CIO Leadership Characteristics and Styles

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Abstract

Although studies targeting CIO's leadership characteristics are numerous, studies examining CIOs' leadership styles are scarce. Today's CIOs are often members of the firm's C-level executive team with a wide range of leadership capabilities and characteristics that are not much different from those of the CEOs. What, then, are the characteristics and leadership styles for those CIOs? This literature review study attempts to answer those two questions by examining prior research on these topics. First, we examine prior literature identifying all studied characteristics and then, propose four categories to group them into meaningful sets. Second, we identify what leadership styles are used by researchers. And while the general leadership field has been evolving over the past twenty years shifting its focus and introducing new leadership styles, CIOs' leadership research is still entrapped in the old school of thinking. Consequently, we intend to stimulate new thinking about studying CIOs' characteristics and styles.

Keywords

Chief Information Officer, CIO, Leadership, Characteristics, Styles, Leadership theory.

Introduction

Today's chief information officers are often members of the firm's C-level executive team with a range of responsibilities that are not very much different from those of the CEOs (Banker et al. 2011). CIOs are now in charge of overseeing the information technology function, managing the firm's information resources, promoting information technology as an agent of change, offering vision, preparing a strategy, and ultimately creating business value (Banker et al. 2011). Nevertheless, CIOs and other C-level executives struggle to understand what defines CIO effectiveness. This struggle is echoed by many of the existing leadership studies that do not adequately address concerns that are unique to the challenges faced by CIOs (Karahanna and Watson 2006).

Chief Information Officers are expected to have leadership characteristics and capabilities that enable them to effectively direct a wide range of complex and diversified fields including security, relationship building, governance, shareholder wealth management, organizational performance, interacting, educating and influencing other top management team members in addition to implementing new technologies (Chun and Mooney 2009; Horner-Long and Schoenberg 2002; Hu et al. 2014a; Karahanna and Preston 2013; Kettinger et al. 2011; Nolan and McFarlan 2005; Strickland and Theodoulidis 2011). The complexity of the CIO role contributed to appointing different CIOs to many of the business units within the same corporation and to creating additional roles closely related to the CIO role. For example, we now see the emergence of the Chief Digital Officer (CDO) who is typically closer to the product experience than the CIO and manages the customer engagement part of the digital platform in addition to generating value around it (El Sawy et al. 2015).

What, then, are the characteristics and leadership styles for those CIOs? This literature review study attempts to answer those two questions by examining prior research on these topics.

Research into CIO leadership is multi-faceted and includes diverse topics like leadership styles, characteristics, and behaviors in addition to CIOs' roles, responsibilities and relationship with the top management team as illustrated in Figure 1. This is a literature review study with a focus on CIO leadership characteristics and styles. Some authors compare middle or senior management characteristics and leadership styles to those of CIOs while others select some characteristics for their studies without a clear justification of why this specific set of characteristics is chosen. In addition, most of the studies do not

identify a particular style of leadership associated with those CIOs or link a particular CIO's leadership style to measured or observed characteristics and behavior.

Consequently, the intent of this study is to stimulate new thinking about studying CIOs' characteristics and styles with two objectives. The first objective is to summarize the existing body of literature related to CIO's leadership characteristics and styles then to group these characteristics into logical categories. The second objective is to propose a new framework that links leadership characteristics to styles which can be further developed and empirically tested at a later time.

To achieve these objectives, this study continues as follows. Next section describes the review methodology followed by the literature review section. Then, the fourth section proposes a new framework to study CIO leadership characteristics. This framework groups the diverse characteristics into four distinct categories and defines the links among them. The study concludes with a discussion and future research section.
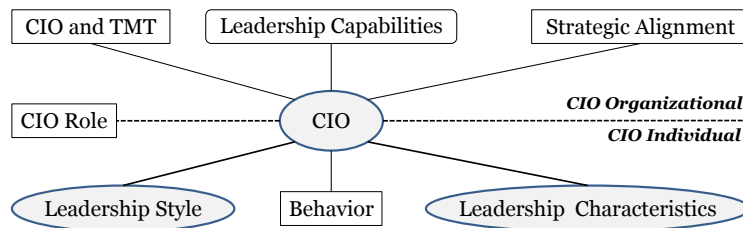
Figure 1: Summary of Topics in the CIO Leadership Literature

Methodology

The methodology adopted for this literature review paper is similar to the one described by Webster and Watson (2002). The key words used were chief information officer, CIO, information technology (IT) or information systems (IS) with leader*, leadership, role, behavior, character, characteristic, style, type or leadership theory. Combinations of these words were created using logical modifiers to combine (AND) or substitute (OR) in several search engines and databases: Google Scholar, Web of Science, ABI/INFORM Global, and ProQuest. Once a set of core papers was established, Google Scholar was used to conducting backward and forward searches on citations for relevant papers in addition to references that cited the selected works. We identified two groups of papers with 75 papers in the first group that addresses CIO leadership characteristics and behavior, and 18 articles in the second group that deals with CIO leadership style or type. After scanning the abstracts of these papers manually for relevance, we decided to retain 36 and 12 papers in the two groups respectively for further examination. Another set of papers that addresses CIO roles, responsibilities, alignment and relationship with top management teams is also located and consisted of 165 articles. The abstracts of these articles are also reviewed for relevance but they are beyond the scope of this literature review.

Literature Review Results

There is an active and on-going research on several themes related to CIOs' and information systems strategic leadership (Karahanna and Watson 2006). Several debates exist regarding whether CIOs are general or technical leaders and on what leadership characteristics are needed for them to succeed. In reference to Figure 1, we concentrate this article's effort on two elements of CIO leadership: characteristics and styles.

Leadership Characteristics

Literature has described effective CIOs as having specific personality characteristics. The authors counted 146 different characteristics that were either measured or discussed in the literature. There exists, however, a lack of logic and theory supporting why researchers choose to focus on specific CIO characteristics in their studies. Therefore, we suggest four general groups of characteristics in this paper based on how each group impacts the CIOs' behavior and relationships with others. This categorization scheme is based on

several criteria: the authors understanding of how these characteristics are manifested within the context of interaction between a CIO and his or her team, the philosophical dimensions and origins of these characteristics (Athanassoulis 2000; DePaul 2000; Harman 1999; Zaccaro 2007; Zalta and Abramsky 2003) and how general leadership studies view these characteristics (Avolio et al. 2009; Conger et al. 2000; Gregory Stone et al. 2004). The first category represents the fundamental characteristics which are typically static and to some degree stable and hard to change through training or coaching. The second category represents the relationship building characteristics manifested by inspiring and influencing others. This category is directly related to emotional intelligence and team building. The third category represents what distinguishes CIOs from other leaders. It deals with their expertise characteristics and includes elements of experience, tenure, education, and expertise. The final category addresses sensing, vision and risk-taking characteristics and it is labeled as sensing. Appendix A provides a summary of the literature highlighting what category of characteristics is addressed directly or through measured or observed behavior. It also indicates where a leadership style is explicitly referenced.

Fundamental characteristics

Over thirty fundamental characteristics describing CIOs or IT directors appeared between 2002 and 2015. CIOs' age and gender are considered by many authors (Enns et al. 2003; Karahanna and Preston 2013; Li and Tan 2013; Sobol and Klein 2009) and were often grouped with educational level, tenure, and functional background. Trust is also considered as an important attribute for leaders (Stewart 2002). Openness of CIOs is associated with innovation on the positive side and rigidity, inflexibility and lack of adaptability on the negative side (Gonzalez 2014; Horner-Long and Schoenberg 2002; Li and Tan 2013). Intelligence, integrity, self-confidence and fairness characteristics are highly desirable traits that CIO's peers and team members list as important (Gonzalez 2014; Horner-Long and Schoenberg 2002).

Relationship characteristics

These characteristics are related to understanding, motivating, inspiring and influencing people and are often associated with the emotional intelligence characteristics (Goleman 2004). Enns and McDonagh (2012, p. 1) assert that "Most of the CIOs in their study were able to successfully influence other executives to support … innovations which led to better IT-business alignment." Communicativeness describes the leader's ability to listen more and defend their arguments; as such, it has been linked to transformational versus transactional styles of leadership (Boot 2010; Enns and McDonagh 2012; Gupta et al. 2009). Interpersonal and relationship building characteristics (Horner-Long and Schoenberg 2002) are important to facilitate wider dialogue, establish understanding, trust, and cooperation among all stakeholders companies (Chen and Wu 2011) in addition to both direct reports and the top management team (Feeny et al. 1992). Finally, Correia and Joia (2014) identified the capacity to influence the organization and technical expertise as the two core competencies for CIOs.

Expertise characteristics

In 2002, Horner-Long and Schoenberg claimed that leaders of the future will require significantly greater skills in information technology and project management (Horner-Long and Schoenberg 2002). A decade later, McLean and Smits (2012, p. 8) stated, "Companies without strong technological leadership will be "blind-sided" by their competition and will fall increasingly behind in their ability to master new technological developments." Technical expertise, education, job tenure, organizational tenure, business skills, business savviness, innovativeness, being a nerd or a geek, planning expertise and competency represent CIOs' expertise category. Business savviness, also called strategic business knowledge, comes from education, training, and experience represented by tenure (Smaltz et al. 2006) and is related to setting clear expectations, efficient resource allocation, collection and dissemination of data, directing, maintaining good relationships, partnering with executives wisely, in addition to being a change agent, business expert, organizational designer, business visionary and business system thinker and implementer (Chen and Wu 2011; Enns and McDonagh 2012; Gupta et al. 2009; Wu et al. 2008). CIO's technical background influences his or her leadership style and organizational performance (Boot 2010; Gupta et al. 2009; Kettinger et al. 2011). Job tenure and organizational tenure were assessed by many researchers. For example, Li and Tan (2013) indicate that CIOs' tenure depends on the type of business, with shorter tenures in organizations whose prime capability is in exploring new product and market opportunities, and longer tenures in organizations relying on operational efficiency and economies of scale. Most IT leaders have a

technical undergraduate and business graduate degrees (Karanja and Zaveri 2012; Li and Tan 2013; Sobol and Klein 2009). Also, there is a link between educational background and leadership style: those with BAs are more likely to exhibit a transformational style of leadership (Boot 2010).

Sensing characteristics

Badaracco (1998, p. 2) asks an important question: "What combination of shrewdness, creativity, and tenacity will make my vision a reality?" Therefore, sensing, awareness, and reading the market (Peppard 2010), vision, risk-taking combined with entrepreneurial spirit, strategic and futuristic thinking (Li and Tan 2013) and capability to act at the right time are all important characteristics of this category. Maitlis and Christianson (2014, p. 57) state that "Sensemaking is the process through which people work to understand issues or events that are novel, ambiguous, confusing, or in some other way violate expectations. Sensemaking goes beyond interpretation and involves the active authoring of events and frameworks for understanding, as people play a role in constructing the very situations they attempt to comprehend." Sensemaking characteristics include awareness, sensing, intuitiveness, vision, strategizing, decisiveness and risk taking in addition to few other characteristics that are required to make sense of the environment and plan ahead. Researchers have posited that CIOs need to be visionary leaders (Correa and Joia 2014; Peppard 2010; Stewart 2002), strategic thinkers (Horner-Long and Schoenberg 2002; McLean and Smits 2012; Smaltz et al. 2006) and risk takers (Enns et al. 2003; Horner-Long and Schoenberg 2002; Li and Tan 2013). The entrepreneurial mentality is another sensing characteristic defined as the capacity and agility to respond quickly (Chen and Wu 2011; Chun and Mooney 2009; Enns and McDonagh 2012; Horner-Long and Schoenberg 2002; Wu et al. 2008).

Leadership Style

Compared to studies on leadership characteristics, there are only a handful of studies that explore leadership style as shown in Appendix A. Those articles mainly examine styles of leadership such as transactional or transformational. Boot (2010) concludes that CIOs practiced more transformational leadership while middle managers practiced more transactional leadership; however, this study is limited in terms of the number of the CIOs and the number of meetings filmed. Gupta et al. (2009) compared the behavior of two highly effective CIOs to that of 25 middle managers and concluded that CIOs mostly exhibit behavioral characteristics of transformational leaders and to a lesser degree of transactional leaders while middle managers exhibit behaviors similar to those practicing transactional leadership. Kettinger et al. (2011) found three styles of leadership: transformational, servant and participative. Some articles didn't label leadership style explicitly but gave enough evidence to support the influence of leadership style (Correa and Joia 2014; Enns et al. 2003; Horner-Long and Schoenberg 2002).

Horner-Long and Schoenberg (2002) found that there are certain characteristics that distinguish e-world leaders from their bricks and mortar counterparts. Leaders of e-businesses were noted as being significantly more entrepreneurial, risk-taking and less conservative than traditional leaders, who were rated as more collaborative and as having greater integrity. However, their study also showed that there is a clear direction to the Universalist versus Contingency debate regarding leadership characteristics.

In addition, literature has differentiated CIOs into supply-side and demand-side orientation. Supply-side represents the educator, the information steward, and the utility provider. The demand-side represents the strategist, relationship architect and integrator. Nolan and McFarlan (2005) identified four modes of leadership: factory, support, turnaround and strategic. Finally, researchers have established norms of the environment as important indicators of supply-side or demand-side leadership (Al-Taie et al. 2013; Peterson et al. 2003; Smaltz et al. 2006). Appendix A shows that studies targeting CIO leadership styles are rare.

CIO Leadership Framework

The above review and groupings of the measured characteristics into categories suggest a leadership framework as presented in Figure 2. This framework is general and can be used for any style of leadership. However, it can be made a CIO-specific using a special set of expertise characteristics that are necessary and unique to the success of CIOs, such as software, hardware, or networking expertise and experiences, education, job and organizational tenure, and cyber security knowledge. Propositions 1 to 7 represent the

individual level of analysis directly related to the reviewed literature. These can be measured empirically and easily verified.

1. Leader's fundamental characteristics define her/his leadership style
2. Leader's technical expertise positively contribute to her/his leadership style
3. Leader's relationship characteristics influence her/his leadership style positively
4. Leader's sensing characteristics transform her/his leadership style in accordance with situational requirements
5. Leader's fundamental characteristics and technical expertise interact and affect each other
6. Leader's fundamental characteristics affect her/his relationship characteristics
7. Leader's technical expertise affects her/his sensing characteristics
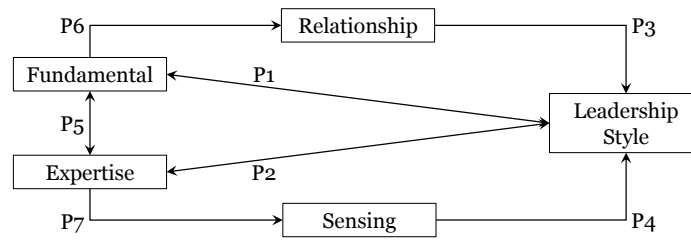
Figure 2: Leadership Framework

Discussion and Future Research Directions

This literature review identified seventy characteristics that the researchers addressed during their course of examining CIOs. Some of these characteristics are examined by several researchers while others did not receive the same attention. None of the examined studies grouped the investigated characteristics into a unique or unified theme that could provide a reasonable direction for future research. We propose grouping leadership characteristics into four dimensions categorized as fundamental, relationship, expertise, and sensing. These dimensions are not static and not isolated and are manifested through behaviors. They interact, evolve, are shaped by and have the potential to reshape the organization. Combinations of these characteristics define leadership styles in general and for a particular person, they become her or his leadership signature.

We also suggest a framework to study CIOs' leadership characteristics and styles and present propositions indicating the relationships among these constructs. Empirical research should test these propositions and the framework. Future research could clarify those characteristics that are essential to each category, add additional characteristics as needed and eliminate repeated or not so relevant characteristics.

Li and Tan (2013) argue for a relationship between business strategy and CIO characteristics. They also found evidence for the impact of such a relationship on organizational performance. Michael Porter (1996) argues in his article titled *What is Strategy?* that "one of the leader's jobs is to teach others in the organization about strategy—and to say no." Many CIOs and IT leaders reach their positions by the dedication and hard work that spans many years and it is understandable that those leaders are open-minded and willing to improve their capabilities and effectiveness. One way to do so is through coaching and leadership training. Using the proposed model and the four categories help to identify and to target leaders' specific needs more effectively.

In addition to examining these suggestions, future studies should address other issues that are missing or rarely studied by researchers. For example: What kind of leadership style is optimum for a particular industry sector? Can coaching and leadership training impact CIOs leadership style? What happens when a CIO changes jobs? Could her or his leadership style be shifted? What characteristics or styles make a CIO be a misfit within an organization or among the top management team?

This study has several limitations. First, we focused on two aspects of CIO leadership: characteristics and styles and did not address literature associated with CIO roles, alignment, and relationship with the top management team which could provide additional insight into understanding the CIOs' leadership char-

acteristics and styles. Second, it is possible that we have missed some literature that could bring additional value but we think that what we present represents the majority of the publications in this field. And, finally, due space limitation, our discussion of the proposed framework is parsimonious. Certainly, more elaboration is needed.

CIO leadership is both universal and contingent (Horner-Long and Schoenberg 2002). It requires both general business-savviness and technical capabilities (Karahanna and Watson 2006). Research into CIO leadership can and should make use of advancements in the general leadership field that has been evolving over the past twenty years. This field is now focusing, in addition to the leader, on the followers, peers, supervisors, work setting/context, and culture. Leadership is now depicted in various models as dyadic, shared, relational, strategic, global, and a complex social dynamics (Avolio et al. 2009, p. 422). There are new and emerging leadership theories (Avolio et al. 2009; Carter and Greer 2013) that are directly applicable to studying CIO leadership. There are also several new leadership styles that are generally accepted (Allison 2012; Avolio et al. 2009; Carter and Greer 2013; Russell and Gregory Stone 2002; Senge et al. 2015) and have the potential to help advancing our understanding of the role and impact of CIOs in organizations. In addition to the traditional transactional and transformational leadership styles, we now have authentic, servant, charismatic, system, resilient and strategic leaderships. Each one of these styles is associated with a unique set of characteristics in addition to sharing some other characteristic with other styles. Only four of these leadership styles appear in studies of CIO leadership, and the majority of the studies shy away from identifying any leadership style despite studying many of the characteristics associated with them.

This study provides several contributions to the literature as it examines the prior research, identifies the studied characteristics and styles, and synthesizes the findings and suggests an approach for categorizations and a framework for leadership studies. In addition, it highlights the existing gap in defining CIOs' leadership styles and draws attention to the importance of following the new trends in the general leadership field in terms of studying the leadership characteristics and styles of CIOs.

Conclusions and Implications

Although studies targeting CIOs' leadership characteristics are numerous, studies examining CIOs' leadership styles are scarce. Research into CIOs' characteristics identifies what are the most important characteristics for effective CIOs. Between 2002 and 2015, more than thirty studies identified over seventy important characteristics of CIOs, while at the same time, we only found three studies that clearly defined three leadership styles: transactional, transformational and servant.

The seventy leadership characteristics are studied in isolation in relation to each other and in relation to the leadership styles. We suggest subdividing these characteristics into four categories including fundamental, expertise, relationship and sensing to allow more meaningful identification of how a CIO fairs on each one of these dimensions and how his or her style is being identified and manifested.

Identifying CIOs' leadership style, particularly for a specific sector of the industry, has the potential to enrich our understanding of the demands and challenges faced by both CIOs and their corporations and open the door to allowing leadership training and coaching to address some of these challenges. In addition, it would be helpful in matching potential CIOs to corporations during the hiring process (Boot 2010; Gupta et al. 2009; Kettinger et al. 2011).

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Appendix A

Summary of Characteristics, Behaviors and Styles According to Published Studies

	Reported Behavior	References
Fundamental Characteristics		
Adaptable		Horner-Long & Schoenberg (2002)
Age		Enns et al. (2003), Karahanna & Preston (2013), Li & Tan (2013), Sobol & Klein (2009)
Aggressive		Li et al (2006)
Ambitious		Horner-Long & Schoenberg (2002), Gonzalez (2014)
Analysis		Li & Tan (2013)
Assertive		Enns et al. (2003)
Complacency		Horner-Long & Schoenberg (2002)
Confidence		Gonzalez (2014), Horner-Long & Schoenberg (2002), Stewart (2002)
Conservative		Gonzalez (2014)
Courage		Correia & Joia (2014)
Creative		Horner-Long & Schoenberg (2002)
Defensiveness	Self-Defending, Defending own position	Boot (2010), Gupta et al. (2009), Li & Tan (2013)
Deliverer		Peppard et al. (2010)
Demanding		Gonzalez (2014)
Energetic		Horner-Long & Schoenberg (2002)
Ethical		Gonzalez (2014)
Fairness	Reward and recognise, Ingratiate	Horner-Long & Schoenberg (2002)
Focused	Focuses on achieving results	Gonzalez (2014)
Gender		Enns et al. (2003), Sobol & Klein (2009), Karahanna & Preston (2013)
Honesty		Horner-Long & Schoenberg (2002)
Integrity	Lives the values	Horner-Long & Schoenberg (2002)
Intelligent		Gonzalez (2014), Horner-Long & Schoenberg (2002)
Introvert		Gonzalez (2014)
Openness		Gonzalez (2014), Li & Tan (2013), Stewart (2002)
Organized		Correia & Joia (2014)
Persistent		Horner-Long & Schoenberg (2002)
Powerful	Exert pressure	Enns et al. (2003), Gonzalez (2014)
Proactiveness		Li & Tan (2013)
Rigidity		Gonzalez (2014)
Task-focused		Gonzalez (2014)
Trust		Horner-Long & Schoenberg (2002), Stewart (2002)
Relationship Characteristics		
Charismatic		Gonzalez (2014)
Collaborative	Partnerships, Avoidance of close supervision, Coalition	Horner-Long & Schoenberg (2002)
Communicativeness	Listens more to his employees, Spend more time structuring the conversation and verifying with their subordinates, Providing feedback, Structuring conversation, Inform executives	Boot (2010), Enns & McDonagh (2012), Gonzalez (2014), Gupta et al. (2009), McLean & Smits (2012)
Controlling		Gonzalez (2014)
Delegation		Chun & Mooney (2009)
Diplomat	Facilitating participation in decision making, Facilitator	Gonzalez (2014), Horner-Long & Schoenberg (2002), Peppard et al. (2010), Peppard et al. (2011), Smaltz et al. (2006)
Favours	Exchange of favours	Enns et al. (2003)
Networking		Correia & Joia (2014)
Extraversion		Li & Tan (2013)
Influencing	Capacity to influence the organization, Convince Others to Influence	Correia & Joia (2014), Enns & McDonagh (2012)
Inspiring	Inspiring Vision, Encourage Challenge,	Horner-Long & Schoenberg (2002)
Interpersonal Relationship	Demonstrating interest and concern in their subordinates, Relationship builder	Correia & Joia (2014), Horner-Long & Schoenberg (2002), Feeny (1997), Chen & Wu (2011), Wu et al. (2008)
Lobbyist	Ability to network in order to lobby for both resources and stakeholder support	Horner-Long & Schoenberg (2002), McLean & Smits (2012)
Motivating	Motivating people, setting expectations of high standards of performance	Horner-Long & Schoenberg (2002)
Passionate		Gonzalez (2014)
Persuasive	Establish initial credibility, Rational persuasion, Ingratiation, Personal appeals	Enns & McDonagh (2012), Enns et al. (2003), Horner-Long & Schoenberg (2002)

	Reported Behavior	**References**
Relationship builder	Network extensively, Relationship architect	Agarwal & Beath (2007), Gonzalez (2014), Horner-Long & Schoenberg (2002), Peppard et al. (2010), Smaltz et al. (2006)
Respectful-ness		Stewart (2002)
Team player / Sociable	Foster teamwork, Delegation of authority, Gives his subordinates more freedom to interpret factual information themselves	Boot (2010), Gonzalez (2014), Horner-Long & Schoenberg (2002)
Expertise Characteristics		
Business-Savvy	Set clear expectations, efficient resource allocation, collection and dissemination of data for corporate planning and performance evaluation, Directing, Maintain good executive relationships, Partner with executives wisely, Change agent / Business expert, Organisational designer, Business system thinker, Business domain knowledge	Boot (2010), Chen & Wu (2011), Correia & Joia (2014), Enns & McDonagh (2012), Gonzalez (2014), Gupta et al. (2009), Horner-Long & Schoenberg (2002), Li & Tan (2013), Smaltz et al. (2006), Weiss & Adams (2010), Wu et al. (2008)
Competent		Gonzalez (2014)
Education	Share Knowledge, Verifying, Informing, Leverage successful projects, Educator	Agarwal & Beath (2007), Boot (2010), Enns et al. (2003), Enns & McDonagh (2012), Harris (2011), Horner-Long & Schoenberg (2002), Karanja & Zaveri (2012), Li & Tan (2013), Smaltz et al. (2006), Sobol & Klein (2009)
Geek / Nerd		Gonzalez (2014)
Innovative-ness	Innovator, Innovator & Creator	Chun & Mooney (2009), Correia & Joia (2014), Gonzalez (2014), McLean & Smits (2012), Peppard et al. (2011)
Negotiator		Gonzalez (2014), Preston et al. (2008)
Planning	Prioritise Activities	Horner-Long & Schoenberg (2002), McLean & Smits (2012)
Technical	Exploiting technology, Professionally challenging, Gather information, System thinker, Information steward, Technologist, Informed buyer, Infrastructure builder	Agarwal & Beath (2007), Boot (2010), Chen & Wu (2011), Correia & Joia (2014), Enns et al. (2003), Feeny (1997), Gonzalez (2014), Gupta et al. (2009), Horner-Long & Schoenberg (2002), Karahanna & Preston (2013), McLean & Smits (2012), Smaltz et al. (2006), Sobol & Klein (2009), Weiss & Adams (2010), Wu et al. (2008)
Tenure - Job / Organization		Enns et al. (2003), Li & Tan (2013), Karahanna & Preston (2013)
Sensing Characteristics		
Agility		Peppard et al. (2011)
Decisive		Horner-Long & Schoenberg (2002), Gonzalez (2014)
Entrepreneur-ial	Soliciting new ideas, Opportunity seeker, Entrepreneur	Horner-Long & Schoenberg (2002), Chen & Wu (2011), Chun & Mooney (2009), Wu et al. (2008)
Futurity		Li & Tan (2013)
Reading the market		Peppard et al. (2010)
Risk Taking / Aversion		Enns et al. (2003), Horner-Long & Schoenberg (2002), Li & Tan (2013)
Sensing	Interpret external IT developments	Enns & McDonagh (2012)
Strategist	Establish Strategic Controls, Strategist	Agarwal & Beath (2007), Gonzalez (2014), Horner-Long & Schoenberg (2002), McLean & Smits (2012), Peppard et al. (2010), Smaltz et al. (2006), Stewart (2002)
Vision	Anticipating Opportunities, Visionary leadership	Boot (2010), Correia & Joia (2014), Horner-Long & Schoenberg (2002), Peppard et al. (2010), Stewart (2002)
Leadership Style		
Transactional		Boot (2010), Gupta et al. (2009), Kettinger et al. (2011)
Transforma-tional		Boot (2010), Gupta et al. (2009), Kettinger et al. (2011)
Servant		Kettinger et al. (2011)
Not Specific Leadership Style	Demand-side, Supply-side, Factory, Support, Turnaround, Strategic	Al-Taie et al. (2013), Correia & Joia (2014), Enns et al. (2003), Horner-Long & Schoenberg (2002), Kettinger et al. (2011), Nolan & McKarlan (2005), Peterson et al. (2003) Smaltz et al. 2006