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Literature Review:

Soft e-leadership skills

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List of Acronyms

EU	**European Union**
SMEs	**Small and Medium Enterprises**
AIS	**Advanced Information Systems**
ICT	**Information and Communications Technology**
AIT	**Advanced Information Technology**
AST	**Adaptive Structuration Theory**
LLL	**Lifelong Learning**
IST	**Information Society Technology**
CWA	**CEN Workshop Agreement**
e-CF	**e-Competence Framework**
VoIP	**Voice over IP**
EFA	**Education for all**

Title: Literature Review: Soft e-leadership skills
Prepared by: Sue Rossano (Muenster University of Applied Sciences), Simon Hill (Coventry University)

1 INTRODUCTION

The digital economy has evolved massively over recent decades, with new technologies creating spin off markets using the primary technology of the internet. As with all growth of markets, the global economy has been positively impacted by this and continues to open new avenues for further growth. The change in the economy with these innovative technologies have presented new challenges to business leaders that requires a new set of skills. A number of these skills are not new, however by improving some of the skills that leaders already possess, it is possible to further enhance the leaders of tomorrow to continue the economic growth seen throughout the European Union (EU).

Developing E-leadership skills within businesses is an essential step towards improving competitiveness and innovation, as the digital economy is evolving on a daily basis so muss the leaders. Yet this is not a straight forward journey, but one that requires a critical understanding of the needs of the economy and the most effective methodology for delivering this training.

Internet has become pervasive in all relationships between people, processes, objects, data, information ("digital Darwinism"). Top technologies are radically reshaping the way we establish relationships, communicate, study, learn, teach, do business; for example: *mobile, big data, artificial intelligence, social media, cloud, cybersecurity, virtual reality, and others.* Due to the rapid rate of change the gap between digital native and "digital immigrants" is a dramatic challenge, in business, corporations and strategy for competitiveness.

The "Web" concept is evolving from Web 1.0 (the "producer" of content was separated and distinguished from the "consumer" of content), to Web 2.0 ("producer" and "consumer" overlap in creation of content and documents), to the forthcoming Web 3.0 (or semantic web, fully digital age, contents are co-produced and mediated by technology, through Advanced Information Systems (AIS), semantic indexing and mark-ups). For setting up a new business or managing an existing one, technical skills should be complemented with a solid set of soft e-skills, i.e. those skills that are enabling factors in leading the change, innovating societal practices, establishing new business model, helping to attract, develop and manage talents.

Although an area that can often be seen as unimportant, Soft e-leadership skills is a topic that requires further innovation towards educating individuals in non-technical disciplines. Soft skills such as creativity and tolerance to ambiguity, are not skills that can be learnt quickly, rather they develop over long periods of time, therefore innovation must be also considered in the training methodologies and pedagogies used to develop them.

2 THE DIGITAL ECONOMY

The term digital economy refers to the sale of goods through electronic commerce on the internet (Nathan, M., & Rosso, A., 2012). Whilst in the late stages of the 20th Century the digital economy was still in its infancy, recent years have seen an explosion of multiple avenues of trade from Smartphone applications to the sale of 3D printing CAD[1] models. Figures suggest that the digital economy in the United Kingdom alone accounts for 14.4% (270,000) of all online businesses[2]; which puts global electronic businesses at almost 2 million.

The initial growth of the digital economy began primarily within the corporate sectors, however with further developments of consumer technologies, more opportunities have been created to support user contents creation, social media integration and the establishment of more Small to Medium Enterprises (SMEs). The advancement of General Purpose Technologies (GPT) has been found to infiltrate all levels of commerce, with improved levels of information and communications, such as cloud computing, social media, broadband connectivity and wireless connectivity (European Commission, 2014).

Understanding and measuring what is and is not included within the digital economy, is still under great debate; especially as it has become impossible to separate the main digital factors, from other economic sectors. However there is no questioning its importance within the development of individual economies and the EU more broadly. Multiple factors have contributed to the development of this sector, with some of the main points discussed below:

- **Over 50% of productivity development has been attributed to increase investment in Information and Communication Technologies (ICT).**
- **Internet traffic is doubling every 2-3 years and mobile internet traffic every years.**
- **By 2015 there will be 25 billion wirelessly connected devices globally; doubling to 50 billion in 2020.**
- **Mobile data traffic is expected to increase 12-fold between 2012 and 2018, and data traffic on Smartphone's to increase 14 times by 2018.**
- **There are more than 4 million ICT workers across many sectors in Europe and their number is**

Whilst factors such as *Smart phones* have significantly influenced the level at which commerce can take place between business and consumer, it has also introduced a further significant force that can have significant influences upon the leadership strategies employed within future business developments - Big Data. As consumers and businesses increase in their level of connectivity, significant levels of data is collected on usage, preference, personal segmentation and more; which in turn is used to increase efficiency of both online and offline businesses. The other key benefit of these new data mining exercises is their ability to influence the level of competitiveness amongst businesses (European Commission, 2014).

[1] Computer Aided Design

[2] See,http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/good_governance_matters/digital/2014-03-13_fact_figures.pdf

2.1 The importance of the digital economy

Whilst the growth of the Digital Economy is significant and can in some circumstances be overwhelming, it can possible forget the importance of effectively leadership and management on this development. The US Department of State, have recognised the importance of effective leadership upon the digital economy and is therefore sponsoring exchange programs to share best practices on a global scales to further influence the growth of the market (US Department of State, 2015).

Yet dependent on the various market sectors, there is a degree of disparity between those industries that have effectively become leaders in the digital field, and those that are falling behind. Friedrich et al. (2011) suggested that the key leading sectors within the development of the digital economy are:

- Financial services & Insurance
- Computers & electronics
- Media & telecommunications
- Automotive

These leading industries are not surprising, given their association with digital technology in their day-to-day operations, yet there is still clear evidence in support of effective leadership towards embracing new technologies as early adopters. These are the leaders that look to long-term strategizing and skill management to prepare for changing market positions. However there are sectors that are lagging behind such as:

- Hotels and restaurants
- Construction
- Consumer goods
- Transportation and Logistics

Whilst a number of these sectors are now embracing technologies in many of their specific industries, many of them are reacting to the current situation rather than evaluating the situation from a proactive stand point (Friedrich et al., 2011). Thus the need to nurture a more entrepreneurial leadership, that can embrace the new challenges imposed to leaders in the digital economy but with a proactive attitude.

3 E-LEADERSHIP SKILLS

3.1 E-leadership

Avolio et al. (2001) defined e-leadership as — "a social influence process mediated by AIT (advanced information technology) to produce a change in attitudes, feelings, thinking, behaviour, and/or performance with individuals, groups, and/or organizations". Applying Adaptive Structuration Theory (AST) on their study about the impact of technology on leadership, the authors found that leadership and technology enjoy a recursive relationship where each one affects and transforms each other. AST states that human action is guided by structures, those structures are defined as rules and resources that serve as templates for planning and accomplishing tasks. According to Avolio et al. (2000), technology creates organizational structures of which leadership is a part, but at the same time, these organization structures continue to be transformed by the impact of leadership and technology.

In 1961, W.C.H. Prentice published an article[3] on "Understanding Leadership" in the Harvard Business Review. In the article, Prentice offers the following definition of leadership (Prentice 2004: 102-3): "Leadership is the accomplishment of a goal through the direction of human assistants. The man who successfully marshals his human collaborators to achieve particular ends is a leader. A great leader is one who can do so day after day, and year after year, in a wide variety of circumstances." Drawing on the work of Prentice and other scholars, INSEAD researchers have defined e-leadership as follows: "e-Leadership is the accomplishment of a goal that relies on ICT through the direction of human resources and uses of ICT."

Both definitions acknowledge the recursive relationship between humans and technology, with the latter emphasising the link between leadership and followers mediated by technology. Notwithstanding the importance of leaders exerting their influence on follower's attitudes, behaviours and performance, the "knowledge economy" enabled by ICT has increased the focus on collective rather than individual leadership, with leadership capacity increasingly spread throughout the organization rather than sitting with one person or role. ICTs have flattened hierarchies, making organisations more horizontal and leading to different working patterns where leaders must treat their employees as collaborators.

Furthermore, at a time when the EU pays particular attention to the opportunities offered by ICTs for recovery from the financial crises and for sustainable economic development (EC, 2012), leaders are expected to act and think as entrepreneurs and innovators being able to take advantage of ICTs at strategic level and in the decision making process; calling for specific – e-business and e-leadership skills.

> ***"E-Leadership skills enable people with strong ICT skills to lead qualified staff from different disciplines towards identifying and designing business models and exploiting key innovation opportunities, making best use of developments in ICT and delivering value to their organisations".***
>
> **INSEAD eLab (2014)**

[3] Source: "e-Leadership Skills for Competitiveness and Innovation", 2013, research findings developed by: empirica, IDC and INSEAD for the European Commission, DG Enterprise and Industry

With this enhanced role from e-leaders, a definition of e-leadership skills was introduced by empirica and INSEAD eLab in 2014: "e-Leadership skills enable people with strong ICT skills to lead qualified staff from different disciplines towards identifying and designing business models and exploiting key innovation opportunities, making best use of developments in ICT and delivering value to their organisations".

3.2 The digital competence and skills

The term "competency" is a multidimensional concept that has been described as observable behaviours or sets of skills. Richey et al. define the term "competency" as: "a knowledge, skill, or attitude that enables one to effectively perform the activities of a given occupation or function to the standards expected in employment" (2001, p. 31). Competence/y/ies is a set of terms with widely used in the human resource development domain, where they are used in assessment of people's job performance (Moore et al., 2002).

Sanchez (2011) defines competencies as "a cluster of related knowledge, traits, attitudes and skills that affect a major part of one's job; that correlate with performance on the job; that can be measured against well-accepted standards; and that can be improved via training and development" (ibid, p.241). Competence/y/ies also have regional variations in interpretation, especially between United Kingdom and United States (Mitchelmore & Rowley, 2010). Against these variations, Moore et al. (2002) defines **competence** as relating to an area of work, **competency** as behaviours supporting that area of work, and **competencies** to relate to the attributes underpinning these behaviours. Based on Burgoyne (1989) the authors relate behaviour to both **ability** and **willingness** to act. Under this definition, to be competent means *"to be able to behave effectively in a particular performance domain or activity"*.

In this line, "the digital competence" is acknowledged as one of the eight key competences for lifelong learning (LLL) in Europe. According to European Parliament and the Council (2006): "Digital Competence involves the confident and critical use of Information Society Technology (IST) for work, leisure and communication, underpinned by basic skills in ICT (the use of computers to retrieve, assess, store, produce, present) and exchange information, and to communicate and participate in collaborative networks via the Internet". Therefore, the digital competence is composed by a set of hard and soft skills.

Acknowledging this interdependence of hard- and soft skills for the digital competence, Ferrari (2012)

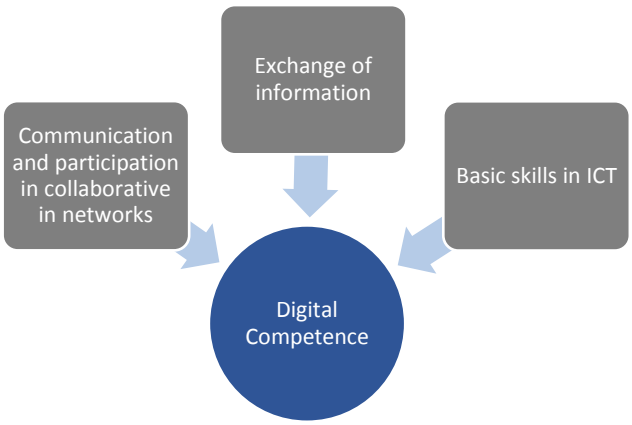

Figure 1. Components of the Digital Competence

defines it as aggregates of knowledge, skills, and attitudes focused on specific activities, process or outcomes (e.g. leadership, teaching...), in this vein "the digital competence" is defined as:

> *[. . .] the set of knowledge, skills, attitudes [. . .] that are required when using ICT and digital media to perform tasks; solve problems; communicate; manage information; collaborate; create and share content; and build knowledge effectively, efficiently, appropriately, critically, creatively, autonomously, flexibly, ethically, reflectively for work, leisure, participation, learning, socialising, consuming, and empowerment.*

The main building blocks of the digital competence framework suggested by Ferrari (2012) include:

- **Information management:** to identify, locate, access, retrieve, store and organise information.
- **Technical operations:** to use technology and media and to perform tasks through digital tools.
- **Evaluation and problem solving:** to identify digital needs, to solve problems through digital means and to assess the information retrieved.
- **Collaboration:** to facilitate linking with others, to participate in online networks and communities and to interact constructively.
- **Communication and sharing:** to communicate through online tools, to respect privacy including safety and the *"netiquette".*
- **Creation of content and knowledge:** to integrate and re-elaborate previous knowledge and content, as well as to construct new knowledge.
- **Ethics and responsibility:** to behave in an ethical and responsive way, being aware of legal frames.

A conceptual model was also proposed by Ala-Mutka (2011) for the digital competence with three main areas:

- **Instrumental knowledge and skills** for digital tool and media usage, which are a precondition for developing or using more advanced skills.
- **Advanced skills and knowledge for communication and collaboration**, information management, learning and problem-solving, and meaningful participation.
- **Attitudes to strategic skills** usage in intercultural, critical, creative, responsible and autonomous ways.

Both authors acknowledge the need of developing, in addition to specialized competences, a broad range of multidisciplinary and transferable skills; which El-Bakry and Mastorakis (2009) classifies as management and organisational skills, team work and communication skills, flexibility to changes, respect of ethical rules, awareness and respect of legal, social and environmental rules.

The digital competence thus comprises, beyond the narrow confines of technical skills, a set of multidisciplinary skills, which are often defined as transversal or horizontal skills. In this line, it has been recognised that for achieving Europe's competitiveness and innovation capabilities, there are a set of skills

required to go far beyond the technical competences defined as the information and communication technologies (ICT) skills. In this respect, the skills needed to take full advantage of ICTs potential, comprise three main groups of skills defined by the European e-Skills Forum in its Synthesis Report (2004):

- **ICT professionals**, being in the centre of ICT development, need skills for ICT design, marketing and maintenance.
- **ICT users** should be able to apply ICTs in their work processes, and in particular, need practical knowledge for specialized software systems and technology solutions.
- **Managers and entrepreneurs** should be able to take advantage of ICTs at strategic level and in the decision-making process, and thus, need specific ***– e-business and e-leadership skills.***

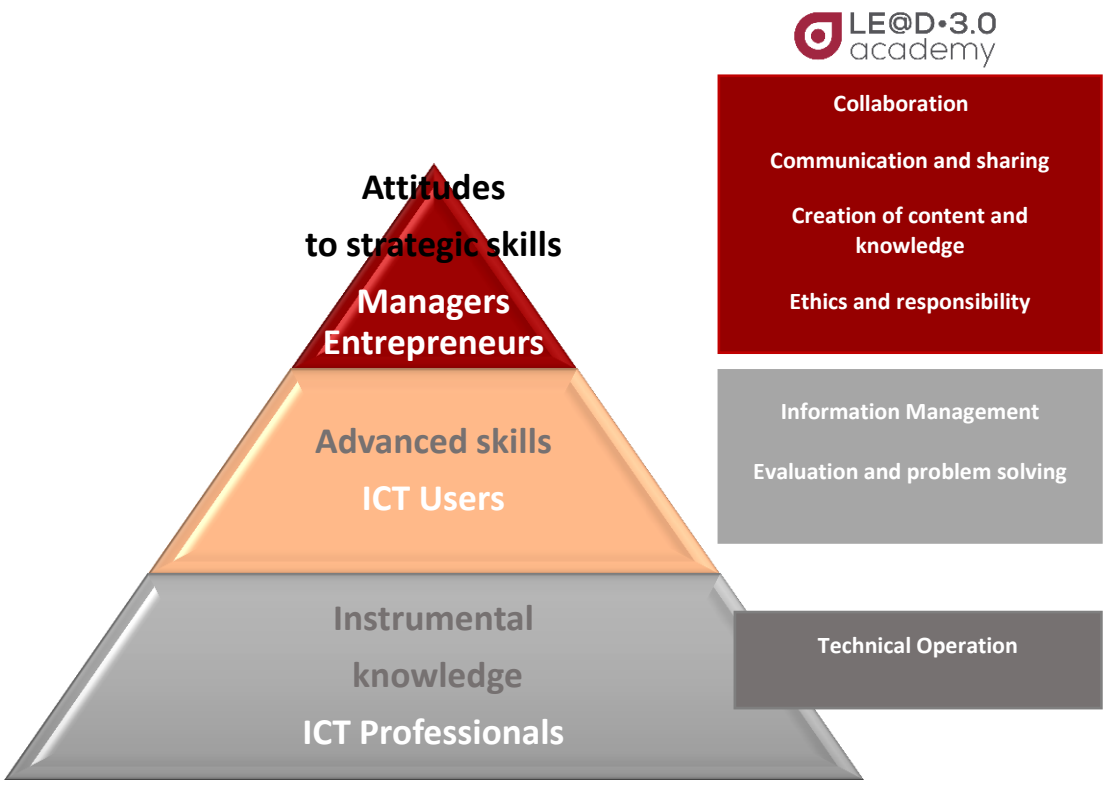

Figure 2. The digital Competence for Entrepreneurs and Managers used in LE@D 3.0

3.3 E-leadership Skills

E-Business skills (also called e-leadership skills) are then defined as the capabilities needed to exploit opportunities provided by ICT, notably the Internet, to ensure more efficient and effective performance of different types of organisations, to explore possibilities for new ways of conducting business and organisational processes, and to establish new businesses (European Skills Forum, 2004).

This perspective on taking full advantages of the opportunities provided by the digital economy demands the development of hybrid profiles from ICT professionals in management and leadership positions. In the framework of the CEN Workshop Agreement (CWA)[4], a number of representative ICT Profiles were created (see Figure 3). In Le@d3.0 Academy, the area of interest will be the profiles from the first two families, **Business Management** and **Technical Management**.

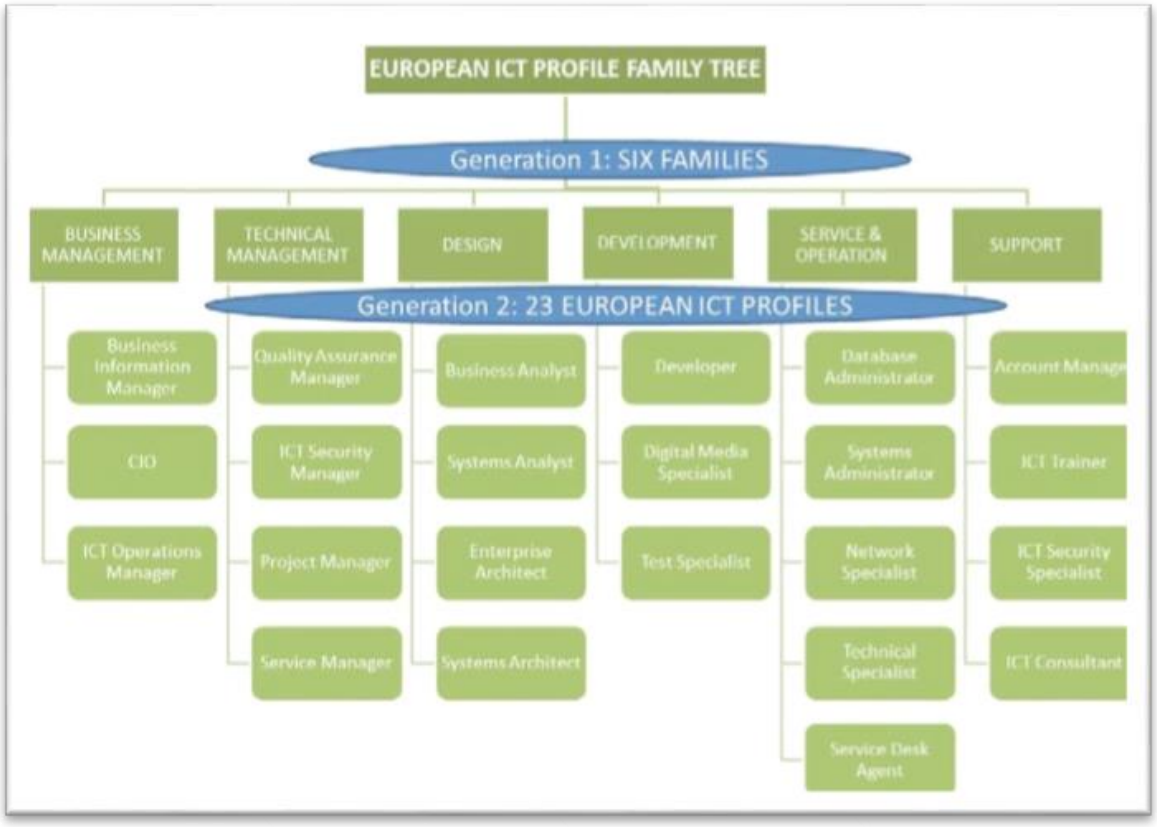

Figure 3 . European ICT Profile Family

Source: http://www.ecompetences.eu/ict-professional-profiles/

[4] For further reference and information please visit http://www.cen.eu/work/products/CWA/Pages/default.aspx

Many European schemes for education and certification of e-skills make use of, or are closely aligned with the e-Competence Framework (e-CF)[5], which represents a common standard that is used across Europe by practitioners, employers and educators to assess practitioner competencies and proficiencies, and to define professional ICT job roles and relevant certifications and qualifications. The e-CF was released in its version 3.0 in December 2013. According to this framework, Table 1 presents a detailed definition of the selected profiles, specifying the functions, competences needed and a brief summary of the profile. For a detailed description of the e-CF and its composition, please refer to Appendix I from this report.

Table 1. Profiles from management positions in ICT and target group for LE@D 3.0

European ICT Profile Title	Functions	Competences identified by the European e-CF	ICT Profile Summary Statement
BUSINESS MANAGEMENT			
Business Information Manager	Manage and Design	<u>Manage</u>	Plans, implements and manages solutions provision
Chief Information Officer	Manage	• Forecast Development • Project and portfolio management • Risk management	Develops and maintains Information Systems for the Business and Company needs.
ICT Operations Manager	Manage	• Relationship management • Process improvement • ICT quality management • Business change management • Information security management • IS governance	Manages operations, people and further resources for the ICT activity.
TECHNICAL MANAGEMENT			
Service Manager	Manage and Run		Plans, implements and manages solutions provision
Project Manager	Manage		Manages project to achieve optimal performance that conforms to original specifications.
Quality Assurance Manager	Manage		Guarantees that Information Systems are delivered according to organization policies (quality, risks, Service Level Agreement).
ICT Security Manager	Manage		Manages the Information System security policy.

[5] http://ecompetences.eu/wp-content/uploads/2014/02/User-guide-for-the-application-of-the-e-CF-3.0_CEN_CWA_16234-2_2014.pdf

In line with the definition of e-leadership skills introduced by Empirica and INSEAD eLab in 2014, E-Leadership skills enable people with very strong ICT skills to lead qualified staff from different disciplines towards identifying and designing business models and exploiting key innovation opportunities, making best use of developments in ICT and delivering value to their organisations.

E-Leadership skills comprise a body of knowledge and set of competences which an individual in the modern economy requires to initiate and achieve innovation utilising ICT. The expectation is that e-leaders (manager and entrepreneurs) should have a T-shaped portfolio of skills. In simple terms, having a T-shaped portfolio of skills means that an e-leader is both a business-savvy and an ICT-savvy professional. Therefore, E-leadership will involve leading and managing e-skilled professionals as well as other professionals. More precisely, having a T-shaped portfolio of skills which needs strategic skills (Hüsing et al., 2015).

Figure 4 E-leadership competence areas and the focus of LE@D 3.0 academy

Against this background, the e-Leadership skills can be classified as follows.

- Strategic Management skills focused on the general management skills relevant for IT and business;
- Hybrid market-IT skills focused on the combination of IT and business skills in order to better exploit IT for business goals;
- Industry-specific skills focused on the understanding and exploitation of IT for business goals in a specific sector, with specific knowledge of the industry and its requirements.

Strategic skills are skills needed by entrepreneurs and managers, combining a mastery of e-related issues with abilities to think and act strategically. These may include for example a set of transversal skills and competences, e.g. leadership and entrepreneurial abilities, project and innovation management competences, ethics, flexibility, creativity, etc., and the capacity to inspire and manage multi-cultural, multi-disciplinary and virtual teams, which demands a set of soft skills. Table 2 shows how this definition can be mapped out onto the European e-CF 3.0.

Table 2. Strategic Management Skills definition mapped against the e-CF[6]

Strategic Management skills	• Lead inter-disciplinary staff • Innovate strategic business and operating models • Exploit new ICT / digital trends • Envision and drive change for business performance • Influence stakeholders across boundaries (functional, geographical)
Hybrid market-IT skills	• A.1. IS and Business Strategy Alignment • A.2. Service Level Management • A.3. Business Plan Development • A.4. Product / Service Planning • A.5. Architecture Design • A.7. Technology Trend Monitoring • A.8. Sustainable Development • A.9. Innovating • D.1. Information Security Strategy Development • D.2. ICT Quality Strategy Development • D.10. Information and Knowledge Management • D.11. Needs Identification • E.1. Forecast Development • E.2. Project and Portfolio Management • E.3. Risk Management • E.4. Relationship Management • E.5. Process Improvement • E.6. ICT Quality Management • E.7. Business Change Management • E.8. Information Security Management • E.9. IS Governance
Industry specific skills	• As above, but focused on the specific sector needs (needs identification) • A.1. IS and Business Strategy Alignment • A.2. Service Level Management • A.3. Business Plan Development • A.4. Product / Service Planning • A.5. Architecture Design • A.7. Technology Trend Monitoring • A.8. Sustainable Development • A.9. Innovating

[6] For a clear understanding of the competence groups' definition from the e-CF, please refer to Appendix I from this report.

The topic of virtual and geographically dispersed teams is addressed by Avolio et. al., (2009) who defines "e-leadership" as: „leadership where individuals or groups are geographically dispersed and interactions are mediated by technology". Technological mediation, however may be due to cultural or temporal causes, besides geographical ones (Ocker et al., 2011).

Articles covering the thematic of leadership in a technology-enabled working environment, covers a wide range of topics, such as leader's competence and the requirements of tasks, interaction, leadership and distance, networks, electronic communication networking and e-Leadership (Representative articles: Avolio et al., 2001; Golden, Veiga, & Dino, 2008). This literature is in line with the call for Global Economic Talents, represented in the INSEAD's skills pyramid represented in Figure 4.

Figure 5. The INSEAD eLab skills pyramid: Definitions

Source: http://ec.europa.eu/enterprise/sectors/ict/files/eskills/insead_eleadership_en.pdf

Global Knowledge Economy Talents include the capacity to generate innovation as well as the ability to lead in cross-cultural environments, ability to manage virtual teams, and collective and individual capacity to address new and global issues where leadership takes different shapes and requires different skills. For many global companies innovation is vital. In the digital economy, innovation is the result of co-creation and collaboration (often web- based), and requires several meeting, typically by video-conference, and implementation strategies to bring innovations to the market and turn them into products and services, for which leadership is crucial and thus requires a broader set of skills to perform within a multicultural environment, in virtual teams and through technology enabled environments.

Thus, the required strategic e-leadership skills are a combination of the e-business skills (e-leadership skills) proposed by the European e-Skills forum (2004) and the Global Knowledge Economy Talents – the top layer of INSEAD's eLab skills pyramid. Table 3 presents both sets of skills.

Table 3. E-business skills (e-leadership skills) proposed by the European e-Skills forum and the Global Knowledge Economy Talents

E-business skills (e-leadership skills)	Global Knowledge Economy Talents
Lead inter-disciplinary staff Innovate strategic business and operating models Exploit new ICT / digital trends Envision and drive change for business performance Influence stakeholders across boundaries (functional, geographical)	The capacity to generate innovation The ability to lead in cross-cultural environments The ability to manage virtual teams The collective and individual capacity to address new and global issues where leadership takes different shapes and requires different skills

4 SOFT E-LEADERSHIP SKILLS

4.1 Challenges for leaders in the digital economy

How leaders differ according to the environments where they operate, specifically addressing to leaders operating in traditional "bricks and mortar organisations" and leaders operating in the "digital economy"? While some characteristics can be equally valued in both environments, some characteristics are emphasized within the digital economy, including entrepreneurialism, networking ability, collaboration and the required technical skills. The concept of e-leadership refers to leaders who mainly use technological mediation in their leadership work (Avolio et al. 2000; Avolio & Kahai 2003; Zaccaro & Bader 2003). According to Molinsky et al. (2012), this new environment have flattened organisational hierarchies, which increases the value of building and influencing networks; therefore managers acting in this environment must develop, what he denominates a "Wielding Digital Influence" – where the devolution of hierarchy increases the value of building and wielding influence through digital networks.

It might be argued that the challenges faced by leaders are the same as they have ever been. Yet given the volatility of the current economy and rise of the digital economy, it is imperative to understand the current challenges that can be accommodated for in future pedagogical design. Following research with global business leaders Barton, Grant and Horn (2012) highlighted as main challenges that globalisation, continual need for personal development, 24/7 nature of business and uncertain decision making.

1. Globalization

The development of communication at the speed of light shrinks the size of the global business environment, requiring leaders to present strategies that are designed to not only be competitive in the local environment, but take on emerging economies such as Brazil, Russia, India and China.

2. Personal Development

The rapid progress of business forces leaders to not only continually develop their organisations but themselves too. In delivering continual development for a business, a leader needs to ultimately have the

ability both mentally and physically push themselves. Without the continued development of business leaders, the sustainable trajectory of the business and therefore affecting its overall contribution to the economy.

3. 24/7 Business

Where rapid text based communications led the way forward in the latter half of the 20th century, so to now the flexibility of Voice over IP (VoIP) calling now allows for even greater efficiency and cost saving. So the biggest barrier may be considered to be varying time zone wouldn't it? Not today. It has become common place for business leaders to work flexibly across time zones to ensure the most effective maintaining of the business operations, as well as emphasising the value of collaboration.

4. Uncertain decision making

Global networked business models causes managers to react in real time for any change that occurs in any place of the world. These interconnectedness has turned the attention of academics and practitioners to a field denominated "disruptive change" where flexibility it key to survival. Extreme planning and processes can cause organisational inertia and rigidity which will make them in turn collapse. In this sense, leaders need to be flexible, collaborate and stay alert to opportunities and threats in the environment; which in turn demands from them more proactive and entrepreneurial mind-set and behaviour.

At the other side of the "challenges coin" "new opportunities" can be found. In this respect the e-Leadership Skills: Vision Report prepared by INSEAD (2012, p. 9), calls for the development of the "right e-skills" to take advantage of the opportunities created, for example around new e-business models, which are created around network-based information flows (social networks, freemium, viral marketing). In this report, the authors mention the need for "inter-disciplinary e-skills", such as math and statistics. Notwithstanding the importance of these skills, there is a need to develop a set of skills needed to foster innovation, collaboration and trust, being these "soft e-leadership skills".

4.2 Soft e-leadership skills

Skills are defined by the Oxford Dictionary (2014) as 'Capability of accomplishing something with precision and certainty; practical knowledge in combination with ability; cleverness, expertness. Also, an ability to perform a function, acquired or learnt with practice'.

Furthermore skills are 'an ability and capacity acquired through deliberate, systematic, and sustained effort to smoothly and adaptively carryout complex activities or job functions involving ideas (cognitive skills), things (technical skills), and/or people (interpersonal skills) (Business Dictionary, 2014), soft-skills relate to those skills needed to deal **with people and for people**.

Within the new generation of web 3.0, interaction and content co-creation are the norm, e-leaders need to be able to collaborate and co-create and co-innovate with colleagues, suppliers, customers and competitors. In this environment, leaders need to develop the necessary skills to collaborate and co-innovate. Further, leaders need to develop the necessary skills to face the challenges from the digital economy addressed in the previous section. For example, leaders will need to grant greater autonomy to employees and empower them, as it would be impossible for them to monitor 24/7 employees dispersed among regions and time zones; this in turn will demand from leaders to harness higher levels of trust among individuals and organisations. Finally, the rapid progress of business forces, will require leaders that embrace personal development and lifelong learning as an attitude to face this turbulent environment.

In this vein, collaboration, innovation, trust and lifelong learning are underlying principles for e-leadership and thus form the basis for the soft-leadership skills classification and taxonomy. The following section presents the literature review around these four principles and the required soft skills to perform as successful e-leader in the digital economy.

4.3 Underlying principles of e-leadership and the need for soft e-leadership skills

4.3.1 Principle #1 for e-leadership: Foster collaboration and networking.

Based on a study of the approaches taken to developing leaders at several schools at Harvard University (Education, Business, Law, Government, and Psychology), through a literature review of the field of leadership development, as well as interviews with 30 experts in the field, the author identifies that one of the major trends in leadership development is the increase of focus on collective rather than individual leadership, as leadership capacity will increasingly spread throughout the organization rather than sit with one person or role (Petrie, 2011). This issue is allowing for greater levels of autonomy among workers, which in turn demands greater levels of trust and leadership skills, not only for managers but also for employees.

Pulley and Sessa (2001) explored the impact of digital technology on leadership and found that, in order for people to overcome the challenge of e-leadership, people within organizations must make sense together of the challenges facing them, and participate in leadership at every level. According to the authors, perhaps the greatest e-leadership challenge is "how to make individuals work collectively to create a culture that allows all the voices of leadership to be heard". A key challenge then for e-leaders is to exercise their influence over followers through digital technology. In this case, leaders must provide structure to followers, evaluate their performance, inspire and develop them, and enable them to identify with the organization. Hambley et al. (2007) also support this proposition; in their field study they found that it is the leader's responsibility to set the coordination and the emotional tone of the virtual team. Emphasizing the "soft side" of leadership skills the authors found that personalizing the relationships between the leader and his/her virtual followers, as well as between the team members was important. In this vein, successful leaders of virtual teams are able to act as mentors (Kayworth & Leidner, 2002). This characteristic mirrors the "empathy skills" also highlighted by Goleman (1995)[7] among the literature on leadership and emotional intelligence. Kayworth & Leidner, (2002) highlight also as equally important the communication skills from leaders to communicate regularly and promptly and to provide sufficient details in their communication messages.

Assessing this challenge of leadership through technology, the literature on virtual team's management (Duarte and Snyder, 2006) asserts that leaders need, at the beginning, to communicate the teams vision, the problem to solve and the teams objectives. In the same vein, leaders need to define the role of each team member. This set of tasks demands from the leaders a set of excellent communication skills, including oral and written.

Acknowledging also the need for communication skills, Gurr (2004) found that leaders performing in technology-mediated environments need to cope with the associated behavioural complexity and strive harder for establishing an appropriate social climate through sustained communication, as well as display

[7] Daniel Goleman brought the term "emotional intelligence" to a wide audience with his book of that name in 1995 and it was Goleman who first applied the concept to business with his 1998 Harvard Business Review article. In this sense, Empathy is the ability to understand the emotional makeup of other people. Leaders with empathy have expertise in building and retaining talent.

exemplary interpersonal skills through the technology in place. The challenge rests on leaders dealing with dispersed and anonymous groups where formal leadership may be detrimental to group performance.

On their study on virtual teams, Chutnik and Grzesik (2009) mention as some of the main challenges for virtual teams, the cultural diversity brought as a consequence of team dispersion enabled by new technologies, and the increased autonomy that employees need. With dispersed teams, it would require too much effort to stay closely connected and monitoring team members, therefore leaders must empower employees and grant them a higher degree of autonomy. These two challenges are for the authors, what differentiates the leader of collocated teams[8] from the leader of virtual teams.

In this same vein García (2014) proposes the reliance on e-teams, just as they rely on the dominant coalitions in traditional leadership paradigms, e-teams will transmit cultural forms such as rites, rituals, and rumours (Malvey & Hamby, 2004). Within this category, leaders will need a set of persuasion skills in order to effective transmit cultural forms and communicate the vision and mission from the team (Chutnik and Grzesik, 2009).

The importance of collaboration is also stressed beyond organisational boundaries. Particularly important and relevant to Le@d 3.0 Academy is the work from Don Tapscott who has shown the world how mass collaboration has changing the way business communicate, create value, and compete in the global digital economy[9].

Collaboration is a key element of innovation, and has been enabled by ICTs. In this context Tapscott and Williams (2012, p.63-64) highlight the role of the leader as responsible for setting a context for innovation and co-creation by providing venues for discussion. Thus, e-leaders must develop a set of skills that can enable, not only employees, but collaborators to communicate and collaborate. These role and demand calls for the development of skills for collaboration, cooperation, and in general set of team working skills.

Within the literature on e-business innovation, “collaboration” is also one of the major success factors. Using a Delphi model, Lin and Hsia (2011) identified thirteen core capabilities for e-business innovation in three main areas; within the area of “collaboration”, the core capabilities are:

1. Developing partnerships
2. Governing the value network
3. Enabling open innovation
4. Improving co-production and co-creating value

In this same line, cooperative business forms, including: strategic value-added partnerships, networks and cross-company project orientated cooperation, need to foster a higher degree of “relational capacity” (Gassman & Enkel 2004), where the e-leader requires highly-developed interpersonal, communication and management skills. Table 4 shows a summary of the skills needed to foster collaboration and networking.

[8] The authors use the term “collocated teams” to refer to teams that are in the same geographical space.
[9] See, for example, Don Tapscott, *The Digital Economy: Rethinking Promise and Peril in the Age of Networked Intelligence* (New York: McGraw-Hill, 2015).

Table 4. Summary of the skills needed to foster collaboration and networking

Challenging activities from e-leaders to foster collaboration	Required response from e-leaders	Set of soft skills needed
Make individuals work collectively	• Foster a culture of trust • Provide greater autonomy to workers • Foster leadership attitudes • Foster collective leadership instead of individual leadership • Provide structure to followers • Coordinate the team and set the emotional tone	. Delegation skills . Communication skills . Leadership skills . Motivation skills . Managing/influence people skills . Empathy skills
Mentor the virtual team members	• Communicate effectively the mission and vision • Mentor the team members	. Communication skills . Empathy skills . Mentoring skills
Provide direction to virtual teams	• Communicate the vision and mission to team members • Set direction to the team • Set roles for team members • Keep sustained communication • Rely on team coalitions • Transmit cultural forms and communicate the vision	. Communication skills (written and oral) . Persuasion skills . Team working skills . Cooperation skills
Manage and lead geographically dispersed virtual teams	• Grant autonomy to employees • Deal with cultural diverse teams	. Delegation skills . Conflict resolution skills . Multicultural skills . Cooperation and coordination skills
Foster inter-organisational collaboration	• Provide venues for discussion • Enable open innovation • Govern networks • Develop partnerships	. Communication skills . Team working skills . Negotiation skills . Empathy skills . Interpersonal, communication and management skills

4.3.2 Principle #2 for e-leadership: Foster co-innovation

The value of networks becomes even higher when it comes to innovation and entrepreneurialism. In this line Lin and Hsia (2011) state that "successful firms exploit e-business innovations through value networks outside of their current operations in order to generate value co-creation" (as cited in vision report). In order to take advantage of these opportunities, technical skills should be complemented with a solid set of "soft e-skills", i.e. those skills that are enabling factors in leading the change, innovating societal practices, attract, develop and manage talents and establishing new business models within the digital economy. Therefore, as the topics of collaboration and innovation are interrelated, the second major principle for successful e-leadership is the promotion and facilitation of collaboration for co-innovation.

Acknowledging the need for innovation, since 2009, the Strategic Framework for European Cooperation in Education and Training (European Council, 2009) has stressed the need for "enhancing creativity and innovation, including entrepreneurship, at all levels of education and training" and "improving the quality and efficiency of education and training in this matter". Nonetheless, a common question about this issue and found within the literature is, if entrepreneurship (and innovation) can be taught? Are entrepreneurs born or made? Based on the arguments from the authors that argue that entrepreneurship can be taught (Kuratko, 2005) Le@d 3.0 Academy proposes a set of skills for innovation and entrepreneurship that e-leaders performing in a new digital environment need to develop.

Dyer et al. (2008) defines an innovative entrepreneur, as "(1) the founder of a new venture that offered a unique value proposition relative to incumbents; and (2) as the person who came up with the original idea to start the venture". In addition, they argue that four behavioural patterns, through which they acquire information, distinguish innovative entrepreneurs and business executives, these are: (1) questioning; (2) observing; (3) experimenting; and (4) idea networking". The authors argue that ICT have an influence on several of these characteristics by providing new ways of accessing, acquiring and processing information, idea networking and opportunities to build and exploit social networks. Thus, ICT can enhance the features that make people innovative and entrepreneurial, if e-leaders possess the skills required to read opportunities (entrepreneurial and intrapreneurial skills) and exploit social networks (soft skills including leadership).

Leaders' pursuit of innovation is not done in isolation, it requires motivating and engaging highly qualified staff, with excellent understanding of ICT and its potential value. Specific skills include the rapid, disciplined assessment of business cases and risks while encouraging the creativity needed to design new business models and exploit innovation opportunities (Hüsing et al., 2013). Thus, a particular set of skills for e-leadership is needed: the skills for innovation.

Stressing the need for special skills for innovation, Fredberg et al. (2008) recognizes the need for innovation managers to adapt their skills and competencies to cope with the complexity of the process of innovation. Technology and customer needs are moving faster than ever; therefore linear innovation process are no longer effective, instead, a more iterative process needs to be carried out in organizational networks (Rampersad et al., 2010, Power and Malmberg 2008), increasing with this the need to manage multiple stakeholder groups (Caniëls and van den Bosch 2011), thus finding the task of the innovation manager increasingly complex. While these skills are difficult to define and

measure, the framework proposed by Kergroach and van Welsum (2008), cited in INSEAD e-leadership skills report (2012) propose to distinguish six "families" of skills for innovation:

1) **Basic or "platform" skills** to function in a knowledge-based society (including "digital-age literacies", multicultural openness and innovation-friendly society, etc.);
2) **Technical skills** to evolve in professional environments (including S&T, engineering, management, implementation, monitoring, analysis, marketing, financial, legal, design skills, etc.);
3) **Soft skills** to interact and collaborate with others while respecting social rules (including team-working, communication, networking, flexibility, emotional and aesthetic skills, etc.);
4) **Cognitive skills** to process information and think (including creativity, critical thinking, knowledge and complexity management, constant learning, etc.);
5) **Entrepreneurship and intrapreneurship skills** to undertake, manage and take responsibility (including basic employability skills, autonomy, risk-taking, personal responsibility, acceptance of failures, etc.);
6) **Leadership skills** to lead and influence (including team building and steering, coaching, lobbying, negotiating, coordinating, etc.).

Since ICT´s provide greater opportunities of collaborative innovation, the skills for innovation in this environment include beyond network management skills, a set of skills needed to integrate knowledge from external partners into the companies own knowledge as well as externalising own knowledge for external partners (Gassman & Enke, 2004, Commonwealth of Australia, 2001). A pre-requisite for this is to have a common language and a means for exchanging and integrating complex sets of information and technologies. Effective innovation collaborations require a common understanding of the technical issues to avoid breakdowns in communication (Philbin, 2008). Thus, a useful competence for e-leaders is to be able to translate (decode and encode) technical data which is generally reliant on having both a technical understanding (establish a common frame of reference) and an ability to explain complex topics simply to customers or collaborators.

With an emphasis on the market opportunities and on finding the right collaborative concept, there is a much greater focus on opportunity skills which entitle the identification of it (Deschamps, 2005), the evaluation, by sensing market potential (Hunter & Cushenbery, 2011) and the exploitation of it by creating new value (McEntire & Greene-Shortridge, 2011). Methods of opportunity identification (prior to the discovery) include trend analyses methods, forecasting methods, qualitative analysis methods as well as the knowledge of how to extract market opportunities from big data. Such skills are also denominated as marketing skills (Velamuri et al. 2004).

Furthermore, in respect to strategic partnerships, capabilities in building and maintaining relationships are expected managerial capabilities, but also a set of strategic skills which have been defined as the ability to evaluate the complementarity of partners, the ability to establish trust quickly, the ability to establish a common vision of the collaboration including having a common set of goals, metrics of success, a shared risk/reward agreement and governance (Gassman & Enkel, 2004).

Collaboration and innovation are interrelated concepts in the digital economy, therefore in order to harness effective innovation through collaboration, e-leaders need to develop a set of skills for

innovation as well. Table 5 presents a summary of the skills required for innovation, particularly in collaborative innovation or co-innovation.

Table 5. Summary of the skills needed to foster co-innovation

Challenging activities from e-Leaders to foster co-innovation	Required response from e-leaders	Set of soft skills needed
Be an innovative intrapreneur	• Offer Unique Value Propositions (UVP) • Come up with original ideas • Experiment • Network the idea • Build and exploit social network	. Opportunity skills . Networking skills . Creative thinking skills
Lead qualified staff with understanding of ICT and the potential value of opportunities	• Assess business cases and risks • Encourage creativity among qualified staff • Lead the design of business models	. Leadership skills . Analytical skills . Motivating skills
Cope with the complex process of innovation	• Manage complex iterative process in organisational networks • Manage multiple stakeholders	. Strategic skills . Design thinking skills . Network management skills . Leadership skills (Team building and steering, coaching, lobbying, negotiating and coordinating)
Integrate knowledge from external partners into the companies knowledge and externalise the companies knowledge for external partners	• Translate technical data into customer needs and products/services • Explain complex concepts to customers and collaborators • Find the right innovation concept	. Communication skills . Marketing skills . Empathy skills . Analytical skills . Problem solving skills . Opportunity skills
Form strategic partnerships	• Evaluate complementarity of partners • Establish trust among partners and network • Establish a common vision for collaboration	. Strategic skills . Relationship building skills . Managerial skills . Ethics and Professional moral (attitudes)

4.3.3 Principle #3 for e-leadership: Harness trust among networks and teams

Besides collaboration and innovation, another principle underlies this interrelation of both concepts. According to Hall and Andriani (2003), trust among people is the most significant factor in differentiating successful innovators. Jarvenpaa et al. (2004) determined that timely and consistent communication was likely to engender trust within virtual teams. Lynn and Reilly (2002) found that members of virtual teams "reported lower levels of trust and that these lower levels of trust correlated with lower levels of innovation and collaborative behaviour" (p. 18). As trust must be fostered by the leaders and among the network the next principle underlying e-leadership is "Trust".

Mayer et al. (1995) defined trust as "the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that party" (p. 3). This definition mirrors the same conclusions from Chutnik and Grzesik (2009) on the need to grant autonomy to workers. In this sense trust becomes the most effective tool from e-leaders to exercise their leadership mediated by technology.

The objectives of leadership in the digital environment have not changed, some authors assert that they keep focusing on creating a vision, set direction, motivate followers, serve as role models and most important, harness trust (DasGupta, 2011; Avolio and Kahai, 2003; Avolio et al, 2000). However, the e-leader needs to implement those activities electronically and in a technology mediated environment where teams are dispersed in time and space (Avolio and Kahai, 2003; Avolio et al, 2000).

With today's technology, organisations reshape from a pyramid to a net or web where employees become collaborators and the lines between the leaders and follower become blurred. As advanced technological applications become available, managers will need to empower team members, giving the team members more autonomy and independence in their work. This autonomy and independence may increase the need for reciprocal trust, in this vein, e-leaders need to build a sense of community based on trust where people can stay connected, this task will demand the development of management, organisational, team work and communication skills (with colleagues, clients, suppliers, etc.).

Trust is an interpersonal process, therefore both, leaders and members of a virtual team need to develop strong interpersonal dynamics and support mechanisms to develop trust. According to Zaccaro and Bader (2003) that development and maintenance of trust may be one of the most important factors contributing to virtual team success, in this respect they suggest a three phases model in order to implement trust, (cited in Samartinho et al, 2012): a first phase, implying the recognition of the beneficial aspects of team work; in this venin, Johnson (2010) mentions that it is the e-leader's job is to guide the team, by creating a common goal of positive sympathy that shapes the e-team perceptions, including motivational factors and the development of coherent and integrated working teams. The second phase is based on knowledge sharing within the team since this sharing promotes natural trust among members and makes them able to foresee actions or behaviours. Finally, the third phase represents a deeper reliance when each team member starts sharing the same values, goals and intentions. In this respect communication will be imperative as the leader needs to unify a number of diverse individuals around a core purpose so they can all move in the same direction (Pulley, et al.,2001).

Within this area, Ferrari (2012) proposes ethics and responsibility as one of the main building blocks of the proposed digital competence framework. This building block is understood as the knowledge, attitudes and

skills needed to behave in an ethical and responsible way, aware of legal frames. In this report, this definition is also extended to being aware of social rules for interaction, including empathy and interpersonal skills. This dimension is particularly important to harness trust among networks and inter-organisational collaboration.

The e-CF 3.0 provides the following examples of skills needed by professionals in ICT to establish trust and set the moral tone of the organisation. Such examples include: provide constant communication with peers, colleagues, employees and customers; set an open space for transparent communication; establish realistic expectations to support development of mutual trust; monitor, understand and act upon quality indicators; reinforce the organisation's values through role modelling, rewards and punishments, and communications about ethics in order to set the organization's moral tone; among others. Table 6 presents a summary of the skills needed to harness trust.

In conclusion, a challenge for the e-leader in virtual leadership environments is to build reliable relationships with and within his or her e-teams members, who may not even know him or her in person. Therefore e-leaders must harness trust as a tool for leadership which implies to guide the team, by creating a common goal, motivating employees and developing strong working teams that perform because they expect that the leader and other team members will perform a particular action important for the accomplishment of the teams goal, irrespective of their subjectivity to be monitored or controlled by another party. In addition, García (2014) mentions the importance of empathy skills, empowerment and constant and open communication to harness trust among teams.

Table 6. Summary of the skills needed to harness trust

Challenging activities from e-leaders to harness trust	Required response from e-leaders	Set of soft skills needed
Harness trust in a technological mediated environment	• Build a sense of community • Develop strong interpersonal dynamics and support mechanisms • Create a common goal of positive sympathy • Develop coherent and integrated working teams • Share knowledge within the team • Unify diverse individuals around a common core purpose	. Empathy . Management skills . Organisation skills . Communication skills . Team working skills
Establish trust and set the moral tone of the organisation	• Provide constant communication with peers, colleagues, employees and customers • Set an open space for transparent communication • Establish realistic expectations to support development of mutual trust • Monitor, understand and act upon quality indicators • Reinforce the organisation's values through role modelling, rewards and punishments, and communications about ethics in order to set the organization's moral tone	. Communication skills . Ethics and professional moral
Build reliable relationships	• Communicate clear goals • Provide constant and open communication • Deploy empathy to employees and collaborators	. Communication skills . Empathy

4.3.4 Principle #4 for e-leadership: Be a Lifelong learner

The concepts of lifelong learning and lifelong education began to enter the discourse on educational policies in the late 1960s (Tuijnman & Boström, 2002). At the same time, lifelong learning became a topic in European educational policies (Borg & Mayo, 2005). In 2000, the European Commission, with its 'Memorandum on lifelong learning', initiated a Europe-wide consultation, which resulted in a communication from the European Commission on 'Making a European Area of Lifelong Learning a Reality' (European Commission, 2001). In this document, lifelong learning was defined as 'all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competence with a personal, civic, social and/or employment-related perspective' (European Commission, 2001, p. 9).

The importance of digital technologies has been recognised in educational policies for some time. In the Dakar Framework for Action, one of the "Education for All" (EFA) strategies was to harness new information and communication technologies to help to achieve the EFA goals (UNESCO, 2000, p. 21). Digital technologies play an important role in the Europe 2020 framework for smart, sustainable and inclusive growth in Europe (European Commission, 2010a). In this respect, digital competence was also listed by the European Parliament and Council (European Council, 2006) as one of eight 21st century key competences, together with the competence for self-regulated learning (learning to learn). One important aspect of digital technologies is that they have the potential to support learning.

As we live in knowledge societies, LLL becomes more important and relevant. Equally important becomes the pedagogy for LLL development. The European Commission observed that innovative pedagogical methods for LLL include a transition from „knowledge" to „competence" and from „teaching" to „learning" (European Commission, 2001, p. 23). Therefore, in 2006, the European Parliament and the Council recommended a catalogue of eight key competences for lifelong learning:

1. communication in the mother tongue;
2. communication in foreign languages;
3. mathematical competence and basic competences in science and technology;
4. digital competence;
5. learning to learn;
6. social and civic competence;
7. sense of initiative and entrepreneurship;
8. cultural awareness and expression (European Council, 2006).

While the first three, and partly the forth, are domain-specific, the other four, are transversal and domain-general. According to Halász and Michel (2011) they might be context specific and might be perceived and interpreted differently in different European countries.

In today's global knowledge and digital economy, labour markets are global, thus business models are networked through ICT; therefore, individuals face global competition in real time Tapscott (2012, p.142). Within this environment workers and managers need to perform like never before. According to Tapscott (2012, p.141-142), while technical competences are important, half of what a university student learns might be obsolete by the year of graduation; to confront this challenge it is imperative to be a "lifelong learner", where creative thinking, research skills, analytical skills, capacity of contextualise, critical evaluation of information, application of research to problem solving and the capacity of collaboration and communication are crucial in the digital networked economy.

For Wagner (2012), "in today's world, knowledge has become a commodity that everyone can obtain, what matters is what you can do with it". Referring to students, Wagner says that students must learn to analyse and solve problems, collaborate, persevere, take calculated risks and learn from failure". The same principles could apply to the case of e-leaders as the ICT has democratized the sources of information and knowledge; individuals are "creators", who acquire skills and knowledge as part of solving a problem, creating a product or generating a new understanding. With this premise, Wagner (2012) in his book, argues that the set of core competencies that every student must master before the end of high school is composed by:

- Critical thinking and problem solving skills (the ability to ask the right questions)
- Collaboration across networks and leading by influence
- Agility and adaptability skills
- Initiative and entrepreneurialism
- Accessing and analysing information
- Effective written and oral communication
- Curiosity and imagination

Therefore, the usage of ICT in learning and training has enabled the transfer of ownership to the individual in matters of development, where individuals are more responsible for their own development, than the HR departments, managers or trainers. In this sense, e-leaders need to be lifelong learners that acquire skills and knowledge as part of solving problems and create and generate products and services, as well as generate new understandings.

Leaders and employees need to adopt a lifelong learning attitude. From one side, leaders must be able to act and react to a fast moving interconnected world where problems are global and no solution has been elaborated. On the other side, with an increased need to grant autonomy to dispersed workers, they need to be responsible for their own development and develop the necessary skills to become also lifelong learners able to perform in the digital economy.

Based on the previous studies, it is evident the interdependency of collaboration, innovation, trust and LLL. Against this background, there is a need to nurture the capacities in e-leaders to collaborate at an intra and inter organisational spectrum, innovate and co-create, harness trust within team members and networks of innovation, and to be lifelong learners. These principles mirror the same trends and evolution of the role of CIOs who are performing on leadership and entrepreneurial positions. According to the findings of the recent study form INSEAD on IT-enabled leadership (2011), the role of CIOs is evolving; in this respect the findings of the study classify the leaders according to how they spend their time within the three following groups:

i. Technology-driven driven leaders ensure the organization is spending more on innovation and less on operations and maintenance.
ii. Business process driven leaders help non-IT colleagues map, re-design and improve how things get done in the organization.
iii. Client-driven leaders help extend their organization's capacity to innovate with customers.

Leaders are spending their time on innovation, collaboration with colleagues and customers and they are constantly learning new ways to improve their organisations and how things get done. Against this background Table # provides a summary of the referenced skills required by a leader for lifelong learning

Table 7. Summary of the skills related to Lifelong Learning

Challenges facing e-leaders that demands them to be Lifelong learners	Required response from e-leaders	Set of soft skills needed
Global labour markets with networked business models facing global competition in real time	• Adopt an attitude of learning throughout life with the aim of improving knowledge, skills and competence with a personal, civic, social and/or employment-related perspective • Develop competences for self-regulated learning • Be a lifelong learner • Analyse and solve problems, collaborate, persevere, take calculated risks and learn from failure • Be curious and imaginative • Be courageous • Have a sense of entrepreneurship and initiative • Be responsible for your own learning	. Learn to learn . Social and civic skills . Sense of initiative and entrepreneurship . Cultural awareness and expression . Creative thinking skills . Research skills . Analytical skills . Application of research to problem solving . Communication skills

5 A FRAMEWORK FOR SOFT E-LEADERSHIP SKILLS

Based on the challenges that leader's face (globalisation, personal development, 24/7 business, uncertain decision making) four main principles underlie the new role for the e-leader, being these: foster collaboration and networking, foster collaborative innovation (co-innovation), harness trust among networks and teams, and be a lifelong learner. According to these principles, the soft skills needed, have been clustered into six main groups of soft skills, being these:

1. **E-leadership skills (with an emphasis on the interpersonal dimension):**

This set of skills entails the ability to lead in various activities through the usage of ICT and web 3.0 technologies. It also includes the ability to understand the role of a leader and the one of a group member; and to be able to carry out those roles interchangeably as needed.

2. **E-team working skills:**

Entails the ability to work and cooperate with people from various social, cultural and professional backgrounds, inside and outside the organisation; so as to achieve a common goal through the usage of ICT web 3.0 technologies.

3. **E-communication skills:**

Entails the ability to convey their thoughts with clarity and confidence, both in written and oral forms, to be active listeners while providing the necessary response; and to enable employees to communicate effectively, particularly through the usage of ICT and web 3.0 technologies.

4. **E-entrepreneurial and innovation skills:**

It entails to the ability to venture into the discovery, evaluation and exploitation of business opportunities while creating risk awareness. It includes the ability to identify innovative business opportunities and be able to prepare, build, and exploit business models (which eventually leads to self-employment). Activities accomplished mainly with and through the usage of ICT web 3.0 technologies.

5. **E-trust building skills:**

In entails the required skills (and attitudes) to develop, foster and maintain trusting relationships to achieve organisational success. It includes the demands for harnessing ethics and professional moral within the organisation and among networks of collaboration and innovation.

6. **E-lifelong learning building skills:**

It includes the required skills to apply acquired knowledge. It entails the skills to think in a critical, creative, innovative, and analytical manner about a problem, situation or opportunity. These skills also include the ability to expand and improve thinking skills, to provide ideas, and alternative solutions. It also includes the ability to do self-regulated learning such as skills required to search for relevant information from various sources and be able to manage them efficiently.

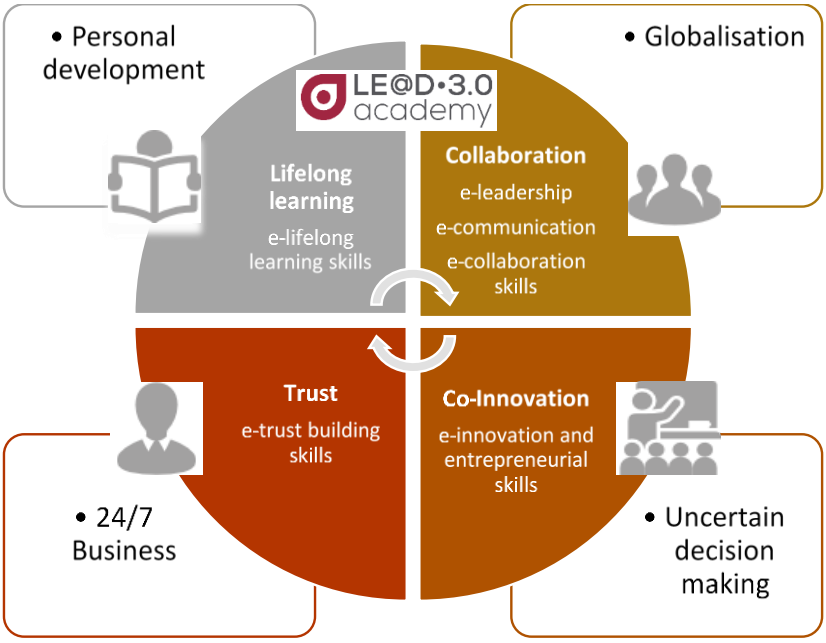

Figure 6. Underlying principles of e-leadership and required soft e-leadership skills

Finally a proposed framework has been created for the Soft e-leadership skills to be developed by LE@D 3.0 Academy. In order to provide context and operationalisation to the skills, the soft e-leadership skills have been operationalised using the skills proposed by the e-CF 3.0 and the literature review. This list is created in order to provide context to the soft skills and does not mean to be an exhaustive and complete list. Table 8 presents a proposed taxonomy for soft e-leadership skills.

Table 8. Taxonomy for soft e-leadership skills

MAIN CLUSTER OF SOFT E-LEADERSHIP SKILLS	DEFINITION	SUB-GROUP OF SOFT SKILLS	SOFT E-LEADERSHIP SKILLS (SOFT SKILLS TRANSLATED TO THE DIGITAL ENVIRONMENT) IS ABLE TO….
E-leadership skills	This set of skills entails the ability to lead in various activities through the usage of ICT and web 3.0 technologies. It also includes the ability to understand the role of a leader and the one of a group member; and to be able to carry out those roles interchangeably as needed.	• Motivating others • Managing/Influence people • Empathy • Delegation • Mentoring skills	• *optimise project portfolio timelines and delivery of objectives by achieving consensus on stakeholder priorities* • *identify potential win-win opportunities for customer and own organisation* • *assist process owners in the choice and use of measures to* • *evaluate effectiveness and efficiency of the overall process* • *provides leadership for quality policy implementation* • *apply pervasive influence to embed organisational change* • *manage applicable governance models* • *stimulate others intellectually* • *build confidence and self-efficacy on subordinates* • *provide constructive feedback*
E-team working skills	Entails the ability to work and cooperate with people from various social, cultural and professional backgrounds, inside and outside the organisation; so as to achieve a common goal through the usage of ICT web 3.0 technologies**.**	• Conflict resolution skills • Empathy skills • Multicultural skills • Cooperation skills	• *delegate tasks and manage team member contributions appropriately* • *provide IS strategic leadership to reach consensus and commitment from the management team of the enterprise.* • *assist in communication of the enterprise architecture and standards, principles and objectives to the application teams* • *provide expert guidance and advice, to the leadership team to support strategic decision making.* • *cooperate with development team and with application designers* • *share functional and technical specifications with ICT teams in charge of the maintenance and evolution of ICT solutions* • *manage communications with ICT teams in charge of the maintenance and the evolution of information systems solutions* • *•co-ordinate and facilitate multidisciplinary teams contributing to project proposals*

E-communication skills	Entails the ability to convey their thoughts with clarity and confidence, both in written and oral forms, to be active listeners while providing the necessary response; and to enable employees to communicate effectively, particularly through the usage of ICT and web 3.0 technologies.	• Listening skills • Written skills • Oral skills • Persuasion skills • Negotiating skills	• *communicate project progress to all relevant parties reporting on topics such as cost control, schedule achievements, quality control, risk avoidance and changes to project specifications* • *communicate and promote the organisation's risk analysis outcomes and risk management processes* • *communicate good and bad news to avoid surprises* • *compose, document and catalogue essential processes and procedures* • *illustrate how methods, tools and procedures can be applied to implement the organisation's quality policy* • *construct and document a plan for implementation of process enhancements* • *communicate the value, risks and opportunities derived from the IS strategy*
E-entrepreneurial skills and innovation skills	It entails to the ability to venture into the discovery, evaluation and exploitation of business opportunities while creating risk awareness. It includes the ability to identify innovative business opportunities and be able to prepare, build, and exploit business models (which eventually leads to self-employment). Activities accomplished mainly with and through the usage of ICT web 3.0 technologies.	• Marketing skills • Opportunity skills • Resource (acquisition) skills • Strategic skills • Network management skills	• *manage external ,contracted resources to achieve project objectives* • *deploy empathy to customer needs* • *make connections across teams and groups* • *foster a positive and open environment* • *create a value proposition* • *boundary-span across industries* • *sense new market needs* • *identify opportunities* • *generate new ideas* • *sense market potential*

E-trust building skills	In entails the required skills (and attitudes) to develop, foster and maintain trusting relationships to achieve organisational success. It includes the demands for harnessing ethics and professional moral within the organisation and among networks of collaboration and innovation.	• Empathy • Ethics and professional moral	• *generate and sustain trust through the utilization of ICT (information and communication technology)* • *build confidence and self-efficacy on subordinates* • *implement innovations within legal and environmental regulations* • *provide constant communication with peers, colleagues, employees and customers* • *set an open space for transparent communication* • *establish realistic expectations to support development of mutual trust* • *monitor, understand and act upon quality indicators* • *reinforce the organisation's values through role modelling, rewards and punishments, and communications about ethics in order to set the organization's moral tone*
E-lifelong learning skills	It includes the required skills to apply acquired knowledge. It entails the skills to think in a critical, creative, innovative, and analytical manner about a problem, situation or opportunity. These skills also include the ability to expand and improve thinking skills, to provide ideas, and alternative solutions, do self-regulated learning such as skills required to search for relevant information from various sources and be able to manage them efficiently.	• Self-Learning skills • Critical thinking and problem solving skills • Information management skills • Self-awareness	• *learn from experience* • *propose solutions to problems* • *evaluate and analyse process steps to identify strengths and weaknesses* • *analyse costs and benefits of business changes* • *analyse the company critical assets and identify weaknesses and vulnerability to intrusion or attack* • *analyse the business context of the company and its evolution*

6 CONCLUSIONS AND IMPLICATIONS FOR THE LE@D 3.0 ACADEMY

Soft skills operate across disciplines and industries; therefore a review on the existent literature on soft skills at management level in traditional industries was a pivotal role to understand the role they play in e-leadership. With this understanding, it was important to link them to hard skills, therefore the taxonomy was elaborated by consulting the e-CF 3.0 set of skills that professionals of ICT at a management level need to perform.

The acquisition of strategic skills requires a combination of soft and hard skills. Both sets of skills are interdependent. Soft skills are necessary for further management development. These interpersonal skills can affect the sharing of information and the way in which organizational members perceive and understand the environments around them. Without this ability, individuals could not further develop as they would not be able to interpret their social context and thus identify further development needs.

Besides knowledge about what ICT can do for the organisation and the business model, formulating a vision and a mission on where to take the company and guide talented workforce is crucial. These activities can only be accomplished if the leader can communicate both to his or her followers, as well as to his or her peers and team members. In this sense, leaders must be able to optimise the use of social and other networks in new innovative ways and for vision communicating process, such as transmission of cultural forms, such as rites and routines.

Innovation and entrepreneurship appear across the desired behaviours and proficiency level descriptions of mastery for each competence as indicated in the e-CF 3.0. In the same vein, the ability to promote and manage change is constantly addressed in the literature, for this reason, the design of the course, should be based on the entrepreneurial process where the discovery, evaluation, exploitation and management of the opportunity is at the core. We propose to adopt a standard process view for innovation and entrepreneurship, in order to design the curriculum and program of Lead 3.0 Academy and define the soft skills required according to the stage of the entrepreneurship and innovation process.

Due to their similarity in both environments, existing pedagogical frameworks to nurture soft skills can serve as a guide for designing training courses such as: collaborative learning, competence based curriculum development, story-telling approaches, simulation games, and action based learning.

Face-to-Face communication is crucial to build trust, also constant communication is crucial therefore according to DeRosa et al. (2004) leaders must choose communication technology that resembles the most to Face-to-Face communication and make sure that employees and users are comfortable with the technology employed in order to maintain constant communication. Therefore, technologies, such as videoconferencing and personal online and video tutoring should be a priority to nurture and develop soft skills in a technology mediated environment and not only rely on MOOC´s.

7 REFERENCES

Aarts, B., Chalker, S., & Weiner, E. (2014). The Oxford dictionary of English grammar. Oxford University Press.

Ala-Mutka, K. (2011). Mapping digital competence: towards a conceptual understanding. Institute for Prospective Technological Studies. Available at: ftp://ftp. jrc. es/pub/EURdoc/JRC67075_TN. pdf (Accessed 15/01/2013).

Avolio, B. J., & Kahai, S. S. (2003). Adding the "E" to E-Leadership:: How it May Impact Your Leadership. Organizational Dynamics, 31(4), 325-338.

Avolio, B. J., Kahai, S., & Dodge, G. E. (2001). E-leadership: Implications for theory, research, and practice. The Leadership Quarterly, 11(4), 615-668.

Avolio, B. J., Walumbwa, F. O., & Weber, T. J. (2009). Leadership: Current theories, research, and future directions. Annual review of psychology, 60, 421-449.

Barton, D., Grant, A., & Horn, M. (2012). Leading in the 21st century. McKinsey Quarterly, 3, 30-47.

BORG, C. & MAYO, P. (2005) The EU Memorandum on lifelong learning. Old wine in new bottles? Globalisation, Societies and Education, 3, pp. 203–225.

Burgoyne, J. (1989). Creating the managerial portfolio: building on competency approaches to management development. Management Learning, 20(1), 56-61.

Caniëls, M. C., & van den Bosch, H. (2011). The role of higher education institutions in building regional innovation systems. Papers in Regional Science, 90(2), 271-286.

Chutnik, M., & Grzesik, K. (2009). Leading a virtual intercultural team. Implications for virtual team leaders. Journal of Intercultural Management, 1(1), 82-90.

DasGupta, P. (2011). Literature review: E-leadership. Emerging Leadership Journeys, 4(1), 1-36.

DeRosa, D. M., Hantula, D. A., Kock, N., & D'Arcy, J. (2004). Trust and leadership in virtual teamwork: A media naturalness perspective. Human resource management, 43(2-3), 219-232.

Deschamps, J. P. (2005). Different leadership skills for different innovation strategies. Strategy & Leadership, 33(5), 31-38.

Duarte, D. L., & Snyder, N. T. (2006). Mastering virtual teams: Strategies, tools, and techniques that succeed. John Wiley & Sons.

Dyer, J. H., Gregersen, H. B., & Christensen, C. (2008). Entrepreneur behaviors, opportunity recognition, and the origins of innovative ventures. Strategic Entrepreneurship Journal, 2(4), 317-338.

El-Bakry, H. M., & Mastorakis, N. (2009). Advanced technology for E-learning development. Proc. of Recent Advances in Applied Mathematics and Computational and Information Sciences, Houston, USA, 501-522.

EUROPEAN COMMISSION (2001) Making a European Area of Lifelong Learning a Reality. http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52001DC0678&from=EN

European Commission (2004), e-Skills Forum Synthesis Report, September 2004, DG Enterprise and Industry, European Commission, Brussels.

European Commission (2010), Self-employment in Europe, European Employment Observatory Review 2010, European Union, 2010.

European Commission (2012), Effects and impact of entrepreneurship programmes in higher education,

European Commission, March 2012, Brussels

European Commission, 2014. EXPERT GROUP ON TAXATION OF THE DIGITAL ECONOMY Working Paper: Digital Economy - Facts & Figures. http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/good_governance_matters/digital/2014-03-13_fact_figures.pdf"

European Council (2006) Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning. http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006 :394:0010:0018:en:pdf"

Ferrari, A. (2012). Digital Competence in practice: An analysis of frameworks. Seville: JRC-IPTS.

Fredberg, T., Elmquist, M., & Ollila, S. (2008). Managing Open Innovation. Present Findings and Future Directions.

Friedrich, R., Gröne, F., Koster, A., & Le Merle, M. (2011). Measuring Industry Digitization: Leaders and Laggards in the Digital Economy. Booz & Co., December, 13.

Gassmann, O., & Enkel, E. (2004, July). Towards a theory of open innovation: three core process archetypes. In R&D management conference (Vol. 6).

Golden, T. D., Veiga, J. F., & Dino, R. N. (2008). The impact of professional isolation on teleworker job performance and turnover intentions: Does time spent teleworking, interacting face-to-face, or having access to communication-enhancing technology matter?. Journal of Applied Psychology, 93(6), 1412.

Goleman, D. (1995). Emotional intelligence. New York: Bantam Books.

Gurr, D. (2004). ICT, Leadership in Education and E-leadership. Discourse: studies in the cultural politics of education, 25(1), 113-124.

Halász, G., & Michel, A. (2011). Key Competences in Europe: interpretation, policy formulation and implementation. European Journal of Education, 46(3), 289-306.

Hall, R., & Andriani, P. (2003). Managing knowledge associated with innovation. Journal of business Research, 56(2), 145-152.

Hambley, L. A., O'Neill, T. A., & Kline, T. J. (2007). Virtual team leadership: The effects of leadership style and communication medium on team interaction styles and outcomes. Organizational behavior and human decision processes, 103(1), 1-20.

Hunter, S. T., & Cushenbery, L. (2011). Leading for innovation: Direct and indirect influences. Advances in Developing Human Resources, 1523422311424263.

Hüsing, T., Korte, W. B., Fonstad, N., Lanvin, B., Welsum, D. V., Cattaneo, G., ... & Lifonti, R. (2013). E-skills for competitiveness and innovation vision, roadmap and foresight scenarios. Final report, European Commission.

INSEAD (2011), "IT Enabled Leadership – The expanding strategic roles of Chief Information Officers",

INSEAD eLab, Fontainebleau, France.

INSEAD eLab. (2013). "Building Competitiveness and Business Performance with ICT: How investments in new technology can make companies more competitive." A research report developed in collaboration with AT&T. Available at www.corp.att.com/bemoreproductive/"

Jarvenpaa, S. L., Shaw, T. R., & Staples, D. S. (2004). Toward contextualized theories of trust: The role of trust in global virtual teams. Information systems research, 15(3), 250-267.

Kayworth, T. R., & Leidner, D. E. (2002). Leadership effectiveness in global virtual teams. Journal of Management Information Systems, 18(3), 7-40.

Kuratko, D. F. (2005). The emergence of entrepreneurship education: Development, trends, and challenges. Entrepreneurship theory and practice, 29(5), 577-598.

Lin, L. M., & Hsia, T. L. (2011). Core capabilities for practitioners in achieving e-business innovation. Computers in Human Behavior, 27(5), 1884-1891.

Malvey, D., & Hamby, E. (2004). E-Leadership: An Investigational Study of a New 21 st Century Leadership Phenomenon-Organizational Strategies for Transitioning to E-Leadership Systems. Association on Employment Practices and Principles, 169.

McEntire, L. E., & Greene-Shortridge, T. M. (2011). Recruiting and selecting leaders for innovation: How to find the right leader. Advances in Developing Human Resources, 1523422311424712.

Mitchelmore, S., & Rowley, J. (2010). Entrepreneurial competencies: a literature review and development agenda. International Journal of Entrepreneurial Behavior & Research, 16(2), 92-111.

Molinsky, A., Davenport, T., Iyer, B. and Davidson, C. (2012) 'Three skills every 21st -century manager needs', Harvard Business Review, 1-2, pp.139-143, Academic OneFile, Business Source Complete, EBSCOhost [Online], (Accessed: 1 Apri 2015).

Moore, D. R., Cheng, M. I., & Dainty, A. R. (2002). Competence, competency and competencies: performance assessment in organisations. Work study, 51(6), 314-319.

Nathan, M., & Rosso, A. (2012). Measuring the uk's digital economy with big data. The Nafional Insfitute of Economic and Social Research, July 22nd.

Ocker, R. J., Huang, H., Benbunan-Fich, R., & Hiltz, S. R. (2011). Leadership dynamics in partially distributed teams: An exploratory study of the effects of configuration and distance. Group Decision and Negotiation, 20(3), 273-292.

Petrie, N. (2011). Future trends in leadership development. Center for Creative Leadership white paper.

Philbin, S. (2008). Process model for university-industry research collaboration. European Journal of Innovation Management, 11(4), 488-521.

Power, D., & Malmberg, A. (2008). The contribution of universities to innovation and economic development: in what sense a regional problem?. Cambridge Journal of Regions, Economy and Society, 1(2), 233-245.

Pulley, M. L., Sessa, V. I., Fleenor, J., & Pohlmann, T. (2001). E-Leadership Separating the Reality from the Hype. Leadership in Action, 21(4), 3-6.

Rampersad, G., Quester, P., & Troshani, I. (2010). Managing innovation networks: Exploratory evidence from ICT, biotechnology and nanotechnology networks. Industrial Marketing Management, 39(5), 793-805.

Richey, R. C., Fields, D. C., & Foxon, M. (2001). Instructional design competencies: The standards. ERIC Clearinghouse on Information & Technology, Syracuse University, 621 Skytop Rd., Suite 160, Syracuse, NY 13244-5290.

Samartinho, J., Resende da Silva, P., & Faria, J. (2012). e-Liderança–Revisão de Literatura, Desafios e Orientações Futuras.

Sánchez, J. C. (2011). University training for entrepreneurial competencies: Its impact on intention of venture creation. International Entrepreneurship and Management Journal, 7(2), 239-254.

Singh, S. (2012). Developing e-skills for competitiveness, growth and employment in the 21st century: The European perspective. International Journal of Development Issues, 11(1), 37-59.

Tapscott, D. The Digital Economy: Rethinking Promise and Peril in the Age of Networked Intelligence (New York: McGraw-Hill, 2015

Tapscott, D., & Williams, A. D. (2012). Macrowikinomics: New solutions for a connected planet. USA: Portfolio.

TUIJNMAN,A. & BOSTRÖM, A. K. (2002) Changing notions of lifelong education and lifelong learning, International Review of Education, 48, pp. 93–110.

UNESCO (2000) The Dakar Framework for Action (Paris, UNESCO).

Wagner, T. (2012). Creating innovators: The making of young people who will change the world. Simon and Schuster.

Zaccaro, S. J., & Bader, P. (2003). E-Leadership and the Challenges of Leading E-Teams:: Minimizing the Bad and Maximizing the Good. Organizational dynamics, 31(4), 377-387.

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8 APPENDIX I

Overview of the European Competence Framework 3.0 (e-CF 3.0)

The e-Competence Framework is a tool to describe the skills of professionals in ICT-related roles. The e-CF is a reference for job and role descriptions, skill development, training and education. The framework has been developed by a large number of European ICT and HR experts in the context of the CEN Workshop on ICT Skills. The European e-Competence Framework is structured from four dimensions. These dimensions reflect different levels of business and human resource planning requirements in addition to job/work proficiency guidelines. The four dimensions of the e-CF are specified as follows:

- **Dimension 1:** Five e-Competence areas, derived from the ICT business processes:
  Plan – Build – Run – Enable – Manage. This area is instrumental in HR assessment and the allocation of training programmes.

- **Dimension 2:** A set of reference e-Competences for each area, with a generic description for each competence. 36 competences have been included in e-CF 2.0. These competences are not business sector-specific.

- **Dimension 3:** Proficiency levels of each e-Competence provide European reference level specifications on e-Competence levels e-1 to e-5, which are related to the EQF levels 3 to 8.

- **Dimension 4:** Samples of knowledge and skills relate to e-Competences in dimension 2. They are provided to add value and context and are not intended to be exhaustive.

European e-Competence Framework 3.0 overview

Dimension 1 5 e-CF areas (A – E)	Dimension 2 40 e-Competences identified	Dimension 3 e-Competence proficiency levels e-1 to e-5, related to EQF levels 3–8				
		e-1	e-2	e-3	e-4	e-5
A. PLAN	A.1. IS and Business Strategy Alignment				■	■
	A.2. Service Level Management			■	■	
	A.3. Business Plan Development			■	■	■
	A.4. Product/Service Planning		■	■	■	
	A.5. Architecture Design			■	■	■
	A.6. Application Design	■	■	■		
	A.7. Technology Trend Monitoring				■	■
	A.8. Sustainable Development			■	■	
	A.9. Innovating				■	■
B. BUILD	B.1. Application Development	■	■	■		
	B.2. Component Integration		■	■	■	
	B.3. Testing	■	■	■	■	
	B.4. Solution Deployment	■	■	■		
	B.5. Documentation Production	■	■	■		
	B.6. Systems Engineering			■	■	
C. RUN	C.1. User Support	■	■	■		
	C.2. Change Support		■	■		
	C.3. Service Delivery	■	■	■		
	C.4. Problem Management		■	■	■	
D. ENABLE	D.1. Information Security Strategy Development				■	■
	D.2. ICT Quality Strategy Development				■	■
	D.3. Education and Training Provision		■	■		
	D.4. Purchasing		■	■	■	
	D.5. Sales Proposal Development		■	■		
	D.6. Channel Management			■	■	
	D.7. Sales Management			■	■	■
	D.8. Contract Management		■	■	■	
	D.9. Personnel Development		■	■	■	
	D.10. Information and Knowledge Management			■	■	■
	D.11. Needs Identification			■	■	■
	D.12. Digital Marketing		■	■	■	
E. MANAGE	E.1. Forecast Development			■	■	
	E.2. Project and Portfolio Management		■	■	■	■
	E.3. Risk Management		■	■	■	
	E.4. Relationship Management			■	■	
	E.5. Process Improvement			■	■	
	E.6. ICT Quality Management		■	■	■	
	E.7. Business Change Management			■	■	■
	E.8. Information Security Management		■	■	■	
	E.9. IS Governance				■	■