The Critical Competencies of Successful Senior IT Leaders - A Field Study

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Abstract

This research investigates what skills, behaviors and traits characterize an effective senior leader within information technology (IT) organizations. We explore specifically IT executives (a leader of leaders) who report directly to the Chief Information Officer. We conducted a qualitative study by interviewing 36 IT professionals using 360˚ approach to distill which competencies define an effective IT leader. We draw upon emotional and social competencies index (ESCI) as a means to code for existing social leadership competencies and conduct an open thematic analysis to discover new themes related to technical leadership. Seven well established ESCI competencies and four competencies related to technical domain leadership, Technical Credibility, Relate to Technical People, Guide and Deliver Technology Solutions, and Technical Aptitude, are identified as key factors that promote effective IT leadership. Our analysis suggests that a heretofore unknown blend of competencies forms necessary and sufficient condition for leadership effectiveness within IT domain.

Keywords: Senior IT Leadership, Skills, Technology Competencies, Competencies, Executive IT Leaders, ESCI, Information Technology Leaders
Introduction

Advancements in information technology (IT) continue to transform organizations. These changes place incessant demands for IT leaders to meet the increasing and shifting needs of top management, employees, consumers and business partners (Chandler & Cortada, 2003; McCafferty, 2012; Philip & Booth, 2001). At the same time, the IT industry has changed rapidly and will remain in this trajectory for some time (Lim, Stratopoulos, & Wirjanto, 2013). Rapid changes in technology services such as cloud, mobile or social media creates a competitive playing field for technology professionals (Lim et al., 2013). Understanding and managing these services calls for a continual review of the skills that IT professionals need to remain effective. Today’s IT department is now a strategic capability for most organizations, as the success of the IT organization may now also define the success of the organization as a whole (Chandler & Cortada, 2003; McCafferty, 2012; Philip & Booth, 2001). Therefore the skills of the IT workforce matter. No wonder, due to this expansion and change, the demand for effective IT leaders has also grown (Blanton, Schambach, & Trimmer, 1998; Byrd, 2001; Kakabadse & Korac-Kakabadse, 2000; Lewke & Kelner, 2007; Weiss & Anderson, 2004). Senior technology leaders today must demonstrate a broad range of competencies that help IT organizations transform and prevail through the rapidly changing world of IT services (Hwang, Kettinger, & Yi, 2014). Accordingly, identification of professional attributes that define an effective senior IT leader is becoming critical to the success of most IT organizations.

So far extant research has studied IT professional’s competencies and skills either in the context of the individual Chief Information Officers (CIO) role or the general personnel competencies related to project performance (Cavosi, 2012; Chen, Preston, & Xia, 2010; Feeny & Willcocks, 1998; Hwang et al., 2014; Peppard, Edwards, & Lambert, 2011; Preston, Leidner, & Chen, 2008; Reich & Nelson, 2003). Evaluating the changing IT competencies related to other IT leadership roles has not been studied. CIO’s need access to such competencies in their efforts to build up substantial, flexible and effective executive leadership teams in their IT organizations. Overall, there is little research on what skills, blended technical knowledge and behavioral traits a person needs to have in order to be an effective senior leader within the IT domain. Consequently, there is a gap within the literature to address competencies necessary to succeed within the CIO’s senior leadership teams. To address this gap we investigate competencies at this level of leadership within IT- competencies which are often deemed critical in creating the overall effectiveness of the IT function.

Current research suggests that CIO’s must be able to manage technology investments, understand business and technology integration, have interpersonal skills and be effective in establishing the overall strategy for the IT organization (Chen & Wu, 2011). The CIO’s leadership team must aid in these tasks but not just in formulating the strategic vision, but also building competencies for technical and operational excellence. CIO’s depend on their executive subordinates to drive not only their strategic engagements, but also to enhance the quality and cost of technical services (Hoving, 2007). This creates a nagging tension in competence building as it calls for IT leaders to maintain leadership qualities that blend demonstrated technical prowess with strategic executive leadership skills. As the CIO looks to build a team of highly effective IT leaders, these leaders, in turn, must provide support and development to their subordinates. Therefore the question of how the subordinates perceive their IT leaders, and whether this affects the leader effectiveness forms also an important aspect of leadership development.

Overall, the current claim is that contemporary IT leaders must be able to adapt to fast paced change in IT services by acquiring new skills, leadership competencies and changing management styles (Austin, Nolan, & O’Donnell, 2009). Moreover, skills, competencies, and leadership styles need to be reviewed on a regular basis to keep pace with such changes. Previous knowledge of salient leadership capabilities may not apply in the future. Therefore, this paper will inquire what the necessary current competencies are to become an effective senior leader within IT organizations. We ask: What are the necessary and sufficient competencies to become an effective senior leader within an information technology organization? This research is especially aimed to help CIO’s and HR professionals understand what skills are needed for an IT executive, who reports to the CIO, to lead large IT organizations through the highly technological demands of a world that is driven by the consumerization of IT.
Literature Review

There is a significant stream of research on the effectiveness of Chief Information Officers (Cavosi, 2012; Chen et al., 2010; Chen & Wu, 2011; Peppard et al., 2011; Preston et al., 2008; Reich & Nelson, 2003; Weiss & Anderson, 2004). There is additional research that explores general IT competencies by focusing on the overall IT organizational value, process improvement and organizational performance (Andrew Patrick, 2012; Fickenscher & Bakerman, 2011; Roepke, Agarwal, & Ferratt, 2000; Weiss & Adams, 2011). The research, relative to skills, behaviors and traits needed at designer/engineer level and manager level suggest typically that IT professionals must maintain technical domain knowledge, but also have business acumen and be able to maintain high levels of self-efficacy (Feeny & Willcocks, 1998; Pittenger, 2010). Most of this research does not address specific competencies needed to be effective at layers between the technical experts and CIO roles within the IT pyramid. Yet, such executives within IT are responsible for not only all technical operations but also developing strategic plans or innovating with new services (Lim et al., 2013; Weiss & Adams, 2011). Knowing which blend of competencies are necessary to be an outstanding IT leader in such a role, may help CIO’s also build competent executive leadership teams.

Competency Explained

Competence is generally used as an umbrella term to cover all aspects that affect job performance, either directly or indirectly (Bassellier, Reich, & Benbasat, 2001). Boyatzis (1982), McClelland (1973), and Spencer and Spencer (1993) define competence as further being comprised of the following characteristics: motive, traits, skills, self-image and body of knowledge, which all contribute to being an effective and/or superior performer in a job or role. Additionally, competence has been suggested to be a differentiator for high achieving and high performing individuals above general intelligence tests (Boyatzis, 2008; McClelland, 1973; Spencer & Spencer, 1993). Motive, trait and self-image competencies tend to predict skill behaviors, which ultimately predicts job performance (Spencer & Spencer, 1993: 12). Since it is the motive and trait force that cause skill effectuation to produce an outcome, the intent of this behavior must also be considered in defining a competency (Spencer & Spencer, 1993).

Generally, two categories of competencies are observed: threshold and differentiating. Threshold competencies are the essential skills or knowledge needed to be minimally effective in a job or role, while differentiating competencies characterize superior performers (Spencer & Spencer, 1993). Threshold competencies comprise of the following: 1) expertise and experience; 2) knowledge (i.e. metacognitive, procedural, functional and declarative); and 3) assortment of basic cognitive functions like memory and deductive reasoning (Spencer & Spencer, 1993). Differentiating competencies typically comprise of: 1) cognitive ability (systems thinking and pattern recognition); 2) emotional abilities (including self-awareness, self-management, emotional self-control, and emotional self-awareness); 3) social abilities (including social awareness and relationship management which may include empathy and teamwork abilities) (Boyatzis, 2008). The blend of both threshold and differentiating competencies is what shapes effective leaders (Boyatzis, 1982).

Previous behavioral research on leaders in the technical industries suggests that technology professionals working in a managerial capacity must let go of their deep technical domain knowledge and focus on their managerial, differentiating competencies (McClelland & Boyatzis, 1982; Spencer & Spencer, 1993). However, there is not research that support this claim in the fast changing domain of IT industry and in the context of executive IT leaders who need to manage highly technical teams or functions. While the general literature supports the broad claim that a great leader tend to be socially and emotionally adept (Boyatzis & Kolb, 1995) it does not show that that technical competencies and skills are not needed as differentiators in such roles. Therefore, this research engages in an exploratory study as to discover whether such technical competencies also form significant differentiators and what is the right blend of technical and managerial competencies that differentiate effective IT executives.

IT Competencies

According to Bassellier, Reich, & Benbasat (2001), IT competencies can be generally grouped into two knowledge areas: explicit and tacit knowledge. Explicit knowledge can be taught and it encompasses technical aspects of basic IT domain knowledge such as, understanding applications, systems development and technology platforms. Looking into the organizational behavior literature, this concept correlates to
what Boyatzis (1982) calls “specialized knowledge”- a foundational aspect of competence. Bassellier et al. (2001) describes tacit knowledge as having two main components, experience and cognition. The experience captures the “know-how” garnered over time. The cognitive component comprises of the individual’s perceptions and development of working models, which guides a person’s vision or acumen in his or her work. While tacit knowledge scratches the surface of how people interact with and mobilize knowledge, it does not cover the foundational aspects of identifying motives, traits or self-image, which general competency literature defines as the underlying characteristic of a differentiating competency (Boyatzis, 1982).

Bassellier’s work focused specifically on understanding the IT capabilities of people who worked in the line business units interacting with IT departments. She found that those with IT acumen had the potential for improved interaction with the IT department potentially leading to better alignment between the business unit and the IT department. Building on this theory that IT skills are needed to bridge the gap to IT professionals, we explore next through behavioral interviews to learn what blended behaviors and foundational skills are needed today to be outstanding at the senior executive level.

**Resonant Leadership Theory**

Beyond functional skills, we look to understand differentiating managerial skills. Maintaining positive relationships and helping others grow is arguably reflected in their level of Emotional Intelligence (EI) (Goleman, 1998). In later research, (Goleman, 1998) defined EI as having five key elements: self-awareness, self-management, social skill, empathy and motivation. Goleman argues positive EI could potentially impact relationships and influence others (Goleman, 1999). Boyatzis posits that having positive EI and being able to project positive emotional situations helps produce healthier relationships (Boyatzis & McKee, 2005). Boyatzis goes on to suggest that leaders who intentionally engage through positive experiences leads from a place of hope, vision and thinks of the future possibilities. Those type of experiences are categorized as positive emotional attractors (PEA) (Boyatzis, 2013). Conversely, those who engage in adversarial reactions, fear and focus on problem behaviors could lead to unhealthy relationships where the leader is not engaging effectively with others. These types of experiences are categorized as negative emotional attractors (NEA) (Boyatzis, 2013). Boyatzis and McKee (2005) state that both the experiences of the sacrifice syndrome (NEA) and the process of renewal (PEA) are needed to maintain balance in relationships, work and daily life.

Through the investigation process of this research, we hope to learn which behavioral competencies a senior IT leader should display to be an effective leader as perceived by self and others. The ability to promote healthy relationships through PEA types of engagements should help to improve the leader-member dyad.

**Research on IT Leadership Skills**

Previous IT skills research aligns mostly with the findings associated with general leadership development literature. Technical leaders, who focus on improving their managerial skills at the expense of their technical skills are likely to become more effective leaders (Babcock, 1986; McClelland & Boyatzis, 1982; Spencer & Spencer, 1993; Wilkerson, 2012). Babcock (1986) and Wilkerson (2012) both suggest that technical skills should be a secondary consideration when assessing potential IT leaders during the hiring process. Yet, given today’s trajectory of IT service change and complexity of the IT service delivery, we suspect that senior IT leaders of today will need a richer blend of skills where technical capability and foundational knowledge is necessary to complement general leadership skills. Building on Basselier’s theory that IT skills are needed to bridge the gap to IT professionals, we want to understand what type of combination is required in today’s IT leadership. In particular, we are looking to understand how and to what extent two distinct groups of competencies help build a well-rounded IT leader. By doing so we aspire to update and discover new IT leader competencies and behaviors.

**Research Design**

This research aimed to understand what makes senior IT leaders more effective. Due to lack of theory and research on this topic we decided to conduct an exploratory qualitative field study because such study helps the researchers be open to emerging themes and identify so far not identified behaviors and/or processes (Boyatzis, 1998). We used theoretical sampling and behavioral interviews in collecting data. We used
comparative method and thematic analysis until the data collection and analysis reached a point of saturation (Boyatzis, 1998; Charmaz, 2006; Glaser & Strauss, 1967). The interviews sought to capture real life narratives and experience of IT executives through conducting open or semi-open in-person interviews. This also allow new themes to emerge in the study context (Glaser & Strauss, 1967). While this study was informed by previous literature on social and technical competencies and leadership qualities we were open to new and novel insights as to how the leadership experience was defined by interviewed IT leaders. We simply looked to learn from our research subjects when they shared their personal examples of effective and non-effective leadership situations.

**Sample**

Our study sampled 36 in-person interviews from four different companies. These organizations varied in size from 65 IT employees to 500 IT employees and were split between for-profit and non-profit evenly. The sample demographics are outlined in Table 1. This table provides an overview of the organizations, how they may be structured and how the interviewee’s split out across these companies. The following criteria were met by each organization to qualify for the study: (1) The organization must have more than one senior IT director that supports technology efforts, (2) The organization must have a designated senior executive (CIO) to which the IT director(s) or equivalent reports to, and (3) The IT director(s) or equivalent, must have at least one IT Manager or equivalent reporting directly to them. The four participating organizations were asked to provide a list of potential interviewees that met the following requested conditions, with the goal of having complimenting numbers for each type of performer: Two – four outstanding and average IT directors (leaders of leaders) and two – four direct subordinates of each of the IT directors.

This resulted in a total of 36 individual interviews. The sample was comprised of 13 executives, who report to a CIO, who are leaders of leaders. A demographic table of these 13 leaders can be found in Table 2. There were 23 subordinates who directly report to those IT directors. The subordinate level consisted of those individuals who are also leaders of leaders or first line managers. The performance rating of each of these individuals was not shared at the time of the interview selection process with any of the interviewee’s or the researcher, thus reducing bias from the researcher. The human resources (HR) department of each organization identified the outstanding (O) and average (A) leaders within each of the participating companies, where each organization used the annual performance review assessment of each individual to gather a sample of potential interviewees.

<table>
<thead>
<tr>
<th>Table 1. Sample Distribution and Organization Demographics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Industry</strong></td>
</tr>
<tr>
<td>Industry</td>
</tr>
<tr>
<td>Headquarters Location</td>
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<td>Headquarters Location</td>
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<tr>
<td>Headquarters Location</td>
</tr>
<tr>
<td>Profit Sector</td>
</tr>
<tr>
<td>Profit Sector</td>
</tr>
<tr>
<td>Title of Head of IT</td>
</tr>
<tr>
<td>Total # of IT employees</td>
</tr>
<tr>
<td>IT Structure and Management Layers</td>
</tr>
<tr>
<td># of CIO Direct Reports interviewed</td>
</tr>
<tr>
<td># of subordinates</td>
</tr>
</tbody>
</table>

**Table 1. Overview of the Four Organizations**
Table 2. Direct Report Demographics

<table>
<thead>
<tr>
<th>Direct Report</th>
<th>Age Group</th>
<th>Education Level</th>
<th>Gender</th>
<th>Outstanding /Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>DirectReport1.Cmp1</td>
<td>36-45</td>
<td>Master Degree</td>
<td>Male</td>
<td>O</td>
</tr>
<tr>
<td>DirectReport1.Cmp2</td>
<td>46-55</td>
<td>Master Degree</td>
<td>Male</td>
<td>A</td>
</tr>
<tr>
<td>DirectReport1.Cmp3</td>
<td>46-55</td>
<td>Bachelor Degree</td>
<td>Female</td>
<td>A</td>
</tr>
<tr>
<td>DirectReport1.Cmp4</td>
<td>56+</td>
<td>Bachelor Degree</td>
<td>Male</td>
<td>O</td>
</tr>
<tr>
<td>DirectReport2.Cmp1</td>
<td>46-55</td>
<td>Bachelor Degree</td>
<td>Male</td>
<td>A</td>
</tr>
<tr>
<td>DirectReport2.Cmp2</td>
<td>36-45</td>
<td>Master Degree</td>
<td>Male</td>
<td>O</td>
</tr>
<tr>
<td>DirectReport2.Cmp3</td>
<td>56+</td>
<td>Some College - No degree</td>
<td>Male</td>
<td>O</td>
</tr>
<tr>
<td>DirectReport2.Cmp4</td>
<td>56+</td>
<td>Master Degree</td>
<td>Male</td>
<td>A</td>
</tr>
<tr>
<td>DirectReport3.Cmp2</td>
<td>46-55</td>
<td>Doctorate</td>
<td>Male</td>
<td>O</td>
</tr>
<tr>
<td>DirectReport3.Cmp3</td>
<td>36-45</td>
<td>Bachelor Degree</td>
<td>Male</td>
<td>A</td>
</tr>
<tr>
<td>DirectReport3.Cmp4</td>
<td>56+</td>
<td>Associates Degree</td>
<td>Male</td>
<td>O</td>
</tr>
<tr>
<td>DirectReport4.Cmp3</td>
<td>46-55</td>
<td>Master Degree</td>
<td>Male</td>
<td>O</td>
</tr>
<tr>
<td>DirectReport4.Cmp4</td>
<td>46-55</td>
<td>Master Degree</td>
<td>Female</td>
<td>O</td>
</tr>
</tbody>
</table>

**Data Collection**

Since this qualitative research was set to understand the skills, behaviors or attributes that make an effective senior IT leader, the interviews will be conducted with the IT director, and at least two subordinates to learn behavioral insights and perspectives of those targeted leaders. A series of 36 semi-structured in-person interviews were conducted starting in May 2014 through September 2014. The interviews used the Behavioral-Event Interview (BEI) protocol (Boyatzis, 1982; McClelland, 1998) with each interview taking approximately 45-80 minutes. This interview approach is designed to provide a flexible way to discover differences between two types of performers, those seen as outstanding (O) and those who are seen as average (A) (McClelland, 1998). This approach also provided consistency in our interview protocol and allowed for minor adjustments throughout the research study. All interviewee’s participated as volunteers and no incentives were provided to participate. All interviews were transcribed to prepare for the thematic analysis process, resulting in 480 pages of transcribed text.

Specially designed questions asked each respondent to describe in their own words a time when a senior IT leader was effective or ineffective. For example, the Director respondents were asked: “As you think back over your professional career, please share with me the key experiences/learning’s that attributed to helping you get where you are today?” or “Please tell me about a time when you felt you were effective in your role?” This approach was used because people agree more readily on who is an outstanding performer as opposed to what makes them outstanding, and having people rate characteristics supposedly related to success, instead of just rating successful people, helps reduce bias criterion (Spencer & Spencer, 1993). Further probing questions like, “Who was involved”, “What did you do as a result of X?”, “What was the outcome of this situation...?”, were used to explore the lived experiences of each interviewee to ensure the capture of actions, behaviors and outcomes of all involved in the situation. The power of this process will allow the behavioral themes to emerge through the lived experiences provided by each respondent (Boyatizis, 1998).

**Data Analysis**

Thematic analysis was carried out to continually compare and contrast of outstanding and average performers where any difference might suggest a differentiating competency (Boyatizis, 1998; McClelland, 1998; Spencer & Spencer, 1993). To be able to code the interviews for competencies, two analysis methods were used to identify competencies from a BEI interview: 1) Coding interview transcripts for known
competencies, using the emotional and social competencies inventory (ESCI) and conceptualizing new competencies themes from interview narratives. Throughout the data collection process, each interview was reviewed for themes, patterns, and notable events. This process of constant comparison facilitated also slight adjustments to the interview questions as the research progressed.

A multi-phase coding process outlined by Saldana (2013) was used to categorize, recognize, analytically reflect, and identify patterns and themes through repeated comparison of all the interviews. The first phase of the coding used two elemental methods and one procedural method (Saldana, 2013) resulting in three passes of the data within phase one. The two elemental methods used were In Vivo and Initial Coding. These two coding styles allow for the exploration of new and open coding reflection in which practitioner research is being conducted (Saldana, 2013).

In Vivo and Initial coding helped build the foundation for future coding cycles (Charmaz, 2006; Glaser & Strauss, 1967; Saldana, 2013; Strauss & Corbin, 1990). The two next passes of coding identified 786 key codable moments. The procedural method utilized the protocol coding style (Boyatzis, 1998), which uses the known competency dictionary to identify existing competencies within the data set. Protocol coding within research of human subjects allows the researcher to utilize a pre-defined or recommended list of codes and apply these codes to the collected data set (Boyatzis, 1998; Saldana, 2013). With the completion of phase one the excerpts were refined to 254 initial/protocol codes identified.

The second phase of coding transitioned into axial coding. The axial coding allows the researcher to move similarly coded data into groups and categories to help refine and reduce the number of initial codes (Glaser & Strauss, 1967; Saldana, 2013). This phase resulted in 29 axial codes and 7 known competency codes. Further examination and review of the data moved the research into theoretical coding. This final phase of data analysis provided an additional review of all transcripts, analytical memo’s, and interview notes to help capture themes and discover the phenomena. This phase included an evaluation of the most frequently occurring themes across all respondents, and then a comparison of the outstanding versus average performers at all levels to help identify which skills or attributes prevail as effective. This concluded in the refinement of eleven total differentiating competencies including four new technology related competencies: 1) Relate to Technical People; 2) Technical Credibility; 3) Guide and Deliver Technology Solutions; 4) Technical Aptitude, in addition to seven previously identified competency differentiators. Further exploration of these competencies will be defined in the results section.

To ensure these competencies prevailed as differentiating, a deep comparative analysis was performed and is summarized in Figure 1. This illustrates the comparison of the differentiating competencies of outstanding over the average performers. These themes are viewed at the direct report of the CIO level as differentiating outstanding performers from average performers. The same themes were compared from the subordinate’s interviews, these are either first line managers or leaders of leaders. Finally, a comparison between outstanding direct reports and outstanding subordinates were compared to note differences in perception. The gap analysis proved quite interesting as even though the ESCI competencies prevailed as differentiating, the gap for the technology competencies was higher.

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1 The following literature was used as the foundation for the known competency dictionary: (Boyatzis, 1998, 2009; Boyatzis & McKe, 2005; Spencer & Spencer, 1993)
Further comparison of the most frequent codes took place as to validate that the identified themes occur at the outstanding level over average performer level. Contained within the 36 interviews, 21 respondents were identified as outstanding. The remaining 15 respondents from the sample were considered average. To ensure inter-rater reliability two independent coders reviewed excerpts from interview transcripts to ensure coding consistency. Fifteen coded instances, of the eleven most frequent codes, were provided to the independent coders. See Table 3. Using the ESCI and the four newly developed codes, the independent coders were able to validate the coding consistency.

<table>
<thead>
<tr>
<th>Competency</th>
<th>Coder A</th>
<th>Coder B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Credibility (New)</td>
<td>93%</td>
<td>80%</td>
</tr>
<tr>
<td>Developing Others</td>
<td>93%</td>
<td>86%</td>
</tr>
<tr>
<td>Relate to Technical People (New)</td>
<td>86%</td>
<td>73%</td>
</tr>
<tr>
<td>Group Management</td>
<td>86%</td>
<td>80%</td>
</tr>
<tr>
<td>Technical Aptitude (New)</td>
<td>80%</td>
<td>86%</td>
</tr>
<tr>
<td>Flexibility</td>
<td>80%</td>
<td>73%</td>
</tr>
<tr>
<td>Communication</td>
<td>80%</td>
<td>93%</td>
</tr>
<tr>
<td>Social Objectivity</td>
<td>80%</td>
<td>67%</td>
</tr>
<tr>
<td>Guide &amp; Deliver Technology Solutions (New)</td>
<td>73%</td>
<td>60%</td>
</tr>
<tr>
<td>Pattern Recognition</td>
<td>67%</td>
<td>73%</td>
</tr>
<tr>
<td>Systems Thinking</td>
<td>73%</td>
<td>67%</td>
</tr>
</tbody>
</table>

Table 3. Inter Rater Reliability
Results

Thematic and Axial coding proved reliable for the discovery of the four new competencies found in this study. Each new differentiating competency is structured to contain a label, a definition that could include qualifications and/or exclusions to identify the theme, and a description of how to know when the theme occurs (i.e. indicators) (Boyatzis, 1998). Examples containing direct quotes from the respondents are provided for each competency theme. All quotes are from a different respondent within each competency theme. Table 4 provides a quick view of the differentiating competencies that prevailed with a break out of the percentage of confirmed occurrences at each performance level. Gaps between performers are indicative of identifying differentiating competencies (Boyatzis, 1982).

<table>
<thead>
<tr>
<th>Differentiating Competency</th>
<th>Description</th>
<th>Found in Outstanding Performers</th>
<th>Found in Average Performers</th>
</tr>
</thead>
<tbody>
<tr>
<td>(New) Technical Credibility</td>
<td>The intent is to establish a level of domain credibility to reinforce domain competence</td>
<td>100%</td>
<td>40%</td>
</tr>
<tr>
<td>(New) Relate to Technical People</td>
<td>The intent is to demonstrate shared or similar technical experiences have occurred between leader and subordinate</td>
<td>100%</td>
<td>60%</td>
</tr>
<tr>
<td>Developing Others</td>
<td>ESCI Known Competency</td>
<td>100%</td>
<td>90%</td>
</tr>
<tr>
<td>Group Management</td>
<td>ESCI Known Competency</td>
<td>100%</td>
<td>60%</td>
</tr>
<tr>
<td>Flexibility</td>
<td>ESCI Known Competency</td>
<td>100%</td>
<td>80%</td>
</tr>
<tr>
<td>Communication</td>
<td>ESCI Known Competency</td>
<td>100%</td>
<td>80%</td>
</tr>
<tr>
<td>Social Objectivity</td>
<td>ESCI Known Competency</td>
<td>100%</td>
<td>80%</td>
</tr>
<tr>
<td>(New) Guide &amp; Deliver Technology Solutions</td>
<td>The intent is to demonstrate from a leadership capacity to ensure success of service delivery and provide guidance</td>
<td>88%</td>
<td>40%</td>
</tr>
<tr>
<td>(New) Technical Aptitude</td>
<td>The intent is to demonstrate openness to renewed learning; to keep skills current</td>
<td>75%</td>
<td>40%</td>
</tr>
<tr>
<td>Pattern Recognition</td>
<td>ESCI Known Competency</td>
<td>75%</td>
<td>40%</td>
</tr>
<tr>
<td>Systems Thinking</td>
<td>ESCI Known Competency</td>
<td>75%</td>
<td>40%</td>
</tr>
</tbody>
</table>

Finding 1: Technical Credibility, 100% (O) 40% (A)

The leader’s intent here is to establish a level of technical domain credibility as to help team members or clients have a clarity and direction on their technical efforts. This is often seen as a decision making process that requires deep domain expertise that signals the capability to make informed decisions. This competency is generally indicated when a leader: (1) Demonstrates broad industry knowledge of technology service offerings (products or services), technical strategies (consulting and best practices), or foundational knowledge of how technology works together to create a product or produce results. (2) Assessed technology trends and provided advice or guidance on potential future impacts to organization or client, is perceived as a thought leader in their field. (3) Showed consistent communication refinement of complicated technical solutions into a clear simple non-technical message for all, translate tech speak to non-tech speak. (4) Demonstrated a clear understanding of various technology service offerings and can leverage these services to help guide technical teams, set direction and clarify priorities (5) Demonstrated ability to engage and lead in technical conversations, strategies, solve technical problems, thus leading by example.
Technical Credibility Quotes

“I'm respected technically, as well as they know I care about the people and trying to do things for the right reasons about business and to make people successful. I think if I hadn’t had the broad technical experience from very low level embedded systems and real-time programming to the cloud and lab and dealt with expertise in Python and test-driven development in those areas, I wouldn’t be as effective with our customers from a credibility standpoint or within our teams on the architecture side and helping them solve problems if necessary.”

“If we're going to lead technical people, they have to feel like you’re credible. And I don’t think it’s possible to be credible and not have any kind of technical street cred. When I first got to Company-X, the fact that I could sit down with my staff and talk about, well, I could talk units, command line and I could talk compilers and whatever, I mean, just immediately made life much easier for me and the team than it would have been otherwise. So you know, it’s like they don’t want to feel like you’re just another guy from the accounting department.”

“Being effective also means being able to engage in conversation with technical people and understand what they’re talking about, and you also have to have the capacity to take the technical language from the really technical programmer and you have to be able to play translator to the business owner. You have to be able to do this as a leader.”

“So, he has some of those technical things down. But to answer the question, I feel that technical background is extremely important. It’s a credibility thing, and especially with us we’re in the service industry. The customers expect people to come and hit the ground running. You know, here’s this, here’s that. This is how we do this. Now go.”

**Finding 2: Relate to Technical People, 100% (O) 60%(A)**

The leaders’ intent is to demonstrate shared or similar technical experiences that have occurred between leader and subordinate. This often appears as a need to stay current on latest trends within domain due to volatile and constant flux in service offerings. It was indicated when a leader: (1) Used past technical experiences to help build rapport with subordinates. (2) Had worked in the industry over a decade and demonstrates progressive upward movement in responsibilities. (3) Demonstrated desire to stay current on technology changes and best practices in order to be able to relate to current subordinate work demands. (4) Sought to further advance one’s foundational knowledge, technical certification programs, or continuing educational pursuits with the intent to keep up to date on changing trends. (5) Compared another person’s technical experience to their own and was able to extrapolate similar experiences in an effort to build rapport with other technology professionals.

**Relate to Technical People Quotes**

“Sometimes IT is Swiss army knife, right? You wear a hat or two or three. Sometimes there are fiery hoops to jump through to meet deadlines or to make stuff work or there is a massive project that takes all kinds of skills and people to get done. It is a wide range of skills that you must have at least some of the basics on or you are not going to be able to get anyone on the same page.”

“As a Director I keep my skills up to date. I find that if I do not do this, I am not able to help guide my team on the lasted trends or set strategic direction for the group. My team has told me, “I value her technical skills, she is just the same as me” to me that helps motivate me to stay current so that I can relate to my team.”

“Well, my Director is certified to a high degree in various levels of technology. He’s got Microsoft certs, VMware certs, and Citrix certs. So from an IT leadership standpoint all of that validates it. These certs validate his leadership. When you’re working with people who are technical and they see that you have put time and energy into being certified, to those people it tends to validate your leadership. So you can kind of say I’ve been there too.”

**Finding 3: Guide and Deliver Technology Solutions, 88%(O) 40%(A)**

The leader’s intent was to demonstrate from a leadership capacity his/her skill to leverage domain experience as to ensure success of service delivery and provide guidance to project teams. It was indicated when a leader: (1) Worked in a leadership capacity to guide and direct the overall goals and intended
outcomes of delivering technology work to a customer or client (e.g. sets direction, provides high level planning, helps project team tie work to larger organizational initiatives). (2) Demonstrated a grasp of how technology challenges and potential risks can arise and provides guidance to help overcome. (3) Recognized the limitations of technology and guides solutions to maximize service delivery while ensuring the project team remains grounded and focused.

**Guide & Deliver Technology Solutions Quotes**

“He would come and sit down and talk with you and say, “Okay. Tell me about the issues that you’re having,” or “What can we do to make this better?” And he would talk it through with you and just say, “Well, have you tried this? Have you thought about this?” I mean, I think part of it is experience or whatever, I mean he had been in the industry for a long time so he had a much broader perspective of things, but he just sort of helped you think about things outside the box, or turning the problem on its side, thinking about it in a little different way. We would then be able to move forward and get back on track.”

“Understanding what the problem is and how it affects the overall company strategy along with any technical implications is where I fit in now. I must be able to connect the dots for the team, and have an understanding of what their ideas are and how we tackle that problem, and sometimes this is a back and forth process as this is where I come in. If their solution or idea does not fit in the overall plan or strategy it is my job to keep everyone in the same field, but they are the players executing the strategy.”

“We can just go up to Leader1 and say, hey, look here’s a problem, it’s a technical problem, we’re not really sure the best way of solving it. We can talk through the problem with him and he doesn’t need to get ramped up, he doesn’t need to really think about it too much and he already knows the context of the conversation. He knows the direction that he would approach. A lot of the times he has personal experiences that he’s already solved this problem and so he shares his life story with us. So he helps mentor us as we get into stumble blocks from that regard.”

**Finding 4: Technical Aptitude, 75%(O) 40%(A)**

The leader’s intent is to demonstrate his or her openness to renewed learning as to keep his or her skills current and demonstrate a deeper technical skill set and problem solving. It was indicated when a leader: (1) Sought out ways to learn the foundational aspects of the domain in which they are leading, learning can be non-traditional. (2) Demonstrated an ability to learn new domains and continually fine-tune their own technical skills. (3) Used foundational skills to further diagnose high-level strategic technical difficulties through troubleshooting or project management best practices.

**Technical Aptitude Quotes**

“I have extensive background in fiber design, fiber engineering, network engineering and I must keep current on what hardware trends are available in order to be able to offer competitive services to our customers.”

“I’m also network engineer, so I handle all the network engineering for the company as well as the process in deployment of new network, technologies of the network, how we deploy it, creating operational models, just everything that kind of comes with as IT changes, as things change, how we integrate that into our present system, how we upgrade all our systems to make it more modern to keep us up to date.”

“There have been situations where something was going south and I would roll my sleeves and get behind the keyboard and the network rack and help with that implementation, engaging thoughts, asking questions, getting the team to think about things, all sorts of things that I’ve done.”

**Confirmation of Known Leadership Differentiator Competencies - ESCI**

We also leveraged the known leadership differentiator competency profiles provided within the emotional and social competencies index (ESCI) and noted that the following competencies prevailed as potential differentiators for effective IT leaders: 1) Developing Others 100%(O) / 90%(A), 2) Group Management 100%(O) / 60%(A), 3) Flexibility 100%(O) / 80%(A), 4) Communication 100%(O) / 80%(A), 5) Social Objectivity 100%(O) / 80%(A), 6) Pattern Recognition 75%(O) / 40%(A), and 7) Systems Thinking 75%(O) / 40%(A). All garnered high representation within the sample and showed a significant gap between outstanding over average performers.
The first four (Developing Others, Group Management, Flexibility, and Communication) abilities demonstrated a clear 100% representation within the outstanding performers over the average, including 100% representation at both levels of outstanding leadership. Social Objectivity had 100% representation from the outstanding sample within the IT Director level and 66% from the outstanding subordinate level. Pattern Recognition and Systems Thinking represent slightly less than half of the overall outstanding performers, however, when comparing those outstanding performers to the average, the gap is in these competencies is significant. Pattern Recognition and Systems Thinking had 75% of the outstanding IT directors demonstrated this ability, while reviewing outstanding subordinate perceptions, 31% representation for Pattern Recognition and 23% Systems Thinking. A possible explanation for a lower overall representation could be due to the subordinates not being able to share stories that are related to cognitive functions as opposed to emotional and social abilities.

Discussion

Our research addresses the need for an update in evaluating leadership competencies within the information technology domain. Our findings strongly suggest that top management teams within IT must have a blend of both technical and managerial competencies— not just between people but also within each leader. Our findings also question previous leadership and IT literature which states that the leaders within technical realms such as IT domains must “let go” of their technical skills but instead strongly focus on their managerial skills (Babcock, 1986; Spencer & Spencer, 1993; Wilkerson, 2012). This may be an outcome of bias towards focusing on what skills need to be added to an IT person’s competency repertoire when they move from technical ranks to leadership ranks. However, it should not be read as an indication that such skills solely make an effective IT leader. Indeed, our research confirms that a blend of ESCI competencies are necessary for effective IT leaders. In addition we observed that four new technology focused competencies need to be garnered and sustained to become an outstanding IT leader. While this research does not identify that any specific technology skill need to be maintained by an IT leader, our study strongly suggest that effective IT leaders need to maintain a broad foundational understanding of how current technology works, keep up to date on domain trends, educate themselves within the relevant domains and have built up over time core technology skills as to remain a credible technology leader.

These findings also add to the sparse literature on IT leadership skills and competencies within the IT domain. Most of the literature suggests how to be either an effective CIO or the general skills needed to be an effective IT professional (Bassellier et al., 2001; Feeny & Willcocks, 1998; Peppard et al., 2011; Pittenger, 2010; Reich & Nelson, 2003). While some of this literature specifically supports our findings around the need for IT management to maintain domain specific skills and knowledge (Feeny & Willcocks, 1998; Hwang et al., 2014; Reich & Nelson, 2003), our findings extend those skills as differentiating skills. In conjunction with organizational behavior research, it is the differentiating skills that lead to highly effective leaders (Boyatzis, 1982).

In fact our outstanding leaders consistently shared stories where they were able to use their technical skills to help the organization solve complex technical problems. This also gave them credibility in leading their teams. These leaders had demonstrated ability to clear roadblocks that impeded projects by tapping into their technical skills that helped them understand complex dynamics of technical solutions and services. These attributes helped formulate the Guide and Deliver Technical Solutions competency. This foundational skill set requires building technical historical memory and related industry experience that can only be gained by working in relevant settings over a person’s career. These findings also contradict the previous literature that states that IT leaders should focus just on managerial skills (Spencer & Spencer, 1993), as these skills are part of the overall blend of competencies necessary to being highly effective within IT.

This research also suggests that leaders in the IT domain have come to recognize that emotional and social competencies are important. However, the balance in skills has been tipped too far in this direction. Based on the comparative analysis displayed in Figure 1, the data clearly shows that the ESCI competencies, while still differentiating, have a smaller gap as opposed to the new competencies found. Theoretically this could be driven by extensive leadership training programs targeted to enhance those ESCI skills as organizations shift these leaders away from technical responsibilities and into leadership ones. This research supports this type of training, however, it is also just as critical to stay technically relevant in this rapidly changing
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field. Technical skills, while not directly used as in previous individual contributor roles, are still needed for credible decision making.

We also sought to clarify to what extent our findings help understand aspects of leadership credibility within the technical domain. We found perceived and validated credibility is a critical aspect of effective leadership within executive IT ranks. The past literature suggests that credibility is perceived only in the eyes of the follower, thus proposing that the follower attributes credibility to the leaders (Hoffman, 2008). For this study, our findings suggest that both the leader and the follower recognize that, not only is credibility critical to success, but that each leader must take continual action to remain up to date on the latest relevant domain trends to remain credible. This suggests that IT leaders who actively seek out new ways to maintain their technical knowledge and keep up to date on the latest trends, will have higher credibility among subordinates and peers.

Popular practitioner literature offered by Kouzes and Posner (2008) posit that when a leader is consistent, has relevant experience, and can walk the walk, helps establish credibility (Kouzes & Posner, 2008). The specific subdomain of Technical Credibility found in our study offers further depth into the specific indicators of how to be credible within the IT domain. Furthermore, displaying and maintaining technical credibility was viewed as critical to being an effective leader within IT. All outstanding leaders provided examples of how being credible in the technology domain was critical to perform well in their role. Continual references to making sure they had relevant experience within IT, having worked their way up through the ranks and being able to use difficult technology terminology and refine the messages to a simpler form, all contributed to being credible leader within IT. Kouzes et al. (2008), offers that trust is the critical element in establishing credibility. While trust is a critical aspect of each relationship (Burns, 1978; McClelland, 1975), in the context of this study, establishing credibility and thereby relating to people were attributes that were earned separately from trust. IT leaders had to demonstrate adequate knowledge and skills within their domain, which was separate from being trusted as a manager. The latter invited to continuous personal development, renewed skills, and focused maintenance of domain specific knowledge as to enhance IT leaders’ performance. In this regard our research provides deeper insights into what it means to be credible within the IT domain, going beyond Kouzes and Posner’s (2008) definition of credible leadership to offer a new definition of IT credible leadership.

Past research also posits that a leader’s ability to relate to their staff has a direct effect on effectiveness (Burns, 1978; Goleman, 2004; Graen, 1975). When considering the Leader Member Exchange, (LMX) is a theoretical approach to defining the dyadic relationship between a supervisor and subordinate (Graen, 1975). LMX states that relationships which are solely transactional exchanges based on basic employment requirements are often considered low LMX relationships (Graen, 1975; Greguras & Ford, 2006). Empirical research has demonstrated that higher levels of LMX as perceived by coworkers are linked with a myriad of positive outcomes (Liden, Sparrowe, & Wayne, 1997). The LMX theory suggests that the reciprocal behaviors between both dyads in the relationship are important factors for generating high LMX (Deluga, 1998; Greguras & Ford, 2006; Liden et al., 1997; Sears & Holmwall, 2010). Our new competency, Relate to Technical People- confirms that the dyadic relationship of relating through technical experience to subordinates is critical in IT leadership. This includes also considerations of the technical ‘culture’ of subordinates. In order to be able to relate to technical people, IT leaders must engage in different behaviors than those suggested by mere ESCI competencies. They must stay current on the latest technology trends, have comparable technical experiences as their staff and demonstrate that they have a vibrant interest in understanding technology. We can accordingly postulate that if relating to other technology professionals is a differentiating competency for senior leaders within the IT field, then this competency could potentially become an antecedent to promote high LMX (Leader Member Exchange LMX).

If we extend our research findings into the literature on leadership qualities our findings are largely in agreement with the findings of Resonant Leadership Theory: senior leaders promote healthy relationships through positive emotional attractor (PEA) types of engagements (Boyatzis & McKee, 2005). Emotional and social intelligence competencies make it possible for a leader to engage with others. In this study, such competencies were in particular: Developing Others, Group Management, Flexibility, Communication, and Social Objectivity. These abilities can be assessed relatively easily using standardized Emotional and Social Competency Inventory (ESCI) scales (Boyatzis & McKee, 2005). Two of our findings: Developing Others and Group Management are competencies that help the growth and development of staff and team collaboration, respectively. Outstanding performers within this study shared that due to the high
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collaborative nature of IT projects (Feeny & Willcocks, 1998), teamwork competencies are always necessary. Developing Others and Group Development are therefore likely to prevail as differentiating competencies for IT leaders. When a IT leader excels in these two competencies, there is the potential to engage also in high PEA and generate an emotional response what Boyatzis and McKee (2005) refer to as the Renewal Process. This involves demonstrating hope (vision), compassion (caring), mindfulness (integrity), and playfulness (Boyatzis & McKee, 2005).

The Flexibility, Communication, and Social Objectivity findings identify the IT leader's ability and need to engage with others (Boyatizis, 1998). These competencies call for the aptitude in adaptability, interpretation and perception management. These skills are also critical in IT domain, because IT leaders must constantly adapt to new demands (Hwang et al., 2014). The success of IT organizations will thus require its leadership to be not only outstanding, but sustainable (Blanton et al., 1998). Our respondents indeed continually referred to the ever-changing pace of change in IT organizations. Outstanding leaders talked constantly about how they work hard to understand differing viewpoints and use technology when it improves operations and stay away from the “wiz-bang” gadgets if they do not make business sense. Overall, our findings are in line with Resonant Leadership Theory in that when social and emotional competencies prevail as necessary leadership competencies, positive relationships, better work performance and a better work environment could prevail (Boyatzis & McKee, 2005).

The two final cognitive competencies—Pattern Recognition and Systems Thinking—were identified as potential differentiating abilities for truly effective IT leaders. These two findings are consistent with an extent literature that suggest that leaders who have the cognitive ability to recognize patterns and systematically organize causal events have the potential to become outstanding leaders (Boyatzis, 1998, 2009; Boyatzis, Smith, Van Oosten, & Woolford, 2013; Boyatzis, Stubbs, & Taylor, 2002). Respondents who were outstanding would talk about situations where they would help lead IT projects that required a multitude of process engagement from multiple teams, all constantly iterating to deliver new solutions. These leaders would articulate a pattern of events that led up to delivering effective solutions. While this behavior was not strongly represented within the subordinate level, our research supports that overall 75% of the outstanding leaders displayed these competencies. This should be explored in future research as to see if these competencies are true differentiators between good and outstanding levels of leadership—a topic which was not within the scope of this study.

This research opens up several possible endeavors to explore within the IT leadership practice: hiring practices for IT top management teams, top management team development, and/or promotion practices within IT organizations. Future academic quantitative studies into the aspects of the four potential themes identified here should be explored. Additionally, an investigation into the potential differentiating abilities to clarify if they could be antecedents to Resonate Leadership Theory and/or the Leader Member Exchange for IT leaders could be reviewed.

**Limitations**

There are several limitations to our study. Our theoretical sample size only covered 4 organizations and could not cater for all types of IT organizations including IT startups or leading IT firms such as Google. As our unit of analysis was the individual leader, our study did not focus on organizational factors related to leadership effectiveness or cultural considerations. While the accounts of the subordinates were critical to validate the competencies, it is possible that their recall of managerial action may not be exactly accurate.

**Conclusion**

The field of information technology will continue to change. Since this function is increasingly critical to business operations, service and product innovation and business integration within value chains, the IT department must seek to recruit leaders who can lead and rise above these demands. We found that Technical Credibility, Relate to Technical People, Guide and Deliver Technical Solutions, and Technical Aptitude are specific technical competencies called from these leaders. These skills and behaviors placed some IT leaders over average performers. This helps CIO's and HR managers to better understand which attributes are necessary to become an effective IT leader.
We helped bring to light the importance of relevant technical domain knowledge, guide and deliver technical solutions, relating to other technical people and foundational technical skills prevail as differentiating competencies. However, these facets of IT leadership alone are not sufficient to create effective IT leadership. In contrast, this study posits that effective leaders within IT need to maintain a balance of skills to be effective. Their differentiating skills are both managerial and technical. To excel as a leader within IT, one must have the necessary technical foundation and sufficiently demonstrate managerial competencies. This study suggests that while an IT leader can have either technical or managerial competencies, high performance follows only if the leader has both. This study is one of the first which seeks to understand the successful blending of the domain and foundational competencies with the emotional and social competencies that differentiate effective IT leaders from the rest of the pack.
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