be adversely impacted (Cannon & Nielsen, 2016; Tonelli et al., 2017). Billions of dollars in funding from taxes are being spent on services and every initiative represents an opportunity cost of providing other equally important services (Tate et al., 2018). The Ontario Digital Action Plan (2018, p. 20) called for a “new kind of leadership” that can establish flexible bimodal operations with teams that are empowered to be creative, risk tolerant, inclusive and bold in their ideas for change. The Ontario Digital Action Plan (2018) further stated that digital literacy and sound

understanding how technology impacts the economy, people, the workforce, legislation and the general society is now a requisite competence for provincial leaders. Similarly, Seijts et al. (2021) posited that there is a need to focus on leadership character as it is a collective responsibility to improve organizational leadership.

In the Ontario Government, leadership performance and competencies are assessed based on people leadership, collaboration, innovation, inclusion, diversity, accessibility, responsible and accountable management as well as trust and integrity (Performance & Readiness Assessment, 2018). The OPS Learning Strategy 2017-2021 (2017) highlighted the need to develop the ability to connect with employees and stakeholders, deliver program activities and projects, transform program areas, act with integrity and being self-aware. The five leadership competencies and the three character dimensions selected were chosen because they are broad enough to incorporate features of the other variables in the character dimension model and they also closely align with the requirements of the OPS Learning Strategy 2017-2021 (2017). These eight variables were also selected because they are reflective of some of the areas identified by Ernst & Yonge and The Conference Board (2018) as critical for digital leadership development.

Although digitalization is a major challenge for many organizations, there is not enough integrated leadership and digital transformation studies today to support digitalization during a pandemic (Bartsch et al., 2020). Furthermore, Neumeyer and Liu (2021) contended that some business schools are not emphasizing the importance of leadership competencies in their MBA programs, which creates a gap in the effectiveness of future leaders. Additionally, other gaps identified include the absence of sufficient actionable research to integrate leadership behaviours into digital transformation, and the lack of digital leadership development as a strategic asset for many organizations (Crossan et al., 2017). Furthermore, Seijts, Crossan and Carleton (2017)

suggest that there is a gap in the understanding of the importance of character dimensions to inform effective leadership behaviours.

To address these gaps, this research sought to identify the competencies and character dimensions that should be integrated and included in the job descriptions, hiring plans, training and the development for IT leaders when the Ontario Digital Action Plan (2018) is being implemented.

Purpose of the Study

Displayed behaviour is the best conduit for providing effective leadership and this is influenced by the leader's character and competencies (Avolio et al., 2014). Therefore, the purpose of the study was to research the leadership competencies and character dimensions that improve the success of current and future digital initiatives undertaken by the Ontario Government. This research assessed the impact of five competencies, namely *Anticipate*, *Challenge*, *Decide*, *Align* and *Learn* (Schoemaker et al., 2013) as well as the impact of the three character dimensions, namely *Accountability*, *Judgement* and *Collaboration* as identified by Seijts et al. (2017) on the effectiveness of public-sector IT leaders in a digital environment. Leadership effectiveness was measured by five digital leadership behaviours namely *Transformative Vision, Forward Looking, Integrates Technology, Change Oriented* and *Leading Others* (Kane et al., 2019; Mikalef & Pateli, 2017; Redick, Reyna, Schaffer & Toomey, 2014). The main task for digital leaders today is to develop the ability to integrate strategic decision making, capabilities and digital technologies to meet the organization's goals (Li, Liu, Belitski, Ghobadian & O'Regan, 2016). Therefore, this research contributed to body of knowledge in the planning and execution of future digital projects in the public sector.

Research Questions

This research was done in the Ontario Government and the target population was the IT staff. This research was a non-experimental quantitative correlational study, with the primary intent to determine the antecedents of effective IT leadership in a digital Ontario Government. The research questions were as follows:

1. To what extent does an IT leader's competencies (being able to anticipate environmental changes, challenge status quo, be decisive, align stakeholder's interest and facilitate a learning environment) impact effective leadership in a digital public sector?
2. To what extent does an IT leader's character dimensions (judgement, collaboration and accountability) impact effective leadership in a digital public sector?

Practical Application

This research provided practical recommendations to help develop digital leadership competencies and character dimensions in public-sector IT leaders. While the research was carried out in the Ontario Government, many other provinces and levels of government such as federal and municipal are grappling with the same citizens' expectation gap and could use the findings to guide the development of their training and recruitment plans. The major concerns of citizens impact all levels of government and therefore these research findings are also relevant to many types of government.

Summary

This research assessed five leadership competencies and three character dimensions as antecedents to effective IT leadership within the Ontario Government. The five independent variables for leadership competence selected from previous leadership research done by

Schoemaker, Krupp and Howland (2013) are *Anticipate*, *Challenge*, *Decide*, *Align* and *Learn* and used to assess the impact on *Effective Leadership.* This research also assessed how *Effective Leadership* is impacted by the three character dimensions *Judgement*, *Accountability* and *Collaboration* that were selected as independent variables from the eleven character dimensions *Drive*, *Transcendence*, *Accountability*, *Justice*, *Integrity*, *Humanity*, *Temperance*, *Humility*, *Judgement*, *Courage* and *Collaboration* developed by Seijts et al. (2015) and later updated by Crossan, Byrne, Seijts, Reno, Monzani and Gandz (2017).

Chapter 2. Literature Review

Introduction

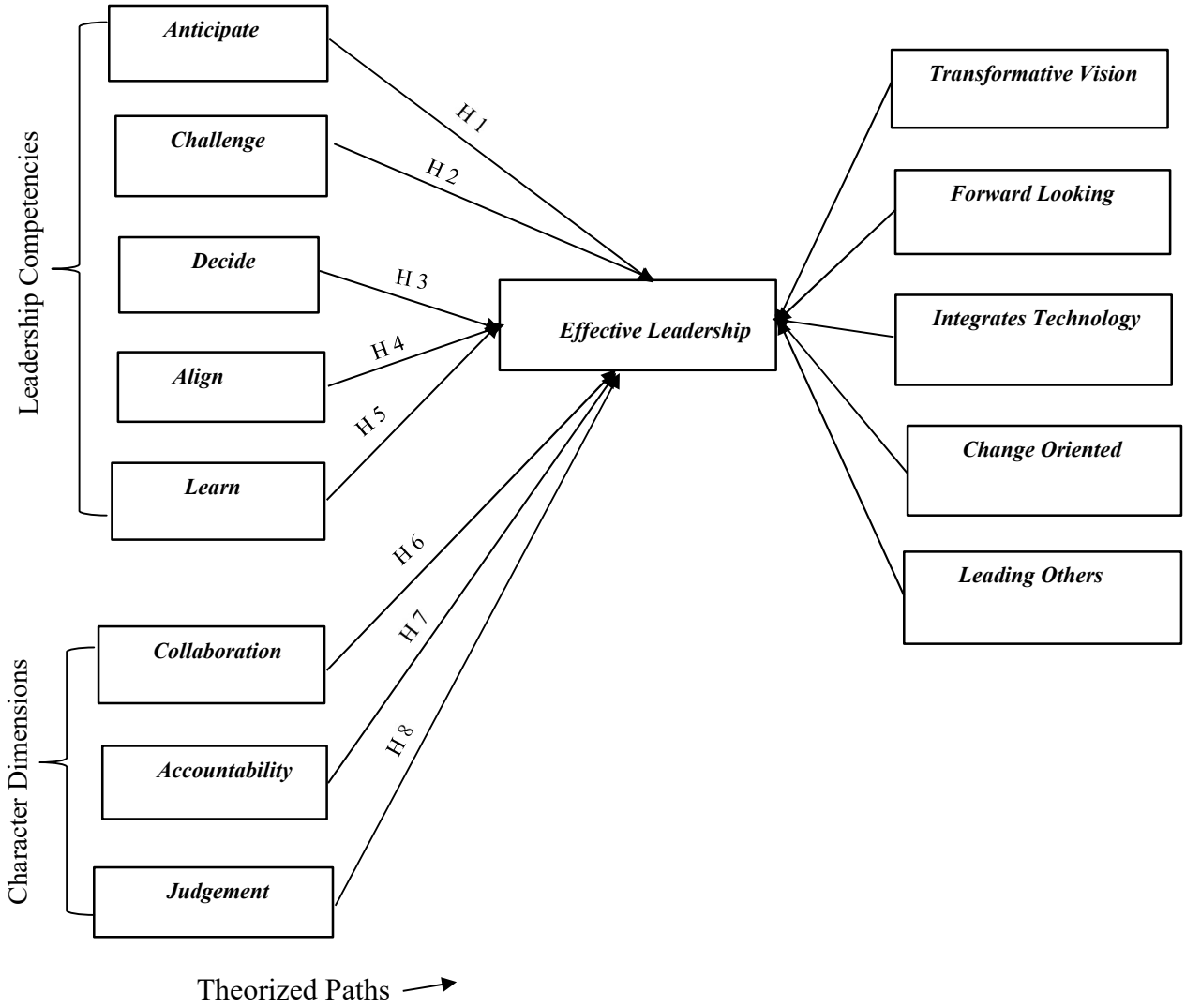
This chapter synthesizes and reflects on past empirical and practitioner research in the areas of effective leadership in a digital public-sector environment. This research is essential as no previous research have been done in the Ontario Government examining the impact of leadership competencies and character dimensions on effective IT leadership, especially in a pandemic setting.

Leadership in a public-sector environment entail managing a complex relationship between elected officials and the leadership team of each ministry and therefore, governments should improve the leadership competencies of senior civil servants (EU, 2017). The current political agenda influences policy decisions and the latitude to implement aggressive changes must be negotiated both from a citizen-centric and a social impact perspective, requiring judicious stakeholder management and collaborative leadership behaviour (Deutscher, Walker & Phillips, 2019; Sagarik, Chansukree, Cho & Berman, 2018).

The research model in Figure 1 and research hypotheses proposed that a combination of leadership competencies and character dimensions directly influence the effectiveness of IT leaders in a digital public-sector environment. All five independent variables for leadership competence were selected from a previous digital leadership research items used by Schoemaker et al. (2013), Mikalef and Pateli (2017), van Laar, van Deursen, van Dijk and de Haan (2017), Trivellas & Drimoussis (2013) and Tonelli et al. (2017) to assess leadership effectiveness. The five leadership competencies are the leader's ability to *Anticipate*, *Challenge*, *Decide*, *Align* and *Learn*, in a changing environment (Schoemaker, Krupp & Howland, 2013; Mikalef & Pateli, 2017; van Laar et al., 2017; Tonelli et al., 2017; Trivellas & Drimoussis, 2013).

Figure 1

Research Model



Note. Theoretical Research Model with Hypotheses

Seijts et al. (2015) developed a character framework consisting of eleven character dimensions that influence effective leadership. This leadership character framework was later updated in 2017 (Crossan et al., 2017). The character dimensions are *accountability, collaboration, judgement, drive, transcendence, justice, integrity, humanity, temperance,*

humility and courage (Crossan et al., 2017; Seijts et al., 2015). This research selected the three character dimensions *Judgement*, *Accountability* and *Collaboration* that are included in the performance plans of all Ontario Public Service leaders and are also identified in the OPS Learning Strategy 2017-2021, as requiring further development to support effective leadership in a digital government (OPS Learning Strategy 2017-2021, 2017; OPS Performance Readiness & Assessment, 2018; Crossan et al., 2017). Moreover, public-sector leaders are also being asked to exercise more discretion in implementing several complex and divergent policies to address social, economic and political issues through vertical and horizontal integration with various stakeholders (Patzer, Voegtlin & Scherer, 2018; Mukhopadhyay, Bouwman & Jaiswal, 2019). Consequently, clear identification of the levels of judgement, accountability and collaboration expected must be articulated and requires further research (Deutscher et al., 2019; Mukhopadhyay et al., 2019). Therefore, the character dimensions of *judgement, accountability* and *collaboratio*n are independent variables in this research. Selecting a sub-set of the eleven character dimensions is appropriate for this research study as in a subsequent research Seijts and Gandz (2018) found that some character dimensions are more appropriate at different stages of the organizational change process. *Judgement*, *Accountability* and *Collaboration* were all identified as being more important in the earlier stages of organizational transformation, such as is occurring in the Ontario Government today (Seijts & Gandz, 2018).

The dependent variable is *Effective Leadership* in a digital environment and was analyzed by examining the behaviours that support successful transformations via digital initiatives (Kane et al., 2019; Mikalef & Pateli, 2017; Redick et al., 2014). Effective IT leaders do not simply think from a digital perspective, they also act and lead digitally and therefore, higher levels of behavioural competencies are reflected in their cognitive abilities, affinity for collaboration,

political acuity and stakeholder management ability, as well as proclivity for exercising good judgement and making tough decisions (Trivellas & Drimoussis, 2013; Neumeyer & Liu, 2021).

Effective IT leadership is shaped by character dimensions and demonstrated through natural behaviours and displayed attitudes such as self-control, assertiveness and openness (Seijts et al., 2018; Trivellas & Drimoussis, 2013). At different stages of the digital transformation process behavioural flexibility is needed to adapt the leadership style to the needs of the organization at that point in time, for example, reverting to directive, transformational or transactional leadership styles (Avolio et al., 2014; Bartsch et al., 2020). Effective digital leadership pivots on leadership behaviours that result in a positive organizational image and great business outcomes (Breuer & Szillat, 2019). In researching e-leadership and the adoption of advanced IT, Avolio et al. (2014) contended that behaviour is the main mode of demonstrating effective leadership and through their research identified four behavioural aspects that permeates effective leadership. These behaviours are demonstrating behavioural flexibility, good conflict resolution among diverse stakeholders, building a strong leadership brand among followers, and empowering staff through appropriate delegation and timely performance feedback (Avolio et al., 2014). In this research, Avolio et al. (2014) measured *Effective Leadership* using traits, cognition, affect and behaviour, and the research concluded that *Effective Leadership* behaviours help to reimagine the organization's future by integrating business processes, culture, staff capabilities with the functionalities of large enterprise applications for superior business outcomes (Avolio et al., 2014).

The success of major digital initiatives hinges on the behavioural competencies displayed by the leaders in charge (Trivellas & Drimoussis, 2013; Neumeyer & Liu, 2021). In researching the impact of leadership styles and behaviours on the success of projects, Trivellas and

Drimoussis (2013) examined the impact of fifteen behavioural competencies. These behavioural competencies considered leadership behaviours that demonstrate leadership, engagement, self-control, assertiveness, relaxation, openness, creativity, results orientation, efficiency, consultation, negotiations, conflict and crisis management, reliability, values appreciation and ethics, using the ICB-IPMA Competence Framework (Trivellas & Drimoussis, 2013). This research found the highest levels of correlation associated with behaviours that demonstrate openness, values appreciation, creativity, leadership and assertiveness (Trivellas & Drimoussis, 2013). With respect to virtual leadership, Neumeyer and Liu (2021) reviewed the role of digital leaders to manage teams by displaying behaviours that build trust, promote distributed diversity, use technology to manage progress and promote visibility as well as empowerment of team members.

Similarly, Kane et al. (2019) reviewed the behaviours that effective leaders need to display to be successful in a digital environment, namely, transformative vision, forward-looking, understands technology, change oriented and strong leadership. These components were expanded using the items listed by Kane et al. (2019) as definitions for these five behaviours, and then used to assess the dependent variable *Effective Leadership* in this research paper (Ravichandran, 2018).

The upcoming sections provide a more in-depth review of the independent and dependent variables along with theoretical and practitioner research findings on *Effective Leadership* in a digital environment.

Leadership Theories

In-depth leadership research initially started with empirical research works of James McGregor Burns, Bernard Bass and later by Bruce Avolio (Hidayat, Rafiki & Aldoseri., 2017). These early researchers were focused on leadership behaviours considered crucial for organizational transformation such as the four-year government cycle and helped to popularize the "Four I's of Transformational Leadership" (Avolio, Waldman & Yammarino, 1991). Public-sector organizations experience frequent leadership and strategic directional changes, aligned with the electoral cycle and economic globalization (Patzer et al., 2018). As a result, new election platforms such as the elimination the provincial deficit, digital transformation and restoring public trust are frequently introduced, requiring effective IT leadership to implement the required digital programs and technology changes to deliver on election promises (Deutscher et al., 2019; Ontario Budget, 2019). These frequent operational changes also create a work environment where employees are susceptible to change fatigue, job insecurity and uncertainty, requiring effective leaders who can behave with spontaneity, empathy and decisiveness (Levallet & Chan, 2018; Jelaca, Bjekic & Lekovic, 2016).

Leaders perform within the context of their organizational structures and digitalization has created a need to transform business models, standard processes, and leadership competencies to maximize the benefits of digital technology (Brunner et al., 2021; Rudramuniyaiah et al., 2020). To successfully prepare for and adopt digital technologies, front-line leaders require business models that streamline operational process for efficiency, upper-level management need the strategic benefit of data analytics for decision making and expanded communications reach for stakeholder management, while c-suite executives need a collaborative organizational structure to facilitate joint strategic decisions to support

organizational transformation (Neumeyer & Liu, 2021). All levels of leadership require new digital competencies to effectively discharge their duties (Pittenger et al., 2022). Digitalization has therefore fostered the need for a contingency approach to organizational design to ensure there is alignment between the organization's structure, policies and leadership competencies, and the changing environment in which it operates (Dewi & Sjabadhyni, 2021).

Contingency Theory is a popular management approach where organizations are structured relative to internal and external contextual factors impacting the organization's performance (Romero-Silva, Santos & Hurtado, 2018). According to Morgan (2006), management should be concerned with achieving a good organizational fit to attain equilibrium between internal and external stakeholder interests. Moreover, organizations should maintain flexibility in how they manage different tasks by adapting structures, policies, and processes to the local environment (Morgan, 2006; Lim & Moon, 2021). A conceptual feature of contingency theory proposes that management adopts a selection approach for policies and practices because they are a good fit in the operating environment, without considering performance (Romero-Silva et al., 2018; Sabherwal & King, 1992). A second theoretical feature of Contingency Theory proposes that management uses an interaction approach to achieve a good fit when organizational goals are attained through the implementation of policies and practices which consider contextual factors (Brunner et al., 2021; Sabherwal & King, 1992). Contextual factors are constantly changing due to the impact of new technologies such artificial intelligence, advanced predictive analytics and social media reach (Jackson & Dunn-Jensen, 2021).

Contingency Theory is relevant to today's digital public-sector work environment where new technology and citizen expectations are constantly changing and where leadership effectiveness requires a good fit between the structural components and the resources of the

organization (Lim & Moon, 2021). Effective leadership in a digital environment requires the implementation of appropriate public-sector policies and procedures that enable the organization to improve services and respond to environmental stimuli in a timely manner (Lim & Moon, 2021; Romero-Silva et al., 2018).

Over the years, many other leadership styles have emerged such as ideological, charismatic, pragmatic, integrated public sector, transactional, ethical, spiritual, servant, authentic, relational, etc. (Anderson & Sun, 2017). The leadership styles that are relevant to leading the public sector in a digital environment are summarized below:

a. Transformational leadership is akin to charismatic leadership; however, the focus is primarily on moving organizations through a paradigm shift to a higher performance plateau (Avolio et al., 1991). Transformational leadership is best suited for the public sector in periods of uncertainty when drastic changes are needed in performance levels (Huang, Xu, Chiu, Lam & Farh, 2015; Endres & Weibler, 2017).
b. Integrated public-sector leadership is required to address complex issues that affect multiple stakeholders across various sectors (Anderson & Sun, 2017). This leadership style emphasizes, character dimensions, collaboration, competence and stakeholder management to engender creative solutions and support for digital initiatives that include multiple stakeholder groups (Anderson & Sun, 2017; Berry & Mok, 2015).
c. Strategic leadership is rooted in competencies and results in higher levels of organizational performance (Schoemaker et al., 2013). Strategic leadership in a digital environment involves predicting and managing environmental and social changes, aligning with stakeholder interests and being open and decisive (Li et al.,

2016; Schoemaker et al., 2013). These factors encompass the independent variables for leadership competency in this research.

More recently, researchers have been examining the concept of e-leadership, a theory that aligns leadership behaviour with technological changes (Sagarik et al., 2018). The theory of e-leadership proposes that as a driver for change, IT can be used to influence social attitudes and organizational performance (Arnold & Sangra, 2018). This theory pre-supposes that governments know what the local issues are and have the infrastructure to reach a large portion of the population (Li et al., 2016). This is often not the case and therefore, many economic e-leadership strategies implemented by governments have failed to have the desired outcomes (Sagarik et al., 2018).

The pace of digitalization has changed the competencies needed to perform both operational and leadership roles (van Laar et at., 2017). Therefore, the desired impact of effective IT leaders in a digital public sector are fewer failed projects, greater accountability to the public and improvements to the quality of services offered to the public (AGO, 2015; AGO, 2016). The move to fully transform the Ontario Government to a digital organization has signalled the need for more effective IT leaders (OPS Learning Strategy 2017-2021, 2017).

Effective Digital Leadership

Effective Leadership in a digital environment is the dependent variable in this research. Effective leadership indicates a leader's ability to manage an organization well, so that goals are realised, and targets are met (Louw, Muriithi & Radloff, 2017). However, this research is adopting the digital connotation of effective leadership, specifically from a behavioural perspective with respect to successfully implementing digital initiatives to transform the public

sector (Trivellas & Drimoussis, 2013; IMF, 2018). Behavioural perspective reflects a federation of many leaders leading an organization through consensus and shared common knowledge, values and commitment, often referred to as bounded rationality (Rudramuniyaiah et al., 2020; Martino, D'Onza & Melville, 2021). This is based on the premise that individuals make the first good decision because it is timely and costly to optimize all potential solutions (satisfice) (Martino et al., 2021). Bounded rationality assumes that leader develop mental shortcuts for future reference based on sensemaking and heuristics (Martino et al., 2021). The Ontario Government utilizes a cluster model of IT leaders working together collaboratively to provide effective IT leadership for the province, based on their shared knowledge, experiences and digital mindset (Neumeyer & Liu, 2021; Government of Ontario, 2018).

Although the concept is relatively new, the advent of digitalization has significantly changed the leadership standard by placing greater emphasis on leadership behaviours and cognitive abilities (van Laar et al., 2017). As described in Table 1, leading in a digital environment that is rife with uncertainty, constant changes and new opportunities, requires additional dimensions to the leadership persona (Nagarajan & Edwards, 2015; Kane et al., 2019). Therefore, in a digital environment, effective leadership is defined as accomplishing the right things to support strategic digitalization initiatives aimed at improving services and organizational sustainability (El Sawy et al., 2016). Consequently, public-sector digital transformation is successful when leaders enable ministry business areas to collaborate with their IT counterparts to transform and improve the way services are delivered to the public (Boukamcha, 2019). Effective digital leadership can be achieved in the Ontario Government when training and experience are combined to create competencies, and together with character dimensions enable leaders to contextualize their environment and display appropriate behaviours

to influence change (Sturm, Vera & Crossan, 2017; Seijts et al., 2015; OPS Learning Strategy 2017-2021, 2017). Thus, to effectively lead in a digital public-sector environment requires the leadership competence to disentangle bureaucratic domains across ministries and create horizontally integrated program teams to introduce digitalization to the organization (Kosorukov, 2017).

To address the digital public-sector challenge, the European Union (EU) issued the Tallinn Declaration on eGovernment (2017) that called for public administrators who can adopt a 'Digital by Default' principle for investing in the future and adapting to change (EU, 2017). Therefore, with a limited public purse and strong lobbying efforts to convince the Ontario Government to invest more in various social service programs such as autism, mental health and education, current IT leaders require the technology and digital expertise to make the right mix of IT investment decisions to support these programs (Van Wart, Roman, Wang & Liu, 2017). As an enabler, digitalization supports public-sector leaders to implement policies more effectively by improving reach to a wider diaspora and enhancing the security of private information held by the government (IMF, 2018). Operationally, effective digital leaders are developed through their everyday experiences and experience growth as they implement strategies to address new challenges, cultural differences and satisfy divergent stakeholders concerns (Schoemaker et al., 2013; Lester, Palanski, Hammond & Clapp-Smith, 2017; Nagarajan & Edwards, 2015).

In summary, a digital public-sector environment introduces disruption, thus creating the need for IT leaders to acquire additional competencies and character dimensions to tactically integrate technology, business assets and stakeholder feedback to build consensus and support for the strategic direction of their organization in order to lead effectively (Elnaghi, Alshawi,

Kamal, Weerakkody & Irani, 2019; Seijts et al., 2015). As highlighted in Table 1, to be an effective leader in a digital environment requires supporting competencies and character dimensions to effectively strategize and champion change (Schoemaker et al., 2013; Seijts et al., 2015). These competencies and character dimensions were used to assess the degree of association with the dependent variable *Effective Leadership* in this research paper.

Table 1

Summary of Effective Leadership Theories for a Digital Environment

Authors	**Theories**	**Digital & Leadership Principles**
Schoemaker et al., 2013	Strategic Leadership and Essential Competencies	Five essential competencies for strategic leadership: Anticipate environmental changes; Challenge the status quo; Decide on the strategy forward even in dire situations; Align the goals of the organization with those of key stakeholders; and Learn about the organization, key business partners and the business environment in which you operate. Also promote a culture of learning and accepting failure as opportunities to do things differently.
Seijts et al., 2015	Character Dimensions Framework	Eleven inter-connected character dimensions for effective leadership
Nagarajan & Edwards, 2015	Professional Competencies Required of IT Professionals	Communications, time management, teamwork, working with people and working across differing cultures
Crossan et al., 2017	Framework of Leader Character	How leader character dimensions impact and promote effective leadership. Supports a virtues-based approach to effective leadership.
Kane et al., 2019	Digital Leadership	Focused on developing the right muscles, mindset and mettle for digital leadership by being forward-looking, understanding technology, change oriented and demonstrating strong leadership.
IMF, 2018	Digital Government	Using Digitization to improve the effectiveness of government programs
EU, 2017	Digital by Default	Tallin Declaration on eGovernment - Digital by Default Policy

Table 1 summarizes scholarly and practitioner research on digital leadership from a behavioural perspective, including the leadership competencies and character dimensions required for effective leadership in a digital environment (Crossan et al., 2017; Seijts et al., 2015). As highlighted in Table 1, digitalization has created the need for a combination of cognitive competencies and behavioural aptitude to mobilize stakeholder support for changes and better services (Kane et al., 2019; IMF, 2018; Schoemaker et al., 2013; Seijts et al., 2015). Digital initiatives are oftentimes very expensive undertakings with public facing impact, requiring business and IT collaboration under strong visionary leadership (van Laar et al., 2017; Mergel, Edelmann & Huag, 2019). Therefore, the constructs reflecting the behaviours considered essential to effectively lead digital initiatives are examined in more details below.

Transformative Vision. Behaviours that demonstrate transformative vision is the nucleus of effective leadership in the digital world, where the emphasis is on re-imagining the future to solve business problems (Kane et al., 2019). Transformative visionary leadership behaviours are critical for promoting organizational change via digital initiatives, to gain employees and stakeholders support by creating a common sense of ownership, to drive real-time strategic decisions and promote innovation (Avolio et al., 2014; Pittenger et al., 2022). This is crucial because digital initiatives are often very complicated requiring the synergistic use of new technology, business knowledge and emerging consumer preferences to displace organizational inertia and create a unified commitment to innovation and change (Elnaghi et al., 2019; Troshani, Jansen, Lymer & Parker, 2018).

Transformational digital initiatives are more likely to be successful when IT leaders can model behaviours that display knowledge of the public sector, an understanding of the political cycle, industry norms, patterns of business activities and emerging technologies (Kane et al.,

2019). In doing so, IT leaders will influence business partners to closely identify with digital strategies that accurately reflect their operating environment and to propose solutions that resolve the business challenges, thereby promoting support for digital initiatives (Nunno & Gabrys, 2018).

Forward Looking. The ongoing extension of social media reach and social consciousness regarding global issues such as greener methods of production and improved health care etc. have created more complicated portfolios for governments (Wang et al., 2018; van Laar et al., 2017). Addressing these issues through digital transformation requires IT leaders who demonstrate forward-looking behaviours and great curiosity about the next generation of technology that could help resolve today's public-sector issues (The World Bank, 2016; Martino et al., 2021). A forward-looking mindset enables IT leaders to willingly consult with stakeholders to develop a clear vision for the future, supported by a solid strategy to operationalize appropriate digital initiatives to create better services that are aligned with the needs of citizens (Kane et al., 2019).

Effective IT leaders understand the value of being forward looking, investing in new technology and cultivating the social capital among their peers to positively influence funding decisions for digital initiatives (Van Wart et al., 2017). Digital initiatives require an appreciation of technology to be successful and being able to succinctly explain the business impact of social media, cloud computing and data analytics, on policy making in the government (Bounabat, 2017).

Integrates Technology. Effective digital leadership requires more than a cursory knowledge of IT and methods to properly implement the technological changes needed to

produce effective services that are accessible to more citizens (The World Bank, 2016; IMF, 2018). Behaviours that cultivate a sound background in IT to really understand the true potential of emerging technologies to solve business problems can facilitate closer integration with business partners and other stakeholders, as well as more effective oversight of digital projects, thereby improving the potential for project success and overall technology adoption rates (Patzer, et al., 2018; Mikalef & Pateli, 2017). Therefore, prior experience with IT and being digitally literate will help IT leaders to exhibit more collaborative behaviours to motivate stakeholder and employee support for changes that will improve business processes and achieve greater citizen expectation alignment (Kane et al., 2019).

Digital technology literacy supports IT leadership effectiveness by helping leaders to build structural power, credibility and influence in their organization, a critical component when seeking support for organizational changes (Boamah, Laschinger & Clarke, 2017). Digital initiatives introduce turbulence to organizations and IT leaders who are naturally change oriented will exhibit behaviours that build resilience to facilitate greater success in influencing cultural change (Mergel et al., 2019).

Change Oriented. Effective IT leadership requires an intricate mix of competencies, premier among which is change oriented behaviours (Kane et al., 2019). Typical public service organizations pride themselves in being consistent, reliable and predictable in providing services to the public using standard processes (Deutscher et al., 2019). Information technology leadership behaviours, which imbue a natural orientation towards change, will positively impact the productivity and overall performance of the organization by creating a culture that is more collaborative, less bureaucratic, more open to change, more accepting of innovative ideas, as well as displaying higher levels of risk tolerance for potential project failures (Louw et al., 2017).

Change-oriented leadership behaviours improve the likelihood of employees supporting new digital initiatives that drastically change the way they work by building the confidence and resilience to not revert to previous ways of completing tasks (Kane et al., 2019).

Information technology leaders in the public sector are being bombarded with a myriad of social, political and technological advances that require new competencies and character dimensions to make judicious decisions with incomplete information (Seijts & Gandz, 2018; Deutscher et al., 2019). Citizens' expectations are also rapidly changing and displaying change-oriented behaviours helps IT leaders to quickly assess socio-economic factors, levels of connectedness to the government and the extent of the digital-divide in developing digital programs that effectively serve the public (The World Bank, 2016). Strong IT leaders are therefore needed to build a culture of excellence in an arena where experience is not a good indicator of future preferences for public services (Nunno & Gabrys, 2018; Deutscher et al., 2019).

Leading Others. Strong IT leadership behaviours improve the collective efforts and commitment to organizational goals, thereby improving the outcomes of digital initiatives (Behrendt et al., 2017). Strong, decisive and focused IT leadership behaviours are essential to organizational transformation because they propel the organizations forward by supporting a pragmatic approach to resolving issues, making prompt decisions when required and by focusing on the problems to develop inclusive solutions (Kane et al., 2019; Redick et al., 2014). Therefore, strong IT leaders will improve the success rate of digital initiatives by making good judicious decisions, providing vigorous leadership support, and inclusive stakeholder management (El Sawy, 2016; Claassen et al., 2021).

The advent of digitalization in the public sector has introduced a marked difference in the relationship between consumers and the government (Wang et al., 2018). Social media has facilitated a new arena for closer connectiveness and scope for on-line collaboration to co-design services, co-fund initiatives and co-market opportunities (Mergel et al., 2019). Strong IT leadership is needed to manage these new dynamics and harness the potential that social media has introduced to improve the implementation of government policies and new digital services (IMF, 2018).

Digitalization

World leading organizations such as the European Union (EU), the Organization for Economic Co-operation and Development (OECD) and the International Monetary Fund (IMF), have all addressed the impact of digitalization on public-sector leadership effectiveness (EU, 2017; OECD, 2017; IMF, 2018). Digitalization or digital transformation is the use of digital technologies and available data to better utilize employee capabilities, new technology, stakeholder relationships and physical assets to provide better or new goods and services (The Conference Board, 2016; IMF, 2018). Public-sector IT leaders need to adapt to digitization as it will improve the government's ability to provide more reliable and relevant services in a cost effective and responsible manner (EU, 2017; Bartsch et al., 2020). Additionally, the OECD (2017) declared that there is an urgency for governments to examine the benefits of digitalization and adopt policies that will support innovation, economic, and social development. As discussed in the OECD's Digital Economy Outlook (2017), the world is now at a critical digital juncture, creating a need to develop public-sector leadership that mobilizes stakeholder value, increases citizens' trust in government policies and improves public-sector services.

Digitalization supports effective leadership by improving the government's ability to create more responsive fiscal policies by providing easier access to large amounts of data for analysis and action (IMF, 2018). For example, digitalization improves the government's ability to identify where social assistance and taxation policy changes will be most effective in serving targeted areas of the population (IMF, 2018). Digitalization is such an important challenge for many governments, that forty-three member countries have signed a declaration committing their governments to actively develop the mix of leadership competencies needed to manage the introduction of digital technologies, stakeholder participation, employee relations and innovation (OECD, 2017). It is these concerns and gaps identified that are being addressed in this research paper.

Digital strategies are implemented via major projects jointly led by the business and IT programs (Matt et al., 2015; Henkel, Marion & Bourdeau, 2019). As shown in Figure 2, digital strategies can either be operationalized from a citizen-centric perspective with emphasis on process and services, or from a strategic perspective where the organization reconsiders the relevance of services offered as well as business strategies being used (Matt et al., 2015; EU, 2017). Moreover, when implemented, digitalization introduces the capability to perform higher levels of data analytics across a wider business spectrum, as well as the capability to identify patterns, anomalies and social concerns that can be leveraged to improve service levels and product utility (The Conference Board, 2016). Some of the digital technologies available to the public sector include mobile technologies, the internet of things, artificial intelligence and cloud technologies (Bounabat, 2017). Therefore, public-sector organizations can transform themselves by standardizing processes and access to information, improving the citizen's service experience

across each siloed division, improving internal operations to align with citizens' expectations, and by creating a new internal organization to act as the change agent (Weill &Woerner, 2018).

Citizens today expect public-sector leaders to strategize and re-engineer back-office processes to produce digital public services that are tailored to their requirements and available on mobile platforms twenty-four hours every day (Bounabat, 2017; EU, 2017). Public-sector digitalization is often characterized by the following:

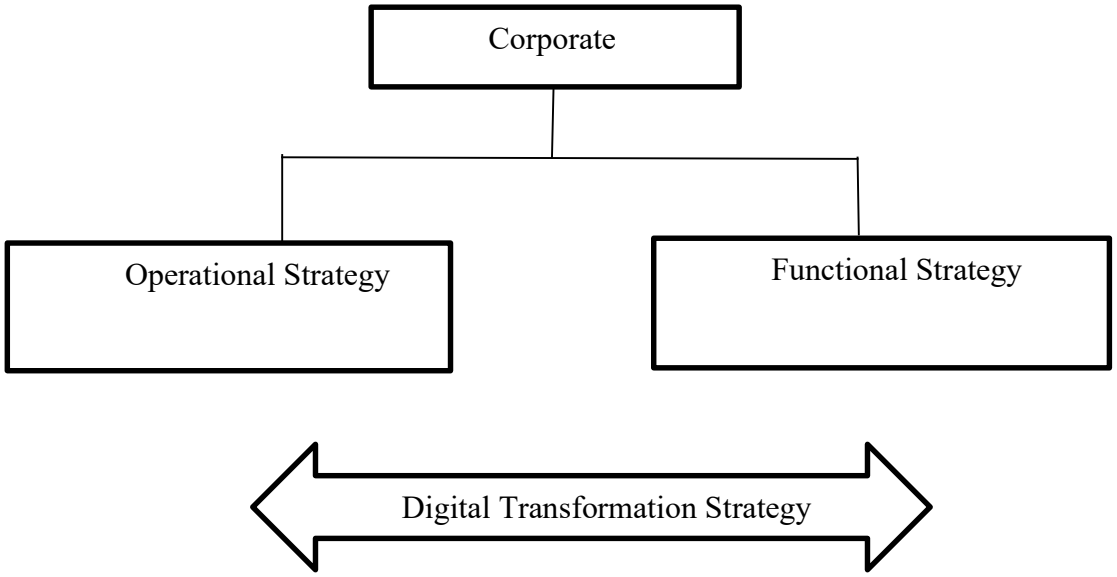
a. A deliberate strategy to build digital leadership competencies and character dimensions; a more collaborative approach to decision making and more openness to innovation
b. A digital by default service model; an agile approach to service and system development; and improved service availability via mobile platforms and integrated service delivery chains
c. Policy decisions informed by data analytics; diverse stakeholder engagements; and citizen-driven requirements (Katsonis & Botros, 2015; Patzer et al., 2018; Seijts & Gandz, 2018; IMF, 2018).

As depicted in Figure 2, digital transformational strategies underpin improvements to the organization's structure, culture and value-chain creation by integrating operational activities with strategic planning (Matt et al., 2015). Adapting to environmental changes is especially important for effectively leading in the public sector where resources are limited and public funding is being used to provide services (Wang et al., 2018). The figure shows that digital transformation of an organization encompasses the amalgamation of operational and functional strategies with corporate commitment to change and excellence (Matt et al., 2015). Therefore,

digital capability is an integral part of the strategic planning process and allows the public sector to stay abreast of social needs to meet the expectation of citizens (EU, 2017; Berry & Mok, 2015).

Figure 2

Digital Transformation Strategy



Note. Digital transformation strategy across operational and functional areas by Matt, C., Hess, T. & Benlian, A. (2015). Digital Transformation Strategies. *Bus Inf Syst Eng*., 57(5), 339-343. Copyright 2015 by International Journal of Education & Development. Reprinted with permission.

Evolution of Digital Theories

Researchers have used various theoretical approaches to investigate the impact of digitalization and leading in a digital environment (IMF, 2018; OECD, 2017). Public-sector leadership has grown from the early Webber Model, then progressed to the New Public Management model (NPM), and now to the Digital Government Model (DGM) (Kosorukov,

2017). The exponential growth of the Internet and innovation in the public sector using social media, cloud computing and data mining have given rise to a Digital Government Model (DGM), where digital approach is the main method of service delivery (Kosorukov, 2017). The DGM emphasizes horizontal collaboration among ministries and different levels of government; reduced bureaucracy; citizen consultation and involvement in service design; multiple digital service channels and public-private sector partnerships (Kosorukov, 2017).

Prior to digital theories becoming popular, e-government was the precursor for public sector transformation (Bounabat, 2017). E-government ushered in electronic services from governments to citizens and businesses (Okunola, Rowley & Johnson, 2017). The growth of the Internet in the early 2000s provided opportunities for governments to expand service channels via the internet and mobile technology (Elnaghi et al., 2019). E-government transformation ushered in automated interactions between the public and the government for the electronic delivery of services and helped to strengthen the trust in government by improving the efficiency and transparency (Sagarik et al., 2018; EU, 2017). E-government also promoted vertical and horizontal integration of government services with alternate service providers using shared infrastructures (Mukhopadhyay et al., 2019). Unfortunately, over the years these e-government initiatives have met with varying levels of success due to factors such as lack of government commitment, poor infrastructure and the Digital Divide (Okunola et al., 2017).

The theoretical concept of the Digital Divide reflects the impact of global economic imbalances which afford some groups easier access to computing capabilities and higher levels of IT education (Okunola et al., 2017; Arshad & Khurram, 2021). Therefore, effective IT leaders need to use their access to data analytics and a wider pool of stakeholders to manage the Digital Divide, by ascertaining how these socio-economic differences will impact the public

consumption of government services, and tailoring their strategies accordingly (Patzer et al., 2018).

A more recent theoretical concept is digitalization, which has emerged from both scholarly and business practitioner research (Kane et al., 2019). The significance and global reach of the changes that accompany digitalization have created an urgency for effective leadership for government transformation (EU, 2017). Due to fiscal constraints, governments have reduced their leadership capacity by outsourcing many businesses and IT functions to the private sector (Wang et al., 2018). Therefore, IT leaders need to rebuild their social capacity, behavioural affinity and cognitive aptitudes for more effective digital leadership (Mergel et al., 2019; Benali, Kaddouri & Azzimani, 2018). Digitalization has created a need to rebuild leadership capacity through adaptive governance, to respond quickly to socio-economic changes (van Laar et al., 2017; Wang et al., 2018). Adaptive governance calls for greater public sector and private sector collaboration, as well as leaders with greater cognitive and behavioural competencies to lead more effectively by leveraging stakeholder capabilities (Wang et al., 2018). By identifying the leadership competencies and character dimensions required for effective leadership in a digital environment, this research has helped to address the gap.

Digital by default is also a recent phenomenon that has garnered international acceptance. The European Union (EU) Tallinn Declaration on eGovernment (2017) asked member states to adopt a Digital by Default policy by 2022, to support future public sector investments. Key contents of the Digital by Default policy included:

a. Giving citizens and businesses the ability to interact digitally with the government

b. Providing a consistent quality of user experience by using user-centric principles for designing and delivering services
c. Improving the public's readiness to conduct business digitally with the government (EU, 2017).

Table 2

Summary of Relevant Digital Theories

Authors	**Theories**	**Digital & Leadership Principles**
Kosorukov, 2017	Digital Government Model (DGM).	Horizontal collaboration across all levels of government; reduced bureaucracy; citizen-centric design of services; one-window access approach to service delivery; digital on-line access to government services; and outsourcing of inefficient programs
Matt et al., 2015	Digital Transformation Framework	Value Creation, Structural Changes and Financial Implications
Benali, Kaddouri & Azzimani, 2018	DigiCompEdu Conceptual Framework	Professional Engagement, Digital Resources, Teaching and Learning, Assessment, Empowering Learners and Facilitating Learner's Digital Competence
European Union, 2017	Digital by Default	Citizens and businesses can interact digitally with the government; user-centric design principles; openness and transparency
Wang, Medaglia & Zheng, 2018	Adaptive Governance	New approach to governance for leading during times of disruption, environmental changes and multi-faceted consumer demands
Bounabat, 2017	e-Government	Putting government services on-line; using IT to deliver public services more effectively
Okunola, Rowley & Johnson, 2017	Digital Divide	Difference between groups that have access and computing capabilities to utilize the internet, and those who do not

Table 2 provides a high-level summary of digital theories from both a scholarly and a practitioner perspective. While the approaches are different, all researchers agree that leaders need to be aware of the challenges introduced by digitalization and develop competencies to address them.

Leadership Competencies

A competency represents what leaders can accomplish and is a function of their intelligence, willingness to work hard, technical qualifications and ability to make difficult decisions (Sturm et al., 2017). As governments adapt to digitalization, leadership competencies must be developed so that leaders have the technical knowledge and intellectual framework to make appropriate business decisions (Ready & Mulally, 2017). The strategic leadership model developed by Schoemaker et al. (2013) was used to measure leadership competence in this research paper.

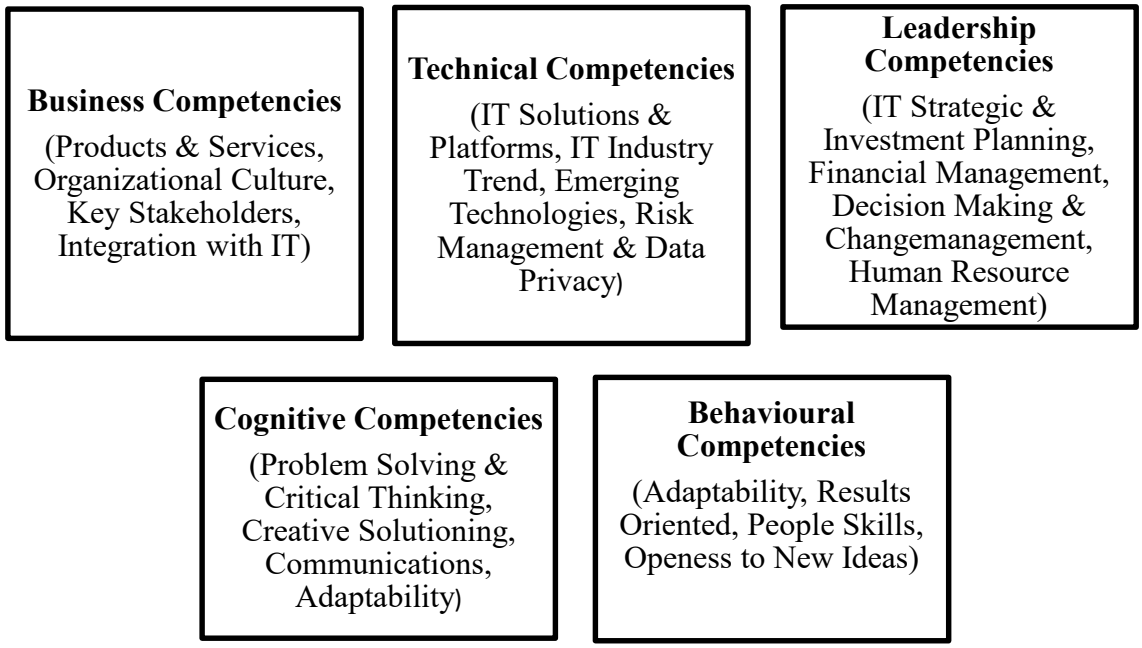
Due to the global arena in which organizations now operate, and a flow of new academic theories asking more of contemporary leaders, there is additional pressure from academia and citizens in demanding that public-sector leaders deliver more with reduced funding, improve the management of public resources, upgrade service quality and increase the number of service delivery channels (Sturm et al., 2017; IMF, 2018; Hooper & Bunker, 2013). To answer this call, IT leaders in the public sector need to acquire the competencies to collaborate with stakeholders and implement digital strategies (El Sawy et al., 2016; Martino et al., 2021). Although this paper focuses on discrete competencies, additional competencies can be built from the amalgamation of different leaders to form leadership teams that collectively have higher levels of competencies based on the diversity of their knowledge and past experiences (Dust & Ziegert, 2016).

A combined leadership team with the synergy and differing perspectives based on diverse backgrounds will enrich decision making and provide greater continuity, broad-based knowledge and originality of thoughts to ensure that the most comprehensive decisions are made for the organization (Dust & Ziegert, 2016). From a business practitioner perspective, Ernst & Yonge and The Conference Board (2018) proposed that to build digital-ready leaders, organizations

should focus on developing the competencies required to support behaviours that will result in effective leadership in a digital environment; be highly adaptable; be able to implement changes; be able to collaborate and build cross-functional teams; nurture and develop digital talent; and take a holistic view from diverse perspectives to take advantage of new trends.

Figure 3

Competencies for Effective IT Leaders



Note. Competencies for Effective Information Technology Leaders Adapted from Hooper, V. & Bunker, B. (2013). Role and Requisite Competencies of the Public Sector CIO: a Two-sided Perspective. The Electronic Journal of Information Systems Evaluation, 16(3), 188-199. Copyright 2015 by Electronic Journal Information Systems Evaluation. Reprinted with permission.

Figure 3 highlights crucial cognitive, behavioural and technical competencies required to effectively lead in a digital environment (Hooper & Bunker, 2013). Information technology leaders require these amalgamated competencies to effectively lead in a digital public sector

(Mukhopadhyay et al., 2019; Hooper & Bunker, 2013). Along the same conceptual horizon, Hooper and Bunker (2013) described a more holistic leadership competency model for IT leaders, encompassing business, technical, strategic, cognitive and behavioural competencies. Similar to the theoretical model in this research, this model examines both the technical and cognitive psychological foundations that support effective leadership in a digital environment (Hooper & Bunker, 2013). This is important because digitalization has evolved the business environment by changing the operational boundaries, rules of stakeholder engagement as well as bargaining power (Li et al., 2016; Kane et al., 2019).

Viewing leadership from a more strategic perspective, Schoemaker et al. (2013) proposed an amalgamation of competencies considered essential to effectively lead during times of significant changes such as the digital disruption in the Ontario Government. Strategic leaders are considered effective when they anticipate threats, challenge existing norms, make difficult decisions, align stakeholder interests and promote a culture of continuous learning in their organization (Schoemaker et al., 2013; Mikalef & Pateli, 2017; van Laar et al., 2017; Redick et al., 2014). These factors align with the principles of the Ontario Government and will therefore be used measure the independent variable, leadership competence in this paper. The factors are further explained below.

Review of Leadership Competencies

Anticipating Environmental Changes. Organizations are constantly adapting to environmental changes, requiring astute IT leadership (Bolden & O'Regan, 2016; ACCA, 2018). These environmental changes typically include technological shifts, demand for different products and service features, different political agenda, regulatory changes and demographic alignment (Bolden & O'Regan, 2016; Classen et al., 2021). Effective IT leaders will anticipate

these changes, weigh different options, constraints, context and then consider the political and social ramifications of alternate courses of action before deciding on the most prudent strategy (Kalali, Momeni & Heydari, 2015; Dewi & Sjabadhyni, 2021). Additionally, the proliferation of digital channels for service delivery has created a public-sector environment where proactive change management thinking is a valuable leadership competency, to be able to quickly assess socio-economic factors in conjunction with technology capability, and then make appropriate cross-jurisdictional decisions (Kosorukov, 2015; Brunner et al., 2021).

To demonstrate effectiveness in a digital environment, IT leaders should be adept at reorganizing their human capital capabilities and at re-aligning their business assets to address imminent environmental changes before they occur (Ravichandran, 2018; Schoemaker et al., 2013). Information technology leaders should plan for environmental changes by becoming digitally industrialized to provide an integrated customer experience, reduced operational costs, eliminating silos and simplifying bureaucratic processes (Amalia, 2019; Weill & Woerner, 2018).

A different approach to anticipate and effectively manage change, is for IT leaders to develop domain excellence in their business environment (Markman, 2017). Domain excellence allows leaders to combine their technical expertise, business knowledge, with behavioural competencies such as critical thinking, good communication, self-motivation and problem solving, to enable them to quickly assess large volumes of information from different sources and elicit the salient points for decision making (Markman, 2017; Schoemaker, 2013). This digital technology shift has created a need for leaders who can challenge status quo and exert influence through hybrid competencies, blurring the lines between specialist IT and specialist business areas (Li et al., 2016; Schoemaker et al., 2013).

Challenging Status Quo. Effective IT leaders are willing to review established processes and ask, "why are we doing it" and "what are the expected outcomes and business value" (Berry & Mok, 2015, p.5). In a digital environment, ingrained business processes and standard operational procedures are barriers to innovation (Dreyfuss, 2017). Therefore, the innovative capacity of an organization is predicated on the leader's aptitude for change, ability to assert views persuasively and authoritatively taking into consideration their impact on decision making and project success, as well as the willingness to reduce redundant or overlapping tasks and to look for the root cause of issues by challenging the status quo (Ravichandran, 2018; Schoemaker et al., 2013; Mikalef & Pateli, 2017). By abandoning previous leadership practices and empowering employees to help chart the future of the organization, IT leaders can disentangle status quo and move their organization to a new operating paradigm (Mikalef & Pateli, 2017; Olding, 2018).

Assessing business problems from multiple perspectives and leveraging digital options to address them can yield more citizen-centric goods and services and better utilization of public resources (Ravichandran, 2018; IMF, 2018). Therefore, changing the status quo in government involves moving to a citizen-driven model for service development, introducing services that are mobile enabled, digital by default, promoting collaboration across program areas and facilitating an agile approach to system development and procurement activities (EU, 2017; Katsonis & Botros, 2015). As social and geographic information become more readily available, citizens are pushing governments to use data to modernize services, and therefore maintaining status quo is no longer an option for effective IT leaders (Tate et al., 2018; Elnaghi et al., 2019).

Making IT Investment Decisions. Effective IT leaders need digital competencies to have the confidence and ability to assess and decide on the new digital technology investments

needed to bring innovation to their organizations (Van Wart et al., 2017). The plethora of new technologies available today means that IT leaders must assess and develop their organization's maturity to operate formal decision-making committees with responsibility and authority for IT investment decisions, to review and decide on the technology changes needed to adapt and innovate, while considering the public impact of digitalization (Tonelli et al., 2017; Bolden & O'Regan, 2016; Schoemaker et al., 2013). Therefore, to effectively lead their organization, public-sector IT leaders require both digital and organizational knowledge to decide how best to adapt their organization to new legislations and to build the IT vision for the future success of the organization (Hooper & Bunker, 2013; Pittenger et al., 2022).

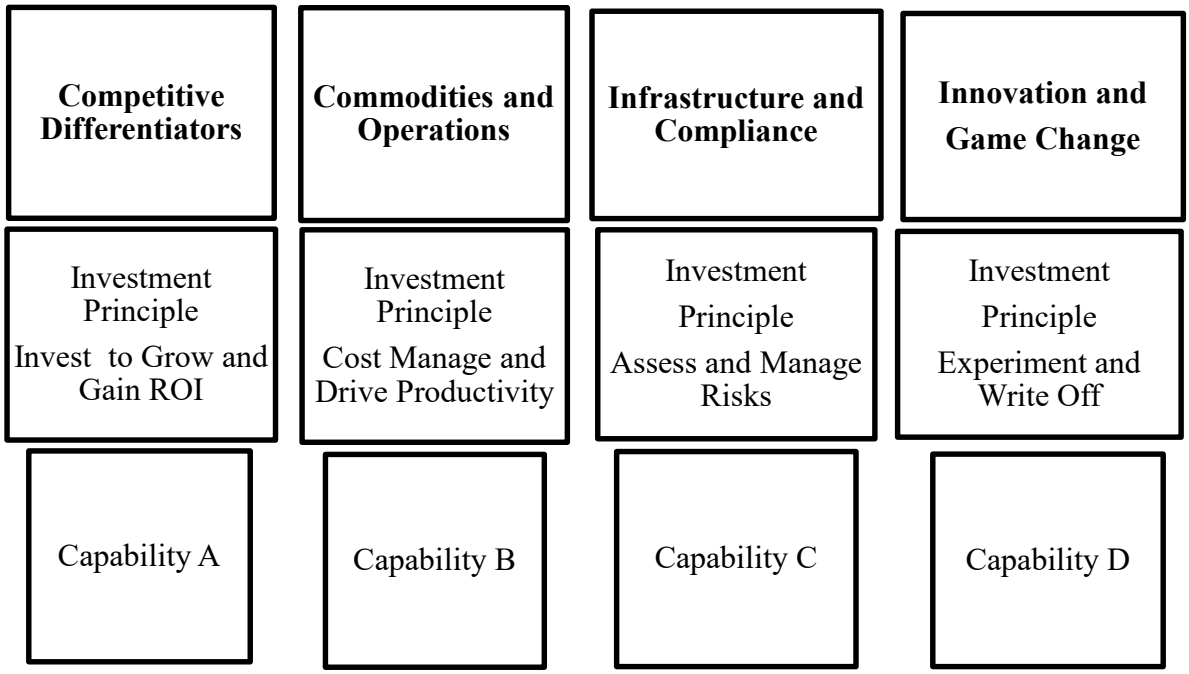
Investment decision making in a digital public service is highly politicized because there are high levels of uncertainty and the potential for success and failure is evenly balanced (Nunno & Gabrys, 2018). Therefore, to neutralize political obstacles, effective IT leaders should use their competencies to engender stakeholder support for decisions to redesign the organization's operations through the simultaneous introduction of digital technologies, cultural and human resources changes, as well as the supporting new business processes, to create organizational transformation and higher levels of efficiencies (Li et al., 2016; Gierlich-Joas et al., 2020).

As shown in Figure 4, Nunno and Gabrys (2018) proposed a CIO Investment Decision Framework, where IT investment decisions are centred around improving return on investment (Capability A), reducing cost and improving productivity (Capability B), managing risks (Capability C) and experimenting (Capability D). Based on this model, IT leaders are expected to diffuse the impact of organizational politics and focus attention on these key reasons for making business investment decisions (Nunno & Gabrys, 2018). Overall, leadership support for astute investment decisions will result in higher levels of productivity, more jobs and better services to

the public (The World Bank, 2016). Figure 4 summarizes the competencies required to support effective IT investment decisions and further highlights the need to address multiple stakeholder concerns (Nunno & Gabrys, 2018).

Figure 4

CIO Investment Decision Framework



Note. CIO Investment Decision Framework based on business principles and capabilities by Nunno, T. & Gabrys, E. (2018). Depoliticize IT Investments with a CIO Decision Framework. *Gartner Inc*. Copyright 2018 by Gartner Inc. Reprinted with permission.

Aligning Organization and Stakeholder Interests. In a digital environment it is crucial for leaders to exhibit consultative skills when interacting with stakeholders in order to maximize contributions from diverse perspectives thereby enrichening decisions (OECD, 2017). A stakeholder is defined as anyone or group who can exert influence on the organization or who will be impacted by the organization's decisions, performance and policies (Gilchrist, et al.,

2018). Major stakeholders of the public sector include citizens as consumers of services, lobby groups hoping to influence government policies and businesses that provide goods and services to the government (The World Bank, 2016). To effectively discharge their accountabilities, IT leaders are expected to engage these stakeholders in social discourse on various topics of interest to inform policy decisions (Patzer et al., 2018). Other interest groups such as regulators, environmentalists, human rights and animal rights groups have become more vociferous in airing their opinions on government policies and have a real opportunity to negatively impact the image and success of any organization they target via social media channels (Hooper & Bunker, 2013; Leong et al., 2019). Therefore, the ability to manage the concerns of these diverse stakeholder groups and align them with those of the organization, is a key competence contributing to effective leadership (Schoemaker et al., 2013; Claassen et al., 2021).

Current and ongoing communications support effective leadership and stakeholder management by providing everyone with access to relevant information so that they can make sense of their changing environment (Berry & Mok, 2015; Gierlich-Joas et al., 2020). The ability to converse with, or communicate changes to public stakeholders, peers and staff at the appropriate technical and detail levels, is key to successfully implementing new strategies or negotiating deals (Nagarajan & Edwards, 2015; Martino et al., 2019). As a key asset, digital technology has improved the ability for public-sector leaders to simultaneously engage all stakeholders by amalgamating social media and analytical capabilities on mobile platforms in support of distributed innovation (Li et al., 2016; Wiesbock, Hess & Spanjol, 2020).

Political acuity and humility in communicating are hallmarks of effective IT leadership and is particularly important in a digital environment where meeting stakeholder expectations and garnering their support are critical competencies to possess (ACCA, 2018). In summary,

facilitating the convergence of stakeholder expertise and input into the organization's strategic plans, is an important role played by effective leaders in an environment where many players have a stake in the success of the organization (Gilchrist et al., 2018). It is also essential that leaders appreciate their own strengths and weaknesses, and more importantly that they realise how they are being perceived by stakeholders (Dreyfuss, 2017; Taylor, Sturm, Atwater & Braddy, 2016). Self-awareness and acceptance of one's limitations are fundamental to a leader's quest for knowledge by constantly being in a learning mode to improve performance and exert stakeholder influence (Taylor et al., 2016).

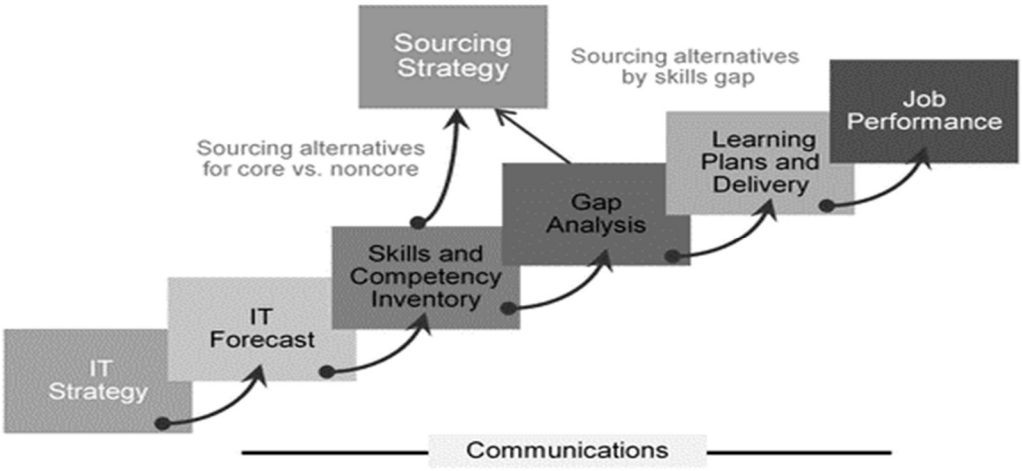
Maintaining a Learning Mentality. A learning mentality is essential to effectively lead in a digital environment where operational variables are constantly changing (van Laar et al., 2017). Such a dynamic environment necessitates learning to be a continuous process where IT leaders follow trends on the internet to remain current and proactively use existing and new information to generate original ideas (Mikalef & Pateli, 2017; Wiesbock et al., 2020). To support the development of knowledge in their organization, IT leaders should identify, evaluate and introduce new information and technical knowledge, and then use the accumulated information to inform the decision making as their organization adapts to changes in their operating environment (Schoemaker et al., 2013; Heslin & Keating, 2017; Mikalef & Pateli, 2017).

To be very effective, IT leaders should also have the confidence and self-awareness to recognize when additional competencies and external expertise are needed to augment the decision-making capability of the executive team and to course correct when there is evidence that previous decisions were not optimal (Schoemaker et al., 2013; Niesten & Jolink, 2015). Permission should be granted to widely communicate successes and failures to promote

intuitional learning, provide permission to experiment and innovate, to further enhance the things that worked well and to learn from the strategies that failed (Schoemaker et al., 2013; Jackson & Dunn-Jensen, 2021). Consequently, as IT leaders develop in their careers, there should be a shift away from acquiring technical knowledge and a greater focus on developing their cognitive and behavioural competencies including, broader functional knowledge, judgement and intangible character driven dimensions (The Conference Board, 2018). In summary, IT leaders in the digital era need to cultivate the competencies of ``HyperThinking`` where they are constantly challenging the status quo (hypershift), seeking out new knowledge (hyperlearn), willing to change (hyperlink) and adapting creatively to achieve new outcomes (hyperact) (The Conference Board, 2016).

Figure 5

Road Map to Skills and Competency Management



Note. Road Map to Skills and Competencies for Effective Job Performance by Berry, D. & Mok, L. (2015). *Gartner Inc*. Copyright 2020 by Gartner Inc. Reprinted with permission.

Figure 5 provides a roadmap for organizations to develop IT leadership competencies (Berry & Mok, 2015). By developing a gap analysis of the required competencies for effective IT leadership, organizations can implement the appropriate sourcing, performance management, and learning and development strategies to improve the effectiveness of their IT leaders (Berry & Mok, 2015). Berry and Mok (2015) proposed that leadership development should be an integral part of the organization's IT strategy with the establishment of a formal Information Technology Skills and Competency Inventory.

More recently, Guthrie and Meriwether (2018) found that leadership can be developed in the digital environment through mentoring, coaching, and advising. Keeping a growth-oriented mindset promotes an openness to learning and acts as a catalyst for changing the status quo of organizations (Heslin & Keating, 2017). Good alliance management increases learning by providing access to expert knowledge and information sharing, collective efforts to resolve a common problem and joint participation in new knowledge creation (Niesten & Jolink, 2015). Developing knowledge of their business environment and enhancing their character dimensions will position IT leaders to be the enablers of change as required in a digital environment (Bolden & O'Regan, 2016; Rupcic, 2021).

Character Dimensions

Character dimensions are defined as the virtues, values and beliefs that when combined produce a higher level of performance (Seijts, Crossan & Carleton, 2017). Character reflects entrenched values, normative ideals, psychological cognitive sensemaking, and is the yardstick by which effective leaders measure goals, aspirations and negotiate settlements (Seijts et al., 2015; Seijts et al., 2021). The Leaders Character Framework by Seijts et al. (2015) is often

referenced for discussions on character dimensions. Character dimensions inform the types of decisions that leaders make by deploying various competencies (Byrne et al., 2018).

Character dimensions are developed over time through a repeated pattern of awareness, judgement, behaviour and reflection (Sturm et al., 2016). Character is reflected in the IT leader's intrinsic virtues and can be changed through self-awareness and development (Kiel, 2015; Rupcic, 2021). According to Kiel (2015), behaviours that demonstrates character dimensions such as judgement (integrity and heart), accountability (responsibility) and collaboration (compassion), all have a positive effect on organizational performance.

Character acts as a moral compass and guides our perception of what is fair and allows us to contextualize incidents in our environments (Seijts et al., 2015; Seijts et al., 2021). Character is developed over time and provides answers to the who, why and how questions (Sturm et al., 2017). Character dimensions are measurable elements of behaviour and will be manifested in the IT leader's ability to be honest, friendly and to make ethical decisions (Sturm et al., 2017). Seijts et al. (2015) developed a Leaders Character Framework consisting of eleven character dimensions considered essential for effective leadership. This model was later updated (Crossan et al., 2017) and three of these dimensions (*Collaboration*, *Accountability* and *Judgement*) are used as independent variables in this research. These three character dimensions were selected because the closely align with the leadership values in the Ontario Digital Action Plan (2018) and are also included in the performance plans of all leadership staff and the OPS Learning Strategy 2017-2021, (2017). These three character dimensions are discussed below.

Review of Character Dimensions

Promoting Collaboration. Collaboration refers to the natural affinity to work well with others, to openly share ideas, cross-pollinate knowledge and share experience to improve the organization's performance (Crossan et al., 2017; Seijts et al., 2015). Good collaboration is essential in a digital era where the government, businesses and technology teams are solving problem together (Hill & Bartol, 2016; IMF, 2018). The Ontario Government has ministries in all areas of the province, with branch locations often in remote northern communities (Government of Ontario, 2018). Where public-sector teams are geographically dispersed, effective IT leadership improves decision making by creating a culture of close cooperation, which facilitates the development of trust, conflict resolution, diversity of views and transparent information sharing (Hill & Bartol, 2016; Martino et al., 2021). Collaboration supports positive interactions, creates a sense of being inter-connected and improves group dynamics with a focus on the issues, as well as what is in the best interest of all stakeholders (Crossan et al., 2017; Seijts et al., 2015). Collaborative leadership can be demonstrated through varying forms such as mentoring, coaching and peer review, where there is an open two-way flow of information and both parties learn from each other to implement joint solutions (Min, Modeste, Salisbury & Goff, 2015; Claassen et al., 2021).

Effective IT leaders also demonstrate collaboration through flexibility in their decision making and by promoting a collegial and cooperative atmosphere in their organization (Crossan et al., 2017; Dreyfuss, 2017). This improves participation and provides a cross-pollination of ideas for better decision making (Marques, 2015). Therefore, being flexible and inter-connected to peers allows IT leaders to be more effective as they become more aware of activities in other areas that could impact their organization unit, and by providing an avenue for potential

resolutions (Crossan et al., 2017; Heslin & Keating, 2017; Gilchrist et al., 2018). Citizens are holding public-sector leaders accountable for effectively leading multi-disciplinary teams and collaborating across multiple ministries by utilizing digital technologies to be location agnostic as they improve service quality and improve access equality to citizens (Kosorukov, 2017).

Accepting Accountability. Effectively leading in a digital environment demands a conscious decision to make changes and accept responsibility if decisions are proven to be wrong at a later date (Crossan et al., 2017; Wang et al., 2018). Accountability refers to the ground rules demarcating who is responsible for achieving certain outcomes (Chan, Atanasov, Patil, Mellers, & Tetlock, 2017). Accountability is grounded in the established rules being accepted by everyone and requires IT leaders to be conscientious in reliably discharging responsibilities in line with organizational standards and expected levels of professionalism (Crossan et al., 2017). Consequently, the willingness to be held liable for achieving performance targets and owning decisions made, regardless of the outcome is the essence of accountability (Seijts et al., 2015). Accountability should be aligned with the mission of the organization and delegated from IT leaders downwards, which helps to create a culture of high moral, values and dependability (Weber, 2018).

The latitude to demonstrate accountability in the Ontario Government is governed by the *Fiscal Sustainability, Transparency and Accountability Act, 2019.* The Fiscal Sustainability, Transparency and Accountability Act (2019) promotes public-sector accountability and is based on the principles of sustainability, transparency, responsibility, flexibility and equity as articulated below:

1. *Sustainability: Ontario's fiscal policy should consider the government's financial position, including the burden of the provincial net debt, over the long term.*
2. *Transparency: it should be clearly articulated and information about it should be readily available to the public without charge.*
3. *Responsibility: it should be based on cautious assumptions.*
4. *Flexibility: it should recognize the need to respond to changing circumstances.*
5. *Equity: its impact on different groups within the population and on future generations should be considered.*

To support effective IT leadership, accountability can be assigned based on outcome targets or process adherence (Chan et al., 2017). Outcome accountability is better suited in times of uncertainty and provides public-sector leaders with more flexibility to dynamically adapt processes as situations warrant, to ensure targets are met (K. Nei, Foster, Ness & Nei, 2018). Process accountability is focused on maintaining established standards and is better suited in times of stability (Chan et al., 2017). In the middle of both outcome and process accountability is hybrid-accountability, which provides a limited degree of flexibility to make changes when needed (Chan et al., 2017). Digital transformation is a complicated and disruptive event, which requires full commitment to adapting to change, accepting consequences and exercising good judgement (Crossan et al., 2017; Troshani et al., 2018). Therefore, for IT leaders to be fully effective and accountable, they should be assigned the right span of control and the appropriate levels of accountability (Matt et al., 2015; Seijts et al., 2021).

Exercising Good Judgement. A digital environment is constantly changing and presenting new opportunities and challenges, which requires critical thinking, astute IT leadership and good judgement to make great decisions (Crossan et al., 2017). Good judgement

refers to the leader's cognitive propensity to quickly analyze and distill large volumes of complex information down to the key decision points, and then deploy practical wisdom and prudence to arrive at a reasoned decision (Shotter & Tsoukas, 2014; Crossan et al., 2017). Therefore, the acuity to critically analyze the facts of a situation, adapt as more current information becomes available and make decisions based on incomplete information, demonstrates good judgement and insightful leadership (Crossan et al., 2017). Good judgement requires wisdom and expertise as an overlay on the leader's other character dimensions to make the moral decisions (van Laar et al., 2017; Shotter & Tsoukas, 2014). In the Ontario Government, judgement is one of the leadership performance elements evaluated annually and prior to being assigned new job responsibilities (OPS Performance Readiness & Assessment, 2018).

Good judgement is the character dimension that influences the leader's thought process to put decisions into context and exercise discretion (Deutscher et al., 2019; Seijts et al., 2015). As a result, good judgement is much more than problem analysis; it is an intellectual common-sense approach to discretely deal with new situations that don't align with previously established protocols (Shotter & Tsoukas, 2014; Seijts et al., 2021). To effectively lead by exercising good judgement requires an integrated approach for assessing context, scarce resources, differing stakeholder interests and the political landscape, to make mutually beneficial decisions for all stakeholders (Shotter & Tsoukas, 2014; IMF, 2016).

Additionally, good judgement is a function of a leader's emotional intelligence and sensemaking (Weick, 2007; Ferrero et al., 2019). Emotions refer to level to which IT leaders are expressively affected by a situation and will influence the speed and extent to which they will judge and address an issue (Muchhal & Solkhe, 2017; Shotter & Tsoukas, 2014). Emotional

intelligence helps leaders to be more effective by controlling their emotions, ability to react positively to difficult situations and by being politically astute in making decisions for their organizations (N. Sing & Singh, 2015). Gestures, speech and body language when juxtaposed with social norms, all combine to help IT leaders intuit the true essence of activities occurring in the environment, and then judge the most appropriate response (Shotter & Tsoukas, 2014; Weick, 2007).

Comparison of Leadership Competencies and Character Dimensions

Competencies reflect the knowledge, skills and abilities to produce quality outcomes and are considered an amalgamation of intellect, diligence, technical training and the natural inclination to make tough business decisions (Sturm et al., 2017; Ready & Mulally, 2017). Some of the competencies associated with effective leadership include being willing to challenge status quo, address environment changes, communicate effectively, build strong teams, and maintain an open mind (Schoemaker et al., 2013; Seijts et al., 2021). On the other hand, character dimensions are the core values that guide and inform the IT leaders' cognitive capacity to exemplify virtue and make moral decisions on behalf of their organization (Seijts et al., 2017). The character dimensions included in this paper are *Accountability*, *Judgement* and *Collaboration* (Seijts et al., 2015). Effective IT leaders possess both the competencies and character dimensions to make difficult decisions required to adapt their organization to the digital arena (Lam, 2016).

Leadership competencies and character dimensions are similar in that they are both factors that combine to produce more effective IT leaders (Sturm et al., 2017). They both provide the business context and moral framework for leaders to review information and make well reasoned, appropriate decisions (Sturm et al., 2017). In a digital environment, developing a

portfolio of competencies and character dimensions will improve self-identity and overall effectiveness as an IT leader (Lester et al., 2017; Seijts et al., 2017).

Leadership competencies and character dimensions are different in that they influence different aspects of the analytical decision-making process of effective IT leaders (Sturm et al., 2017). Competencies focus on driving innovation, developing technical knowledge and building stakeholder alignment to achieve specific targets, while character dimensions help to inform what is the right thing to do for all stakeholders (Ready & Mulally, 2017; Seijts et al., 2017). Additionally, character dimensions are the distinguishing psychological factors that anchor leaders to be models of virtue, ethics and integrity (Sturm et al., 2017). Digital technologies have altered workplace culture and job requirements, increasing the demand for more just-in-time short term value-added work assignments and for more effective IT leaders who can facilitate quick and astute decision making (Rubens, Schoenfeld, Schaffer & Leah, 2018).

Character and competence are closely intertwined, enjoy a symbiotic relationship and act as triggers for each other to help IT leaders make good decisions (Sturm et al., 2017). In an organizational context, cultural environment and routine daily activities help to develop leadership character and integrate it with competence over time (Sturm et al., 2017). Based on emerging IT in the digital marketplace, today's effective leaders need to be systematic thinkers who can confidently combine character and competence to make strategic decisions to reposition their organization for future opportunities (Bolden & O'Regan, 2016).

Integrating Leadership Competencies and Character Dimensions

The focus of government is now shifting to be more client-centric, and the new digital era has highlighted the need for organizations to be future ready by innovating to meet citizen

requirements and to reduce costs (Weill & Woerner, 2018). Digital services now incorporate multiple delivery channels to the public, as well as a closer integrated feedback loop via social media for services is being received (Katsonis & Botros, 2015; Pittenger et el., 2022). In addition, the Internet has created a medium through which the aggregated of knowledge of the public and government employees can be shared and used to develop better services, as well as make more appropriate policy decisions (Kosorukov, 2017). To manage these dynamic changes, effective IT leaders have realised that leadership and technology have a synergistic effect on each other's ability to support effectiveness and can be a change agent for each other (Avolio et al., 2014). As a result, today's IT leaders are expected to regularly reinvent themselves so that they can adapt to the changing requirements of their organizations (Heslin & Keating, 2017; Benaroch & Chernobai, 2017).

Character dimensions such as *Accountability*, *Collaboration* and *Judgement* help effective leaders to develop a psyche that cultivates trust and loyalty, and then utilize this sense of solidarity to inspire their followers to innovate and excel to improve performance (Seijts et al., 2015; Dreyfuss, 2017). These dimensions allow leaders to gain strong insights into the social factors impacting their organization, develop inclusive solutions and display greater levels of emotional intelligence when addressing difficult situations (Kimura, 2015; Ready & Mulally, 2017). Therefore, to build organizational adaptability, IT leaders are expected to build organizations that are "purpose driven, performance focused and principles led" (Ready & Mulally, 2017, p.65).

Good digital leadership requires strength in character and a virtuous perspective to remodel organizational processes as well as to introduce social and digital changes that align with business priorities and stakeholder needs (Li et al., 2016; Seijts et al., 2015). Information

technology leaders today require digital-era capabilities to successfully navigate a constantly changing environment, connect and resonate with a more diverse stakeholder base and to think differently by envisioning what may be possible, so that their organizations can successfully transform (Tate et al., 2018; Ernst & Yonge & The Conference Board, 2018). According to Ernst & Yonge and The Conference Board (2018), key digital-era capabilities include the ability to drive digitalization, navigate a complex digital environment, relate and connect people to digital possibilities, and to think differently to embrace innovative solutions. These capabilities are similar to the leadership competencies (*Anticipate*, *Challenge*, *Decide*, *Align* and *Learn*) and character dimensions (*Collaboration*, *Accountability* and *Judgement*) included as independent variables in this study (Schoemaker et al., 2013; Crossan et al., 2017; Seijts et al., 2015).

Corporate leadership is the responsibility of the entire management team and Lim, Stratopoulos and Wirjanto (2013) argued that when IT leaders have expert and structural power in their organization, they can influence corporate strategies that support transformation through the adoption of digital strategies. Expert power is developed through work experience, investment in training and acquisition of expert knowledge; structural power is obtained when IT leaders are appointed to high levels among the organization's executives (Lim, Stratopoulos & Wirjanto, 2013). Typical leadership roles for IT professionals include the Chief Digital Officer, Chief Technology Officer, Chief Information Officer, Chief Cyber Security Office and Chief Architect (Singh & Hess, 2017; Hooper & Bunker, 2013; Berry & Mok, 2015; Government of Ontario, 2018). Key accountabilities for these roles are listed in Table 3, and these IT leaders are expected to collaborate with their business counterparts to advance the interest of their organization through digitalization (Singh & Hess, 2017; Matt et al., 2015; Martino et al., 2021).

Table 3 summarizes key IT leadership roles and accountabilities in the Ontario Government. To effectively execute the accountabilities of theses positions, competencies can be developed through structured learning and when integrated with character dimensions can produce extraordinary strategic leaders (Sturm et al., 2017). During times of transformation IT leaders require strong behavioural competencies and character dimensions to support their display of intellectual quotient (IQ), managerial quotient (MQ) and emotional quotient (EQ) (Trivellas & Drimousis, 2013). The leaders' ability to demonstrate leadership competencies and character dimensions are reflected in their display of ethics, reliability, values appreciation, self-control, assertiveness, conflict and crisis management, creativity and efficiency (Trivellas & Drimousis, 2013; Seijts et al., 2015).

Table 3

Public-Sector IT Leadership Roles

IT Leadership Roles	Chief Digital Officer	Chief Technology Officer	Chief Information Officer	Chief Cyber Security Officer	Chief Architect
Program Support Activities	Introducing Digital Technologies	Developing and Promoting IT Emerging Technologies	Business Relationship and Stakeholder Management	Cyber Risk Assessment and Remediation	Developing and Promoting IT Infrastructure Standards
	Building momentum for Digital Transformation	Setting Technology Standards	Maintaining IT Infrastructure Systems	Architectural Security Design Advice and Consultation	Developing and Maintaining IT Roadmaps for major IT Applications
	Championing a Digital Mindset	Business Relationship and Stakeholder Management	Supporting IT Applications	Monitoring & Responding to Cyber Incidents	Architectural Design, Advice and Consultation
	Clearing roadblocks that limits transformation	Collaborating with Vendors and Industry Experts	Aligning Program business needs with IT priorities	Managing Vulnerabilities	Business Relationship and Stakeholder Management
Strategic Leadership	Developing and Promoting the Digital Strategy	Developing corporate Investment Strategy for new Technology Adoption	Developing and Promoting IT Strategy	Establishing Security Policies and Standards	Influencing Senior Management to adopt and Implement Architectural Best Practices
	Influencing Senior Management to invest in Transformation	Influencing Senior Management to Switch to new Technologies	Supporting Strategic Objectives of Ministries	Establishing the Corporate Protocol to respond to Major Cyber Attacks	Developing Policies for Shared or Reusable Architecture

Note. Source: Singh & Hess (2017); Berry & Mok (2015); Hooper & Bunker (2013); Government of Ontario (2018)

Ernst & Yonge and The Conference Board (2018) found that 50% of the organizations they surveyed did not incorporate leadership development as part of their strategic plans. This topic is relevant because, to realize the full potential of their investment in IT, corporate leaders rely on the intellectual capacity of their IT colleagues to be participants in the decision-making process and strategic planning for the organization (Lam, 2016). The study of leadership

competencies and character dimensions is pertinent to effective IT leadership in a digital environment as the ability to build social capital and political acuity will promote greater leadership effectiveness (Sturm et al., 2017; Kimura, 2015).

Summary

Digitalization in the public sector introduces more innovative ideas, a broader stakeholder base, as well as real time access to vast amounts of data for analysis and decision making (The World Bank, 2016; Van Ee et al., 2020). This creates a growing need for more public-sector IT leaders who are digital ready and further research is needed in this area (Deutscher et al., 2019; Sagarik et al., 2018). Therefore, this research addresses this gap by adding to the research findings and providing timely insights on effective leadership as the Ontario Government mobilizes for a digital transformation.

Chapter 3. Theoretical Framework

Conceptual Framework

Public-sector IT leadership plays a critical role in the success of transformational initiatives via digital projects (Gierlich-Joas et al., 2020). However, prior leadership researchers have identified several current gaps and a lack of common understanding of digital terminologies in existing academic literature (Jackson & Dunn-Jensen, 2021; Bican & Brem, 2020). For example, previous empirical research suggest that strong character dimensions and leadership competencies are key components for effective leadership (Schoemaker et al., 2013; Crossan et al., 2017). However, many organizations are not emphasizing digital leadership development as a strategic asset for their organization, which has created a gap in scholarly and business research in supporting effective leadership development (Martino et al., 2021; Crossan et al., 2017). This gap is reflected in training programs that do not integrate competencies and character dimensions to support a more balanced development of effective digital leaders, resulting in failed transformational projects in some instances (Martino et al., 2021; Crossan et al., 2017; Brunner et al., 2021).

Many public-sector organizations are finding it challenging to successfully implement digital projects (Bican & Brem, 2020). The pace of technological changes is exacerbating the need for additional new leadership research, specifically focused on building leadership competencies such as the ability to *Anticipate* environmental changes, *Challenge* status quo, be *Decisive*, *Align* with stakeholders and foster a *Learning* environment in order to address the challenges of digitalization (Neumeyer & Liu, 2021; Schoemaker et al., 2013). Additionally, while general leadership is well researched, scholarly research integrating leadership behaviours and digital innovation is still lacking, thus creating a gap for actionable business research to

support the development and performance monitoring of IT leaders (Rudramuniyaiah et al., 2020; Crossan et al., 2017).

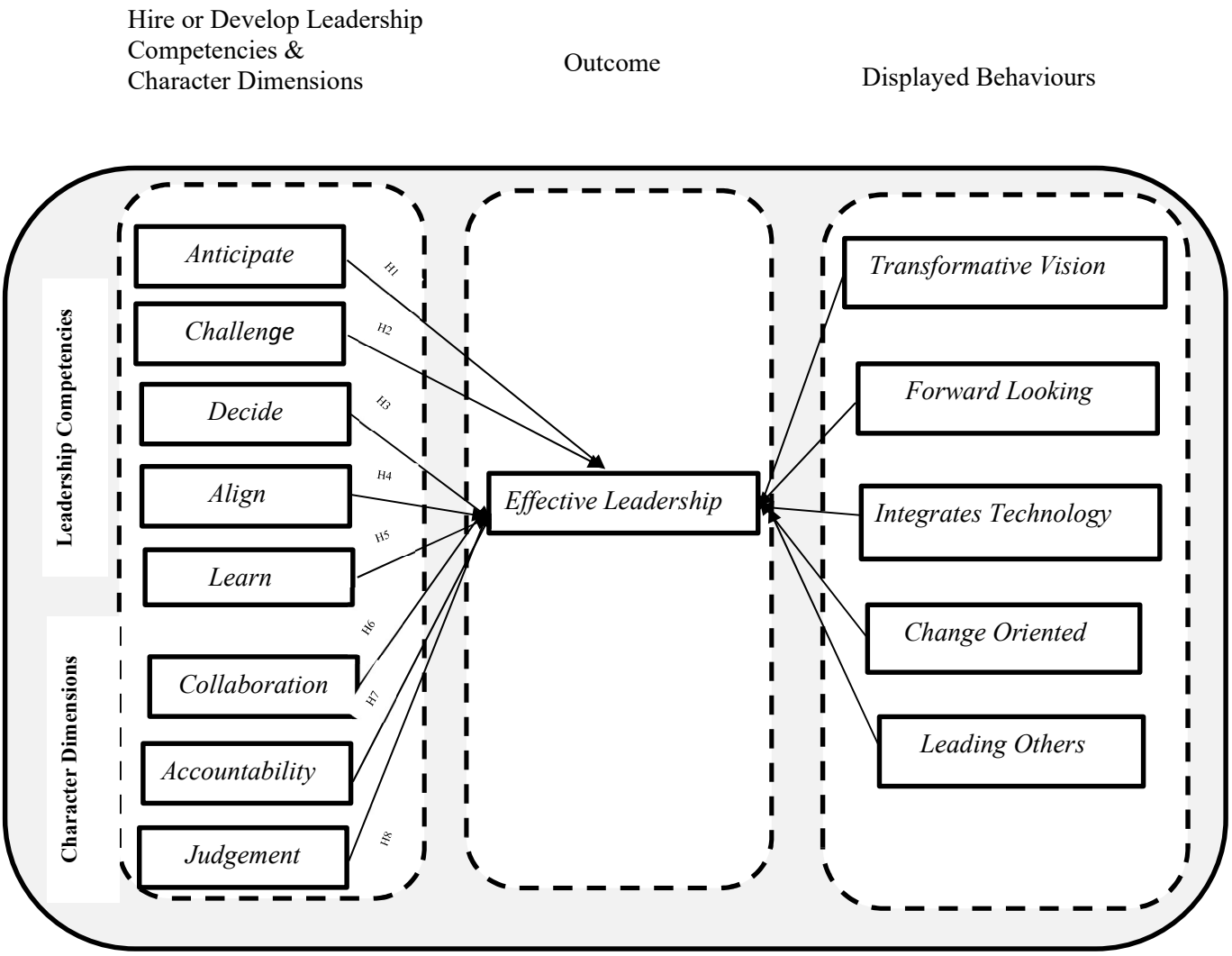
Some business schools are not emphasizing the importance of digital leadership competencies in their MBA programs, thereby creating a knowledge gap that could potentially impact the performance of future leaders (Neumeyer & Liu, 2021). Additionally, the concept of character dimensions is not well understood in the business world and some of the dimensions such as transcendence, temperance and humanity are not considered modern language applicable to today's work environment (Crossan et al., 2017; Rupcic, 2021). This lack of understanding of the importance of character dimensions and the need for more contemporary business-oriented research have created a knowledge gap in understanding how character dimensions such as *Accountability* and *Collaboration* help to support responsibility, flexibility and open-mindedness in leaders, while *Judgemen*t provides an integrative balance for good decision making (Rupcic, 2021; Crossan et al., 2017). Furthermore, past information technology leadership training has focused more on competencies at the expense of developing soft skills or character dimensions for effective leadership (Strum et al., 2017; Seijts et al., 2021). The deployment of soft skills is influenced by the strength of the character dimensions and therefore this gap warrants additional research (Seijts et al., 2021; Strum et al., 2017).

To address these gaps, this quantitative social science research sought to probe the relationship between character dimensions, leadership competencies and effective leadership in a digital public-sector environment. This research also sought to identify the competencies and character dimensions that should be integrated and included in the job descriptions, hiring plans, training and development programs for IT leaders in the Ontario Government, as conceptualized in the framework depicted in Figure 6. The eight hypotheses in Figure 7 and Figure 8 have been

developed and tested to answer the two research questions in this research and are further discussed in the next section.

Figure 6

Conceptual Framework



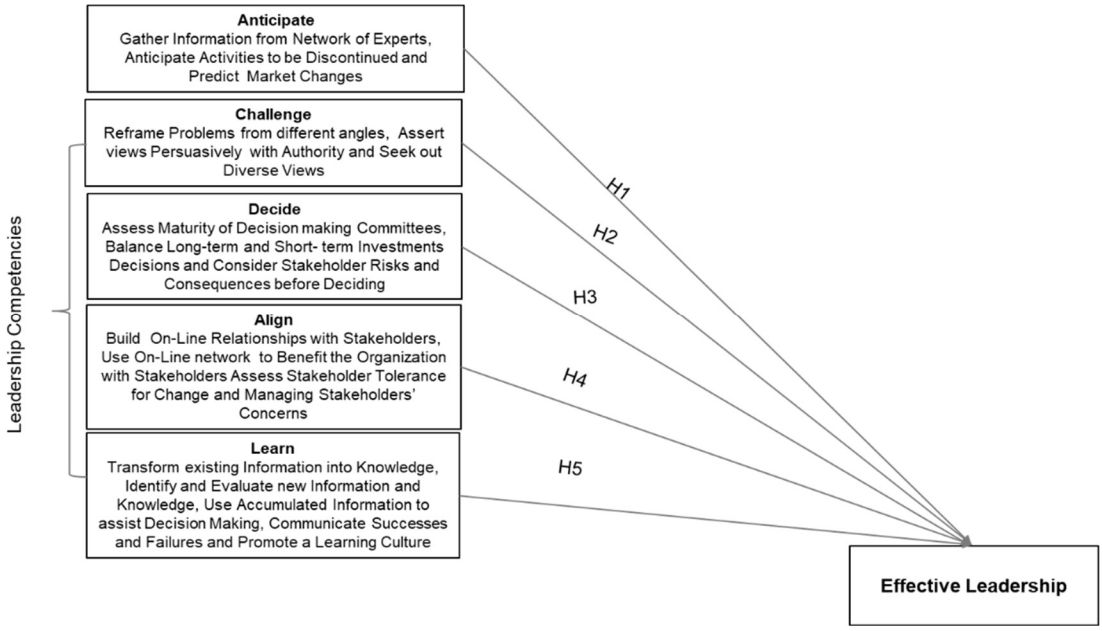
Research Hypotheses

Leadership Competencies

A competency reflects the business outcomes leaders achieve by integrating their intellect, due diligence, professional expertise and ability to make tough decisions (Schoemaker et al., 2013; Sturm et al., 2017).

Figure 7.

Leadership Competencies Independent Variables



Note. Leadership Competencies Independent Variables and associated Hypotheses

Ability to anticipate change. Effective IT leaders are critical to organizational survival and adaptation to change, based on their ability to gather and evaluate the reliability of relevant information from industry experts and then build consensus for alternate strategies (van Laar et al., 2017; Heslin & Keating, 2017). By anticipating the effects of public sector changes such political instability, customer trends and emerging technology, IT leaders can proactively plan

and then adapt the organization's strategies to capitalize on new opportunities (Schoemaker et al., 2013; Neumeyer & Liu, 2021). Since digitalization is a major agent of change, the ability to anticipate change also allows IT leaders to proactively plan for and better manage the psychological impacts of introducing change by addressing stress management, altered group dynamics and prioritizing resources (Redick et al., 2014; Schoemaker et al., 2013; Dewi & Sjabadhyni, 2021). Given that one of the main responsibility of leaders is to manage the impact of change, it is expected that there will be a strong positive relationship between the independent variable *Anticipate* and the dependent variable *Effective Leadership* in a digital environment (Schoemaker et al., 2013; Pittenger et al., 2022). It is therefore hypothesized that:

H1: An IT leader's ability to anticipate environmental changes is positively related to effective leadership in a digital environment

Willingness to Challenge Status Quo. By challenging the accepted norms in the public sector, IT leaders can improve the leadership of their organizations by creating a culture where diversity and innovation thrives, digital improvements are embraced and divergent perspectives considered in decision making (Ravichandran, 2018; Schoemaker et al., 2013). The willingness to challenge status quo builds the emotional intelligence of IT leaders to think more digitally and utilize competencies to increase efficiencies for improved organizational performance (Zhang, Cao & Wang, 2018; Mikalef & Pateli, 2017). Additionally, the willingness to challenge status quo in today's digital environment, fosters dynamic capabilities in IT leaders by building greater organizational proactive and reactive strengths through root cause analysis for greater productivity (Mikalef & Pateli, 2017; Jackson & Dunn-Jensen, 2021). The symbiotic relationship between digitalization and the willingness to accept change, suggests that there will be a positive correlation between this independent variable *Challenge* and the dependent variable *Effective*

Leadership in a digital environment (Schoemaker et al., 2013; Mikalef & Pateli, 2017). Therefore, it is hypothesized that:

H2: An IT leader's ability to challenge accepted assumptions and to be inclusive of diverse ideas is positively related to effective leadership in a digital environment

Ability to be Decisive. Effective public-sector leaders use their ability to be decisive to make timely decisions based on the evidence available, trade-offs, risks and consequences for stakeholders determined through a thorough analysis of the options (Schoemaker et al., 2013; Bolden & O'Regan, 2016). By being decisive, IT leaders are more likely to take advantage of time-bound opportunities to introduce new digital transformations to their organizations (Kalali et al., 2015; Gierlich-Joas et al., 2020). The leadership competence decisiveness has been found to support leaders' general ability to balance the merits of long-term investment decisions for growth against short term pressures for results (Schoemaker et al., 2013; Neumeyer & Liu, 2021). By being decisive, leaders demonstrate effectiveness through behaviours that eliminate a "do nothing mentality" (Cannon & Nielsen, 2016, p. 2). By making good and timely decisions, IT leaders improve the effective of the overall leadership team and therefore this competence (*Decide*) is expected to have a positive relationship with the dependent variable *Effective Leadership* in a digital environment (Lim & Moon, 2021). Therefore, it is hypothesized that:

H3: An IT leader's ability to be decisive in making evidence-based decisions is positively related to effective leadership in a digital environment

Align with Stakeholder Interests. Being able to build stakeholder relationships and alignment with their interests are crucial to achieving buy-in for new strategies for digital transformation and public sector success (Marques, 2015; Martino et al., 2021). Digitalization

has created a new supply chain ecosystem and the ability to align with stakeholder interests allows public-sector IT leaders to seamlessly connect with suppliers, employees and citizens for improved services (Neumeyer & Liu, 2021). By aligning with stakeholders' interests, public-sector IT leaders can more effectively manage the impact the economic decisions by the government and the political climate of the organization through win-win decisions (Redick et al., 2014; Schoemaker et al., 2013; Pittenger et al., 2022). By aligning with stakeholders and communicating well during times of uncertainty and digital disruption, public-sector IT leaders can also assess stakeholders' tolerance for change and adjust as needed to effectively lead digital transformational initiatives (Claassen et al., 2021; Butler, Kwantes & Boglarsky, 2014; The Conference Board, 2014). Since stakeholder alignment is so critical for building support for digital transformation, it is expected that the independent variable *Align* will have a positive correlation with the dependent variable *Effective Leadership* in a digital environment (Gierlich-Joas et al., 2020). It is therefore hypothesized that:

H4: An IT leader's ability able to align with stakeholders' interests is positively related to effective leadership in a digital environment

Adopting a Learning Mentality. Digital leadership literature has identified the need to instill core competencies, a learning mentality and innovative behaviours to develop more effective public-sector information technology leaders (Jackson & Dunn-Jensen, 2021). Being learning-oriented helps IT leaders to propagate a culture of learning throughout the organization resulting in creative ideas being generated, tested and accepted to improve performance (van Laar et at., 2017; Schoemaker et al., 2013; Van Ee et al., 2020). By developing and displaying a learning mentality, public-sector IT leaders are more likely to appreciate failures as learning opportunities to support changes to the internal organization, technology adoption and updates to

operating procedures for improved performance (Jackson & Dunn-Jensen, 2021; Classen et al., 2021). Since empirical research purports that a learning mentality is a requirement for effective digital leadership, this independent variable (*Learn*) is expected to have a strong positive relationship with the dependent variable *Effective Leadership* in a digital environment (Schoemaker et al., 2013; Dewi & Sjabadhyni, 2021). Therefore, it is hypothesized that:

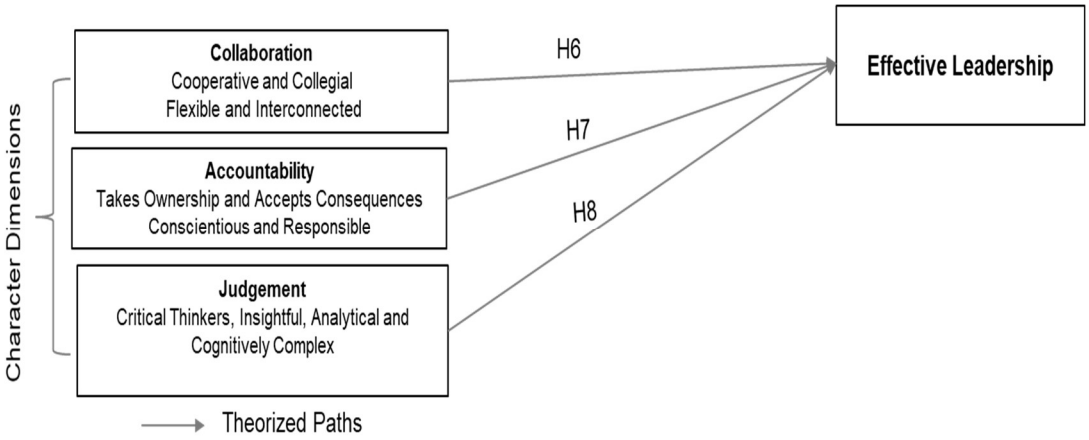
> H5: An IT leader's ability to facilitate a learning environment is positively related to effective leadership in a digital environment

Character Dimensions

Character dimensions influence the moral values, psychological and cognitive thought process of leaders, and therefore can have far reaching impacts on organizations (Nei et al., 2018). This means that added due diligence is required in the selection process and greater emphasis should be placed on leadership training (Taylor et al., 2016; Neumeyer & Liu, 2021). *Collaboration*, *Accountability* and *Judgement* are key digital era character dimensions for effective public-sector management (Seijts et al., 2015; Rupcic, 2021).

Figure 8

Character Dimension Independent Variables



Note. Character Dimension Independent Variables and associated Hypotheses

Collaboration. By displaying collaborative behaviours, public-sector IT leaders help to stimulate relationship building, the development of trust in management, as well as the dissemination of knowledge and expertise across their organization (Min et al., 2016; Crossan et al., 2017). By being collaborative in nature, IT leaders will likely create and nurture groups of inter-connected people working cooperatively towards the achievement of organizational goals (Crossan et al., 2017; Bartsch et al., 2020).

Through collaborative leadership, IT leaders can empowerment staff to make bold decisions, build cross-functional relationships and share resources to improve their organization's performance (Martino et al., 2021). Since collaboration is such an important component of effective leadership, a positive relationship is expected between the independent variable *Collaboration*, and the dependent variable *Effective Leadership* in a digital environment (Crossan et al., 2017; Hill & Bartol, 2016; Bounabat, 2017). Therefore, it is hypothesized that:

H6: An IT leader's ability to collaborate is positively related to effective leadership in a digital environment

Accountability. By taking accountability for effective leadership, public-sector IT leaders accept responsibility for achieving performance targets and process compliance in their organizations (Chan et al., 2017; Seijts et al., 2021). By displaying behaviours that reflect accountability, IT leaders promote effective leadership by taking ownership of business decisions and accepting the consequences of their decisions being wrong (Weber, 2018; Nunno & Gabrys, 2018; Crossan et al., 2017). Based on previous leadership studies, accountability is especially important in a digital environment where leaders must be willing to make difficult decisions and accept accountability for their organization's performance in implementing major digital initiatives (Rupcic, 2021; Bolden & O'Regan, 2016; Seijts et al., 2015). By accepting full accountability for introducing digital technology, IT leaders are likely to incorporate the expected levels of professional competence to make lawful and conscientious decisions that produce good outcomes, without assigning blame (Weber, 2018; Crossan et al., 2017). Since accountability enables leaders to take responsibility for decisions that promote effective leadership, a positive relationship is expected between the independent variable *Accountability*, and the dependent variable *Effective Leadership* in a digital environment (Crossan et al., 2017; Rupcic, 2021). Therefore, it is hypothesized that:

H7: An IT leader's ability to take accountability for difficult decisions and accepting the consequences, and effective leadership in a digital environment

Judgement. One of the main responsibilities of public-sector IT leaders is to deploy their character dimensions and exercise good judgement on behalf of their organizations (Crossan et

al., 2017; Seijts et al., 2021). In exercising good judgement, IT leaders deploy their critical thinking skills to respond promptly and appropriately to environmental stimuli such as digitalization, new legislations and natural disasters by making astute financial and organizational decisions (Vidic, Burton, South, Pickering & Start, 2017; Crossan et al., 2017). As an enabler of effective leadership, judgement acts as practical lens for shaping complex cognitive perception and is the scale that IT leaders will use to measure the extent to which they are willing to push the boundaries of acceptable behaviour to implement changes (Vidic et al., 2017; Crossan et al., 2017; Rupcic, 2021). Since judgement is considered the central character dimension that activates and regulates other character dimensions through the hermeneutical process of sensemaking and emotional response, it is expected that the independent variable *Judgement* will have a positive relationship with the dependent variable *Effective Leadership* in a digital environment (Seijts & Gandz, 2018; Rupcic, 2021). Therefore, it is hypothesized that:

H8: There is a positive relationship between an IT leader's ability to exercise good judgement and effective leadership in a digital environment

The conceptual framework described above will be used to guide this research and is grounded in the digital and leadership concepts discussed in the literature review. The upcoming chapter outlines the steps in executing the research.

Summary

The conceptual framework for this research consists of five leadership competencies and three character dimensions as the independent variable, and *Effective Leadership* in a digital environment as the dependent variable. The conceptual framework as depicted in Figure 6

proposes that these eight leadership competencies and character dimensions positively influence the ability of IT leaders to be effective in their workplace.

Chapter 4. Research Design Methodology

Introduction

This is a quantitative correlational research based on primary data collected via an on-line survey in the Ontario Government. The rating responses collected from staff were used to measure the relationships between the independent variables *Anticipate*, *Challenge*, *Decide*, *Align*, *Learn*, *Accountability*, *Collaboration* and *Judgement* and the dependent variable *Effective Leadership* in a digital environment (Schoemaker et al., 2013; Crossan et al., 2017; Kane et al., 2019; Mikalef & Pateli, 2017; van Laar et al., 2017; Tonelli et al., 2017). The employees surveyed are professional staff working in different capacities to support various digital initiatives. The staff surveyed therefore had the requisite knowledge and work experience to understand the questionnaire and to answer the questions appropriately.

Research Design

A positivist philosophy was adopted for this research where the researcher remained independent and detached during the process by maintaining minimal interaction with respondents (Wilson, 2014). Positivism proposes that knowledge is objective and exists independently on its own (Wilson, 2014; Partington, 2002). This was an empirical research conducted using scientific best practices and strict academic rigour to support unbiased findings using a deductive research approach (Partington, 2002). A deductive research approach seeks to test the hypotheses, based on previously established theories (Wilson, 2014).

This research assessed the theoretical research model depicting the relationship between leadership competencies, character dimensions (independent variables) and *Effective Leadership* in a digital environment (dependent variable). Questions from previous research done in the

areas of leadership competencies, character dimensions and effective leadership were reused, and confirmatory factor analysis and structural equation modeling were utilized for data analysis.

Organizational-level research has the potential to introduce variability based on divisional priorities, relative aptitude for innovation and levels of hierarchy (Sheehan, Garavan & Morely, 2020; Abu Bakar & McCann, 2018). However, for this research effective leadership was studied as a diffused concept and therefore multi-level analysis was not applicable (Adams & Gaetane, 2011; Tourigny, Han, Baba & Pan, 2019). Information technology leadership in the Ontario Government is diffused across nine IT divisions and the Office of the Corporate Chief Information Officer (Government of Ontario, 2018). This diffused organizational structure creates a shared leadership accountability for fostering the right digital culture, building support for the corporate vision, and influencing high levels of employee performance (Rudramuniyaiah et al., 2020). The formal structure of CIOs, directors, managers, and supervisors unites the leadership team and fosters a shared leadership responsibility and collective accountability for effective IT leadership in the Ontario Government (Tourigny et al., 2019).

This shared culture, influence and normative behaviour across all IT divisions shape the cognitive framework and social norms that helps to facilitate effective leadership among the leadership team (Rudramuniyaiah et al., 2020). The manager and supervisor levels act as intermediaries to connect general staff to the directors and CIOs, thereby helping to build a shared culture and to operationalize new initiatives through shared networks (Moutousi & May, 2018).

Normative behaviours across the leadership team create a sense of socially acceptable behaviours, is the lens for cooperative interactions and creates a collective responsibility for

leadership (Adams & Gaetane, 2011; Moutousi & May, 2018). It is this diffused concept that is referenced and applied in this research (Adams & Gaetane, 2011; Moutousi & May, 2018). Contrasting, a multi-level approach accounts for variabilities due to differences at each level of the hierarchy, diverse divisional priorities and changes in perceptions as time elapses, by incorporating the mediating effect of these differences (Tourigny et al., 2019).

This research applied a descriptive research approach to assess effective leadership and to answer the two research questions instead of the typical normative approach (Ha-Vikstrom & Takala, 2018). A descriptive research approach to leadership studies focuses on the respondent's observations and perceptions regarding the leaders' behaviours and whether it is normatively appropriates (Moutousi & May, 2018). A descriptive research approach also focuses on how the leaders demonstrate behaviours from the respondent's frame of reference and is influenced by the respondent's sensemaking in the local context and culture (Vibert, 2004). On the other hand, normative theories describe how leaders should behave based on philosophical perspectives such as ethics, virtues and morals (Moutousi & May, 2018).

Site Selection and Sampling Frame

This research survey was conducted in the Ontario Government using an exclusive data collection strategy utilizing a convenient and random sampling method to select the sample from among IT staff to whom the researcher had access (Saleem, Batool & Khattak, 2017). This research was introduced and discussed at the quarterly divisional meetings held via Microsoft Teams. This research survey was conducted in three divisions of the Ministry of Government and Consumer Services (Cyber Security Division, Information Technology Services Division and Government Services Integration Cluster) and two divisions of Treasury Board Secretariat (Ontario Digital Services and Central Agencies I&T Cluster).

The sample population was 2,554 Ontario Government employees, inclusive of five categories of staff or strata, ranging from entry-level staff, supervisors, managers, directors, and assistant deputy ministers. All five categories of staff have leaders to whom they report. A total of 1,811 IT employees in the Ministry of Government and Consumer Services and 743 IT employees in the Treasury Board Secretariat were surveyed. These professional staff perform various IT roles and work at various levels on diverse digital projects supporting Covid-19 activities and other ministry priorities. Participants were identified using the Global Address List for the Ontario Government.

The entire divisional population was selected by stratified random sampling per Hahn (2017) with a 100% strata representation. Stratified random sampling is more precise than random sampling as it divides the population into smaller units that share similar characteristics thus ensuring that every group is represented in the sample, while at the same time reducing variability (Hahn, 2017; Begzadeh & Nedaei, 2017). The research included 100% of each of the five strata (Hahn, 2017).

Table 4

Survey Distribution

Ministry	Number of Staff Surveyed	Responses Received	Usable Responses	Effective Response Rate
Ministry of Government and Consumer Services	1,811	355	286	16%
Treasury Board Secretariat	743	224	189	25%
Total	2,554	579	475	18%

Two separate techniques were used to determine the approximate sample size required:

a. Smart PLS requirement: (10 times x 8 structural paths) = **80** (Tonelli et al., 2017)
b. Structural Equation Modeling (SEM) (Hair et al., 2010)
    - Minimum sample size of **500** if the model has large numbers of constructs, where some constructs have 3 or less measured items and low levels of communalities

As reflected in Table 4, five hundred and seventy-nine (579) responses were received for the survey. After data cleaning, four hundred and seventy-five (475) responses were usable.

Structural Equation Modeling

Partial least squares structural equation modeling (PLS-SEM) and covariance-based structural equation modeling (CB-SEM) are two statistical approaches available for data analysis in quantitative research (Rigdon, 2016). Scholars have argued the merits and shortcomings of both the PLS-SEM and CB-SEM with no definitive answers, except to advise researchers to explain the rationale for selecting one approach over the other (Rigdon, 2016; Cakit, Olak, Karwowski, Marek & Hejduk, 2020). The following justifications are being provided for electing to use PLS-SEM in this research.

Structural equation modeling (SEM) is a multivariate statistical method that integrates multiple regression analysis and factor analysis to assess the suitability of a structural model (Joia & Mangia, 2017). PLS-SEM was chosen over a CB-SEM approach as it better aligned with the objective of this research (Kock, 2018; Reinartz, Haenlein & Henseler, 2009). The objective of this research is to assess the impact of various leadership competencies and character dimensions on effective leadership in a digital environment. PLS-SEM is the recommended

approach when the emphasis of the research is on prediction and the development of theory, as compared to CBS-SEM, which is mostly used to confirm theoretical models (Kock, 2018; Risher & Hair, 2017).

PLS-SEM is suitable for this research as it seeks to maximize the variance explained in the research model (Kock, 2018). It is also very suitable for complex models such as the model depicted in Figure 6 and supports the simultaneous calculation of multiple causal and predictive relationships between multiple independent variables and one dependent variable (Mikalef & Pateli, 2018; Hair, Risher, Sarstedt & Ringle, 2019). PLS-SEM was also chosen as it is recommended for use in data analysis when the data collected is not normally distributed, as is the case in this research (Hair, 2010). PLS-SEM does not make any assumptions regarding the distribution of the data collected. PLS-SEM utilizes the weighted average of the indicators, often referred to as block variables (Kock, 2018).

PLS-SEM is also an appropriate method for this research as it is suitable for behavioural sciences and business research such as digital leadership studies and it works well with all sample sizes (Hair et al., 2010; Ingenhoff & Buhmann, 2016). Also, PLS-SEM enables robustness, precision and flexibility in performing various types of statistical analyses and among all the variance-based methods, PLS-SEM is considered to be the most comprehensive and general variance-based technique (Henseler, Ringle & Sarstedt, 2015; Risher & Hair, 2017).

Similar to this research, past researchers in the IT field have predominantly utilized partial least squares structural equation modeling (PLS-SEM) to conduct their data analysis (Kock, 2018). PLS-SEM was therefore selected over CBS-SEM based on the factors outlined

above and because it was also used in similar leadership research (Mikalef & Pateli, 2017; Ravichandran, 2018; Moon et al., 2018).

Questionnaire Design

The survey questions were written in clear concise standard English and did not include jargons (Wilson, 2014). The questionnaire was reviewed with two ministry executives and eight staff for clarity of questions and layout to ensure alignment with ministry human resources guidelines and the provisions of the union agreements. Based on feedback received the instructions were adjusted slightly to advise respondents to reflect on their IT leadership team when answering the questions. These adjustments did not materially change the questions from the original studies, which similarly assessed leadership competencies and character dimensions for effective leadership. However, these changes provided added clarity for the respondents who often work on cross-functional teams with both business and IT leaders. The questionnaire was broken down into five sections as follows:

- Section 1 - Participant Consent
- Section 2 - Leadership Competencies (18 questions)
- Section 3 - Character Dimensions (11 questions)
- Section 4 - Effective Leadership (15 questions)
- Section 5 - Demographic Information (5 questions)
- Section 6 - Thank you

The leadership competencies were measured using items from research done by Schoemaker et al. (2013), Mikalef and Pateli (2017), Trivellas and Drimoussis (2013), van Laar, van Deursen, van Dijk and de Haan (2017) and Tonelli et al. (2017), and the character

dimensions from research done by Crossan et al. (2017). Appendix F provides further details of the latent variables and measurement items.

As shown in Appendix F, the survey contained eighteen questionnaire items to examine five leadership competencies (*Anticipate*, *Challenge*, *Decide*, *Align* and *Learn*) associated with effective IT leadership in a digital environment (Schoemaker et al., 2013; Mikalef & Pateli, 2017; van Laar et al., 2017; Tonelli et al., 2017; Trivellas & Drimoussis, 2013). Each of the five leadership competencies (*Anticipate*, *Challenge*, *Decide*, *Align* and *Learn*)) were measured by three to five questionnaire items to be answered on a 7-point Likert scale of 1 to 7 and adapted from Schoemaker et al. (2013), Mikalef and Pateli (2017), van Laar et al. (2017), Trivellas and Drimoussis (2013) and Tonelli et al. (2017). Participants were asked to rate how important it is for their IT leaders to demonstrate each competence regularly, using rarely demonstrated (1) to almost always demonstrated (7). The independent variable *Anticipate* was measured by three questionnaire items based on digital leadership research done by Schoemaker et al. (2013) and Mikalef and Pateli (2017). The independent variable *Challenge* was measured by four questionnaire items based on digital leadership research done by Schoemaker et al. (2013) and Trivellas and Drimoussis (2013). The independent variable *Decide* was measured by three questionnaire items based on digital leadership research done by Schoemaker et al. (2013) and Tonelli et al. (2017). The independent variable *Align* was measured by four questionnaire items based on digital leadership research done by Schoemaker et al. (2013) and van Laar et al. (2017). The independent variable *Learn* was measured by five questionnaire items based on digital leadership research done by Schoemaker et al. (2013) and Mikalef and Pateli (2017).

The questionnaire had eleven questionnaire items to measure the importance of three character dimensions (*Collaboration*, *Accountability* and *Judgement*) on influencing effective IT

leadership in a digital environment (Crossan et al., 2017). These character dimensions are crucial in the digital areas where business and IT must be agile and connected to help solve business problems (Ravichandran, 2018). Participants were asked to rate how important it is for their IT leaders to demonstrate each character element regularly, ranging from not at all important (1) to extremely important (7). *Collaboration* was measured using three questionnaire items on a 7-point Likert scale ranging from 1 to 7, where 1 is not at all important and 7 is extremely important (Crossan et al., 2017). *Accountability* and *Judgement* were measured using four questionnaire items on a 7-point Likert scale ranging from 1 to 7, where 1 is not at all important and 7 is extremely important (Crossan et al., 2017). The independent variable *Collaboration* was measured by three questionnaire items based on character dimension research done by Crossan et al. (2017).

The dependent variable, *Effective Leadershi*p in a digital environment was measured using five constructs and 15 questionnaire items on a 7-point Likert-scale ranging from 1 to 7, adapted from previous digital leadership research (Kane et al., 2019; Redick et al., 2014; Mikalef & Pateli, 2017). Three of the constructs (*Transformative Vision*, *Forward Lookin*g and *Change Oriented*) used by Kane et al. (2019) to measure effective digital leadership were expanded to nine questions using the items listed as definitions for the five identified digital leadership behaviours, to provide a more in-depth look at each factor (Ravichandran, 2018). The construct *Integrates Technology* was measured using three questionnaire items based on IT leadership research done by Mikalef and Pateli (2017). The construct *Leading Others* was measured using three questionnaire items based on IT project leadership research done by Redick et al. (2014). Responses were measured on a 7-point Likert scale with 1 for lowest up to 7 for highest, using five leadership behaviours (*Transformative Vision*, *Forward Looking*, *Integrates Technolog*y,

Change Oriented and *Leading Others*) that contribute to achieving great business outcomes (Kane et al., 2019; Redick et al., 2014; Mikalef & Pateli, 2017). Respondents were asked to rate what they think is the most important behaviour leaders should display to succeed in a digital workplace (Kane et al., 2019; Redick et al., 2014; Mikalef & Pateli, 2017). Section 5 requested demographic information such as the age, tenure, sex and the job level of each respondent.

Data Collection Approach

The Ministry of Government and Consumer Services and Treasury Board Secretariat provided formal approval for the research survey to proceed in their respective ministries (Appendix B). Per the Ontario Government approval protocol, the Deputy Ministers were pre-briefed and then provided with a detailed briefing note, copies of the questionnaire, all communications to staff and the Ethics Certificate from Athabasca University. Treasury Board Secretariat provided bargaining agent disclosures to the two unions representing the unionized staff. To improve the potential for a high response rate, introductory emails were sent from the Chief Information Officers and one executive to all potential respondents, encouraging their voluntary participation (Appendix C).

Before the survey was distributed, participants were also briefed on the research and provided with copies of the Ethics Certificate (Appendix A) and the On-line Research Consent Form (Appendix F), which explained how the participants were selected, as well as the purpose and benefits of the research (Wilson, 2014). They were also informed that their participation in the survey was voluntary and that they could opt not to complete the survey (Wilson, 2014). Subsequently, participants were provided with the URL to complete the survey in Survey Monkey on either a mobile phone, desktop or laptop. The anonymous output settings in Survey Monkey were used to ensure the data output excluded any identification markers (Wilson, 2014).

A web-based questionnaire is considered appropriate for collecting data from IT professionals (Rudramuniyaiah et al., 2020).

Respondents were asked to rate the importance of leadership competencies and character dimensions to effective leadership, based on their experience working with their leadership team. The survey ran from January to March 2021, with weekly reminders sent out via Survey Monkey. The average completion time was ten minutes. The information collected was exported from Survey Monkey and carefully transferred into pre-defined Excel data tables for analysis on an encrypted laptop (Wilson, 2014). The information was collected anonymously with names and email addresses omitted from the survey output. The research information was kept locked in the researcher's home office with no access to family members.

Ethical Assurances

This research study was conducted in accordance with the ethical standards, academic research rigour and research best practices. The researcher completed the required Ethics Training and received a Certification of Ethical Approval from the Athabasca University Research Ethics Board prior to the start of data collection (Appendix A). Every participant was provided with a copy of the Athabasca University Online Participant Consent Form, which provided contact information of the researcher, the research supervisor, the university research ethics officer, as well confirmation that prior ministry approval was obtained. A copy of the Online Participant Consent Form is provided in Appendix G, and provides an overview of the research paper, the benefits of participating, assurances that participation is voluntary, and that the data would be collected anonymously, stored securely and only used for the purposes of this academic research. Each participant was provided with a slide presentation of the research and an opportunity to ask clarification questions. The benefit to each participant was the opportunity

afforded to help identify the leadership competencies and character dimensions that support effective leadership in a digital Ontario Government. Four clarification questions were received regarding why the participant was selected and which leaders were in scope. All four questions were answered explaining that they were selected because they were IT staff working in one of the two ministries being surveyed and that they should respond based on their experience working with IT leadership teams. The results of the study will be shared as an executive summary with the Office of the Chief Talent Officer to support leadership recruitment and development in the Ontario Government so as to benefit all employees.

The participants were not paid or offered any consideration to encourage their participation. The topic of the research and the survey questions were not controversial or emotional in nature to cause the respondents any distress. The respondents were also told that they could skip any questions they did not want to answer, and the design of the survey facilitated unanswered questions. The survey was sent to the entire staff population of the divisions included in the survey, so that no one felt like they were being targeted or excluded. Although Survey Monkey sent out reminders, the respondents were never contacted directly by researcher during data the data collection period, except when responding to follow-up questions. The senior executives for both ministries and the unions were satisfied with the nature and value of the survey, the appropriateness of the instructions and that the questions would not evoke any emotional distress for the staff participating. The data collected was anonymously from Survey Monkey and securely stored on the researcher's encrypted computer locked at the researcher's home office.

Summary

This quantitative research was completed in the Ontario Government. A descriptive research approach was used and in designing this research, care was taken to prevent common method bias from occurring. Close attention was paid to adherence to ethical research principles, including obtaining proper ministry approval. The questionnaire was designed based on questions from previous research papers and distributed to the IT divisions in scope using 100% stratified random sampling.

Chapter 5. Presentation of Results

Introduction

This chapter presents the results of the data collection and analysis for this research. The findings provide support for five of the eight hypotheses in the theoretical framework. The survey data was exported from Survey Monkey and reviewed for missing information to manage contamination (Hair et al., 2010). A statistical analysis was done using SPSS Version 27 to summarize the demographic information. Smart PLS Version 3 was used to complete the Confirmatory Factor Analysis (CFA) and Structural Equation Modeling to test the eight research hypotheses. CFA is considered suitable when previously validated measurement scales are being reused, as is the case in this research (Bhattacherjee & Premkumar, 2004; Hair et al., 2010).

Pre-Test of Questionnaire

Prior to distribution, a copy of the survey was pre-tested and reviewed for accuracy in collecting the data, to check that the questions would be displayed correctly when accessed by the respondents on mobile devices to determine the approximate completion time, to confirm that the data could be downloaded correctly for analysis and to test that the customized reminder notices would be sent out at the appropriate time (Wilson, 2014). Respondents in the pre-test were selected from the same population of IT staff at the general staff, supervisory and director levels (Wilson, 2014). As part of the pre-test, a copy of the survey was used to collect a few responses and the results were downloaded from Survey Monkey and reviewed (Wilson, 2014). Based on the pre-test review, it was confirmed that the questions were being displayed correctly on all media devices, that the survey could be completed in approximately ten minutes and downloaded for data analysis. It was also confirmed that the reminder notices could be sent out by the system at the pre-selected time. The pre-test review also revealed that the initial

configuration was counting the participant consent in Section 1 as the first question, and this was corrected.

Data Cleaning

A total of five hundred and seventy-nine (579) completed surveys were downloaded from Survey Monkey and loaded into a pre-coded Microsoft Excel table. To ensure that the data used for analysis was of the highest quality, three techniques were used to examine the data (Hair et al., 2010). Firstly, all responses with missing data for the research model were identified by using the count blank formula in Microsoft Excel. Ninety-five (95) responses were identified with missing data for the independent and dependent variables and were therefore removed from the sample (Hair et al., 2010). If the sample size had been smaller, an all-available approach (Pairwise) would have been used to replace the missing values with the calculated median values to maximize the data available for the research (Hair et al., 2010).

Secondly, a review was done to identify evidence of respondents being unengaged while completing the survey (Rudramuniyaiah et al., 2020). Based on Survey Monkey statistics, the average time taken to complete the survey was approximately ten minutes. The start time and the completion time for each response were compared to identify responses that were completed in less than one minute, which would reflect unengaged participation (Rudramuniyaiah et al., 2020). None of the participants completed the survey in less than one minute. Thirdly, the standard deviation was calculated for each row of non-demographic data and nine responses with standard deviations of zero were removed (Rudramuniyaiah et al., 2020). A standard deviation of zero is indicative of the respondent being unengaged as demonstrated by the scores being the same for every question, and which adds no statistical significance to the research (Rudramuniyaiah et al., 2020).

Respondent Demographics

A frequency distribution table was used to summarize the demographic information collected in data ranges as reflected in the Table 5. The research analysis reflects that twenty-seven percent (27%) of the respondents who completed the survey reported tenure of 1 to 10 years of service, forty-six percent (46%) reported 11 to 29 years of service and sixteen percent (16%) reported having achieved 20 to 29 years of service. The remaining eleven percent (11%) of the respondents reported tenure of 30 years or more working for the Ontario Government. Table 5 provides the breakdown of the respondents' tenure in the Ontario Government.

Of the respondents to the survey, sixty-one percent (61%) identified their gender as male, thirty-seven percent (37%) identified their gender as female and two percent (2%) identified their gender as other. None of the respondents identified their gender as transgender. Table 5 provides summarized details of the gender profile of the respondents to the survey and the results indicate a significantly higher number of male versus female (6:4) participants. The IT industry has traditionally been male dominated, however in recent years this trend has shifted towards a more equal distribution of male and female IT staff, reflective of the work done by various advocacy and interest groups such as Women in IT (Government of Ontario, 2018).

As reported in Table 5, five percent (5%) of the respondents reported that they have high school education, seventy-two percent (72%) reported having achieved post-secondary education and the remaining twenty-three percent (23%) have graduate level education. This is reflective of the IT industry where the workforce requires formal technical knowledge to successfully integrate business requirements with IT (Tonelli et al., 2017).

Based on the completed surveys, ninety percent (90%) of the respondents work in IT and the remaining ten percent (10%) work in other program areas. Table 5 below provides summarized details of the work area for the respondents to the survey. The survey was conducted in the IT divisions, however due to the presence of cross-functional business and IT teams working together on various Covid-19 and other digital transformational projects, ten percent (10%) of the respondents reported that they work in other program areas.

As summarized in Table 5, the highest number of respondents, sixty-seven percent (67%) work at the general staff level, eight percent (8%) work at a supervisory level, twenty-one percent (21%) reported that they were managers, three percent (3%) work as directors and the remaining one percent (1%) reported that they were executives at the Assistant Deputy Minister/ Chief Information Officer level or above. The spread across the five job levels is not surprising and is reflective of the hierarchical leadership model in the Ontario Government (Government of Ontario, 2018). The supervisor and manager roles are considered middle management and are responsible for the operational execution of various IT projects. Ninety-five percent (95%) of the respondents indicated that they have post-secondary education or higher, giving them the requisite knowledge to respond appropriately to the questionnaire (Najaran & Edwards, 2015). The directors and ADM/CIO roles are accountable for project success, strategic planning and investment decisions (Nunno & Gabrys, 2018).

Table 5

Respondents Demographic Profile

Classification	Category	Frequency	Percentage
Years of Service	1-10	128	27%
	11-19	218	46%
	20 -29	76	16%
	30 and over	50	11%
Gender	Male	289	61%
	Female	176	37%
	Transgender	0	0%
	Other	8	2%
Education	High School	22	5%
	Post-Secondary	344	72%
	Graduate	106	23%
Business Area	Information Technology	417	90%
	Program Delivery	48	10%
Job Level	General Staff	313	67%
	Supervisor	39	8%
	Manager	98	21%
	Director	17	4%
	Assistant Deputy Minister/CIO or Above	3	1%

Common Method Bias

Behavioural, IT and business research are susceptible to being influenced by common method variance and common method biases (Podsakoff, MacKenzie & Lee, 2003; Fuller, Simmering, C. Atinc, Atinc & Babbin, 2016). Common method variance can occur when data is collected from one group or is self-reported resulting in the variances being influenced by the measurement method and thereby inflating the correlations among the observed variables (Fuller et al., 2016). The potential for common method bias occurring in this research was mitigated by utilizing preventative research measures combined with a post-verification strategy

(Baumgartner, Weijters & Pieter, 2021; Rodriguez-Ardura & Meseguer-Artola, 2019). As a preventative measure against common method bias, the survey responses were collected from five different levels of IT staff in two different ministries, located in multiple geographic locations (Rodriguez-Ardura & Meseguer-Artola, 2019). Also, as a preventative measure, different rating-scale anchors were used for different classes of constructs (i.e., for leadership competencies, character dimensions and effective leadership) (Sosik, Gentry & Chun, 2012; Hair et al., 2010).

Common method bias can also occur when the measurement method changes the predictive capability that is reported for each independent variable (Huang, Chang & Backman, 2018). The presence of common method bias could invalidate the findings by introducing Type I and Type II errors when a wrong hypothesis is accepted or a correct one is rejected (Huang et al., 2018). Some of the factors that could introduce common method bias include the respondents' affinity to answer consistently, unsupported assumptions, the perception that their response should be socially appropriate and the human tendency to simply answer questions in the affirmative or negatively (Rodriguez-Ardura & Meseguer-Artola, 2019; Podsakoff et al., 2003). As a pre-emptive measure to minimize the likelihood of respondents making unsupported assumptions and selecting socially appropriate responses causing common method bias, clear definitions were provided for key terms in the questionnaire and assurances were given that all responses would be collected anonymously and stored securely (Rodriguez-Ardura & Meseguer-Artola, 2019).

To reduce concerns about common method bias, a post-evaluative test for multicollinearity was performed for this research and the results clearly indicate the absence of common method bias. Collinearity or multicollinearity denotes the relationship between the

independent variables and is measured by their correlation coefficient which is usually between 0 and 1 (Hair et al., 2010). High levels of correlations are closer to 1 and the tolerance level for multi-collinearity is measured by the Variance Inflation Factor (VIF) values (Hair et al., 2010). The suggested threshold for VIF is to obtain values below 10 with a corresponding tolerance value greater than .1 (Hair et al., 2010). Based on the results of the multicollinearity test for this research, the VIF values ranged from 1.83 to 5.044 thus meeting the threshold of being below 10. The corresponding tolerance levels ranged between .198 and .546, meeting the threshold of being greater than .1. Combined with the preventative measures employed, common method bias appears not to be a substantial concern for the analysis of this research data (Rodriguez-Ardura & Meseguer-Artola, 2019; Hair et al., 2010).

Descriptive Statistics

The descriptive statistics for the research model are presented in Table 6. Four hundred and seventy-five (475) useful responses were received and used to evaluate the descriptive statistics. The descriptive statistics indicate the average rating received for each independent variable on a scale of 1 - 7, with associated standard deviation, kurtosis and skewness of the data.

Overall, respondents to the survey indicated a positive perception of all the variables associated with leadership competencies with C*hallenge* receiving the highest rating (M = 5.442, SD = 1.403) and A*nticipate* receiving the lowest rating (M = 4.97, SD = 1.474). The responses to the survey also indicated a positive perception of all the variables associated with character dimensions with *Accountability* receiving the highest rating (M = 6.263, SD = 1.071), and J*udgement* receiving the lowest rating (M = 5.812, SD = 1.15). Respondents rated the impact of the character dimensions higher than the impact of the leadership competencies and A*ccountability* received the highest rating among all variables (M = 6.263, SD = 1.071).

Multi-variate analysis assumes that the data is normally distributed. Normality refers to the shape of the data on a normal curve and is measured by kurtosis and skewness (Hair et al., 2010). Kurtosis refers to the height of the curve at its highest point (Hair et al., 2010). Skewness refers to the balance of data in terms of distribution symmetry (Hair et al., 2010). Both kurtosis and skewness have a value of zero, and values greater or less than zero measures the relative departure from normality (Hair et al., 2010). Negative kurtosis reflects a flatter distribution referred to as platykurtic, and positive kurtosis reflects a mountain-like distribution, referred to as leptokurtic (Hair et al., 2010). Positive skewness reflects data that is mostly distributed to right and negative skewness reflects data predominantly distributed to the left (Hair et al., 2010).

Table 6 provides evidence that the data is not normally distributed with kurtosis showing positive values for seven of eight constructs between 0.0090 and 3.928 indicating the data distributed in a peak-like formation (Hair et al., 2010). The construct *Anticipate* has a negative kurtosis value of -0.064, an indication of a very flat data distribution (Hair et al., 2010). A review of the Table 6 revealed that all constructs have negative skewness values between -0.596 and -1.870, indicating that the data is mostly distributed to the left (Hair et al., 2010). The independent variables *Learn* and *Accountability* had the highest skewness values of -1.870 and -1.834 respectively, reflecting the greatest departures left from symmetry (Hair et al., 2010). The independent variables *Anticipate* and *Align* had the lowest skewness values of -0.596 and -0.694 respectively, reflecting distributions to the left and closer to symmetry (Hair et al., 2010).

Therefore, based on the calculated kurtosis and skewness the values for the data, it was determined that this research data is not normally distributed (Hair et al., 2010; Muchhal & Solkhe, 2017). A bootstrap analysis using 5,000 resamples was also done in SmartPLS Version 3 at a 95% confidence level, to assess the significance of all paths on the structural model by

measuring the t-statistics ($t < 1.96$) and the statistical significance ($p < .05$) (Muchhal & Solkhe, 2017). The use of PLS-SEM for data analysis in this research addressed the non-normality of the data as the PLS algorithm does not assume that the data is normally distributed (Hair et al., 2010).

Table 6

Descriptive Statistics of Sample

Descriptive Statistics				
Constructs	Mean	Std. Deviation	Kurtosis	Skewness
Anticipate	4.970	1.474	-0.064	-0.596
Challenge	5.442	1.403	0.384	-0.902
Decide	5.255	1.440	0.306	-0.803
Align	5.195	1.423	0.090	-0.694
Learn	5.381	1.420	0.419	-1.870
Collaboration	5.994	1.121	1.728	-1.243
Accountability	6.263	1.071	3.928	-1.834
Judgement	5.812	1.150	2.030	-1.186
Effective Leadership	5.802	1.186	1.657	-1.173

Evaluation of Research Model

Research models are evaluated to determine if there is an opportunity to further improve the model (Hair et al., 2010). A measurement model represents the theorized research construct by showing how each measured variable represents the unobserved (latent) variable through a regression relationship (Hair et al., 2010). The theoretical representation of this research is presented in Figure 1 and the structural model is shown in Figure 9, depicting the theorized relationships between the constructs, the impact of changes in the independent variables on the

dependent variable and the significance of the theorized paths (Mikalef & Pateli, 2017). This research was assessed for content validity, discriminant validity and reliability (Hair et al., 2010; Kaba, 2018).

Good construct validity ensures that the research construct measures what the researcher intended to measure and that the sample is a good representation of the population (Wilson, 2014; Hair et al., 2010). Validity refers to the accuracy of the research in measuring the theoretical model as represented by the measurement scales (Hair et al., 2010). Validity also helps to explain how well the research construct represents the theory being investigated and excludes systematic errors (Hair et al., 2010). There are several ways to measure validity and they are further explained below.

Assessing Validity

Content validity. Content validity refers to how well face and sampling validities are managed during the research process (Wilson, 2014). Face validity is concerned with how well the questionnaire will capture and measure what the research construct is proposing (Wilson, 2014). This was managed by first re-using questions from similar studies for both the dependent and independent variables, and then pre-testing the questionnaire with members of the sample population (Wilson, 2014). To ensure sampling validity, this research included two main components of effective leadership, namely leadership competencies and character dimensions. External validity supports research findings being generalizable (Wilson, 2014). Clear and concise research questions, explanations for key terms and specific research objectives were used to improve the content validity of this research (Wilson, 2014).

Discriminant validity. This test is used to assess the relative independence and construct correlation of each variable and was assessed in this research using two steps (Hair et al., 2010).

For the first step, the research discriminant validity was assessed by reviewing the cross loadings of the variables and for the second step, the Fornell-Larcker Criteria Test was utilized. Using PLS Version 3, the loads and cross loads were checked to verify that each item loads the highest on its own construct (Tonelli et al., 2017). Discriminant validity is demonstrated when each indicator item loads highest on its own construct as shown by the diagonal values when compared to off-diagonal values in Table 7 (Tonelli et al., 2017). As shown in Table 7, this condition was met with all items loading above the threshold of .7 and highest on its own construct, demonstrating that this research has good discriminant validity (Kaba, 2018; Tonelli et al., 2017).

Although the requirements for discriminant validity were met for all constructs, there were high cross loadings on some of the items for the *Decide* and *Learn* constructs. Further examination of the cross loadings for the constructs *Decide* and *Learn* items show that the off-diagonal differences from other items met the threshold of being greater than .1, except for the item LE4 which had the weakest loading for the construct learn at .795 (Hair et al., 2010). The indicator reliability of LE4 was therefore calculated by squaring the loading (.795) to verify that it met the threshold of explaining at least 50% of the indictor variance (Ingenhoff & Buhmann, 2016). The calculated indicator reliability indicated that the item *LE4* explains at least for 63% of the indicator variance and is therefore acceptable as it met the threshold of being greater than 50% (Ingenhoff & Buhmann, 2016; Wiesbock et al., 2020). Therefore, the item *LE4* was retained to support content validity (Hair et al., 2010). The option to revise the model and remove or merge the item *LE4* with another item was also not selected as it might not be defensible from a theoretical perspective, given that pre-existing scales from other leadership research were being reused (Franke, 2019).

Additionally, as shown in the path analysis in Figure 9, the impact of the construct *Decide* is significant, explaining 10% of the change in the dependent variable, while the construct *Learn* did not have any impact. Overall, these two constructs (*Decide* and *Learn*) form part of an eight-construct model which explains 64.7% of the change in the dependent variable. Therefore, all the items in the constructs *Decide* and *Learn* were retained in the model for the reasons outlined above and because they loaded strongly on their own constructs exceeding the threshold of .7 (Ravichandran, 2018; Franke, 2019).

Table 7

Discriminant Validity – PLS Loadings and Cross Loadings

	Anticipate	Challenge	Decide	Align	Learn	Collaboration	Accountability	Judgement	Effective Leadership
AN1	**0.873**	0.649	0.618	0.586	0.608	0.325	0.289	0.392	0.484
AN2	**0.875**	0.604	0.626	0.568	0.622	0.300	0.297	0.363	0.469
AN3	**0.797**	0.479	0.494	0.476	0.515	0.237	0.189	0.346	0.398
CH1	0.671	**0.903**	0.717	0.679	0.715	0.376	0.393	0.444	0.531
CH2	0.501	**0.804**	0.577	0.551	0.542	0.347	0.279	0.365	0.442
CH3	0.587	**0.873**	0.663	0.659	0.710	0.411	0.376	0.368	0.500
DE1	0.579	0.656	**0.829**	0.644	0.664	0.355	0.389	0.367	0.491
DE2	0.629	0.657	**0.903**	0.667	0.689	0.342	0.370	0.454	0.538
DE3	0.587	0.681	**0.884**	0.700	0.712	0.336	0.373	0.413	0.536
AL1	0.549	0.609	0.638	**0.825**	0.656	0.415	0.363	0.435	0.549
AL2	0.502	0.497	0.495	**0.741**	0.546	0.271	0.256	0.304	0.415
AL3	0.543	0.669	0.700	**0.877**	0.732	0.363	0.397	0.402	0.523
AL4	0.533	0.642	0.689	**0.860**	0.723	0.320	0.379	0.399	0.513
LE1	0.607	0.618	0.637	0.651	**0.856**	0.399	0.340	0.452	0.506
LE2	0.624	0.653	0.649	0.683	**0.880**	0.359	0.339	0.441	0.505
LE3	0.586	0.708	0.712	0.733	**0.879**	0.386	0.441	0.415	0.559
LE4	0.505	0.585	0.625	0.668	**0.795**	0.385	0.323	0.366	0.423
LE5	0.594	0.681	0.722	0.697	**0.839**	0.379	0.394	0.454	0.539
CO1	0.302	0.402	0.362	0.354	0.402	**0.866**	0.613	0.603	0.539
CO2	0.268	0.374	0.322	0.347	0.358	**0.869**	0.552	0.584	0.520
CO3	0.297	0.337	0.314	0.362	0.377	**0.803**	0.533	0.586	0.492
AC1	0.311	0.403	0.424	0.425	0.427	0.646	**0.890**	0.608	0.559
AC2	0.285	0.414	0.420	0.406	0.427	0.614	**0.935**	0.626	0.597
AC3	0.262	0.325	0.352	0.345	0.350	0.573	**0.899**	0.595	0.552
AC4	0.263	0.345	0.373	0.374	0.377	0.603	**0.913**	0.605	0.591
JU1	0.398	0.432	0.436	0.400	0.451	0.625	0.666	**0.861**	0.636
JU2	0.360	0.389	0.407	0.400	0.416	0.663	0.631	**0.901**	0.631
JU3	0.366	0.389	0.393	0.396	0.438	0.543	0.525	**0.845**	0.610
JU4	0.352	0.346	0.375	0.412	0.409	0.546	0.444	**0.803**	0.539
TV1	0.427	0.353	0.433	0.429	0.416	0.392	0.359	0.553	**0.707**
TV2	0.440	0.442	0.470	0.493	0.437	0.457	0.486	0.522	**0.754**
TV3	0.407	0.492	0.472	0.475	0.477	0.471	0.541	0.603	**0.793**
FL1	0.400	0.478	0.495	0.482	0.458	0.462	0.537	0.505	**0.803**
FL2	0.460	0.528	0.512	0.526	0.528	0.501	0.578	0.580	**0.855**
FL3	0.444	0.449	0.455	0.494	0.438	0.502	0.499	0.591	**0.832**
IT1	0.445	0.371	0.437	0.442	0.444	0.464	0.441	0.555	**0.745**
IT2	0.447	0.368	0.437	0.485	0.453	0.439	0.341	0.529	**0.722**
IT3	0.420	0.375	0.455	0.461	0.455	0.417	0.397	0.546	**0.764**
CR1	0.424	0.517	0.511	0.504	0.503	0.541	0.554	0.594	**0.833**
CR2	0.422	0.537	0.525	0.516	0.544	0.606	0.553	0.619	**0.839**
CR3	0.456	0.479	0.502	0.510	0.519	0.464	0.450	0.571	**0.806**
LO1	0.392	0.455	0.462	0.480	0.484	0.487	0.590	0.541	**0.826**
LO2	0.415	0.493	0.497	0.491	0.514	0.544	0.581	0.577	**0.834**
LO3	0.372	0.450	0.471	0.469	0.470	0.519	0.589	0.580	**0.806**

Note. Items in bold face denotes the highest loading for each item

As the second step, discriminant validity was assessed using the Fornell-Larcker Criteria where discriminant validity is demonstrated when the square root of the construct's AVE is higher than all other correlations, and also when each item loads highest on its associated construct (Hair et al., 2010). The diagonal values in Table 8 reflect the square root of the average variance extracted (AVE) by each construct (Ravichandran, 2018). The AVE measures the variance shared by the scale items and the construct they measure (Ravichandran, 2018). Table 8 demonstrates that this research met the Fornell-Larcker Criteria for discriminant validity with all values falling below the square root of the AVE.

Table 8

Discriminant Validity - Fornell-Larcker Criteria

	Anticipate	Challenge	Decide	Align	Learn	Collaboration	Accountability	Judgement	Effective Leadership
Anticipate	**0.849**			0.643			0.308		
Challenge	0.685	**0.861**		0.735			0.409		
Decide	0.686	0.761	**0.873**	0.768		0.394	0.431		
Align				**0.827**			0.426		
Learn	0.688	0.766	0.789	0.808	**0.850**	0.448	0.435	0.502	0.599
Collaboration	0.341	0.439		0.418		**0.846**	0.670		
Accountability							**0.909**		
Judgement	0.433	0.457	0.473	0.470		0.698	0.669	**0.853**	0.710
Effective Leadership	0.533	0.572	0.598	0.608		0.611	0.632		**0.796**

Assessing Reliability

Reliability. Reliability is concerned with the extent to which the measurement of the variables is free from errors and provides stable results (Wilson, 2014; Hair et al., 2010). The internal consistency reliability of this research model was confirmed by assessing the Cronbach Alpha (CA) and Composite Reliability (CR) values (Begzadeh & Nedaei, 2017; Edirisinghe, Makuloluwa, Amarasekara & Goonewardena, 2021). These two criteria are different in that Cronbach Alpha assumes that all indicators have equal reliability, whereas Composite Reliability does not assume equal reliability and prioritizes the items based on their reliability (Hanus and Wu, 2016; Aguirre-Urreta & Ronkko, 2018). Therefore, as a biased estimator the Cronbach Alpha could underestimate the internal consistency of reliability, and as such the results of the Composite Reliability test is preferred (Hanus & Wu, 2016). However, according to Aguirre-Urreta and Ronkko (2018) the differences between the Cronbach Alpha and Composite Reliability statistics are very small.

As a measure of internal consistency reliability, the Cronbach Alpha was used to assess the reliability of this research construct (Ingenhoff & Buhmann, 2016; Alzahrani & Seth, 2021). The Cronbach Alpha is a reliability coefficient that measures the homogeneity of the constructs and values above the .7 threshold are generally accepted as an indicator of scale reliability (Mikalef & Pateli, 2017; Hair et al., 2010). Per Table 9, the Cronbach Alpha values for this research ranged from .802 to .958 exceeding the threshold value of .7, indicating good scale reliability (Singh & Tarofder, 2020).

Composite Reliability was utilized in this research to assess the reliability of the scales used to answer the survey questions (Tonelli et al., 2017; Alzahrani & Seth, 2021). As shown in Table 9, the CFA returned Composite Reliability values for each construct that were above the

established .7 threshold ranging from .883 to .963, suggesting that the scales have internal consistency (Mikalef & Pateli, 2017). The independent variables selected to measure character dimensions and leadership competencies in this research were also found to be reliable in previous research with calculated Composite Reliability values above .7 (Crossan et al., 2017; van Laar et al., 2019).

Table 9

Construct Reliability

	Cronbach's Alpha (CA)	Composite Reliability (CR)
Anticipate	0.806	0.885
Challenge	0.825	0.896
Decide	0.843	0.905
Align	0.845	0.896
Learn	0.904	0.929
Collaboration	0.802	0.883
Accountability	0.930	0.950
Judgement	0.875	0.914
Effective Leadership	0.958	0.963

Structural Model Assessment

Structural equation models are comprised of a measurement model and a structural model (Henseler et al., 2015). The measurement model is assessed to confirm proper psychometric properties while the structural model which reflects the relationship between the constructs and is assessed to confirm or disprove the research hypotheses (Moon et al., 2018).

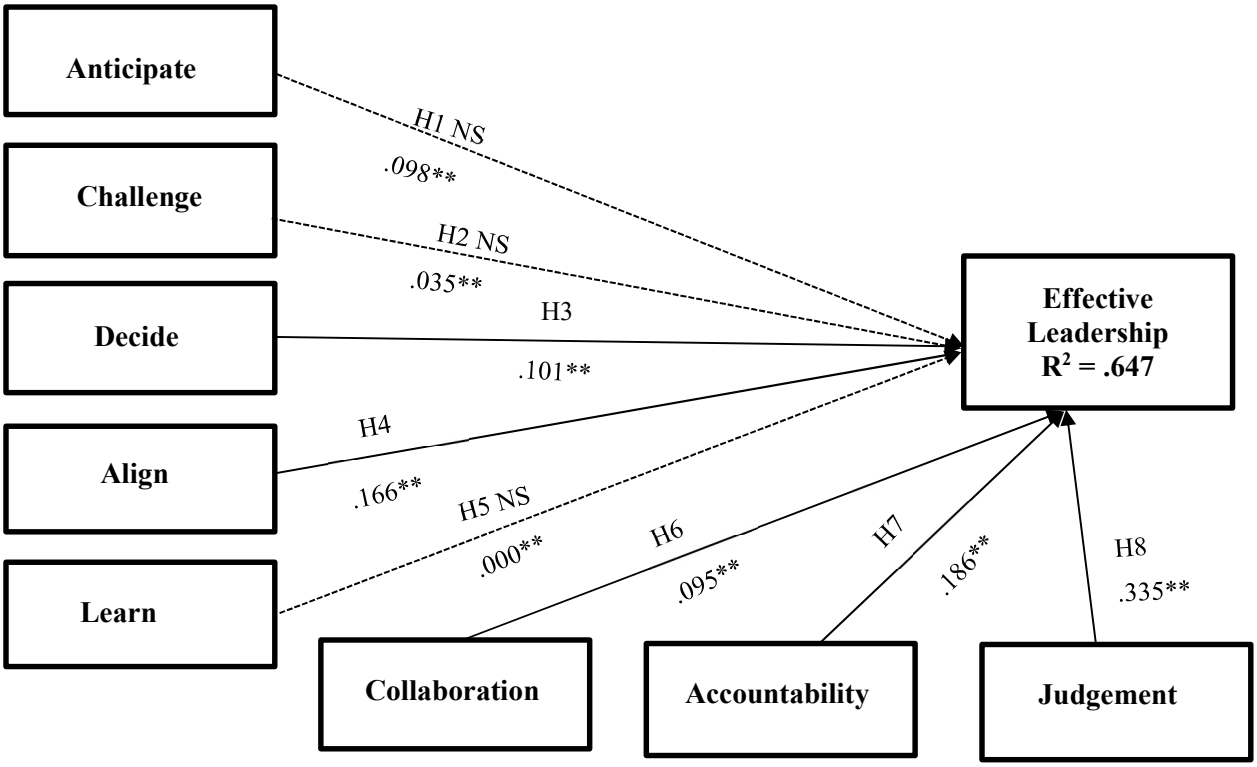
A multi-variate analysis was be done using SmartPLS Version 3 to determine the regression paths between the factors and the dependent variable, to assess differences at

aggregate and group levels, as well as the level of relationship between the dependent variable and the independent variables (Kearney & Smith, 2018; Hair et al., 2010). The structural model was evaluated based on loadings, significance of path coefficients and t-statistics at a 95% confidence level ($t > 1.96$) (Moon et al., 2018). The higher the observed path coefficient value (β), the greater the level of change in the dependent variable, that can be explained by one unit of change (+ or -) in the independent variable (Hair et al., 2010).

As recommended by Tonelli et al. 2017, the predictive capability of the structural model for this research was assessed by examining overall R^2 value and the individual path coefficients (β). Using SmartPLS Version 3, the structural model in Figure 9 returned an R^2 value of .647 indicating that the model explains 64.7% of the variance in the dependent variable, effective leadership in a digital environment. As shown in Figure 9, the individual path coefficients for *Anticipate*, *Challenge*, *Decide* and *Align*, were .098, .035, .101 and .166 respectively. The construct Learn had a path coefficient of 0.00% indicating no impact on effective leadership. *Collaboration*, *Accountability* and *Judgement* had individual path coefficients of .095, .186 and .335 respectively. In addition, all indicator loadings in the measurement model have significant positive values ranging from .707 to .935, which is above the established .7 threshold (Ingenhoff & Buhmann, 2016). Based on the results obtained in Table 10, five of the eight paths were found to be significant meeting the threshold of $t > 1.96$, $p < 0.05$, indicating a good structural model (Hess, 2018).

Figure 9

Structural Model



Note. Structural Model with hypotheses and path coefficients. 95% confidence level.
⟶ Supported Hypotheses ⇢ Unsupported Hypotheses
**Explains the level of change in the Effective Leadership that is explained by one unit of change in the independent variables. R^2 represents the predictive capability of the overall structural model. NS means that the hypothesis was not supported.

Test of Hypotheses

This research used partial least squares structural equation path modeling (PLS-SEM) to establish the significance of the causal relationship among the variables (Luo, Wang, Marnburg & Ogaard, 2016; Haque, Fernando & Caputi, 2019). As shown in Table 10 and Figure 9, five of the eight hypotheses were supported with significant path coefficients.

Anticipating Environmental Changes - Impact on Effective Leadership

Hypothesis 1 proposed that there is a positive relationship between an IT leader's ability to anticipate environmental changes and effective leadership in a digital environment. The results obtained for the statistical significance did not support this hypothesis ($\beta = 0.098$, $t = 1.878$, $p = .06$) as the t-statistics and p-values did not meet the statistical significance threshold of $t > 1.96$ and $p < .05$. Therefore, Hypothesis 1 is rejected as there is not enough statistical evidence to support it.

Challenge Accepted Assumptions – Impact on Effective Leadership

Hypothesis 2 proposed that there is a positive relationship between an IT leader's ability to challenge accepted assumptions and to be inclusive of diverse ideas, and effective leadership in a digital environment. The results obtained for the statistical significance test did not support this hypothesis ($\beta = 0.035$, $t = 0.635$, $p = .525$) as the t-statistics and p-values did not meet the statistical significance threshold of $t > 1.96$ and $p < .05$. Therefore, Hypothesis 2 is rejected as there is not enough statistical evidence to support it.

Decisiveness - Impact on Effective Leadership

Hypothesis 3 proposed that there is a positive relationship between an IT leader's ability to be decisive in making evidence-based decisions and effective leadership in a digital environment. The results obtained for the statistical significance test supported this hypothesis ($\beta = 0.101$, $t = 1.984$, $p = .047$) where the t-statistics and p-values met the statistical significance threshold of $t > 1.96$ and $p < .05$. Therefore, Hypothesis 3 is accepted as there is enough statistical evidence to support it.

Aligning with Stakeholder Interests - Impact on Effective Leadership

Hypothesis 4 proposed that there is a positive relationship between an IT leader's ability able to align with stakeholders' interests and effective leadership in a digital environment. The results obtained for the statistical significance test supported this hypothesis ($\beta = 0.166$, $t = 2.982$, $p = .003$) where the t-statistics and p-values met the statistical significance threshold of $t > 1.96$ and ($p < .05$. Therefore, Hypothesis 4 is accepted as there is enough statistical evidence to support it.

Facilitating a Learning Environmental - Impact on Effective Leadership

Hypothesis 5 proposed that there is a positive relationship between an IT leader's ability to facilitate a learning environment and effective leadership in a digital environment. The results obtained for the statistical significance test did not support this hypothesis ($\beta = 0.000$, $t = 0.007$, $p = .994$) as the t-statistics and p-values did not meet the statistical significance threshold of $t > 1.96$ and $p < .05$. Therefore, Hypothesis 5 is rejected as there is not enough statistical evidence to support it.

Collaboration - Impact on Effective Leadership

Hypothesis 6 proposed that is a positive relationship between an IT leader's ability to collaborate and effective leadership in a digital environment. The results obtained for the statistical significance test supported this hypothesis ($\beta = 0.095$, $t = 2.022$, $p = .043$) where the t-statistics and p-values met the statistical significance threshold of $t > 1.96$ and $p < .05$. Therefore, Hypothesis 6 is accepted as there is enough statistical evidence to support it.

Accountability - Impact on Effective Leadership

Hypothesis 7 proposed that there is a positive relationship between an IT leader's ability to take accountability for difficult decisions and accepting the consequences, and effective leadership in a digital environment. The results obtained for the statistical significance test supported this hypothesis ($\beta = 0.186$, $t = 3.310$, $p = .001$) where the t-statistics and p-values have met the statistical significance threshold of $t > 1.96$ and $p < .05$. Therefore, Hypothesis 7 is accepted as there is enough statistical evidence to support it.

Judgement - Impact on Effective Leadership

Hypothesis 8 proposed that there is a positive relationship between an IT leader's ability to exercise good judgement and effective leadership in a digital environment. The results obtained for the statistical significance test supported this hypothesis ($\beta = 0.335$, $t = 2.982$, $p = .000$) where the t-statistics and p-values met the statistical significance threshold of $t > 6.056$ and $p < .05$. Therefore, Hypothesis 8 is accepted as there is enough statistical evidence to support it.

Summary

In summary, the predictive capability of the research model as shown in Figure 9 was assessed at 64.7% based on the calculated R^2 value of .647. Per Figure 9, only two of the five leadership competencies (*Decide* and *Align*) were found to significantly and positively impact the dependent variable *Effective Leadership* in a digital environment. As shown in Figure 9, all three character dimensions (*Collaboration*, *Accountability* and *Judgement*) were found to significantly and positively impact *Effective Leadership* in a digital environment. Summarized results are also presented in Table 10.

Table 10

Support for the Hypotheses

Constructs	Path Coefficient	T Statistics	P Values	Path Signifi-cant?	Hypotheses Supported?
	(β)	(t>1.96)	(p<.05)	(Y/N)	
Anticipate -> Effective Leadership	0.098	1.878	0.060	N	H1 is not supported
Challenge -> Effective Leadership	0.035	0.635	0.525	N	H2 is not supported
Decide -> Effective Leadership	**0.101**	**1.984**	**0.047***	**Y**	**H3 is supported**
Align -> Effective Leadership	**0.166**	**2.982**	**0.003***	**Y**	**H4 is supported**
Learn -> Effective Leadership	0.000	0.007	0.994	N	H5 is not supported
Collaboration -> Effective Leadership	**0.095**	**2.022**	**0.043***	**Y**	**H6 is supported**
Accountability-> Effective Leadership	**0.186**	**3.310**	**0.001***	**Y**	**H7 is supported**
Judgement -> Effective Leadership	**0.335**	**6.056**	**0.000***	**Y**	**H8 is supported**

$R^2 = 0.647$

*p < .05

Note. Supported hypotheses are in boldface.

Chapter 6. Research Discussion and Conclusion

The topic of digital leadership is very current, and the public sector is being driven to embrace this paradigm shift as the influence of citizens grows exponentially (Kosorukov, 2017; Gierlich-Joas et al., 2020). The objective of this study was to assess the relationship between leadership competencies, character dimensions and effective leadership in a digital environment. To facilitate the assessment, two research questions were proposed and answered. This study provides further evidence that two of the leadership competencies and all the character dimensions assessed have a positive impact on effective leadership in a digital environment. The reliability and validity of this research model were confirmed, and the data collected was assessed as suitable for factor analysis.

The results of this research analysis as shown in Table 10 support five of the eight hypotheses from the research model and clarifies which of the independent variables positively and significantly impact effective leadership in a digital environment. Specifically, the ability to make good timely decisions was supported as a critical aspect of effective leadership. Similarly, aligning with stakeholder values was also seen as a key component required for effective leadership. The results also supported all three character dimensions as being impactful on effective leadership in a digital environment. Collaborative behavior was found to be very influential on effective leadership. Also, the willingness to take accountability for deliverables was also assessed as important for effective leadership in a digital environment. Similarly, the ability to exercise good judgement was assessed as having great impact on effective leadership in a digital environment. Overall, the research model explained 64.7% of the changes in the dependent variable, effective leadership in a digital environment. Each finding is examined and discussed in more details below by contextualizing the research results obtained.

Anticipating Environmental Changes - Impact on Effective Leadership

The results of this study did not support Hypothesis 1, that the ability to anticipate environmental changes positively impact effective leadership in a digital environment. The results of the statistical analysis ($\beta = 0.098$, $t = 1.878$, $p = .06$) did not meet the statistical significance threshold of $t > 1.96$ and $p < .05$ to suggest a significant relationship between anticipating environmental change and effective leadership.

Schoemaker et al. (2013) posited that most leaders are poor at anticipating environmental threats and opportunities facing their organizations. At the time of the study, the Ontario Government was responding to the Covid-19 pandemic and IT leaders were reacting to the need for IT to track and monitor activities such as contact tracing, hospital staffing, vaccine distribution and bookings for various government services (Ontario's Action Plan 2020: Responding to Covid-19, 2020). It is possible that the reactive mode of operation at the time influenced this finding.

The results may also be reflective of the fact that public-sector organizations are typically very risk averse and cautious in nature (Holgate et al., 2018; Hooper & Bunker, 2013). Being accountable to the public for investment success, public-sector organizations like the Ontario Government are more likely to support proven technology that is already production-tested to minimize configuration rework, to reduce implementation costs and to mitigate potential project failures (Gilchrist, et al., 2018). As indicated by this research findings, anticipating environmental changes was not considered critical for effective IT public-sector leadership in a reactive mode of operation.

Governments enjoy a market monopoly for the goods and services they provide to the public and therefore the incentive to be competitive in the marketplace is not relevant. The focus of the government is not profit making but on service provisioning to the public, and therefore as indicated by the research findings, there is little impetus for the Ontario Government to be concerned with competitor strategies in the marketplace. The results of the research imply that the well-entrenched bureaucracy and limited organizational agility in the Ontario Government support less emphasis being placed on the need to anticipate environmental changes, given the need to deliver on previously announced political-agenda items.

Challenge Accepted Assumptions - Impact on Effective Leadership

This research findings did not support Hypothesis 2, which proposed that there is a positive correlation between an IT leader's ability to challenge accepted assumptions and effective leadership in a digital environment. The test results for this hypothesis ($\beta = 0.035$, $t = 0.635$, $p = .525$) did not meet the statistical significance threshold of $t > 1.96$ and $p < .05$ to support a relation between these two variables.

In examining the impact of challenging status quo on effective leadership, Schoemaker et al. (2013) contended that most leaders need additional information to challenge status quo. This research results imply that although it is important to maintain a questioning mindset, there are times when immediate action is needed within the established protocols. In the current pandemic environment where relevant de facto information is emerging very slowly and critical decisions are needed quickly based on current policies and procedures, the opportunity to challenge status quo is somewhat limited. Additionally, comfort with long-standing government bureaucratic processes, a very strong union presence and the perception that changing status quo may adversely impact job security could also have contributed to the results. The results may also be

reflective of learned inertia typical of large bureaucratic organizations such as a provincial government.

This research results could also be reflective of policies in the Ontario Government that are guided by very risk averse public-sector regulations and procedures, which provide the framework for deciding on new initiatives. This research findings may also be interpretive of government regulations and policies that tend to lag behind technology changes, thereby limiting the opportunities for adopting cutting edge technologies that may not yet be proven. Another explanation could be that it is very difficult for large organizations such a provincial government to be nimble and changes in direction require many layers of approvals, which is are not guaranteed at each step. Approvals could also involve multiple strategic adjustments as each level of leader views the requests through different political priority lens. Another factor adversely influencing the ability to challenge status quo, is the need for public-sector IT leaders to make decisions that are popular with the electorate, bargaining agents (unions) and consistent with the election platform priorities. Introducing new digital and more efficient technology that could potentially impact job security, change the skillsets needed and reduce the number of staff hired is a difficult proposition for leaders who also have to consider the political consequences of their decisions.

Decisiveness - Impact on Effective Leadership

This research findings provided support for the Hypothesis 3 that there is a positive correlation between an IT leader's ability to be decisive and effective leadership in a digital environment. Testing of the hypothesis yielded results ($\beta = 0.101$, $t = 1.984$, $p = .047$) where the t-statistics and p-values met the statistical significance threshold of $t > 1.96$ and $p < .05$, thus confirming the theoretical model.

Both Schoemaker et al. (2013) and Tonelli et al. (2017) have suggested that cross-functional leadership decision-making is most effective in times of uncertainty such as is facing the Ontario Government today. This research findings imply that good and timely decisions are needed to support digital projects. This research also suggests that good decision-making is a key aspect of effective leadership, and the positive relationship obtained suggests that when IT leaders make good decisions, their organization will be successful.

Creative decision-making is at a premium right now to spur innovation and convince business leaders to invest in IT (van Laar et al., 2019). As suggested by this research findings, public-sector IT leaders are expected to be decisive in making decisions as all aspects of the government rely on IT to support the delivery of goods and services. Through firm decisions to digitize business processes, the Ontario Government services can be more streamlined and redesigned from a user-centric perspective.

Aligning with Stakeholder Interests - Impact on Effective Leadership

Hypothesis 4 was supported by the research findings that stakeholder alignment has a favourable impact on effective leadership in a digital environment. Based on the results obtained ($\beta = 0.166$, $t = 2.982$, $p = .003$) where the t-statistics and p-values met the statistical significance threshold of $t > 1.96$ and $p < .05$, stakeholder alignment was accepted as a leadership competence needed for effective leadership in a digital environment.

Both Schoemaker et al. (2013) and van Laar et al. (2017) analyzed the impact of stakeholder alignment on effective leadership and arrived at similar conclusions. The positive relationship between these two variables suggests that IT leaders should focus their attention on making decisions that closely align with the requirements of stakeholders, such as ministry

program leaders, citizens and external service partners. Stakeholder alignment is critical at this time as the Ontario Government works with multiple stakeholders such as the federal and municipal governments, pharmaceutical companies and various health care agencies to manage the impact of the Covid-19 pandemic (Ontario's Action Plan 2020: Responding to Covid-19, 2020). Stakeholders in the IT industry have a wealth of knowledge that can be leveraged through alignment to shorten adoption time, reduce the implementation costs of new technology and improve user adoption rates. By sharing industry experiences, lessons learned, workarounds for application bugs and configuration plans, the learning curve for adopting new digital technology can be shortened significantly resulting in a better user experience and cost savings to the government.

Facilitating a Learning Environmental - Impact on Effective Leadership

The research findings did not support Hypothesis 5 that learning has a significant impact on effective leadership. The statistical results of $\beta = 0.000$, $t = 0.007$, and $p = .994$ were not supportive as the t-statistics and p-values did not meet the statistical significance threshold of $t > 1.96$ and $p < .05$. The results of this research may be reflective of a public-sector environment where available funding is limited, and priority is often given to program delivery initiatives at the expense of training and development activities for employees. Another explanation could be that governments rely on external consultants to bring in the required expertise for large projects, thereby reducing the need to train staff on a consistent basis. Digital transformation projects are temporary in nature and therefore it is more cost effective to use a contingent workforce that is already trained on the required technology and who can be easily offboarded after projects are implemented.

Collaboration - Impact on Effective Leadership

The results of this study suggest that there is support for Hypothesis 6, proposing a positive relationship between an IT leader's ability to collaborate and effective leadership in a digital environment. Based on the results obtained ($\beta = 0.095$, $t = 2.022$, $p = .043$), the t-statistics and p-values met the statistical significance threshold of $t > 1.96$ and $p < .05$, that collaboration is seen by the respondents as a key ingredient for effective leadership in a digital environment.

Similarly, in researching leadership effectiveness van Laar et al. (2019) and Crossan et al. (2017) found that collaborative digital abilities to work horizontally on common objectives have a significant and positive impact on effective leadership. Collaboration is generally considered a key success factor for IT leaders to be effective in a digital environment, such as is occurring in the Ontario Government (Hesse, 2018; The Ontario Digital Action Plan, 2018). The results of the survey suggest that a collaborative mindset is a highly-valued disposition for IT leaders in the Ontario Government. Collaborative leadership in the Ontario Government will promote cross-ministry projects to better utilize shared resources and maximize the benefits from economies of scale. The results may also be reflective of the IT cluster support model in the Ontario Government where ministries in the same sector are grouped together and served by one IT organization. This service model requires a collaborative approach to for effective leadership in servicing client ministries.

Accountability - Impact on Effective Leadership

The importance of taking accountability was supported by the results of the research. Hypothesis 7 proposed that there is a positive relationship between effective leadership and the IT leader's ability to take accountability for difficult decisions and accepting the consequences in a digital environment. The results obtained ($\beta = 0.186$, $t = 3.310$, $p = .001$) for the statistical significance test supported this hypothesis where the t-statistics and p-values have met the statistical significance threshold of $t > 1.96$ and $p < .05$.

Consistent with the findings, Crossan et al. (2017) contended that accepting accountability is a key requirement for leadership effectiveness in a digital environment. As indicated by the respondents' ratings in the survey, public-sector IT leaders are expected to be accountable to the citizens of Ontario. By ensuring the success of digital projects through effective leadership, IT leaders in the Ontario Government can improve provincial services to the public and demonstrate strong accountability to citizens (Tonelli et al., 2017). Through the acceptance of accountability and by discharging their duties within their span of control, IT leaders in the Ontario Government are expected implement digital solutions which align business requirements and the mandate for the ministry (Moon et al., 2018). There is currently an increased emphasis on leader accountability for not only achieving results, but also for creating a culture of diversity and inclusiveness in response to global social changes regarding race relations.

Judgement - Impact on Effective Leadership

There was support in the research findings for Hypothesis 8, which proposed a positive relationship between an IT leader's ability to exercise good judgement and effective leadership in a digital environment. The results as shown in Table 15 ($\beta = 0.335$, $t = 2.982$, $p = .000$) where

the t-statistics and p-values met the statistical significance threshold of $t > 1.96$ and $p < .05$ implies a very strong significant positive correlation.

These research findings are similar to the research findings by Crossan et al. (2017) where judgement was found to be a very significant factor in effective leadership. Information technology leaders are very important in an organization as reflected in the highest level of correlation among all the independent variables. The respondents to the survey have indicated that displaying good judgement is the most important character dimension that IT leaders should display in leading their organization. The results are not surprising as good judgement is especially important at this time to support various healthcare initiatives aimed at reducing the impact of the Covid-19 pandemic on the citizens of Ontario (Ontario's Action Plan 2020: Responding to Covid-19, 2020). The results of this research may also be reflecting the need for exceptionally good leadership judgement in the year before a provincial election where great decisions and positive performances could lead to favourable public sentiments.

As a public-sector organization, the Ontario Government is managed using policies and procedures that a very conservative and risk averse to protect the interest of citizens. Therefore, as reflected in the research findings, critical thinking to evaluate options and make reasoned decisions to support the government's efforts to improve services is needed to effectively lead in a digital Ontario Government. Leadership priorities in the Ontario Government change frequently in line with the four-year election cycle and therefore great leadership judgment is needed to pivot the government and redirect resources to the new platform programs and support them with digital services (Seijts et al., 2017; van Laar et al., 2019).

The character dimensions were all rated higher than the leadership competencies with the means ranging from 5.812 to 6.263 compared to 4.970 to 5.442 respectively on the seven-point scale. Good character is demonstrated through behaviours which influence organizational culture, negotiations and collaboration across ministries (Crossan et al., 2017). Leadership character shapes the moral compass of the organization and helps to stimulate critical thinking and a shared vision for the future (Crossan et al., 2017). The three character dimensions examined are considered the most essential ones during times of organizational changes, with *Judgement* considered as the nexus for *Effective Leadership* (Seijts et al., 2015). Leadership performance evaluation in the Ontario Government includes some elements of character dimensions such as collaboration and accountability and this research ratings may be reflective of the attention paid to these types of behaviour. These results also suggest that while competencies can be hired from outside, character is ingrained and sets the culture for an organization to be successful and is therefore considered more desirable in IT leaders.

Discussion

This research theorized that leadership competencies and character dimensions positively impact effective leadership in a digital environment. The results of this study support two main findings. As a first step, this research conceptualized and operationalized a combination of five leadership competencies and three character dimensions considered very important in influencing the leadership effectiveness of IT leaders working in a digital public-sector environment. The results of this study suggest that public-sector IT leaders who demonstrate two of the five leadership competencies and all three character dimensions can improve organizational performance through effective leadership by developing these five behaviours.

The results of this research also address some of the gaps that exist in public-sector leadership-effectiveness research during a major pandemic.

With regards to the relationship between leadership competencies and effective leadership in a digital environment, the research findings suggest that the leadership competencies required for effective leadership in a digital environment are context-based. Greater value was placed on the need to be decisive and to align with stakeholder requirements during a crisis management scenario, such as is occurring now with the Covid-19 pandemic. These research findings imply that when there is a need for immediate action, the ability to anticipate change, challenge status quo and create a learning environment are considered secondary to the need to be decisive and in alignment with stakeholder requirements.

This research utilized the PLS-SEM approach to study the research purpose. The purpose of this research is to assess the impact of leadership competencies and character dimensions on effective leadership in a digital public-sector environment. Although CB-SEM was also an available option, PLS-SEM was selected as it is considered the preferred method for theory building and predictions, as well as being more robust and unaffected by different data types and distribution patterns (Risher & Hair, 2017). These features are better aligned with the purpose of this research and the data distribution. Additionally, PLS-SEM is well suited for business and behavioural research providing flexibility and advanced functionalities for statistical analysis in the SmartPLS Version 3 software (Risher & Hair, 2017).

The research findings are in alignment with the theoretical research model, as five of eight hypotheses were supported. The results of this research help to empirically validate that the cognitive manifestation of the character dimensions *Collaborate*, *Accountability* and *Judgement*

strongly influence *Effective Leadership* in a digital work environment. These research results also indicate that for IT leaders to effectively discharge their leadership responsibilities, decisiveness and stakeholder alignment are the preferred leadership competencies required to successfully develop and implement organizational strategies.

In supporting *Effective Leadership*, the three character dimensions are synergistic and this research findings suggest that great importance should be placed on *Collaboration*, *Accountability* and *Judgement* in developing policies and procedures to effectively lead a digital Ontario Government. The results of this research also suggest that the behavioural manifestation of two leadership competencies *Decide* and *Align*, and the character dimensions *Collaboration*, *Accountability* and *Judgement*, combine to produce effective IT leaders who can properly discharge their duties in a digital public-sector environment.

Modern leadership theories have emphasized the importance of adapting leadership behaviours to the current operating environment of the organization (Brown, Marinan & Partridge, 2020). Effective leadership is situational and can be achieved when leaders are able to deploy the right measure of leadership competencies and character dimensions to reflect the context in which management decisions are being made (Henkel et al., 2019). The results of this research align with the tenets of various leadership theories such as relationship leadership, task-oriented leadership, transformational leadership, transactional leadership, knowledge based, resource dependency, initiating structure and consideration (Brown et al., 2020; Basker, Sverdrup, Schei & Sandvik, 2019).

A combination of relationship-oriented and task-oriented leadership behaviours is desired in leaders (Henkel et al., 2019). The results of this research suggest that more emphasis and

value was placed on relationship-oriented behaviours as evidenced by the support for the independent variable stakeholder alignment and all three character dimensions. Task-oriented leadership was less valued with a clear preference for cognitive leadership abilities as informed by the character dimensions *Collaboration*, *Accountability* and *Judgement*. Task-oriented leadership focuses on establishing operational details, while relationship-oriented leadership focuses on developing trust, respect and a collaborative working relationship with stakeholders (Henkel et al., 2019). The research results imply that as the Ontario Government adapted its capabilities to deal with the Covid-19 pandemic, the corporate culture also adapted to become more relationship-oriented supported by a character-driven attitude and approach to leadership (Morgan, 2006; Henkel et al., 2019).

In the Ontario Government, the entrenched hierarchical leadership structure was flattened in some areas as the government pivoted to make knowledge-based decisions by leveraging the collected knowledge across multiple disciplines and cross-functional teams (The Ontario Digital Action Plan, 2018). Transformational leadership was needed to provide inspiration, exert idealized influence, build employee commitment and stakeholder alignment to the corporate vision addressing new government priorities such as new service requirements, additional social assistance for the public and a hybrid workplace arrangement (Brown et al., 2020; Vibert, 2004). These research results support a preference for character-driven behaviours (*Accountability*, *Collaboration*, *Judgement*) and competencies (*Align* and *Decide*) as reflected in a transformational leadership style. Similarly, the character dimensions deployed in charismatic leadership created an emotional investment and positive outlook by provincial staff, based on deliberate management actions to help employees adapt to a hybrid work environment become more self-directed as well as build personal resilience (Brown et al., 2020). Change acceptance

and stakeholder support were also garnered through consideration and initiating structure behaviours, where individual stakeholder groups and employees are recognized for their contributions and clarification is provided for roles, expectations and remuneration (Basker et al., 2020). These research results provided support for leadership competencies (*Decide* and *Align*) and the character dimensions, which combine to produce both consideration and initiating structure behaviours (Basker et al., 2020).

The organizational theory of resource dependence suggests that leadership behaviours and organizational success are directly related to the environmental context in which they operate (Vibert, 2004). From a resource dependency perspective, effective leadership was needed to digitally adapt citizen-facing services by managing union relationships, established procedures and the resource supply chain that impact judicial services, education and healthcare (Vibert, 2004; Morgan, 2006). The leadership competencies *Decide* and *Align* along with the character dimensions *Collaborate*, *Judgement* and *Accountability* were considered essential in helping the government adapt these services and cut through bureaucratic red tape to implement changes according to the digital action plan (The Ontario Digital Action Plan, 2018).

The impact of the leadership competencies *Anticipate*, *Challenge* and *Learn* were not statistically significant and therefore the results suggest that they have the least impact on *Effective Leadership* in a digital environment. It could be that the leadership competencies *Decide* and *Align* plus the character dimensions *Collaborate*, *Accountability* and *Judgement* were considered better proxies for *Effective Leadership*, where IT leaders need to make context-based leadership decisions as events unfold. These findings are dissimilar to other leadership research where all five leadership competencies were found to positively impact Effe*ctive Leadership* (Schoemaker et al., 2013). However, the findings are similar to previous leadership

research done regarding the positive impact of character dimensions on *Effective Leadership* (Crossan et al., 2017; Seijts et al., 2015).

The results of this research support and further add to the organizational theories regarding effective leadership in a digital environment by highlighting the combination of competencies and character dimensions considered essential for effective leadership in the context of a dynamic and changing digital environment.

Addressing the Research Questions

The research results provided evidence of positive relationships between some of the independent variables for leadership competencies and all of the variables for character dimensions and the dependent variable *Effective Leadership* in a digital environment. The results of the SEM analysis answers both research questions showing strong positive relationship for 5 of the 8 independent variables. Further details are provided below for each research question.

1. To what extent does an IT leader's competencies (being able to *Anticipate* environmental changes, *challenge* status quo, be *Decisive*, *Align* stakeholder's interest and facilitate a *learning* environment) impact *Effective Leadership* in a digital public sector?

Based on this research results as presented above, two of the five the leadership competencies for IT leaders positively impact their ability to be effective in a digital environment. Using a robust sample size of four hundred and seventy-five (475) IT staff in the Ontario Government, it was found that the ability to be decisive and align with stakeholder's interest all positively impact *Effective Leadership* with significant theorized paths at the 95% confidence level. The impact of the variables *Anticipate*, *Challenge* and *Learn* (facilitate a learning environment) was not found to be statistically significant at a 95% confidence level. The

research findings put the need for leadership competencies in context of the organization's needs at that point in time.

2. To what extent does an IT leader's character dimensions (*Judgement*, *Collaboration* and *Accountability*) impact *Effective Leadership* in a digital public sector?

The character dimensions (*Judgement*, *Collaboration* and *Accountability*) were found to all strongly influence *Effective Leadership* in a digital environment. All three independent variables had significant impact on *Effective Leadership* with *Judgement* being the most relevant character dimension. These three character dimensions (*Judgement*, *Collaboration* and *Accountability*) accounted for 33.5%, 9.5% and 18.6% respectively, of the change in the dependent variable, and all three theorized paths were significant at the 95% confidence level. The research findings indicate that in times of change and emergency management, strong character dimensions are highly valued to support effective leadership.

Theoretical Research Contribution

To the best of the researcher's knowledge, this is the first empirical research done in the Ontario Government investigating the impact of leadership competencies and character dimension on effective leadership in a digital public sector during the Covid-19 pandemic. This research has added to the understanding of the literature discussing effective leadership in a digital environment by integrating literature from leadership competencies and character dimensions with the requirements for effective digital leadership. A large sample size was used to empirically test the eight hypotheses at a point in time when many digital projects were in progress to address the Covid-19 pandemic. In answering the research questions, the research results suggest that although leadership competencies are important, behaviours that manifest the

character dimensions are considered more impactful when leading in a digital environment. As indicated by the research findings, behaviours that are influenced by character dimensions support moral decisions, which are very important to public-sector IT leadership. This research provides a contextual lens through which to view leadership behaviours from both a competency and character dimension perspective, and the research model was found to explain 64.7% of the change in *Effective Leadership.*

The findings from this research also adds to the discourse regarding the effectiveness of public-sector IT leaders by highlighting which leadership competencies and character dimensions are considered most essential for effective leadership in a digital environment. This research was done at the height of a major pandemic and therefore was uniquely positioned to assess the digital leadership requirements in the context of a fast-changing fluid public-sector environment managing a major pandemic. As suggested by the findings of this research, effective IT leadership is at a premium at this point in time and is demonstrated by behaviours that display strong cognitive reasoning, a collaborative approach to leadership, and accountability for program results, as evidenced by prudent decision making and alignment with stakeholder values.

Practical Research Contribution

These findings will be shared with the Office of the Chief Talent Officer for the Ontario Government as evidence to help develop future context-based leadership programs and recruitment plans for IT executives. Other provinces and levels of government such as federal and municipal are grappling with the same citizens' expectation gap and Covid-19 pandemic could use the findings to guide their training plans. The training curriculum to develop potential leaders could be enhanced to balance the focus on both competencies and character dimensions

to produce more multi-faceted leaders. Specific competencies such as being decisive when faced with difficult decisions and aligning activities with stakeholder concerns can be incorporated in practical training activities and leadership performance evaluations to build stronger leadership competencies.

The major concerns of citizens impact all levels of government and therefore the findings of this research are relevant to many types of government. The findings can guide policy decisions to reduce bureaucracy by promoting greater levels of risk tolerance to the willingness to be decisive while aligning with stakeholder values. Policies, guidelines and political climate create the context within which public-sector leaders operate and by incorporating the findings to amalgamate leadership competencies and character dimensions in leadership development, the government can stimulate more effective leadership among IT leaders.

The research findings support a balanced recruitment strategy for IT leaders where character dimensions are more valued than leadership competencies when selecting potential leaders. These two facets of leadership enjoy a symbiotic relationship and when combined supports superior cognitive reasoning and moral behaviours inducive to effective leadership in a digital public-sector. Information technology leaders with both strong leadership competencies and character dimensions will be better equipped to make better decisions, build stronger collaborative relationships, create closer alignment with stakeholders through a more effective leadership mindset.

This research results could also be applied to update the *Fiscal Sustainability, Transparency and Accountability Act, 2019.* This legislation provides the framework and principles for leadership in the Ontario Government and updates could include expanding the

provisions to include collaboration and judgement as additional character dimensions needed to manage the Ontario Government.

Research Limitations

This research was limited in scope as the target organization was the Ontario Government. Therefore, there will be limited ability to generalize the findings globally, across the private sector or to charitable organizations. In addition, the data were only collected via a survey and therefore were not cross validated by other means such as interviews and observations. Another limiting factor is that the public sector is governed by specific rules and regulations that influences the policies in place, the attitude towards risks and the types of decisions made. Also, the focus of the public sector is on the provision of quality goods and services to the public, and not on generating profits (Kosorukov, 2017). The private sector on the other hand has different priorities such as maximizing stakeholder investment returns, increasing market share, promoting brand recognition, and improving customer experience (Purchase, 2017). Additionally, this research employed a cross-sectional survey design by collecting data over a three-month period (Wilson, 2014). A longitudinal design where the survey was conducted over a longer period of time may have provided richer insights by accounting for organizational changes over time (Wilson, 2014). These differences will therefore limit the ability to generalize the findings in this report across private sector organizations as IT investment decisions are made based on different criteria.

This research only included three of the eleven character dimensions from the original character dimension model used by Seijts et al. (2015). The eleven character dimensions act as regulators to temper each other and therefore if they were all included in this research, it is likely that the impact of the independent variables *Collaboration*, *Accountability* and *Judgement* would

have been less concentrated, and might have been more balanced across all the character dimensions or with the independent variables for leadership competencies (Rupcic, 2021). Given the Ontario Government Covid-19 pandemic mode of operations at the time, other character dimensions such as transcendence, drive, courage, and integrity are likely to have been rated very high by respondents. Social factors such as the rise to prominence of the Black Lives Matter movement and increased discourse on anti-racism in the Ontario Government may have translated to support for other character dimensions such as justice, humanity and integrity. Other character dimensions such as humanity, humility and temperance are not used in everyday business language and therefore even with definitions, respondents may have scored them on the lower side (Crossan et al., 2017). These factors as outlined have limited the ability to generalize these research findings.

Recommendations for Future Research

This research was focused on the leadership competencies and character dimensions for effective leadership by public-sector IT leaders. Future research could also extend the survey population to include the IT leaders in other levels of government such as municipal and federal. There are other professional areas in the Ontario Government such as legal, policy and finance where effective leadership is also important and further research is warranted.

This research utilized only a subset of the character dimensions as researched by Crossan et al. (2017). The other character dimensions not included in this research (drive, transcendence, justice, integrity, humanity, temperance, humility and courage) could be included in future research to assess the full character dimension model. Additional leadership competencies from other research models could also be included in future research.

Conclusion

This study empirically investigated and assessed the impact of leadership competencies and character dimensions on the dependent variable *Effective Leadership* in a digital environment. The research was conducted in the Ontario Government during the second year of the Covid-19 pandemic. Various new digital projects are being jointly led by IT and business area leaders as the government adjust to introduce new services to help Ontarians cope with the hardships associated with the Covid-19 pandemic (Ontario's Action Plan 2020: Responding to Covid-19, 2020). The Ontario Government is also preparing for a provincial election in 2022.

Government investment in IT is often significant and therefore receives high levels of public scrutiny coupled with leadership accountability (Freed & Ulrich, 2015; Lim & Moon, 2021). Large transformational projects in the public sector are often intended to introduce digital services that will impact vulnerable citizens and must therefore be implemented successfully with appropriate oversight and change management (Kosorukov, 2017; Henkel et al., 2019). Information technology leaders are expected to be able to deliver these digital projects in collaboration with their business partners and major stakeholders by aligning business purpose with performance capabilities and personal principles (Ready & Mulally, 2017). Effective IT leaders can influence political decisions to support digital transformation by explaining and mitigating the risks associated with innovation (Nunno & Gabrys, 2018).

According to the World Bank (2016), there is a need for more accountability to support digital transformation and the results of this research support accountability as being important for effective leadership. Information technology leaders in the public sector are held to higher standards as stewards of the public purse, and therefore require the appropriate leadership competencies and character dimensions to effectively discharge their responsibilities (Hooper &

Bunker, 2013; Neumeyer & Liu, 2021). Information technology is the lynch pin for providing accessible services to the public and therefore IT leaders need the appropriate competencies and character dimensions to influence their corporate colleagues and a diverse stakeholder base (Endres & Weibler, 2017; Martino et al., 2021). The collective accountability and judgement of the IT leadership team is needed as the government responds to the needs of citizens.

As shown in Table 10, the research suggests that five of the eight independent variables have a significant impact on *Effective Leadership* in a digital environment, with *Accountability* and *Judgement* having the highest impact. The results of this research indicate that a higher premium is placed on the need for IT leaders to display stronger character dimensions as compared to leadership competencies. The majority of the respondents were general level information management staff and therefore their perspective is an upward view of leadership. It is possible that the research findings may have been different if more IT leaders were self-reporting. This research results indicates that the need for leadership competencies is context-based depending on the current operating environment of the government. As stewards of the of the public, IT leaders in the Ontario Government are expected to display behaviours that demonstrate good character and the requisite level of competence to make decisions in the best interest of the public. Strong character dimensions inform the cognitive framework for IT leaders to deliberate and arrive at ethical and reasoned decisions.

This research has demonstrated that two leadership competencies and all three character dimensions positively impact and elevate the performance of IT leaders to support the successful delivery digital initiatives (Markham, 2017; Kiel, 2015; Ontario's Action Plan 2020: Responding to Covid-19, 2020). The behavioural expression of leadership competencies and character dimensions at the executive leadership level helps to create a natural culture of innovation

supported by entrenched virtuous values (Crossan et al., 2017; Trivellas & Drimoussis, 2013). According to Crossan et al. (2017), leadership competencies and character dimensions are the foundation for effective leadership and can be enhanced through deliberate leadership development activities. When integrated, leadership competencies and character dimensions can create extraordinary leaders capable of exceptional performance levels (Strum et al., 2017; Seijts et al., 2021). Enhancing the capabilities of IT leaders is one of the best ways for governments to successfully address new global and environmental challenges (Naveen & Haranath, 2015). This research has highlighted the need to emphasize and jointly develop leadership competencies and character dimensions in IT leaders in the public sector with a greater focus on character dimensions.

References

Abu Bakar, H. & McCann, R. (2018). An Examination of Leader-Member Dyadic Politeness of Exchange and Servant Leadership on Group Member Performance. *The International Journal of Business Communication,* 55(4), 501-525.

Adams, C. & Gaetane, J. (2011). A diffusion approach to study leadership reform. *Journal of Educational Administration,* 49(4), 354-377.

Adnans, S. & Nunno, T. (2017). Five Situational Leadership Types for CIOs Working With Digital Teams. *Gartner Inc.* Retrieved from:www.Gartner.com/document/3712018/key-insight

Aguirre-Urreta, M. & Ronkko, M. (2018). Statistical Inference With PLSc Using Bootstrap Confidence Intervals. *MIS Quarterly*, 42(3), 1001-1020.

Alzahrani, L. & Seth, K. (2021). Factors influencing students' satisfaction with continuous use of learning management systems during the COVID-19 pandemic: An empirical study. *Education & Information Technologies, 26*, 6787-6805.

Amalia, E. (2019). Backend Challenges and Issues for E-Government in Indonesia seen through the Perspective of Infrastructure of E-Government Components Cube. *Global Business and Management Research: An International Journal*, 11(1), 110-119.

Anderson, M. & Sun, P. (2017). Reviewing Leadership Styles: Overlaps and the Need for a New "Full-Range" Theory. *International Journal of Management Reviews*, 19, 76-96.

Arnold, D. & Sangra, A. (2018). Dawn or dusk of the 5th age of research in educational technology? A literature review on (e-)leadership for technology-enhanced learning in higher education (2013-2017). *International Journal of Educational Technology in Higher Education,* 15(24), 1-29.

Arshad, S. & Khurram, S. (2021). Gender difference in the continuance intention to e-file income tax returns in Pakistan. *The International Journal of Government & Democracy in the Information Age, 26*, 147-155.

Association of Chartered Certified Accountants (2018). Leaders in a Digital Age. September 2018 Edition.

Auditor General of Ontario – 2015 Annual Report (2015). Retrieved from: 2015 Annual Report - Office of the Auditor General of Ontario

Auditor General of Ontario – 2016 Annual Report (2016). Retrieved from: 2016 Annual Report - Office of the Auditor General of Ontario

Avolio, B. (2016). Candour and Transparency: Aligning your Leadership Constellation. *People +Strategy*, 39(4), 16-20.

Avolio, B., Bass, B. & Jung, D. (1999). Re-examining the components of transformational and transactional leadership using the Multifactor Leadership Questionnaire. *Journal of Occupational and Organizational Psychology*, 72, 441-462.

Avolio, B., Sosik, J., Kahai, S. & Baker, B. (2014). E-Leadership: Re-examining transformation in leadership source and transmission, *The Leadership Quarterly*, 25, 105-131.

Avolio, B., Waldman, D. & Yammarino, F. (1991). Leading in the 1990s: The Four Is of Transformational Leadership. *Journal of European Industrial Training,* 15(4) 9-16.

Bartsch, S., Weber, E., Buttgen, M. & Huber, A. (2020). Leadership matters in crisis-induced digital transformation: how to lead service employees effectively during the COVID-19 pandemic. *Journal of Service Management*, 32 (1), 71-85.

Basker, I., Sverdrup, T., Schei, V. & Sandvik, A. (2020). Embracing the duality of consideration and initiating structure: CEO leadership behaviors and small firm performance. *Leadership & Organization Development Journal*, 41(3), 449-462.

Bass, B. (1990). From Transactional to Transformational Leadership: Learning to Share the Vision. *Organizational Dynamics*, 18 (3) 19-31.

Bass, B. (1999). Two Decades of Research and Development in Transformational Leadership. *European Journal of Work and Organizational Psychology,* 8(1), 9-32.

Bass, B. & Avolio. B. (1994). Transformational Leadership and Organizational Culture. *International Journal of Public Administration,* 17(34), 112-122.

Bass, B., Avolio. B., Jung, D. & Berson, Y. (2003). Predicting Unit Performance by Assessing Transformational and Transactional Leadership. *Journal of Applied Psychology,* 88(2), 207-218.

Baumgartner, H., Weijters, B. & Pieters, R. (2021). The biasing effect of common method variance: some clarifications. *Journal of the Academy of Marketing Science, 49(2)*, 221-235.

Begzadeh, S. & Nedaei, M. (2017). The Relationship between Servant Leadership with Organizational Trust and Employee Empowerment in the Social Security Organization of Ardabil. *International Journal of Management,* 4(3), 270 – 281.

Behrendt, P., Matz, S. & Goritz, A. (2017). An integrative model of leadership behavior. *The Leadership Quarterly,* 28, 229 – 244.

Benali, M., Kaddouri, M. & Azzimani, T. (2018). Digital Competence of Moroccan Teachers of English. *International Journal of Education and Development using Information and* Communication Technology, 14(2), 99-120

Benaroch, M. & Chernobai, A. (2017). Operational IT Failures, IT Value destruction and Board-Level IT Changes. *MIS Quarterly*, 41(3), A1-A6.

Berry, D. & Mok, L. (2015). Inventory of your IT Skills and Competencies to Meet Business Needs. *Gartner Inc*. Retrieved from: https://www.gartner.com/document/2208316?ref=solrAll&refval=212832466&qid=495d7eb32df8978d4767510d7b1414bc

Bhattacherjee, A., & Premkumar, G. (2004). Understanding changes in belief and attitude toward IT usage: A theoretical model and longitudinal test. *MIS Quarterly, (28)*2, 229-254.

Bican, P. & Brem, A. (2020). Digital Business Model, Digital Transformation, Digital Entrepreneurship: Is There A Sustainable "Digital"? *Sustainability*, 12, 1-15.

Boamah, S., Laschinger, H. & Clarke, S. (2017). Effect of transformational leadership on job satisfaction and patient safety outcomes. *Science Direct Nurse Outlook*, 66, 180-189.

Bolden, R. & O'Regan, N. (2016). Digital Disruption and the Future of Leadership: An Interview with Rick Haythornwaite, Chairman of Centrica and MasterCard. *Journal of Management Inquiry,* 25(4), 438 - 446.

Boukamcha, F. (2019). The effect of transformational leadership on corporate entrepreneurship in Tunisian SMEs. *Leadership and Organization Development Journal,* 40(3), 286-304.

Bounabat, B. (2017). From e-government to digital Government: Stakes and Evolution Models. *Revue electronique des Technolgies de I'Information,* 10, 20-20.

Bozzato, R. (2020, May 19). Ontario Collaborates with Med-Tech Innovation Hub in the Fight Against Covid-19. *Ontario Newsroom*. Retrieved from: https://news.ontario.ca/en/release/56967/ontario-collaborates-with-med-tech-innovation-hub-in-the-fight-against-covid-19

Breuer, S. & Szillat, P. (2019). Leadership and Digitalization: Contemporary Approaches Towards Leading In The Modern Day Workplace. *E-Journal, Dialogue,* 1, 24-36.

Brown, S., Marinan, J. & Partridge, M. (2020). The Moderating Effect of Servant Leadership On Transformational, Transactional, Authentic, And Charismatic Leadership. *Journal of International Business Disciplines*, 15(2), 67-86.

Browne, W., Dreitlein, S., Ha, M., Manzoni, J. & Mere, A. (2016). Two Key Success factors for Global Project Team Leadership: Communications and Human Resource Management. *Journal of IT and Economic Development.* 7(2), 40-48.

Brunner, M., Gonzalez-Castane, G. & Ravesteijn, P. (2021). How Digital Leadership competences and IT Capabilities affect an organization's ability to digitally transform and adopt new technologies. *Journal of International technology & Information Management Association,* 139-156.

Butler, A., Kwantes, C. & Boglarsky, C. (2014). The effects of self-awareness on the perception of leadership effectiveness in the hospitality Industry: A cross-cultural investigation. *International Journal of Intercultural Relations*, 40, 87-98.

Byrne, A., Crossan, M. & Seijts, G. (2018). The Development of Leader Character Through Crucible Moments. *Journal of Management Education*, 4(2), 265-293.

Cakit, E., Olak, A., Karwowski, W., Marek, T. & Hejduk, I. (2020). Assessing safety at work using an adaptive neuro-fuzzy inference system (ANFIS) approach aided by partial least squares structural equation modeling (PLS-SEM). *International Journal of Industrial Ergonomics,* 76, 1-11.

Cannon, N. & Nielsen, T. (2016). Savvy Digital Leadership Makes a Difference in Local Government. *Gartner Inc*. Retrieved from: www.Gartner.com/document/3089118/key-insight

Chan, W., Atanasov, P., Patil, S., Mellers, B. & Tetlock, P. (2017). Accountability and Adaptive Performance under Uncertainty: A Long-Term View. *Judgement and Decision Making*, 12(6), 610-626.

Claassen, K., dos Anjos, D., Kettschau, J. & Broding, H. (2021). How to evaluate digital leadership: a cross-sectional study. *Journal of Occupational Medicine and Toxicology*, 16(44), 1-8.

Cole, M., Stavros, J., & Herath, M. (2018). Lawrence Technological University "Leaders in the Making": An Effective Leader is a Learning Leader. *AI Practitioner*, 20 (2).

Colella, H., MacDorman, J., Tyler, I. & Cox, I. (2018). CIO Role Evolution Primer of 2018.Gartner Inc. Retrieved from: www.Gartner.com/document/3846874/key-insight

Colony, G. (2017). CIOs and the future of IT: It's time for CIO's to take charge of both back office and business technology, leading with a customer-driven mindset. *MIT Sloan Management Review,* 59 (3), 1-7.

Crossan, M., Byrne, A., Seijts, G., Reno, M., Monzani, L. & Gandz, J. (2017). Toward a Framework of Leader Character in Organizations. *Journal of Management Studies,* 54(7), 986-1018.

Deutscher, M., Walker, K. & Phillips, P. (2019). Conscience in public administration: More than just a chirping cricket. *Canadian Public Administration*, 62(2), 181-201.

Dewi, R. & Sjabadhyni, B. (2021). Digital Leadership as a Resource to Enhance Managers' Psychological Well-Being in the COVID-19 Pandemic Situation in Indonesia. *South East Asian Journal of Management,* 15(2), 154-168.

Dreyfuss. C (2017). Digital Age Leadership: Guiding People to Engage, Collaborate – and Do Their Best. *Gartner Inc*. Retrieved from: https://www.gartner.com/document/3710117?ref=solrAll&refval=212832918&qid=59d7e4c1e1ce1f03e24a4a7ded0c141a

Dust, S. & Ziegert, J. (2016). Multi-Leader Teams in Review: A Contingent Consideration Perspective of Effectiveness. *International Journal of Management Reviews,* 18, 518-541.

Edirisinghe, N., Makuloluwa, T., Amarasekara, T. & Goonewardena, C. (2021). Evaluating psychometric properties of the Short Form Brief Pain Inventory Sinhala Version (SF BPI-Sin) among Sinhala speaking patients with cancer pain in Sri Lanka. *BMC Psychology.* 9 (34), 1-19.

Ehrlich, J. (2017). Mindful Leadership: Focusing Leaders and Organizations. *Organizational Dynamics*, 46, 233-243.

Eisenbeiss, S. (2012). Re-thinking ethical leadership: An interdisciplinary integrative approach. *The Leadership Quarterly*, 23(5), 791-808.

Elnaghi, M., Alshawi, S., Samad, N., Kamal, M., Weerakkody, V. & Irani, Z. (2019). Exploring the role of a government authority in managing transformation in service re-engineering – Experiences from Dubai Police. *Government Information Quarterly*, 36, 196-207.

El Sawy, O., Kraemmergaard, P., Amsinck, H., & Vinther, A. (2016). How Lego built the foundation and Enterprise for Digital Leadership. *MIS Quarterly Executive*, 15(2), 141-166.

Endres, S. & Weibler, J. (2017). Towards a Three-Component Model of Relational Social Constructionist Leadership: A Systematic Review and Critical Interpretive Synthesis. *International Journal of Management Reviews*, 19, 214-236.

Ernst & Young & The Conference Board (2018). Global Leadership Forecast. Retrieved from: https://www.ey.com/Publication/vwLUAssets/ey-the-global-leadership-forecast/$FILE/ey-the-global-leadership-forecast.pdf

European Union (2017). Tallin Declaration on e-Government. Retrieved from: https://ec.europa.eu/digital-single-market/en/news/ministerial-declaration-egovernment-tallinn-declaration

Ferrero, I., Rocchi, M., Pellegrini, M. & Reichert, E. (2019). Practical wisdom: A virtue for leaders. Bringing together Aquinas and Authentic Leadership. *Business Ethics, the Environment & Responsibility,* 29, 84-98.

Fiscal Transparency and Accountability Act, 2004. Retrieved from: Fiscal Transparency and Accountability Act, 2004**, S.O ...**

Franke, G. (2019). Heuristics versus statistics in discriminant validity testing: a comparison of four procedures. *Internet Research*, 29 (3), 430-447.

Freed, A. & Ulrich, D. (2015). Calculating the Market Value of Leadership. *Harvard Business Review*, 2-5.

Fuller, C., Simmering, M., Atinc, C., Atinc, Y. & Babin, B. (2016). Common Methods Variance in Business Research. *Journal of Business Research*, 69, 3192-3198.

Gardiner, R. (2018). Ethical Responsibility – An Arendtian Turn. *Business Ethics Quarterly*, 28(1). 31-50.

Gierlich-Joas, M., Hess, T. & Neuburger, R. (2020). More self-organization, more control-or even both? Inverse transparency as a digital leadership concept. *Business Research*, 13, 921-947.

Gilchrist, A., Burton-Jones, A. & Green, P. (2018). The Process of Social Alignment and Misalignment within a Complex IT Project. *International Journal of Project Management*, 36, 845-860

Government of Ontario (2018). Public Sector Salary Disclosure. Retrieved from: https://www.ontario.ca/page/public-sector-salary-disclosure

Guthrie, K. & Meriwether, J. (2018). Leadership Development in Digital Spaces Through Mentoring, Coaching and Advising. *New Directions for Student Leadership*, 158, 99-109.

Hahn, A. (2017). Stratified Random Sampling/Randomized Block Design. *Nature of Science: Research Methodologies*, 1-4.

Hair, J., Black, W., Babin, B. & Anderson, R. (2010). *Multivariate Data Analysis*. Upper Saddle River, NJ: Prentice Hall.

Hair, J. F., Risher, J. J., Sarstedt, M. & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, (31)1, 2-24.

Hanus, B. & Wu, Y. (2016). Impact of Users' Security Awareness on Desktop Security Behavior: A Protection Motivation Theory Perspective. *Information Systems Management*, 33(1), 2-16.

Haque, A., Fernando, M. & Caputi, P. (2019). The Relationship Between Responsible Leadership and Organizational Commitment and the Mediating Effect of Employee Turnover Intentions: An Empirical Study with Australian Employees. *Journal of Business Ethics*, 156, 759-774.

Haselberger, D. (2016). A Literature-based framework of performance- related leadership interactions in ICT project teams. *Information and Software Technology,* 70, 1-17.

Hatlevik, O., Guomundsdottir, G. & Loi, M. (2015). Examining Factors Predicting Students' Digital Competence. *Journal of Information Technology Education: Research,* 14, 123-127.

Ha-Vikstrom, T. & Takala, J. (2018). Measuring transformational leadership–an empirical study across 21 nations in a multi-national company. *Theoretical Issues in Ergonomic Science*. 19(1), 1-20.

Henkel, T., Marion, J. & Bourdeau, D. (2019). Project Manager Leadership Behavior: Task Oriented Versus Relationship-Oriented. *Journal of Leadership Education*, 1-14.

Henseler, J., Ringle, C. & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43, 115-135.

Heslin, P. & Keating, L. (2017). In learning mode? The role of mindset in derailing and enabling experiential leadership development. *The Leadership Quarterly*, 28, 367-384.

Hess, A. (2018). Digitalization and Leadership – How Experienced Leaders Interpret Daily Realities in a Digital World. *Proceedings of the 51st Hawaii International Conference on System Sciences*, Hawaii.

Hidayat, S., Rafiki, A. & Aldoseri, M. (2017). Application of leadership style in government organizations: a survey in the Kingdom of Bahrain. *International Journal of Islamic and Middle Eastern Finance and Management,* 10(4), 581-594.

Hill, N. & Bartol, K. (2016). Empowering Leadership and Effective Collaboration in Geographically Dispersed Teams. *Personnel Psychology*. 69, 159-198.

Holgate, R., Mendonsa, A. & Mello, A. (2018). A Master CIO in Government. Gartner Inc. Retrieved from: www.Gartner.com/document/3861181/key-insight

Hooper, V. & Bunker, B. (2013). The Role and Requisite Competencies of the Public Sector CIO: a Two-sided Perspective. *The Electronic Journal Information Systems Evaluation*, 16(3), 188-199.

Huang, Y., Chang, L. & Backman, K. (2018). Detecting Common Methods Bias in Predicting Creative Tourist Behavioural Intention with an Illustration of Theory of Planned Behaviour. *Tourism,* 22(3), 307-329.

Huang, X., Xu, E., Chiu, W., Lam, C. & Farh, J. (2015). When Authoritarian Leaders Outperform Transformational Leaders: Firm Performance in a Harsh Economic Environment. *Academy of Management Discoveries,* 1(2), 180-200.

Ingenhoff, D. & Buhmann, A. (2016). Advancing PR Measurement and Evaluation: Demonstrating the properties and assessment of variance based structural equation model using an example study on corporate reputation. *Public Relations Review*, 42, 418-431.

International Monetary Fund (2018). Digital Government. Retrieved from: https://www.elibrary.imf.org/view/IMF089/24824-9781484333952/24824-9781484333952/ch02.xml?redirect=true

Jackson, N. & Dunn-Jensen, L.(2021). Leadership succession planning for today's digital transformation economy: Key factors to build for competency and innovation. *Business Horizons*, 64, 273-284.

Jelaca, M., Bjekic, R. & Lekovic, B. (2016). A Proposal for Research framework Based on the Theoretical Analysis and Practical Application of MLQ Questionnaire. *Economic Themes*, 54(4), 549–562.

Johnsen, A. (2015). Strategic Management Thinking and Practice in the Public Sector: A Strategic Planning for All Seasons? *Financial Accountability & Management*, 31(3), 243-268.

Joia, L. & Mangia, U. (2017). Career transition antecedents in the information technology area. Inform*ation Systems Journal*, 27, 31-57.

Kaba, B. (2018). Modeling information and communication technology use continuance behavior: Are there differences between users on the basis of their status? *International Journal of Information Management,* 38, 77-85.

Kalali, N., Momeni, M. & Heydari, E. (2015). Key Elements of Thinking Strategically. *International journal of Management, Accounting and Economics*, 2(8), 1-9.

Kane, G., Phillips, A., Copulsky, J. & Andrus, G. (2019). How Digital Leadership Isn't Different. *MIT Sloan Management,* 60 (3), 34-39.

Katsonis, M. & Botros, A. (2015). Digital Government: A Primer and Professional Perspectives. *Australian Journal of Public Administration*, 71(1), 42-52.

Kearney, W. & Smith, P. (2018). Student Bullying, Teacher Protection, and Administrator Role Ambiguity; A Multi-level Analysis of Elementary Schools. *Journal of School Leadership*, 28 (3), 1-24.

Kiel, F. (2015). Leadership Measuring the Return on Character. *Harvard Business Review, 20-21*.

Kiel, F. (2015). Q & A: An executive coaching pioneer defines leadership character and explains how it affects the bottom line. *Rothmanmagazine.ca.,* 93-96.

Kimura, T. (2015). A Review of Political Skill: Current Research Trend and Directions for Future Research. *International Journal of Management Reviews*, 17, 312-332.

Kock, N. (2018). From composites to factors: Bridging the gap between PLS and covariance-based structural equation modelling. *Information Systems Journal,* 29, 674-706.

Kosorukov, A. (2017). Digital Government Model: Theory and Practice of Modern Public Administration. *Journal of Legal, Ethical and Regulatory Issues*, 20(3), 1-10.

Lam, S. (2016). The next generation digital leadership. *Compuworld Hong Kong*, 18-20.

LeBreton, J. & Senter, J. (2008). Answers to 20 Questions About Interrater Reliability and Interrater Agreement. *Organizational Research Methods,* 11(4), 815-852.

Lemieux, C., Groulx, M., Halpenny, E., Stager, H., Dawson, J., Stewart, E. & Hvenegaard, G. (2018). The End of the Ice Age? Disappearing World Heritage and the Climate Change Communication Imperative. E*nvironmental Communication,* 12 (5), 653-671.

Leong, C., Pan, S., Leidner, D. & Huang, J. (2019). Platform Leadership: Managing Boundaries for the Network growth of digital platforms. *Journal of the Association for Information Systems*, 20 (10), 1531-1565.

Lester, G., Palanski, M., Hammond, M. & Clapp-Smith, R. (2017). Multi-Domain Leadership: a whole person approach to leading in the workplace… and beyond. *Organizational Dynamics, 46, 133-139.*

Levallet, N. & Chan, Y. (2018). The Role of Digital Capabilities in Unleashing the Power of Managerial Improvision. *MIS Quarterly Executive,* 17(1), 1-21.

Li, W., Liu, K., Belitski, M., Ghobadian, A. & O'Regan, N. (2016). E-Leadership through strategic alignment: an empirical study of small-and medium-sized enterprises in the digital age. *Journal of Information Technology*, 31, 185-206.

Lim, J. & Moon, K. (2021). Transformational Leadership and Employees' Helping Behavior in Public Organizations: Does Organizational Structure Matter? *Public Personnel Management*, 50 (4), 485-508.

Lim, J., Stratopoulos, T. & Wirjanto, T. (2013). Sustainability of a Firm's Reputation for Information Technology capability: The Role of Senior IT Executives. *Journal of Management Information Systems,* 30 (1), 1-19.

Lisak, A. & Harush, R. (2021). Global and local identities on the balance scale; Predicting transformational leadership and effectiveness in multicultural teams. *PloS ONE*, 16 (7), 1-31.

Louw, L., Muriithi, S. & Radloff, F. (2017). The relationship between transformational leadership and leadership effectiveness in Kenyan indigenous banks. *SA Journal of Human Resource Management,*15(0), 1-11.

Luo, Z., Wang, Y., Marnburg, E., & Ogaard, T. (2016). How is leadership related to employee self-concept*? International Journal of Hospitality Management,* 52, 24-32.

Lyneis, J. & Sterman, J. (2016). How To Save a leaky Ship: Capability traps And The Failure of Win-Win Investment in Sustainability and Social Responsibility. *Academy of Management Discoveries,* 2 (17), 7-32.

Markman, A. (2017). Can You Be a Great Leader Without Technical Expertise? *Harvard Business Review*, 2-4

Marques, J. (2015). The Changed Leadership Landscape: What Matter Today. *Journal of Management Development*, 34 (10), 1310 – 1322.

Martino, P., D'Onza, G. & Melville R. (2021). The Relationship Between CAE Leadership and the IAF's Involvement in Corporate Governance. *Journal of Accounting, Auditing & Finance.* 36(2), 430-448.

Matt, C., Hess, T. & Benlian, A. (2015). Digital Transformational Strategies. *Bus Inf Syst Eng., 57(5),* 339-343.

Mergel, I., Edelmann, N. & Huag, N. (2019). Defining Digital transformation: Results from expert interviews. *Government Information Quarterly*. Retrieved from: doi.org/10.1016/j.giq.2019.06.002 - Search (bing.com)

Mikalef, P. & Pateli, A. (2017). Information technology-enabled dynamic capabilities and their indirect effect on competitive performance: Findings from PLS_SEM and fsQCA. *Journal of Business Research,* 70, 1-16.

Min, S., Modeste, E., Salisbury, J. & Goff, P. (2016). Heeding the Call (Comprehensive Assessment of Leadership for Learning) An Inquiry into Instructional Collaboration among School Professionals. *Journal of Educational Administration*, 54(2), 135-151.

Moon, Y., Choi, M. & Armstrong, D. (2018). The impact of relational leadership and social alignment on information security system services in Korean governmental organizations. *International Journal of Information Management,* 40, 54-66.

Morgan, G. (2006). *Images of Organization*. Thousand Oaks, CA: Sage

Moutousi, O. & May, D. (2018). How Change-related Unethical Leadership Triggers Follower Resistance to Change: A Theoretical Account and Conceptual Model. *Journal of Change Management*, 18(2), 142-161.

Muchhal, D. & Solkhe, A. (2017). An empirical Investigation of the Relationship Between Emotional Intelligence and Job Performance In Indian Manufacturing Sector. *International Journal of Research in Commerce and Management,* 8(7), 18-21.

Mukhopadhyay, S., Bouwman, H., & Jaiswal, M. (2019). An open platform centric approach for scalable government service delivery to the poor. The Aadhar case. *Government Information Quarterly,* 36, 437-448.

Nagarajan, S. & Edwards, J. (2015). Professional Skills Requirements of IT Professional Practice: Australian IT Graduate Perspectives. *Journal of Research and Practice in Information Technology*, 47(1), 3-22.

Naveen, M. & Haranath, G. (2015). The Effects of Transformational Leadership in Organizational Commitment in India's Information Technology Industry. International *Journal of Research in Commerce and Management,* 6 (10), 70-74.

Nei, K., Foster, J., Ness, A. & Nei, D. (2018). Rule breakers and attention seekers: Personality predictors of accountability and in leaders. *International Journal of Selection and Assessment*, 26, 17-26.

Neumeyer, X. & Liu, M. (2021). Managerial Competencies and Development in the Digital Age. *IEEE Engineering Management Review*, 49 (3), 49-56.

Niesten, E. & Jolink, A. (2015). The Impact of Alliance Management Capabilities on Alliance Attributes and Performance: A Literature Review. *International Journal of Management Reviews*, 17, 69-100.

Nunno, T. & Gabrys, E. (2018). Depoliticize IT Investments with a CIO Decision Framework. *Gartner Inc*. Retrieved from: https://www.gartner.com/document/3710117?ref=solrAll&refval=212832918&qid=59d7e4c1e1ce1f03e24a4a7ded0c141a

Office of the Auditor General of Ontario (2015, pg. 471-505). Annual Report 2015. Retrieved from: http://www.auditor.on.ca/en/content/annualreports/arreports/en15/2015AR_en_final.pdf

Office of the Auditor General of Ontario (2016, pg.207-230). Annual Report 2016. Retrieved from: http://www.auditor.on.ca/en/content/annualreports/arreports/en16/2016AR_v1_en_web.pdf

Okunola, O., Rowley, J. &Johnson F. (2017). The multi-dimensional digital divide: Perspectives from an e-government portal in Nigeria. *Government Information Quarterly.34*, 329-339.

Olding, E. (2018) Use the ESCAPE Model to Develop Change Leadership. *Gartner Inc*. Retrieved from: https://www.gartner.com/document/3877084?ref =solrAll&refval=212833663&qid=7312cd623bbd26cbd49b9f30a7214711

Ontario's Action Plan 2020: Responding to Covid-19 (2020). Retrieved from: https://budget.ontario.ca/2020/marchupdate/pdf/2020-actionplan.pdf

Ontario Budget 2018. Retrieved from http://budget.ontario.ca/2018/chapter-1.html#section-0

Ontario Digital Action Plan (2018). Retrieved from: https://files.ontario.ca/books/digital_action_plan.pdf

Ontario Onwards Action Plan: Ontario's COVID-19 Action Plan for a People-Focused Government (2020). Retrieved from: Ontario Onwards | Ontario.ca

OPS Learning Strategy (2017). Retrieved from https://intra.ontario.ca/tbs/ops-leraning-startegy

Organization for Economic Co-operation and Development (2017). OECD Digital Economy Outlook 2017. Retrieved from: https://www.oecd-ilibrary.org/science-and-technology/oecd-digital-economy-outlook-2017_9789264276284-en

Paroski, M., Konjovic, Z., Surla, D. & Popovic, V. (2015). Development of eGovernment services in the Autonomous Province of Vojvodina. *Information Technology for Development*, 21(3), 492-510.

Partington, D. (2002). *Essential Skills for Management Research*. Thousand Oaks, California: Sage.

Patanakul, P., Kwak, Y., Zwikael, & Liu, M. (2016). What impacts the performance of large-scale government projects? *International Journal of Project Management,* 34, 452-466.

Patzer, M., Voegtlin, C., & Scherer, A. (2018). The Normative Justification of Integrative Stakeholder Engagement: A Habermasian View on Responsible Leadership. *Business Ethics Quarterly*, 28 (3), 325-354.

Pidgeon, K. (2017). The Keys for Success: Leadership Core Competencies. *Journal of Trauma Nursing*, 24(6), 338-241.

Pittenger, L., Berente, N. & Gaskin, J. (2022). Transformational IT Leader and Digital Innovation: The Moderating Effect of formal IT Governance. *The DATA BASE for Advances in Information Systems, 53*(1), 106-133.

Podsakoff, P., MacKenzie, S. & Lee, J. (2003). Common Method Biases in Behavioural Research: A Critical Review of Literature and Recommended Remedies. *Journal of Applied Psychology*, 88(5), 879-903.

Purchase, E. (2017). Beware of a Leadership Vacuum in the Digital Workplace. *Gartner Inc*. Retrieved from: https://community.gartner.com/t5/articles/Beware-of-a Leadership-Vacuum-in-the-Digital-Workplace/ta-p/66346

Ravichandran, T. (2018). Exploring the relationship between IT competence, innovation capacity and organizational agility. *Journal of Strategic Information Systems*, 27, 22-42.

Ready, D. & Mulally, A. (2017). How to Become a Game-Changing Leader. *MIT Sloan Management Review,* 59 (1), 63-71.

Redick, A., Reyna, I., Schaffer, C. & Toomey, D. (2014). Four-Factor Model for Effective Project Leadership Competency. *Journal of IT and Economic Development,* 5(1), 21-35.

Reinartz, W., Haenlein, M. & Henseler, J. (2009). An empirical comparison of the efficacy of covariance-based and variance-based SEM. *Journal of Research in Marketing*, 26, 332-344.

Rigdon, E. (2016). Choosing PLS path modeling as analytical method in European Management Research: A realist perspective. *European Management Journal,* 34, 598-605.

Risher, J. & Hair, J., Jr. (2017). The Robustness of PLS Across Disciplines. *Academy of Business Journal*, 47-55.

Rodriguez-Ardura, I. & Meseguer-Artola, A. (2019). How to Prevent, Detect and Control Common Method Variance in Electronic Commerce Research. *Journal of Theoretical and Applied Electronic Commerce Research*, 15(2), 1-5.

Romero-Silva, R., Santos, J. & Hurtado, M. (2018). A note on defining organisational systems for contingency theory in OM. *Production Planning & Control*, 29 (16), 1343-1348.

Rubens, A., Schoenfeld, G., Schaffer, B. & Leah, J. (2018). Self-awareness and leadership: Developing an individual strategic development plan in MBA leadership course. *The International Journal of Management Education*, 16, 1-13.

Rudramuniyaiah, P., Joshi, K., Shah, V. & Ramanujan, S. (2020). Examining Cognitive and Emotive Influences on Knowledge Sharing Behaviour Among IT Professionals: An Empirical Analysis. *E-Service Journal*, 11(3), 1-35.

Rupcic, N. (2021). Character-based leadership and tacit knowledge for learning and resilience. *The Learning Organization.* 28(6), 560-568.

Sabherwal, R. & King, W. (1992). Decision Processes for Developing Strategic Applications for Information Systems; A Contingency Approach. *Decision Sciences*, 23 (4), 430-447.

Sagarik, D., Chansukree, P., Cho, W. & Berman, E. (2018). E-government 4.0 in Thailand: The role of central agencies. *Information Policy,* 23, 343-353.

Saleem, Z., Batool, S., Khattak, S. (2017). Relationship between Leadership Styles and Organizational Commitment: Moderating Role of Emotional Intelligence and Organizational Support. *Journal of Managerial Sciences*, 11(1), 71-84.

Saunders, C., Wiener, M., Klett, S. & Sprenger, S. (2017). The Impact of Mental Representation on the ICT-Related Overload in the use of Mobile Phones. *Journal of Management Information Systems*, 34, 803–825.

Schneider, I., Madler, M. & Lang, J. (2019). Comparability of Self-Ratings and Observer Ratings in Occupational Psychosocial Risk Assessments: Is there Agreement? *Biomed Research International*, 2019, 1-10.

Schoemaker, P., Krupp, S. & Howland, S. (2013). Strategic Leadership: The Essential Skills. *Harvard Business Review*, 2-5.

Seijts, G., Crossan, M. & Carleton, E. (2017). Embedding Leader Character in HR practices to achieve sustained excellence. *Organizational Dynamics*, 46, 30-39.

Seijts, G., De Clercy, C. & Mohan, G. (2021). Trust as Mediator of the Relationship Between Character and Perceptions of Leader Effectiveness During the COVID-19 Crisis. *Canadian Journal of Behavioural Science*, 53(3), 358-364.

Seijts, G., De Clercy, C. & Nguyen, B. (2018). Exploring How Canadian Voters Evaluate Leaders character in Three Cases: Justin Trudeau, Hillary Clinton, and Donald trump. *Journal of Canadian Studies*, 52(2), 427-450.

Seijts, G. & Gandz, J. (2018). Transformational change and leader character. *Business Horizons,* 61, 239-249.

Seijts, G., Gandz, J., Byrne, A. & Crossan, M. (2015). Learning From Boardroom Perspectives on Leader Character. *Ivy Business Journal Reprints*. Retrieved from: https://search.ebscohost.com/login.aspx?direct=true&db=edscpi&AN=edscpi.A411015018&site=eds-live

Seijts, G., Gandz, J., Crossan, M., Mercer, J. & Stevenson, L. (2014). Stress Testing The Character Of Future Business Leaders. *Ivy Business Journal*, 26-30.

Seijts, G., Gandz, J., Crossan, & Reno, M. (2015). Character Matters: Character dimensions' impact on leader performance and outcomes. *Organizational Dynamics*, 44, 65-74.

Sheehan, M., Garavan, T. & Morely, M. (2020). Transformational leadership and work unit innovation: a dyadic two wave investigation. *Journal of Business Research.* 109, 399-412.

Shotter, J. & Tsoukas, H. (2014). In Search of Phronesis: Leadership and the Art of Judgement. *Academy of Management Learning & Education,* 13(2), 224-243.

Singh, A. & Hess, T. (2017). How Chief Digital Officers Promote the Digital Transformation of their Companies. *MIS Quarterly Executive*, 16(1), 1-17.

Singh, M. & Tarofder, A. (2020). Identifying the Predictors of Intention to Leave Among the Female Employees in Malaysia. *Psychology and Education*, 57(9), 686 – 699.

Singh, N. & Singh, R. (2015). Evidences of Emotional Intelligence in Organizational Behaviour of Public Sector Undertakings in India. Scholedge *International Journal of Management & Development*, 2(6), 33 – 37.

Sosik, J., Gentry, W. & Chun, J. (2012). The value of virtue in the upper echelons: A multisource examination of executive character strengths and performance. *The Leadership Quarterly*, 23, 367-382.

Sturm, R., Vera, D. & Crossan, M. (2017). The entanglement of leader character and leader competence and its impact on performance. *The Leadership Quarterly*, 28 (3), 349-366.

Tate, M., Bongiovanni, I., Kowalkiewicz, M. & Townson, P. (2018). Managing the "Fuzzy front end" of open digital service innovation in the public sector: A methodology. *International Journal of Information Management, 39, 186-198.*

Taylor, S., Sturm, R., Atwater, L. & Braddy, P. (2016). Underestimating one's leadership impact: Are women leaders more susceptible? *Organizational Dynamics*, 45, 132-138.

The Conference Board (2016). Beyond Technology: Building a New Organization Culture to Succeed in an Era of Digital Transformation. 1-10. Retrieved from: www.conferenceboard.org.

The Conference Board (2018). 23 Truths about Leadership Development. *2018 Leadership Development Conference.* New York City

The World Bank (2016). World Development Report 2016: Digital Dividends. Retrieved from: https://worldbank.org/en/publication/wdr2016.

Tonelli, A., de Souza Bermejo, A., dos Santos, P., Zuppo, L. & Zambalde, A. (2017). IT Governance in the Public Sector: A Conceptual Model. *Inf Sys Front*, 19, 593- 610.

Tourigny, L., Han, J., Baba, V. & Pan, P. (2019). Ethical Leadership and Corporate Social Responsibility in China: A Multilevel Study of Their Effects on Trust and Organizational Citizenship Behavior. *Journal of Business Ethics*, 158, 428-440.

Trivellas, P. & Drimoussis, C. (2013). Investigating Leadership Styles, Behavioural and Managerial Competency Profiles of Successful Project Managers in Greece. *Social and Behavioural Sciences,* 73, 693-700.

Troshani, I., Janssen, M., Lymer, A. & Parker, L. (2018). Digital transformation of business-to-government reporting: An institutional work perspective. *International Journal of Accounting Information Systems*, 31, 17-36.

Van Ee, J., El Attoti, I., Ravesteyn, P. & De Waal, B. (2020). BPM maturity and Digital Leadership: An exploratory study. *Communications of the IIMA. 18*(1) Article 2.

van Laar, E., van Deursen, A., van Dijk, J. & de Haan, J. (2017). The relationship between 21st - century skills and digital skills: A systematic literature review. *Computers in Human Behavior*, 372, 577 – 588.

van Laar, E., van Deursen, A., van Dijk, J. & de Haan, J. (2019). Determinants of 21st-century digital skills: a large scale survey among working professionals. *Computers in Human Behavior*, 19, 93-104.

van Laar, E., van Deursen, A., van Dijk, J. & de Haan, J. (2019). The sequential and conditional nature of 21st -Century Digital Skills. *International Journal of Communication*, 13, 3462-3487.

Van Wart, M., Roman, A., Wang, X. & Liu, C. (2017). Integrating ICT adoption issues into (e)leadership theories. *Telematics and Informatics*, (34), 527 – 537.

Vibert, C. (2004). Theories of Macro Organizational Behavior. *A Handbook of Ideas and Explanations. Essentials of Business Research.* Armonk, New York: ME Sharpe Inc.

Vidic, Z., Burton, M.D., South, G., Pickering, A. & Start, A. (2017). Emotional and Motivational Correlates of Leadership Styles: A Comprehensive Frame-work for Understanding Effective Leaders. *Journal of Leadership Studies*, 10 (3), 22-40.

Wang, C., Medaglia, R. & Zheng. L. (2018). Towards a typology of adaptive governance in the digital government context: the role of decision-making and accountability. *Government Information Quarterly*, 35, 306-322.

Weber, D. (2018). Achieving Accountability. *Physician Leadership Journal, 18-23.*

Weick, K. (2007). The Generative Properties of Richness. *Academy of Management Journal*, 50 (1), 14 – 19.

Weill, P. & Woerner, S. (2018). Is your Company ready for a Digital Future? *MIT Sloan Management Review,* 21-25.

Wiesbock, F., Hess, T. & Spanjol, J. (2020). The dual role of IT capabilities in the development of digital products and services. *Information & Management*, 57, 1-17.

Wilson, J. (2014). *Essentials of Business Research.* City Road, London: Sage

Zhang, L., Cao, T. & Wang, Y. (2018). The Mediation Role of Leadership Styles in Integrated Project Collaboration. An Emotional Intelligence Perspective. *International Journal of Project Management,* 36, 317-330.

Appendix A: Ethics Certificate

Athabasca University
RESEARCH CENTRE

CERTIFICATION OF ETHICAL APPROVAL

The Athabasca University Research Ethics Board (REB) has reviewed and approved the research project noted below. The REB is constituted and operates in accordance with the current version of the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS2) and Athabasca University Policy and Procedures.

Ethics File No.: **24152**

Principal Investigator:
Miss. Flolet Loney-Burnett, Graduate Student
Faculty of Business\Doctor of Business Administration (DBA)

Supervisor:
Dr. Bangaly Kaba (Supervisor)

Project Title:
DIGITAL LEADERSHIP: DEVELOPING LEADERSHIP COMPETENCIES AND CHARACTER DIMENSIONS FOR PUBLIC-SECTOR INFORMATION TECHNOLOGY LEADERS

Effective Date: January 08, 2021 **Expiry Date**: January 07, 2022

Restrictions:

Any modification or amendment to the approved research must be submitted to the AUREB for approval.

Ethical approval is valid *for a period of one year*. An annual request for renewal must be submitted and approved by the above expiry date if a project is ongoing beyond one year.

A Project Completion (Final) Report must be submitted when the research is complete *(i.e., all participant contact and data collection is concluded, no follow-up with participants is anticipated and findings have been made available/provided to participants (if applicable))* or the research is terminated.

Approved by: **Date: January 08, 2021**

Weiming Liu, Chair
Faculty of Business, Departmental Ethics Review Committee

Athabasca University Research Ethics Board
University Research Services, Research Centre
1 University Drive, Athabasca AB Canada T9S 3A3

E-mail rebsec@athabascau.ca
Telephone: 780.213.2033

Appendix B: Ministry Approval to Conduct Survey

Ministry of Government and Consumer Services Approval

Approval Detail Report

OCCIO - DM Approval to Survey MGCS Information Technology Staff

Package: 258-2021-3 **Status:** **OPEN** Changed on 11 Jan 2021
Tenant: MGCS **Created:** 11 Jan 2021
Group: EITS - OCCIO **Due:** 22 Jan 2021
Type: Briefing Material **Other:** *None*
Summary: Flolet Loney-Burnett, Head, Business & Service Management, Central Agencies I&IT Cluster (CAC), TBS
is seeking MGCS Deputy Minister approval to proceed with data collection via ten minute survey to be
completed by staff in GSIC, ITS and Cyber Security Divisions. Flolet is collecting this data as part of the
Doctor of Business Administration (DBA) program offered by Athabasca University. She is requesting for
an email communicating DM approval to distribute the survey from the Office of the Corporate Chief
Information Officer (OCCIO) to all GSIC, ITS and Cyber Security staff (see Appendix 3).
Once approval is received, the survey process will be as follows:
1. OCCIO to send research approval email to all of GSIC, ITS and Cyber Security staff.
2. On receipt of full Ethics approval from Athabasca University (full Ethics approvals has been received
from Athabasca University, see Certification of Ethical Approval), Flolet will email the research consent
form and survey to all GSIC, ITS and Cyber Security staff
3. Weekly reminders sent by Survey Monkey to participants with outstanding surveys
4. Survey to close in 6-8 weeks

OWNER

[redacted], Strategic Advisor & Business Manager, Corporate Chief Information Officer's Office
[redacted]@ontario.ca / +1 416-565-8039
[redacted], Advisor, Planning, Corporate Chief Information Officer's Office
[redacted]@ontario.ca / +1 (416) 399-8739

REQUESTER

[redacted], Advisor, Planning, Corporate Chief Information Officer's Office
[redacted]@ontario.ca / +1 (416) 399-8739

ORG

None.

APPROVAL PLAN

CIO, GSIC (COMPLETE)

[redacted] (TBS), Head, Business & Service Management, Business Director 11 Jan 2021
& Service Management
[redacted]@ontario.ca / +1 (416) 906-2140
Report Generated On: 21 Jan 2021 at 2:57 pm Page 1 of 4
Approval Detail Report
Type: Review
No of Days: 1

Notify: Yes
Active: 11 Jan 2021
Completed: 11 Jan 2021 by [redacted] (TBS)
Delegate: [redacted] (TBS), Executive Assistant, Business & Service Management
[redacted]@ontario.ca / (647) 884-9312, Notify: Yes
[redacted] (MGCS), Head, Business Solutions and Operations, Business CIO 11 Jan 2021
Solutions and Operations
[redacted]@ontario.ca / +1 (647) 381-5240
Type: Approval
No of Days: 1
Notify: Yes
Active: 11 Jan 2021
Completed: 11 Jan 2021 by [redacted] (MGCS)
[redacted] (MGCS), Special Advisor to the CIO, CIO's Office
[redacted]@ontario.ca / +1 (416) 212-7058, Notify: Yes
CIO, ITS (COMPLETE)
[redacted] (MGCS), Chief Information Officer, Chief Information CIO 12 Jan 2021
Officer, ITS
[redacted]@ontario.ca / +1 (416) 998-6790
Type: Approval
No of Days: 2
Notify: Yes
Active: 11 Jan 2021
Completed: 12 Jan 2021 by [redacted] (MGCS)
Delegate: [redacted] (MGCS), Executive Advisor, Cyber Security Operations
[redacted]@ontario.ca / (647) 309-7424, Notify: Yes
CIO, Cyber (COMPLETE)
[redacted] (MGCS), Chief Privacy Officer and Archivist of Ontario, Office of CIO 12 Jan
2021
the Chief Privacy Officer & Archivist of Ontario
[redacted]@ontario.ca / (647) 983-6694
Type: Approval
No of Days: 2
Notify: Yes
Active: 11 Jan 2021
Completed: 12 Jan 2021 by [redacted] (MGCS)
Delegate: [redacted] (MGCS), EA to Archivist of Ontario, Office of the Chief Privacy Officer &
Archivist of
Ontario
[redacted]@ontario.ca / (647) 823-1664, Notify: Yes
CCIO - CAO - DM (COMPLETE)
Report Generated On: 21 Jan 2021 at 2:57 pm Page 2 of 4
Approval Detail Report
[redacted] (MGCS), Advisor, Planning, Corporate Chief Information Officer's Policy Analyst 11
Jan 2021
Office
[redacted]@ontario.ca / +1 (416) 399-8739
Type: Review
No of Days: 1
Notify: Yes
Active: 11 Jan 2021
Completed: 11 Jan 2021 by [redacted] (MGCS)
Associate
Deputy Minister

[redacted] (MGCS), Corporate Chief Information Officer, Corporate Chief Information Officer's Office 12 Jan 2021
[redacted]@ontario.ca / (416) 526-7933
Type: Approval
No of Days: 2
Notify: Yes
Active: 11 Jan 2021
Completed: 12 Jan 2021 by [redacted] (MGCS)
Delegate: [redacted] (MGCS), Strategic Advisor & Business Manager, Corporate Chief Information Officer's Office
[redacted]@ont[redacted]
[redacted] (MGCS), Assistant Deputy Minister/CAO, Office of the ADM and CAO 14 Jan 2021
Chief Administrative Officer
[redacted]@ontario.ca / +1 (647) 248-0151
Type: Approval
No of Days: 2
Notify: Yes
Active: 11 Jan 2021
Completed: 14 Jan 2021 by [redacted] (MGCS)
Delegate: [redacted] (MGCS), Business Advisor, Office of the ADM and Chief Administrative Officer
[redacted]@ontario.ca / +1 (416) 624-5963, Notify: Yes
[redacted] (MGCS), Senior Policy Advisor, Deputy Minister's Office EA 18 Jan 2021
[redacted]ontario.ca / (416) 662-7197
Type: Review
No of Days: 2
Notify: Yes
Active: 11 Jan 2021
Completed: 18 Jan 2021 by [redacted] (MGCS)
Note: DMO review complete per FT note
[redacted] (MGCS), Deputy Minister's Office DM 18 Jan 2021
[redacted]@ontario.ca / (416) 314-1957
Report Generated On: 21 Jan 2021 at 2:57 pm Page 3 of 4
Approval Detail Report
Type: Approval
No of Days: 2
Notify: Yes
Active: 11 Jan 2021
Completed: 18 Jan 2021 by [redacted] (MGCS)
Delegate: [redacted] (MGCS), Lead, Office Operations, Deputy Minister's Office
[redacted]@ontario.ca / (905) 409-0746, Notify: Yes

DOCUMENTS

MGCS Routing Form 11 Jan 2021
Briefing Note 11 Jan 2021

SUPPORTING DOCUMENTS

Appendix 1 - AU Research Conditional Approval Nov 2020 11 Jan 2021
Appendix 2 - Flolet's Doctoral Research Presentation Aug 2020 DM presentation 11 Jan 2021
Appendix 3 - Research Approval Email Final 2020 11 Jan 2021
Appendix 4 - Research Consent Form MGCS IT employees Final 11 Jan 2021
Appendix 5 - Survey Questions 11 Jan 2021
Appendix 6 - Research Communication Plan 11 Jan 2021

Appendix 7 - GSIC Town Hall - Research Presentation Nov 2020 11 Jan 2021
Certification of Ethical Approval 14 Jan 2021

TASKS

No task added.

RELATED

No related package added.

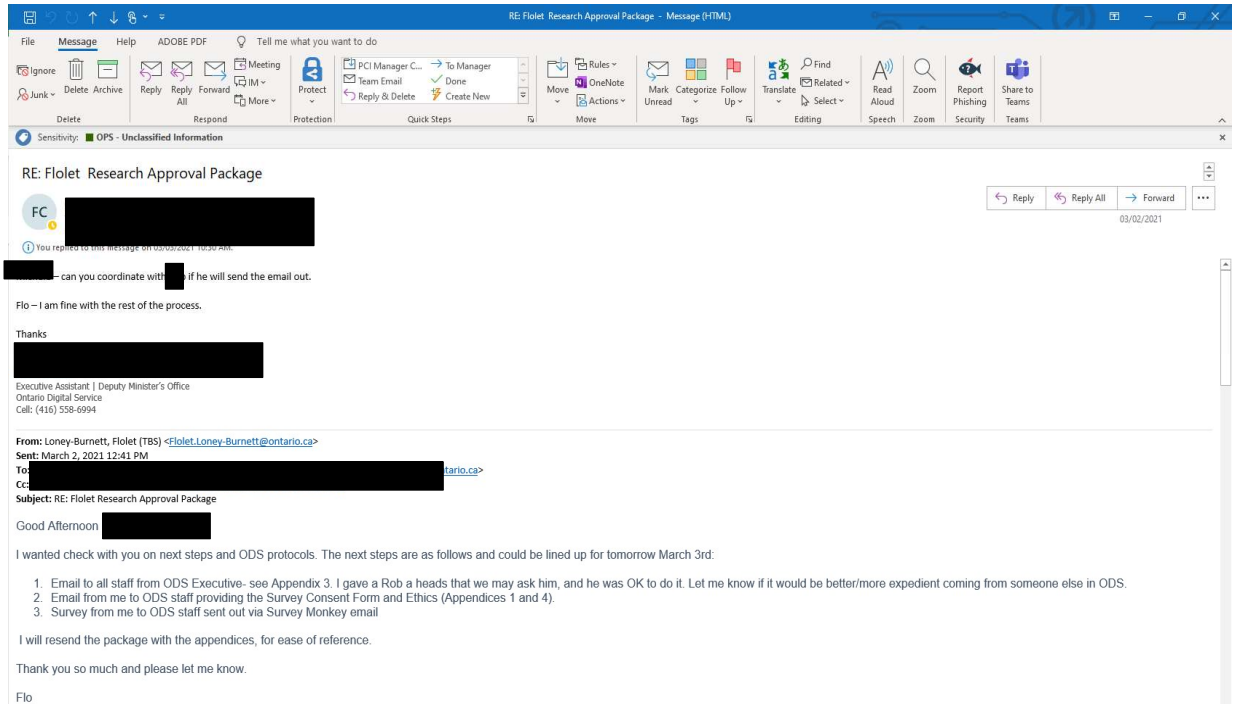
COMMENTS

This item is ADM/CAO approved, Jan 14, 2021.

[redacted] - 14 Jan 2021 8:36 am

Legend

Treasury Board Secretariat Approval - Ontario Digital Services



RE: Flolet Research Approval Package – Message (HTML)

File Message Help ADOBE PDF Tell me what you want to do

Ignore Delete Archive Reply Reply All Forward Meeting IM More Protect PCI Manager C... To Manager Team Email Done Reply & Delete Create New Move Rules OneNote Actions Mark Unread Categorize Follow Up Translate Find Related Select Read Aloud Zoom Report Phishing Share to Teams

Delete Respond Protection Quick Steps Move Tags Editing Speech Zoom Security Teams

Sensitivity: OPS - Unclassified Information

RE: Flolet Research Approval Package

FC [redacted]

Reply Reply All Forward

03/02/2021

[redacted] can you coordinate with [redacted] if he will send the email out.

Flo – I am fine with the rest of the process.

Thanks

[redacted]

Executive Assistant | Deputy Minister's Office
Ontario Digital Service
Cell: (416) 558-6994

From: Loney-Burnett, Flolet (TBS) <Flolet.Loney-Burnett@ontario.ca>
Sent: March 2, 2021 12:41 PM
To: [redacted]tario.ca>
Cc: [redacted]
Subject: RE: Flolet Research Approval Package

Good Afternoon [redacted]

I wanted check with you on next steps and ODS protocols. The next steps are as follows and could be lined up for tomorrow March 3rd:

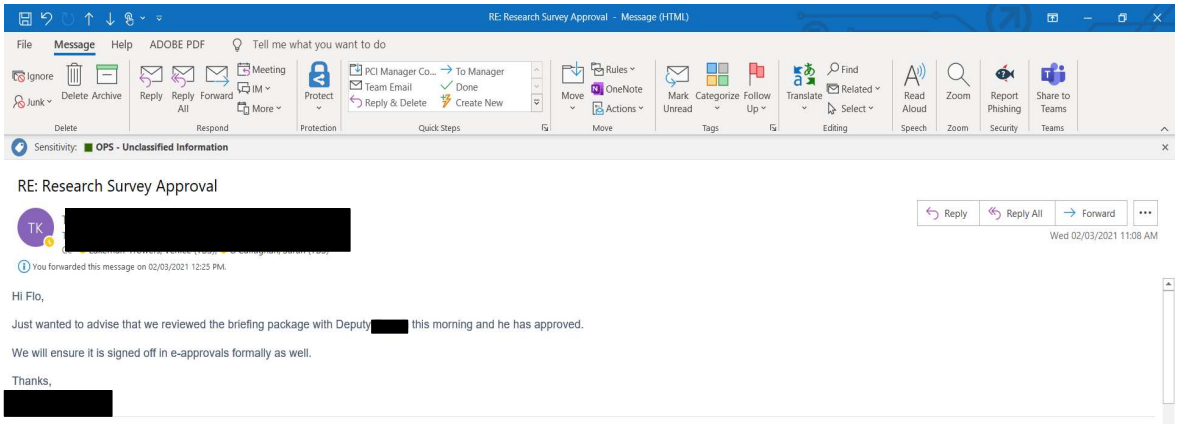
1. Email to all staff from ODS Executive- see Appendix 3. I gave a Rob a heads that we may ask him, and he was OK to do it. Let me know if it would be better/more expedient coming from someone else in ODS.
2. Email from me to ODS staff providing the Survey Consent Form and Ethics (Appendices 1 and 4).
3. Survey from me to ODS staff sent out via Survey Monkey email

I will resend the package with the appendices, for ease of reference.

Thank you so much and please let me know.

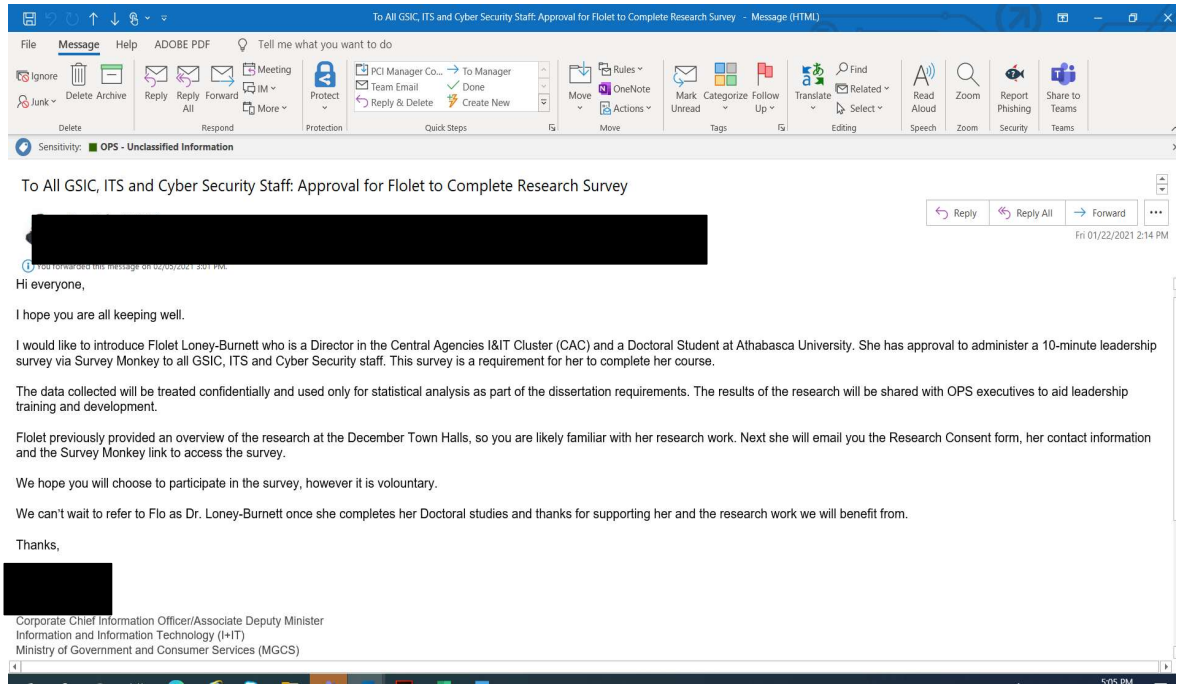
Flo

Treasury Board Secretariat Approval – Central Agencies I&IT Cluster



Appendix C: CIO Email to MGCS Staff

Government Service Integration Cluster, Cyber Security Division and Information Technology Services Division



To All GSIC, ITS and Cyber Security Staff: Approval for Flolet to Complete Research Survey - Message (HTML)

File Message Help ADOBE PDF Tell me what you want to do

Sensitivity: OPS - Unclassified Information

To All GSIC, ITS and Cyber Security Staff: Approval for Flolet to Complete Research Survey

[redacted]

Reply Reply All Forward

Fri 01/22/2021 2:14 PM

Hi everyone,

I hope you are all keeping well.

I would like to introduce Flolet Loney-Burnett who is a Director in the Central Agencies I&IT Cluster (CAC) and a Doctoral Student at Athabasca University. She has approval to administer a 10-minute leadership survey via Survey Monkey to all GSIC, ITS and Cyber Security staff. This survey is a requirement for her to complete her course.

The data collected will be treated confidentially and used only for statistical analysis as part of the dissertation requirements. The results of the research will be shared with OPS executives to aid leadership training and development.

Flolet previously provided an overview of the research at the December Town Halls, so you are likely familiar with her research work. Next she will email you the Research Consent form, her contact information and the Survey Monkey link to access the survey.

We hope you will choose to participate in the survey, however it is voluntary.

We can't wait to refer to Flo as Dr. Loney-Burnett once she completes her Doctoral studies and thanks for supporting her and the research work we will benefit from.

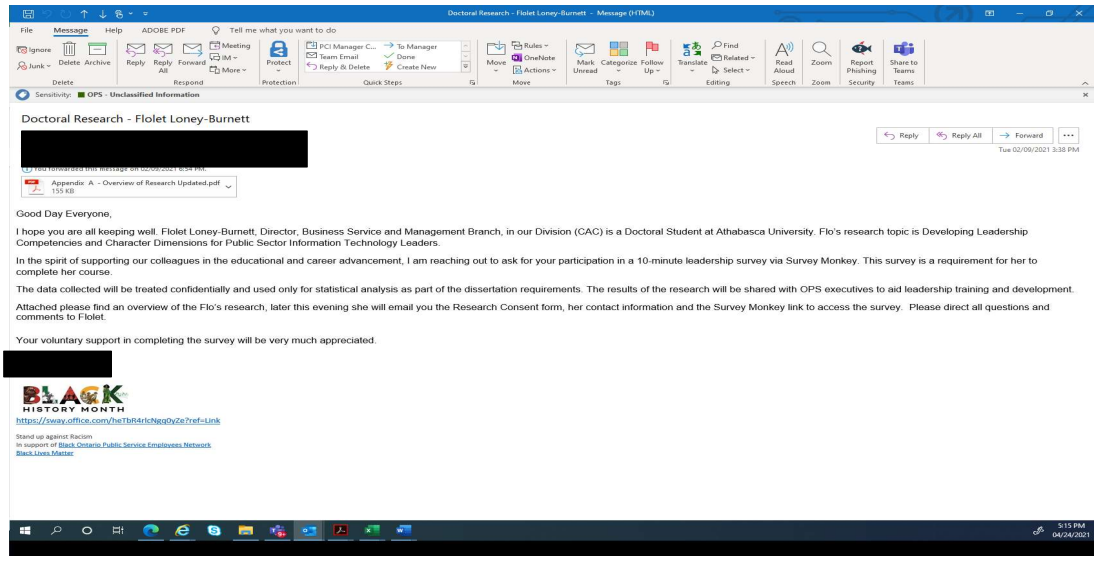
Thanks,

[redacted]

Corporate Chief Information Officer/Associate Deputy Minister
Information and Information Technology (I+IT)
Ministry of Government and Consumer Services (MGCS)

CIO Email to Treasury Board Secretariat Staff

Central Agencies I&IT Cluster Division



Doctoral Research - Flolet Loney-Burnett - Message (HTML)

File Message Help ADOBE PDF Tell me what you want to do

Sensitivity: OPS - Unclassified Information

Doctoral Research - Flolet Loney-Burnett

[redacted]

Reply Reply All Forward

Tue 02/09/2021 3:38 PM

Appendix A - Overview of Research Updated.pdf 155 KB

Good Day Everyone,

I hope you are all keeping well. Flolet Loney-Burnett, Director, Business Service and Management Branch, in our Division (CAC) is a Doctoral Student at Athabasca University. Flo's research topic is Developing Leadership Competencies and Character Dimensions for Public Sector Information Technology Leaders.

In the spirit of supporting our colleagues in the educational and career advancement, I am reaching out to ask for your participation in a 10-minute leadership survey via Survey Monkey. This survey is a requirement for her to complete her course.

The data collected will be treated confidentially and used only for statistical analysis as part of the dissertation requirements. The results of the research will be shared with OPS executives to aid leadership training and development.

Attached please find an overview of the Flo's research, later this evening she will email you the Research Consent form, her contact information and the Survey Monkey link to access the survey. Please direct all questions and comments to Flolet.

Your voluntary support in completing the survey will be very much appreciated.

[redacted]

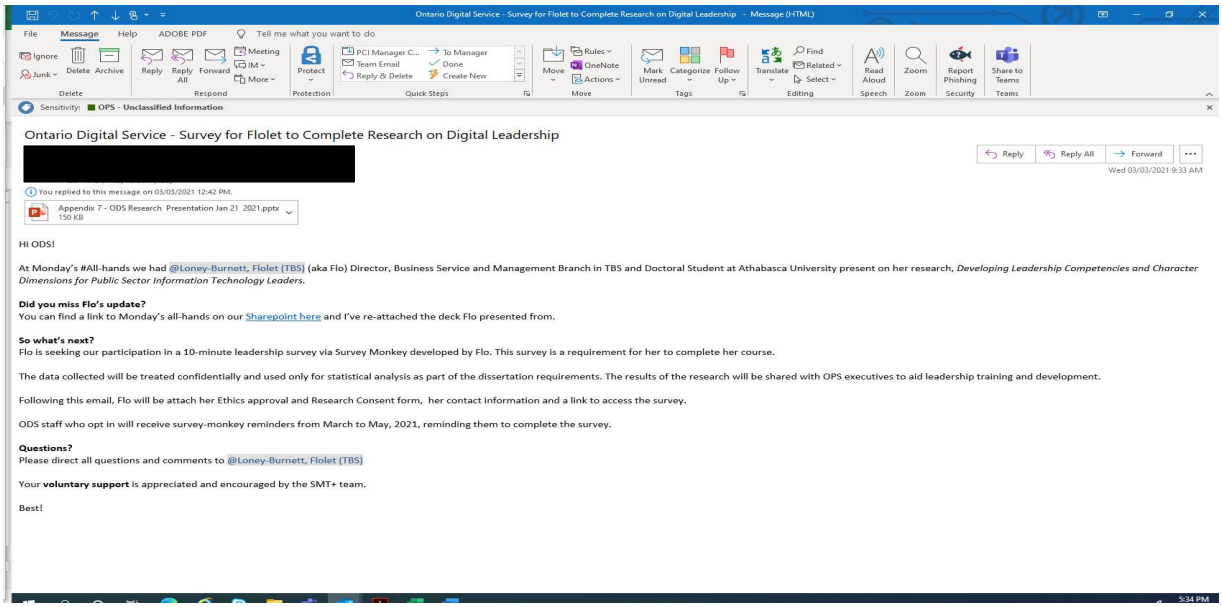
BLACK HISTORY MONTH

https://sway.office.com/heTbR4rIcNgq0yZe?ref=Link

Stand up against Racism
In support of Black Ontario Public Service Employees Network
Black Lives Matter

Executive Email to Treasury Board Secretariat Staff

Ontario Digital Services Division



Ontario Digital Service - Survey for Flolet to Complete Research on Digital Leadership - Message (HTML)

File Message Help ADOBE PDF Tell me what you want to do

Ignore Delete Archive Reply Reply All Forward Meeting IM More Protect PCI Manager C... Team Email Reply & Delete To Manager Done Create New Move Rules OneNote Actions Mark Unread Categorize Follow Up Translate Find Related Select Read Aloud Zoom Report Phishing Share to Teams

Delete Respond Protection Quick Steps Move Tags Editing Speech Zoom Security Teams

Sensitivity: OPS - Unclassified Information

Ontario Digital Service - Survey for Flolet to Complete Research on Digital Leadership

[redacted]

Reply Reply All Forward

Wed 03/03/2021 9:33 AM

You replied to this message on 03/03/2021 12:42 PM.

Appendix 7 – ODS Research Presentation Jan 21 2021.pptx
150 KB

Hi ODS!

At Monday's #All-hands we had @Loney-Burnett, Flolet (TBS) (aka Flo) Director, Business Service and Management Branch in TBS and Doctoral Student at Athabasca University present on her research, *Developing Leadership Competencies and Character Dimensions for Public Sector Information Technology Leaders.*

Did you miss Flo's update?
You can find a link to Monday's all-hands on our Sharepoint here and I've re-attached the deck Flo presented from.

So what's next?
Flo is seeking our participation in a 10-minute leadership survey via Survey Monkey developed by Flo. This survey is a requirement for her to complete her course.

The data collected will be treated confidentially and used only for statistical analysis as part of the dissertation requirements. The results of the research will be shared with OPS executives to aid leadership training and development.

Following this email, Flo will be attach her Ethics approval and Research Consent form, her contact information and a link to access the survey.

ODS staff who opt in will receive survey-monkey reminders from March to May, 2021, reminding them to complete the survey.

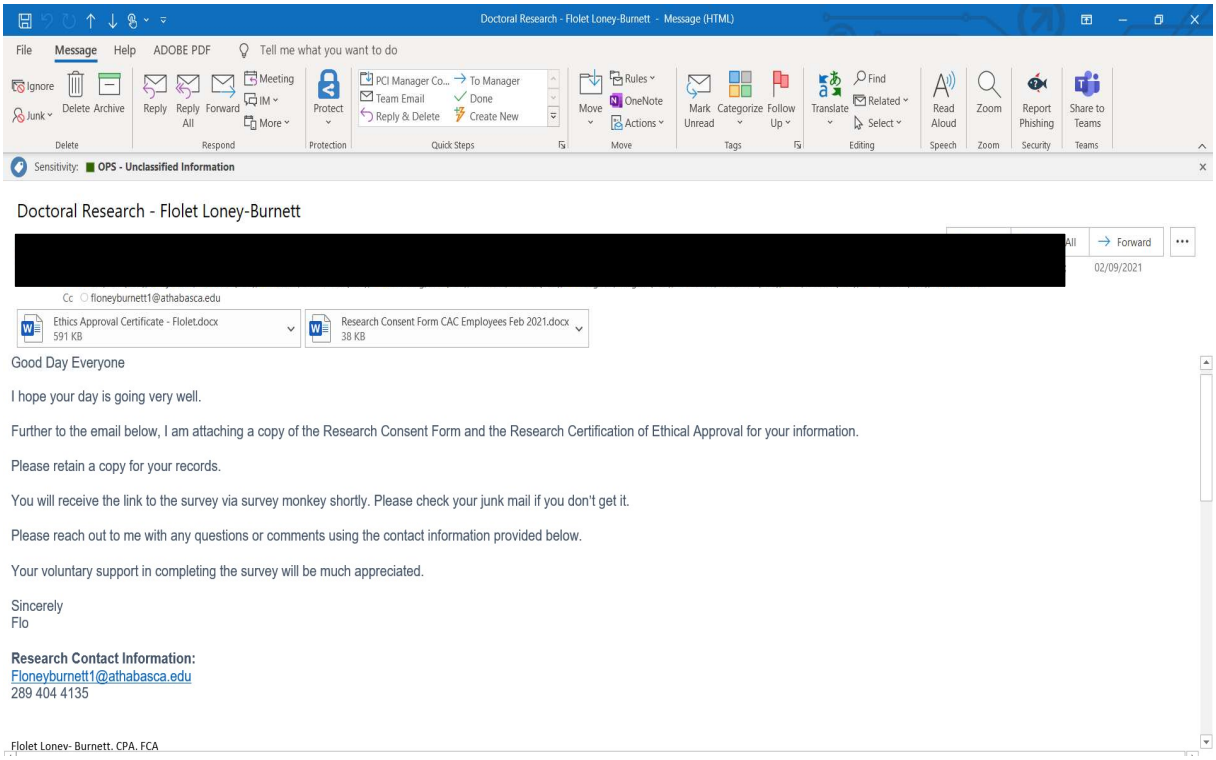
Questions?
Please direct all questions and comments to @Loney-Burnett, Flolet (TBS)

Your **voluntary support** is appreciated and encouraged by the SMT+ team.

Best!

5:34 PM

Appendix D: Research Email Sent to Participants by the Researcher



Doctoral Research - Flolet Loney-Burnett - Message (HTML)

File Message Help ADOBE PDF Tell me what you want to do

Ignore Junk Delete Archive Reply Reply All Forward Meeting IM More Protect PCI Manager Co... To Manager Team Email Done Reply & Delete Create New Move Rules OneNote Actions Mark Unread Categorize Follow Up Translate Find Related Select Read Aloud Zoom Report Phishing Share to Teams

Delete Respond Protection Quick Steps Move Tags Editing Speech Zoom Security Teams

Sensitivity: OPS - Unclassified Information

Doctoral Research - Flolet Loney-Burnett

[redacted] Forward

02/09/2021

Cc floneyburnett1@athabasca.edu

Ethics Approval Certificate - Flolet.docx 591 KB

Research Consent Form CAC Employees Feb 2021.docx 38 KB

Good Day Everyone

I hope your day is going very well.

Further to the email below, I am attaching a copy of the Research Consent Form and the Research Certification of Ethical Approval for your information.

Please retain a copy for your records.

You will receive the link to the survey via survey monkey shortly. Please check your junk mail if you don't get it.

Please reach out to me with any questions or comments using the contact information provided below.

Your voluntary support in completing the survey will be much appreciated.

Sincerely
Flo

Research Contact Information:
Floneyburnett1@athabasca.edu
289 404 4135

Flolet Loney- Burnett, CPA, FCA

Appendix E: Research Survey

Questionnaire

Section 1 – Participant Consent

I have read all the information provided regarding this survey and freely consent to be a participant.

By completing this questionnaire, I have consented to participate in this study.

Section 2 – Leadership Competencies

Instructions:

Please review statements 1-18 below and based on your experience working with leadership teams, rate how important it is for leaders to demonstrate these competencies regularly. As you complete this section, think about the work you and your leadership team have done over the past year related to developing new strategies, solving business challenges and making complex decisions.

A score of (1) = Rarely up to a score of (7) = Almost Always and denotes the extent to which you think it is important that each aspect of leadership competence be demonstrated frequently in your organization. In selecting your ratings throughout the questionnaire, please reflect on the same leader or group of leaders.

a. **Anticipate**, which includes having the skills and ability to gather and evaluate information from a wide network of experts and predict changes in the market environment

	Rarely						Almost Always
1. Gathers information from a wide network of experts and sources both inside and outside of the industry of function	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

2. Anticipates activities to be discontinued in business areas by developing greater proactive and reactive strengths	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
3. Predicts competitors potential moves to new initiatives or products	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

b. **Challenge**, which includes having the ability and willingness to challenge status quo by analyzing problems from diverse perspectives, reduce redundant tasks and anticipate activities to be discontinued by developing greater proactive strengths

	Rarely						Almost Always
4. Reframes a problem from several angles to understand the root causes	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
5. Asserts views persuasively and authoritatively taking into consideration their impact on decision making and project success	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
6. Seeks out diverse views to see multiple sides of an issue	☑ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

c. **Decide**, which includes having the knowledge, skills and ability to build decision making maturity, to balance long-term investment for growth with short term pressures for results and to factor multiple scenarios and stakeholder trade-offs in the decision-making process by determining risks and unintended consequences for customers and other stakeholders

	Rarely						Almost Always
7. Assesses the organization's maturity in operating formal decision making committees with responsibility and authority for IT governance	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
8. Balances long-term investment decisions for growth with short	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

term pressures for results

9. Determines trade-offs, risks and unintended consequences for customers and other stakeholders when making decisions	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

d. **Align**, which include having the skills and ability to manage stakeholders' interests and align it with organizational goals

	Rarely						Almost Always
10. Builds online relationships with stakeholders from the same field	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
11. Uses online network to benefit you and your organization	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
12. Assesses stakeholder tolerance and motivation for change	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
13. Pinpoints and address conflicting interests among stakeholders	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

e. **Learn**, which includes having the skills, knowledge and willingness to utilize the internet to follow trends, to communicate failures and successes to cultivate a learning culture, to evaluate new information to generate knowledge to assist decision making and to change course as needed

	Rarely						Almost Always
14. Transforms existing information into new knowledge	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
15. Identifies, evaluates and import new information and knowledge	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
16. Uses accumulated information and knowledge to assist decision making	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

17. Communicates stories about successes and failures to promote institutional learning	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
18. Course corrects on the basis of disconfirming evidence, even after a decision has been made	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Section 3 - Character Dimensions

Instructions:

Please review statements 19-29 below and based on your experience working with leadership teams, rate how important it is for leaders to demonstrate each character element regularly. As you complete this section, think about the work you and your leadership team have done over the past year related to developing new strategies, solving business challenges, and making complex decisions.

A score of 1 = Not at all Important up to a score of 7 = Extremely Important and denotes the extent to which you think it is important that each aspect of leadership competence be demonstrated in your organization. In selecting your ratings throughout the questionnaire, please reflect on the same leader or group of leaders.

f. **Collaboration**, which includes having core values that support being open-minded, collegial, flexible and interconnected

	Not at all Important						Extremely Important
19. Being Cooperative	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
20. Being Flexible	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
21. Being Inter-Connected	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

g. **Accountability**, which includes having the virtues and moral grounding for taking ownership, accepting consequences, being responsible and conscientious

	Not at all Important						Extremely Important
22. Being Conscientious	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

23. Being Responsible	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
24. Taking Ownership	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
25. Accepting Consequences	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

h. **Judgement**, which includes having the emotional intelligence and ethics to be situationally aware, cognitively complex, analytical, decisive, critical thinker, intuitive, insightful, pragmatic and adaptable

	Not at all Important						Extremely Important
26. Being Critical Thinkers	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
27. Being Insightful	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
28. Being Analytical	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
29. Being Cognitively Complex	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Section 4 – Effective Leadership

Instructions:

Please review the statements 30-44 below and based on your experience working with leadership teams, select the rating that reflects what you think is the most important behaviour leaders should display to succeed in a digital workplace.

A score of (1) = Lowest Importance up to a score of (7) = Highest Importance and denotes the level of importance you place on each aspect of effective leadership behaviour being displayed in your organization. In selecting your ratings throughout the questionnaire, please reflect on the same leader or group of leaders.

i. **Transformative Vision**, which includes behaviours that demonstrate good business acumen, knowledge of the operating market and evolving trends, as well as being an astute problem solver

	Lowest						Highest
30. Demonstrates Knowledge of Market and Trends	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
31. Demonstrates good Business Acumen	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
32. Displays Problem-Solving Skills	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

j. Forward Looking, which includes behaviours that demonstrate great foresight, a clear vison for the future of the organization and sound strategies to address business challenges

	Lowest						Highest
33. Articulates a Clear Vision	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
34. Develops Sound Strategies	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
35. Demonstrates Foresight	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

k. Integrates Technology, which includes behaviours that mobilize and deploy information technology resources to support business strategies, Access Data and valuable resources in real time from business partners and experience, as well as strong digital literacy

	Lowest						Highest
36. Aggregates relevant information from business partners, suppliers and customers	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
37. Accesses data and valuable resources in real time from business partners	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
38. Integrates digital technologies to streamline business processes with suppliers, distributors and customers	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

l. Change Oriented, which includes behaviours that demonstrate innovation in solving problems, open-minded to new ideas and adaptable to change

	Lowest						Highest
39. Demonstrates Open-Mindedness	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
40. Displays Adaptability	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
41. Displays Innovativeness	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

m. Leading Others, which includes behaviours that create a motivating environment, build cohesive teams and resolves conflicts

	Lowest						Highest
42. Builds a Motivating Environment	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
43. Builds Cohesive Teams	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
44. Resolves Conflicts	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Section 5 – Participant Background

Instructions:

Please review questions 40 - 44 below and select one answer for each question.

45. Please check the box that best describes the length of your **years of service** working for the Ontario Public Service.

1 -10 ☐ 11 – 19 ☐ 20 – 29 ☐ 30 and over ☐

46. Please check the box that best describes your **gender**.

Male ☐ Female ☐ Transgender ☐ Other ☐

47. What is your highest **level of education**?

High School ☐ Post-Secondary ☐ Graduate Level ☐

48. Which business area do you **work in**?

Information Technology ☐ Other Program Areas ☐

49. Which category best describes your **job level**?

General Staff ☐

Supervisor ☐

Manager ☐

Director ☐

Assistant Deputy Minister/Chief Information Officer or above ☐

Section 6 – Thank You

Thank you for taking the time to complete this survey. The information you provided will be kept in the strictest confidence and will only be used for the purposes of this course work.

Best Regards

Flolet Loney-Burnett

289 404 4135 or Flo.Loney-Burnett@fb.athabascau.ca

Appendix F: Measurement Items

Measurement Items

Latent Variables	Observable Variables	Source	Measurement Items
Anticipate	AN1	Schoemaker, P., Krupp, S. & Howland, S. (2013).	Rarely/Almost Always (1-7 scale) Gathers information from a wide network of experts and sources both inside and outside of the industry of function (AN1)
	AN2	Mikalef, P. & Pateli, A. (2017).	Rarely/Almost Always (1-7 scale) Anticipates activities to be discontinued in business areas by developing greater proactive and reactive strengths (AN2)
	AN3	Schoemaker, P., Krupp, S. & Howland, S. (2013).	Rarely/Almost Always (1-7 scale) Predict competitors potential moves to new initiatives or products (AN3)
Challenge	CH1	Schoemaker, P., Krupp, S. & Howland, S. (2013).	Rarely/Almost Always (1-7 scale) Reframe a problem from several angles to understand the root causes (CH1)
	CH2	Trivellas, P. & Drimoussis, C. (2013).	Rarely/Almost Always (1-7 scale) Asserts views persuasively and authoritatively taking into consideration their impact on decision making and project success (CH2)
	CH3	Schoemaker, P., Krupp, S. & Howland, S. (2013).	Rarely/Almost Always (1-7 scale) Seeks out diverse views to see multiple sides of an issue (CH3)
Decide	DE1	Tonelli, A., Henrique, P., de Souza Bermejo, Aparecida dos Santos, P., Zuppo, L. & Zambalde, A. (2015).	Rarely/Almost Always (1-7 scale) Assesses the organization's maturity in operating formal decision making committees with responsibility and authority for IT governance (DE1)
	DE2	Schoemaker, P., Krupp, S. & Howland, S. (2013).	Rarely/Almost Always (1-7 scale) Balance long-term investment for grow with short term pressures for results (DE2)
	DE3	Schoemaker, P., Krupp, S. & Howland, S. (2013).	Rarely/Almost Always (1-7 scale) Determines trade-offs, risks and unintended consequences for customers and other stakeholders when making decisions (DE3)
Align	AL1	van Laar, E., van Deursen, A., van Dijk, J. & de Haan, J. (2019).	Rarely/Almost Always (1-7 scale) Builds online relationships with stakeholders from the same field (AL1)
	AL2	van Laar, E., van Deursen, A., van Dijk, J. & de Haan, J. (2019).	Rarely/Almost Always (1-7 scale) Uses online network to benefit you and your organization (AL2)
	AL3	Schoemaker, P., Krupp, S. & Howland, S. (2013).	Rarely/Almost Always (1-7 scale) Assess stakeholder tolerance and motivation for change (AL3)
	AL4	Schoemaker, P., Krupp, S. & Howland, S. (2013).	Rarely/Almost Always (1-7 scale) Pinpoints and addresses conflicting interests among stakeholders (AL4)
Learn	LE1	Mikalef, P. & Pateli, A. (2017).	Rarely/Almost Always (1-7 scale) Transforms existing information into new knowledge (LE1)
	LE2	Mikalef, P. & Pateli, A. (2017).	Rarely/Almost Always (1-7 scale) Identifies, evaluates and import new information and knowledge (LE2)

Latent Variables	Observable Variables	Source	Measurement Items
	LE3	Mikalef, P. & Pateli, A. (2017).	Rarely/Almost Always (1-7 scale) Uses accumulated information and knowledge to assist decision making (LE3)
	LE4	Schoemaker, P., Krupp, S. & Howland, S. (2013).	Rarely/Almost Always (1-7 scale) Communicates stories about successes and failures to promote institutional learning (LE4)
	LE5	Schoemaker, P., Krupp, S. & Howland, S. (2013).	Rarely/Almost Always (1-7 scale) Course corrects on the basis of disconfirming evidence, even after a decision has been made (LE5)
Collaboration	CO1	Crossan, M., Byrne, A., Seijts, G., Reno, M., Monzani, L. & Gandz, J. (2017).	Not at all Important/Extremely Important (1-7 scale) Being Cooperative (CO1)
	CO2	Crossan, M., Byrne, A., Seijts, G., Reno, M., Monzani, L. & Gandz, J. (2017).	Not at all Important/Extremely Important (1-7 scale) Being Flexible (CO2)
	CO3	Crossan, M., Byrne, A., Seijts, G., Reno, M., Monzani, L. & Gandz, J. (2017).	Not at all Important/Extremely Important (1-7 scale) Being Inter-Connected (CO3)
Accountability	AC1	Crossan, M., Byrne, A., Seijts, G., Reno, M., Monzani, L. & Gandz, J. (2017).	Not at all Important/Extremely Important (1-7 scale) Being Conscientious (AC1)
	AC2	Crossan, M., Byrne, A., Seijts, G., Reno, M., Monzani, L. & Gandz, J. (2017).	Not at all Important/Extremely Important (1-7 scale) Being Responsible (AC2)
	AC3	Crossan, M., Byrne, A., Seijts, G., Reno, M., Monzani, L. & Gandz, J. (2017).	Not at all Important/Extremely Important (1-7 scale) Taking Ownership (AC3)
	AC4	Crossan, M., Byrne, A., Seijts, G., Reno, M., Monzani, L. & Gandz, J. (2017).	Not at all Important/Extremely Important (1-7 scale) Accepting Consequences (AC4)
Judgement	JU1	Crossan, M., Byrne, A., Seijts, G., Reno, M., Monzani, L. & Gandz, J. (2017).	Not at all Important/Extremely Important (1-7 scale) Being Critical Thinkers (JU1)
	JU2	Crossan, M., Byrne, A., Seijts, G., Reno, M., Monzani, L. & Gandz, J. (2017).	Not at all Important/Extremely Important (1-7 scale) Being Insightful (JU2)
	JU3	Crossan, M., Byrne, A., Seijts, G., Reno, M., Monzani, L. & Gandz, J. (2017).	Not at all Important/Extremely Important (1-7 scale) Being Analytical (JU3)
	JU4	Crossan, M., Byrne, A., Seijts, G., Reno, M., Monzani, L. & Gandz, J. (2017).	Not at all Important/Extremely Important (1-7 scale) Being Cognitively Complex (JU4)
Transformative Vision	TV1	Kane, G., Phillips, A., Copulsky, J. & Andrus, G. (2019).	Lowest/ Highest (1-7 scale) Demonstrates Knowledge of Market and Trends (TV1)
	TV2	Kane, G., Phillips, A., Copulsky, J. & Andrus, G. (2019).	Lowest/ Highest (1-7 scale) Demonstrates good Business Acumen (TV2)
	TV3	Kane, G., Phillips, A., Copulsky, J. & Andrus, G. (2019).	Lowest/ Highest (1-7 scale) Display Problem-Solving Skills (TV3)

Latent Variables	Observable Variables	Source	Measurement Items
Forward Looking	FL1	Kane, G., Phillips, A., Copulsky, J. & Andrus, G. (2019).	Lowest/ Highest (1-7 scale) Articulate a Clear Vision (FL1)
	FL2	Kane, G., Phillips, A., Copulsky, J. & Andrus, G. (2019).	Lowest/ Highest (1-7 scale) Develop Sound Strategies (FL2)
	FL3	Kane, G., Phillips, A., Copulsky, J. & Andrus, G. (2019).	(Lowest/Highest) (1-7 scale) Demonstrate Foresight (FL3)
Integrates Technology	IT1	Mikalef, P. & Pateli, A. (2017).	(Lowest/Highest) (1-7 scale) Mobilizes and deploys information technology resources to support business strategies (IT1)
	IT2	Mikalef, P. & Pateli, A. (2017).	(Lowest/Highest) (1-7 scale) Accesses data and valuable resources in real time from business partners (IT2)
	IT3	Mikalef, P. & Pateli, A. (2017).	(Lowest/Highest) (1-7 scale) Integrates Digital technologies to streamline business processes with suppliers, distributors and customers (IT3)
Change Oriented	CR1	Kane, G., Phillips, A., Copulsky, J. & Andrus, G. (2019).	(Lowest/Highest) (1-7 scale) Demonstrates Open-Mindedness (CR1)
	CR2	Kane, G., Phillips, A., Copulsky, J. & Andrus, G. (2019).	Lowest/Highest) (1-7 scale) Displays Adaptability (CR2)
	CR3	Kane, G., Phillips, A., Copulsky, J. & Andrus, G. (2019).	Lowest/Highest) (1-7 scale) Displays Innovativeness (CR3)
Leading Others	LO1	Redick, A., Reyna, I., Schaffer, C. & Toomey, D. (2014).	Lowest/Highest) (1-7 scale) Builds a Motivating Environment (LO1)
	LO2	Redick, A., Reyna, I., Schaffer, C. & Toomey, D. (2014).	Lowest/Highest) (1-7 scale) Builds Cohesive Team (LO2)
	LO3	Redick, A., Reyna, I., Schaffer, C. & Toomey, D. (2014).	Lowest/Highest) (1-7 scale) Resolves Conflicts (LO3)

Appendix G: On-Line Participant Consent Form

Digital Leadership: Developing Leadership Competencies and Character Dimensions for Public-Sector Information Technology Leaders

ONLINE PARTICIPANT CONSENT FORM

Principal Researcher:

Flolet Loney-Burnett

FloneyBurnett1@athabasca.edu

289 404 4135

Supervisor:

Dr. Bangaly Kaba

Bangaly.Kaba@fb.athabascau.ca

587 594 9492

Good Day Colleague:

My name is Flolet Loney-Burnett and I am a student at Athabasca University completing a Doctorate in Business Administration, as well as an OPS employee. You are invited to participate in a research study about effective digital leadership in the Ontario Government. The study is an investigation of the impact of leadership competencies and character dimension on effective information technology leadership in a digital environment. I am conducting this study as a requirement to complete my doctoral studies.

The research topic is "Digital Leadership: Developing Leadership Competencies and Character Dimensions for Public-Sector Information Technology Leaders." As a participant, you are asked to participate in this study by completing a short online questionnaire about leadership competencies, character dimensions and effective information technology leadership. You will receive an email from Survey Monkey and participation will take approximately eight minutes of your time.

I have obtained TBS ministry approval to administer this survey and your participation is entirely voluntary. I have also obtained ethics approval from the university (please see attached). The benefits of participating in this research include an opportunity to support digital leadership research in the public sector and specifically our workplace, as well as an opportunity to identify the competencies and character dimensions you consider important for effective digital leadership. Risks of participating include contributing eight minutes of your time and the fact that the information is being collected digitally via Survey Monkey. Please note that the survey data may be initially collected and stored on a server in the U.S. and is subject to access under the U.S. Patriot Act until it is transferred from that server to my computer.

Involvement in this study is entirely voluntary and you may refuse to answer any questions or to share information that you are not comfortable with. You will not be asked to provide any personal or identifiable information or data. You may withdraw from the study at any time by simply closing out of your browser. Once you submit your completed survey however, data cannot be withdrawn as the survey is completely anonymous. Please retain a copy of this consent form for your records.

All hard copy research data will be kept in locked cabinets in my office. All electronic data will be kept in a password protected encrypted computer at my home office. The dissertation report will not contain any information that can identify any of the participants in this survey. Your name was selected from the OPS Global address list, as an employee in the Central Agencies I&IT Cluster.

Results of this study may be shared with the executive leadership of the Ontario Government to aid in leadership development and recruiting. The existence of the research will

be listed in an abstract posted online at the Athabasca University Library's Digital Thesis and Project Room and the final research paper will be publicly available.

This study has been reviewed by the Athabasca University Research Ethics Board. Should you have any comments or concerns regarding your treatment as a participant in this study, please contact the Research Ethics Officer at 1-800-788-9041, ext. 6718 or by e-mail to rebsec@athabascau.ca.

I am asking for your support to complete and submit the survey by Friday March 26, 2021. If you have any questions about this study or require further information, please contact Flolet Loney-Burnett or Dr. Bangaly Kaba using the contact information above.

Please retain a copy of this consent form for your records.

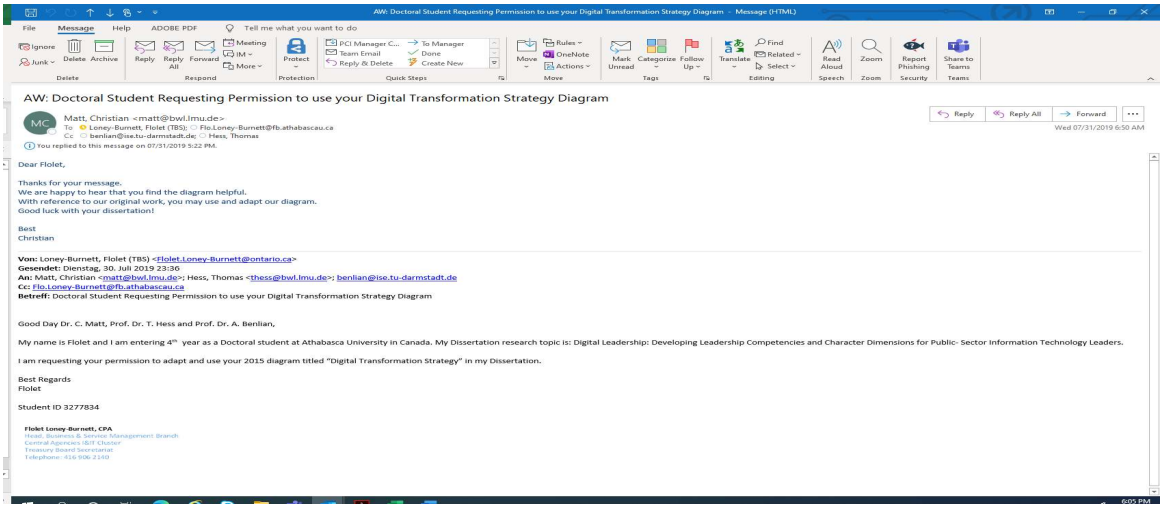
Thank you in advance for your assistance with this project.

Flolet Loney-Burnett

CONSENT:

The completion of the survey and its submission is viewed as my consent to participate.

Appendix H: Approvals to Reproduce Diagrams



AW: Doctoral Student Requesting Permission to use your Digital Transformation Strategy Diagram

Matt, Christian <matt@bwl.lmu.de>
To Loney-Burnett, Flolet (TBS); Flo.Loney-Burnett@fb.athabascau.ca
Cc benlian@ise.tu-darmstadt.de; Hess, Thomas
You replied to this message on 07/31/2019 5:22 PM.

Wed 07/31/2019 6:50 AM

Dear Flolet,

Thanks for your message.
We are happy to hear that you find the diagram helpful.
With reference to our original work, you may use and adapt our diagram.
Good luck with your dissertation!

Best
Christian

Von: Loney-Burnett, Flolet (TBS) <Flolet.Loney-Burnett@ontario.ca>
Gesendet: Dienstag, 30. Juli 2019 23:36
An: Matt, Christian <matt@bwl.lmu.de>; Hess, Thomas <thess@bwl.lmu.de>; benlian@ise.tu-darmstadt.de
Cc: Flo.Loney-Burnett@fb.athabascau.ca
Betreff: Doctoral Student Requesting Permission to use your Digital Transformation Strategy Diagram

Good Day Dr. C. Matt, Prof. Dr. T. Hess and Prof. Dr. A. Benlian,

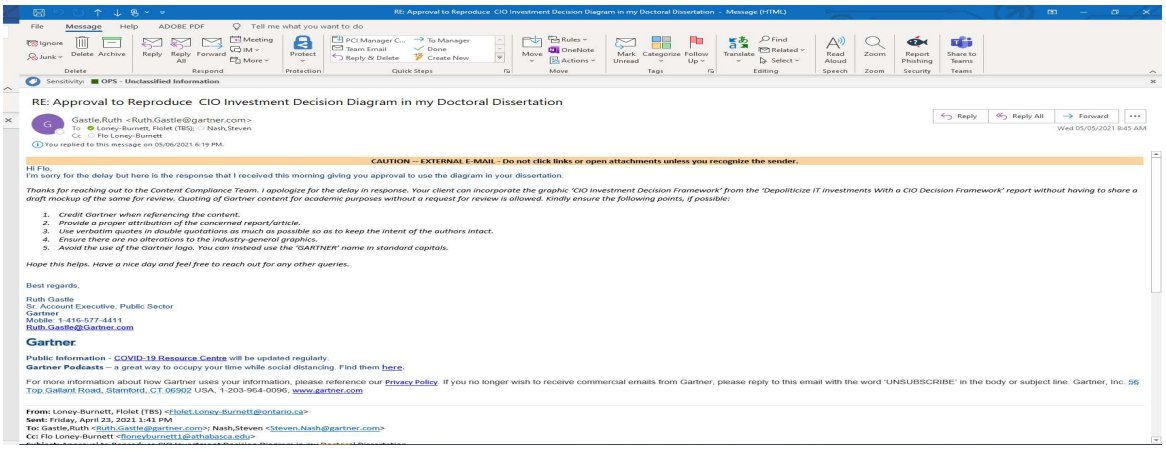
My name is Flolet and I am entering 4th year as a Doctoral student at Athabasca University in Canada. My Dissertation research topic is: Digital Leadership: Developing Leadership Competencies and Character Dimensions for Public- Sector Information Technology Leaders.

I am requesting your permission to adapt and use your 2015 diagram titled "Digital Transformation Strategy" in my Dissertation.

Best Regards
Flolet

Student ID 3277834

Flolet Loney-Burnett, CPA
Head, Business & Service Management Branch
Central Agencies I&IT Cluster
Treasury Board Secretariat
Telephone: 416 906 2140



RE: Approval to Reproduce CIO Investment Decision Diagram in my Doctoral Dissertation

Gastle,Ruth <Ruth.Gastle@gartner.com>
To Loney-Burnett, Flolet (TBS); Nash,Steven
Cc Flo Loney-Burnett
You replied to this message on 05/06/2021 6:19 PM.

Wed 05/05/2021 8:45 AM

Sensitivity: OPS - Unclassified Information

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Hi Flo,
I'm sorry for the delay but here is the response that I received this morning giving you approval to use the diagram in your dissertation.

Thanks for reaching out to the Content Compliance Team. I apologize for the delay in response. Your client can incorporate the graphic 'CIO Investment Decision Framework' from the 'Depoliticize IT Investments With a CIO Decision Framework' report without having to share a draft mockup of the same for review. Quoting of Gartner content for academic purposes without a request for review is allowed. Kindly ensure the following points, if possible:

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Hope this helps. Have a nice day and feel free to reach out for any other queries.

Best regards,

Ruth Gastle
Sr. Account Executive, Public Sector
Gartner
Mobile: 1-416-577-4411
Ruth.Gastle@Gartner.com

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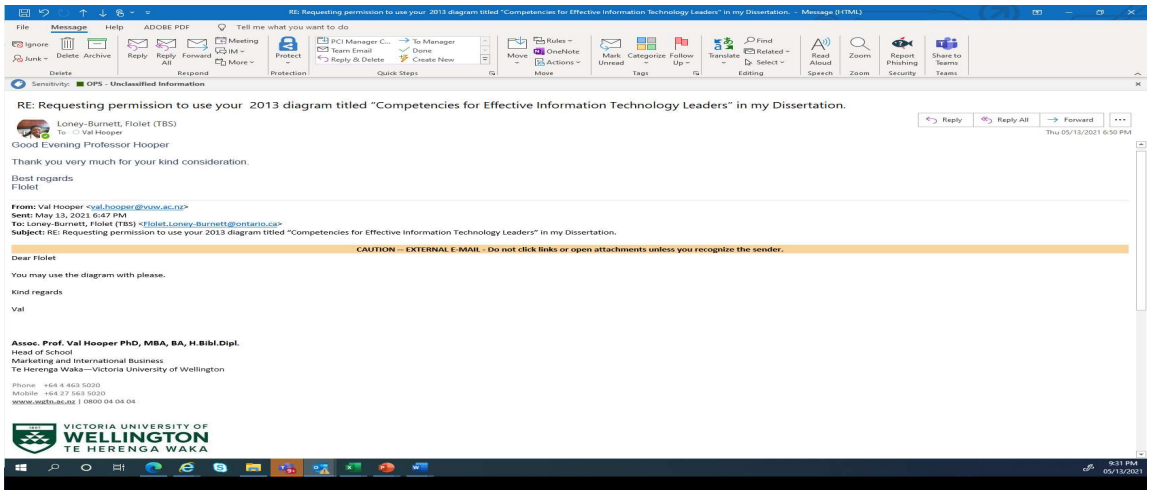
From: Loney-Burnett, Flolet (TBS) <Flolet.Loney-Burnett@ontario.ca>
Sent: Friday, April 23, 2021 1:41 PM
To: Gastle,Ruth <Ruth.Gastle@gartner.com>; Nash,Steven <Steven.Nash@gartner.com>
Cc: Flo Loney-Burnett <floneyburnett1@athabasca.edu>



RE: Requesting permission to use your 2013 diagram titled "Competencies for Effective Information Technology Leaders" in my Dissertation.

Loney-Burnett, Flolet (TBS)
To Val Hooper

Thu 05/13/2021 6:50 PM

Good Evening Professor Hooper

Thank you very much for your kind consideration.

Best regards
Flolet

From: Val Hooper <val.hooper@vuw.ac.nz>
Sent: May 13, 2021 6:47 PM
To: Loney-Burnett, Flolet (TBS) <Flolet.Loney-Burnett@ontario.ca>
Subject: RE: Requesting permission to use your 2013 diagram titled "Competencies for Effective Information Technology Leaders" in my Dissertation.

CAUTION -- EXTERNAL E-MAIL - Do not click links or open attachments unless you recognize the sender.

Dear Flolet

You may use the diagram with please.

Kind regards

Val

Assoc. Prof. Val Hooper PhD, MBA, BA, H.Bibl.Dipl.
Head of School
Marketing and International Business
Te Herenga Waka—Victoria University of Wellington

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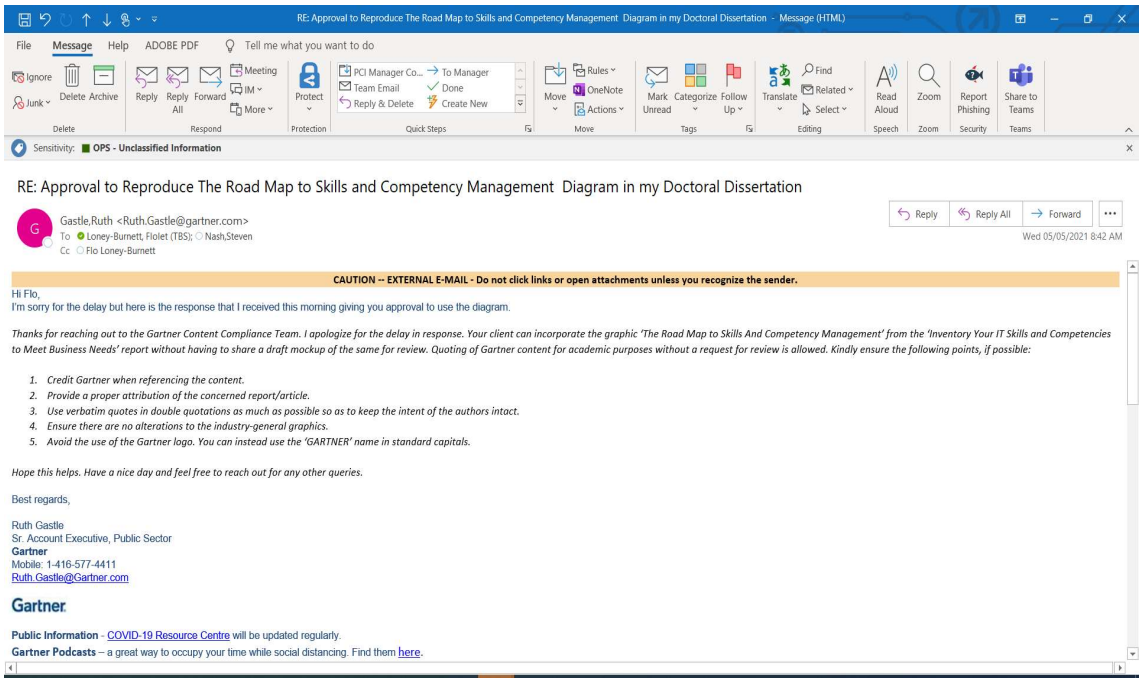

RE: Approval to Reproduce The Road Map to Skills and Competency Management Diagram in my Doctoral Dissertation - Message (HTML)

File Message Help ADOBE PDF Tell me what you want to do

Ignore Junk Delete Archive Reply Reply All Forward Meeting IM More Protect PCI Manager Co... Team Email Reply & Delete To Manager Done Create New Move Rules OneNote Actions Mark Unread Categorize Follow Up Translate Find Related Select Read Aloud Zoom Report Phishing Share to Teams

Delete Respond Protection Quick Steps Move Tags Editing Speech Zoom Security Teams

Sensitivity: OPS - Unclassified Information

RE: Approval to Reproduce The Road Map to Skills and Competency Management Diagram in my Doctoral Dissertation

Gastle,Ruth <Ruth.Gastle@gartner.com>
To Loney-Burnett, Flolet (TBS); Nash,Steven
Cc Flo Loney-Burnett

Reply Reply All Forward

Wed 05/05/2021 8:42 AM

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Hi Flo,
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Thanks for reaching out to the Gartner Content Compliance Team. I apologize for the delay in response. Your client can incorporate the graphic 'The Road Map to Skills And Competency Management' from the 'Inventory Your IT Skills and Competencies to Meet Business Needs' report without having to share a draft mockup of the same for review. Quoting of Gartner content for academic purposes without a request for review is allowed. Kindly ensure the following points, if possible:

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Hope this helps. Have a nice day and feel free to reach out for any other queries.

Best regards,

Ruth Gastle
Sr. Account Executive, Public Sector
Gartner
Mobile: 1-416-577-4411
Ruth.Gastle@Gartner.com

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Appendix I: Definition of Key Terms

Digitalization – The move to a more business-centric operational environment has ushered in an era of digital operations (Kosorukov, 2017). Business areas are streamlining their operations to leverage digital platforms for improved products and services as well as customer experience (Kosorukov, 2017). Digitalization refers to the influence of digital media and platforms on decisions to restructure and change organizational culture, economy and ability to compete globally to achieve greater business value (El Sawy et al., 2016).

Leadership – Leadership is the ability to motivate others to change course and follow a defined strategic direction (Hidayat et al., 2017). Leadership is considered a reciprocal relationship and is demonstrated when followers chose to comply with the leader's direction even when some variables are unknown, and they don't fully understand the bigger picture (Moon, et al., 2017). Good leadership is facilitated using skills and technical knowledge (competence) guided by good values and judgement (character) for social influence (Rubens et al., 2018).

Character Dimensions – The comfort and alacrity with which leaders make difficult decisions under challenging circumstances reflects the relative strength of each dimension of their character (Byrne et al., 2018). The dimensions of good character are integrated and include courage, accountability, justice, judgement, temperance, integrity, humility, humanity, collaboration, drive and transcendence (Seijts et al., 2015).

Leadership Competence – Leadership competencies are knowledge, skills and acuities that allow leaders to inspire followers and can be grouped as cognitive, emotional and social intelligence (Sturm et al., 2016). Over the span of their careers leaders develop business knowledge and technical skills through formal education, on the job learning and problem

solving (Ready & Mulally, 2017). The ability to garner these capabilities and apply them to develop good strategies to address current issues, stems from competence (Naveen & Haranath, 2015). Competence is a key ingredient for good leadership and can be improved through deliberate learning and developmental activities such mentoring, coaching, job rotation, project work and formal training (Seijts et al., 2014).

Appendix J: Definition of Variables

a. Independent Variables for measuring leadership competence:

Anticipate: This variable reflects the leader's ability to gather and review information from multiple sources, evaluate the reliability of information, anticipate activities to be discontinued and predict changes in the market environment. The path for this variable is labelled H1 and questions 1, 2 and 3 are associated with this variable.

Challenge: This variable reflects the leader's willingness to challenge status quo by reviewing the problem from different perspectives, assert views persuasively and authoritatively and reduce redundant or overlapping tasks. The path for this variable is labelled H2 and questions 4 to 6 are associated with this variable.

Decide: This variable reflects the leader's ability to factor various scenarios and impacts on stakeholders in the decision-making process, balance the benefits of long and short-term investments in information technology and to assess the effectiveness of information technology decision-making committees. The path for this variable is labelled H3 and questions 7 to 9 are associated with this variable.

Align: This variable reflects the leader's ability to network, build stakeholder relationships, manage stakeholder expectations, resolve stakeholder conflicts and align their interests with that of the organization. The path for this variable is labelled H4 and questions 10 to 13 are associated with this variable.

Learn: This variable reflects the leader's willingness to follow trends on the internet to generate original ideas, to identify, evaluate and import new information and

knowledge, to use knowledge to assist decision making, to promote a culture of continuous learning and to change course as needed. The path for this variable is labelled H5 and questions 14 to 18 are associated with this variable.

b. Independent Variables for measuring character dimensions:

Collaboration: This variable reflects the leader's entrenched values and natural affinity to be cooperative, inter-connected and flexible. The path for this variable is labelled H6 and questions 19 to 21 are associated with this variable.

Accountability: This variable reflects the leader's entrenched psychological values influencing a willingness to be conscientious, to take ownership and responsibility as well as to be held accountable for the consequences of decisions made. The path for this variable is labelled H7 and questions 22 to 25 are associated with this variable.

Judgement: This variable reflects the leader's virtues influencing a predisposition to be a critical thinker, insightful, situationally aware, analytical and cognitively complex. The path for this variable is labelled H8 and questions 26 to 29 are associated with this variable.

c. Sub-constructs for measuring the Dependent Variable *Effective Leadership*:

***Transformative Vision*:** This sub-construct represents the leader's behaviours that support the ability to achieve outcomes by acquiring knowledge of the market, business trends, having good business acumen and by being a good problem solver. Questions 30 to 32 are associated with this variable.

***Forward Looking*:** This sub-construct connotes behaviours that support the leader's ability to achieve outcomes by having a clear vision and foresight to implement sound strategies. Questions 33 to 35 are associated with this variable.

***Integrates Technology*:** This sub-construct denotes behaviours that support the leader's willingness to achieve outcomes by mobilizing and deploying information technology to support business strategies, integrating digital technologies to streamline business processes with suppliers as well as to access data in real time from business partners. Questions 36 to 38 are associated with this variable.

***Change Oriented*:** This sub-construct reflects behaviours that support the leader's ability to achieve outcomes by being open-minded, adaptable and innovative. Questions 39 to 41 are associated with this variable.

***Leading Others*:** This sub-construct reflects behaviours that support the leader's ability to achieve outcomes as a strong leader by building a motivating environment, building cohesive teams and resolving conflicts. Questions 42 to 44 are associated with this variable.