CHAPTER II

REVIEW OF LITERATURE
II.1 Online Social Media

Before Facebook and the social media explosion, web-based software included user groups, bulletin boards, and listservs used during the 1970s, 1980s and 1990s. Online services such as Prodigy and CompuServe followed by instant messaging services including Instant Relay Chat (IRC), appeared in the 1980s. ICQ, an instant messaging software client, arose in the 1990s. Text abbreviations, avatars, and emoticons (tiny images inserted in messages to add emphasis), first appeared in ICQ. In 1999, LiveJournal opened as a social network encouraging users to follow others, create groups, and interact online. In the early 2000s, gaming software, known as MMORPG or Massively Multiplayer Online Role-playing Games, became popular (web 2.1). Friendster, a social networking site (SNS) popular in Asia, arrived on the web in 2002, with MySpace and LinkedIn appearing in 2003. From a parental perspective, MySpace targeted pre-teens and teenagers. MySpace sites contained a profile section for adding an avatar, an image representing an individual or group, and personal information.

Members could choose the site design via template and colour scheme, post diary or blog entries, collect friends, and respond to postings. LinkedIn’s audience directed its offerings to the professional set. The site has similarities to other social networks. The difference sets it apart. LinkedIn members manage an online resume and network connections to similar professionals. The site has a section that is free, and areas that, for a fee, provide additional capabilities. These sites are all about connecting with friends or career professionals online (web 2.1).

Originally designed for college students, Facebook began on the Harvard University campus in 2004 but by 2006 was open to any person with an Internet connection. By 2009, Facebook had reached 200 million accounts (Simmons, 2009), and in 2011 it was up to 1.11 billion users as of May 2, 2013 (Facebook, 2013). It is very popular all around the world.
At the South by Southwest Interactive conference held in 2007, Twitter, a micro
blogging site, began by broadcasting thousands of postings as attendees responded to
happenings at the conference (web 2.1). Twitter allows users to broadcast short messages, up
to 140 characters, to a community of followers. Like Facebook, it has become extremely
popular all around the world.

O'Reilly (2005) coined the phrase 'Web 2.0' and was the first to write about the
concept. Table 2.1 gives a list of Web 1.0 to Web 2.0 comparisons.

Table 2.1
Comparing Web 1.0 and 2.0 Technologies and Sites

<table>
<thead>
<tr>
<th>Web 1.0</th>
<th>Web 2.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>DoubleClick</td>
<td>Google AdSense</td>
</tr>
<tr>
<td>Ofoto</td>
<td>Flickr</td>
</tr>
<tr>
<td>Akamai</td>
<td>BitTorrent</td>
</tr>
<tr>
<td>mp3.com</td>
<td>Napster</td>
</tr>
<tr>
<td>Britannica Online</td>
<td>Wikipedia</td>
</tr>
<tr>
<td>personal websites</td>
<td>Blogging</td>
</tr>
<tr>
<td>page views</td>
<td>cost per click</td>
</tr>
<tr>
<td>screen scraping</td>
<td>web services</td>
</tr>
</tbody>
</table>


Allen (2009) revisited these ideas and wrote about how the web is currently all about
harnessing collective intelligence. The connectedness of the web extends to mobile phones
and wireless connections in multiple places. The introduction of smart phones and wireless
connectivity hotspots make harnessing knowledge a relatively simple process. Rheingold
(2002) referred to users of portable devices and easy connectivity as 'smart mobs' because users can cooperate and communicate in ways never possible. New technologies make it increasingly easy to ask questions and receive almost instantaneous responses.

The web is an environment of participation, not just a space for retrieving information. Embedded in blogs or wikis, online videos and 3D animations have become common elements to social networks. Social networking sites continue to develop on the Internet. At the site go2web20.net (web 2.2) users can find a plethora of choices for networking, editing photos, blogging, sharing content and more, all part of the growing world of Web 2.0. Go2web20.net continuously updates new tools that are available at no charge, and which help users participate and stay connected.

**Blog:** Short for ‘web-log,’ a blog is an online journal that can be used as an informal method for learning. It is an online space for sharing ideas, strategies, and participation (Solomon & Schrum, 2007). According to Richardson (2010), a blog is a website that is easy to create, update, and maintain. Blogs also foster interactive conversations between author and consumer. Blogs can provide a space for innovative publishing. Some blogs are maintained by individuals, whereas others have multiple posters and large communities of commentators, and thus may be considered a form of social networks.

**Collaborative networks:** Networks are groups of people who join together when needing help in solving problems. Dulworth (2008) sees two kinds of collaborative networks: peer-to-peer networks and communities of practice. Bacon (2009) refers to collaborative networks as community with a sense of belonging. He defines community as a group of people "who interact together in the same environment" (p. 4). In relation to this study, collaborative
networks are groups of adult learners who join together to solve problems, create new ideas, and share knowledge.

**Collaborative projects:** In classrooms from K-16, students work with others in completing an assignment, or project. Collaborative project work is an “in-depth study of a particular topic that one or more children undertake” (Katz & Chard, 1989). In particular to this study, collaborative projects are tasks, assignments or projects completed by students and their teachers in classrooms around the globe.

**Podcast:** Podcasts were originally audio (speech or music) distributed over the Internet, similar in many ways to old-fashioned radio. However, podcasts may now also contain either still images or video clips. They may be downloaded and listened to over users’ iPods and smart phones.

**Social network:** When a computer network connects people or organizations, it is considered a social network. Just as a computer network is a set of machines connected by a set of cables, a social network is a set of people (or organizations or other social entities) connected by a set of social relationships, such as friendship, co-working or information exchange (Garton, Haythornthwaite, & Wellman, 1997).

“Computer networks are inherently social networks, linking people, organizations, and knowledge” (Wellman, 2001).

Preece (2000) defined a social network group as a special type of network whose members are highly interconnected. Groups maybe closely knit and maintain many different kinds of relationship. Their members may also be tightly bound and maintain connections
more with each other than with others outside of the group (pp. 173-174). Facebook is a well-known example of a social network.

**Wikis:** Wikis are multiple web pages linked together focusing on a specific topic or broad idea. Wiki comes from the Hawaiian word meaning quick. *Wikipedia* is an online encyclopaedia in which users can add or edit information, as they desire, and is probably the best-known example of wiki technology.

**YouTube:** *YouTube* is a web site owned by Google, Inc. that allows users to upload video and audio clips of a variety of types. These may include musical performances, clips from television shows or movies, interviews and lectures, ‘how-to’ demonstrations, or user-created clips of all types.

**Social Media and Networking:** The explanation of social media includes free tools such as blogs, wikis, podcasts (audio and radio-type programs distributed over the Internet) and video for new ways of communication, and is presented in simple images making it easy to understand. Social media tools allow anyone to publish ideas and opinions, post ratings and add comments to web sites, wikis and blogs while participating in a new way to create communication with others who care about similar topics. Social networking has been defined by Gunawardena et al. (2009) as the practice of expanding knowledge by making connections with individuals of similar interest. In the Web 2.0 environment, social networking is linked to technological service and software that make it possible for people to communicate with others from anywhere, at any time. Social networking sites are online spaces that can be customized to a large extent by their users, providing space for personal profiles, which users complete in order to make connections with others. (p.4). Social
networking sites can provide alternatives for personal learning. Participation is on a volunteer basis, not required. Learning that may take place is informal. Experiences are based on the domain of using modern technological tools in education. Becoming a member of a social media site designed for educators could be an alternate opportunity for informal learning that addresses the needs of participants interested in making changes in their profession.

II.2 Social Software

In general, social software refers to web-based applications that support human collaboration and communication (Green and Pearson, 2005). Social software is not an entirely new phenomenon; Social computing, groupware, and computer supported cooperative work (CSCW) are similar concepts that have been explored in scientific literature since the 1980’s. However, the spread of the Internet, its bandwidth growth, and the increasing power of personal computers have increased the popularity of social software (Parameswaran and Whinston, 2007). Moreover, social software differs considerably from previous paradigms, since it is more people-oriented. Communities emerge instead of being imposed. Social software comprises various applications from online community platforms, such as wikis or weblogs, to interactive entertainment (Wang, Zeng, Carley and Mao, 2007). Finally, the variety of application areas is large: Whether used in libraries, e-learning, or corporations (Lin and Yuan, 2006; Efimova and Grudin, 2007; McAfee, 2006), social software is adopted within various settings. Corporations focus primarily on two types of social software applications: wikis and weblogs. A global McKinsey study recently confirmed that one-third or more of companies currently use or plan to use these technologies (Bughin and Manyika, 2007). Given the aim of our research endeavour, we focus on wikis and weblogs, which we now briefly describe.
A wiki is an easy to use website designed to collect information collaboratively. Users can rapidly generate new articles and modify existing articles, even if they are not the initial author (Tepper, 2003). Each article is automatically converted into a web page, which is instantly available through the website. The different articles can be sorted into categories, are referenced in an internal search engine, and related web pages are usually linked (Hippner, 2006). A new wiki can be easily set up and requires little initial configuration, since the community organizes the content from the bottom up (Beck, 2007; Gouthier and Hippner, 2007). A community often forms around such a website, and the users not only consume information, but also actively participate in improving and expanding it. Since all users can usually contribute to a wiki, it is easy to keep the information up to date if the community is active and large enough (Beck, 2007; McAfee, 2006). Increasingly, corporations are also using wikis to support employee collaboration and knowledge management (Majchrzak, Wagner and Yates, 2006; Wagner, 2004).

Weblogs are websites in which an author or a group of authors publishes articles sporadically or at regular intervals. The dynamic index page of a weblog lists the articles or extracts from them counter-chronologically so that the most recent item is listed first. Visitors can use this function to read the complete article, and they also have an opportunity to comments on it. The author and other visitors can, in turn, respond to these comments, creating vivid discussions (Hippner, 2006; Ip and Wagner, 2008). Weblogs are often created by individuals or small groups of individuals, but the number of corporate weblogs is also steadily increasing (Du and Wagner, 2006). The application areas of corporate weblogs are very diverse. Some corporate weblogs are only for internal use, but companies also apply this technology to market communications and public relation tasks (Efimova and Grudin, 2007).

The IS literature provides several definitions and measures of IS success. As DeLone and McLean (1992) state, there are nearly as many measures as there are studies. Obviously,
there is no ultimate definition of IS success. Each group of stakeholders who assess IS success in an organization (Grover, Jeong and Segars, 1996) has a different definition. From a software developer perspective, a successful IS is completed on time and within budget, has a set of features that is consistent with the specifications, and functions correctly. Users may find an IS successful if it improves their work satisfaction or work performance. From an organizational perspective, a successful IS contributes to the company’s profits or creates a competitive advantage. Furthermore, IS success also depends on the type of system that is evaluated (Seddon, Staples, Patnayakuni and Bowtell, 1999).

In order to provide a more general and comprehensive definition of IS success that covers these different points of view, DeLone and McLean (1992) reviewed the existing definitions of IS success and their corresponding measures, and classified them into six major categories. They therefore created a multi-dimensional measuring model with interdependencies between the different success categories. This D&M IS Success Model received much attention from IS researchers who thereafter have often treated and measured IS success as a multidimensional construct. Motivated by DeLone and McLean’s call for further development and validation of their model, many researchers have attempted to extend or re-specify the original model. A number of researchers claim that the D&M IS Success Model is incomplete and suggest that more dimensions should be included in the model, or present alternative success models (Ballantine, Bonner, Levy, Martin, Munro and Powell, 1996; Seddon, 1997). Other researchers focus on the application and validation of the model (Rai, Lang and Welker, 2002).

Judged by its frequent citations in articles published in leading journals, the D&M IS Success Model has, despite some revealed weaknesses (Hu, 2003), become the dominant evaluation framework in MIS research, in part due to its understanding ability and simplicity. Ten years after the publication of their first model, and based on the evaluation of the many
contributions to it, DeLone and McLean proposed an updated IS success model (DeLone and McLean, 2003). This updated model consists of six interrelated dimensions of IS success: information, system and service quality, (intention to) use, user satisfaction, and net benefits. The model can be interpreted as follows: A system can be evaluated in terms of information, system and service quality; these characteristics affect subsequent use or intention to use and user satisfaction. As a result of using the system, certain benefits will be achieved. The net benefits will (positively or negatively) influence user satisfaction and further IS use.

Success in the field of social software can be perceived in many dimensions, as is the case with IS success in general. However, there is little documented research on social software success measurement (Hester and Scott, 2008; Trimi and Galanxhi-Janaqi, 2008).

Hsu and Lin investigate people’s intention to blog by considering technology acceptance factors, knowledge-sharing factors, and social influence factors in order to assess whether a person is a blogging candidate. They conclude that people’s blogging tendencies are influenced by their attitude towards blogging, which is influenced by whether they identify with the blogging community (Hsu and Lin, 2008). Ip and Wagner identify several types of bloggers and their corresponding social needs.

These investigations, together with an adapted task-technology fit model, lead to an identification of the possible impact of web logs on organizations and customer relationships (Ip and Wagner, 2008). Du and Wagner highlight another dimension of weblog success by exploring the role of weblog technology and its impact on weblog popularity, highlighting the importance of technological features within weblogs (Du and Wagner, 2006). In addition, Trimi and Galanxhi-Janaqi (2008) emphasize the congruence that has to exist between the organization’s and user’s benefits from blogs and the importance of this for the acceptance and success of blog technology in a corporation. On this basis, they propose a research framework for further empirical studies. Nevertheless, the paper fails to provide precise
operationalised measures and lacks a theoretically validated basis. Hester and Scott do, however base their comprehensive model on the diffusion of innovation theory. They incorporate organizational constructs, such as organizational culture and individual user perceptions, to assess wiki diffusion in organizations. Still, the proposed model is in a very early stage of research and also lacking operationalised measures (Hester and Scott, 2008).

II.3 D & M IS Success Model

The Primary Purpose of the original DeLone and McLean (D & M) paper was to synthesize previous research involving IS success into a more coherent body of knowledge and to provide guidance to future researchers. Based on the communications research of Shannon and Weaver and the information “influence” theory of Mason, as well as empirical management information systems (MIS) research studies from 1981–87, a comprehensive, multidimensional model of IS success was postulated. Shannon and Weaver defined the technical level of communications as the accuracy and efficiency of the communication system that produces information. The semantic level is the success of the information in conveying the intended meaning.

The effectiveness level is the effect of the information on the receiver. In the D&M IS Success Model, “systems quality” measures technical success; “information quality” measures semantic success; and “use, user satisfaction, individual impacts,” and “organizational impacts” measure effectiveness success. In spite of the passage of time since the Shannon and Weaver framework in 1949 and Mason’s extensions in 1978, both appear as valid today as when we adopted them a decade ago.

Based on both process and causal considerations, these six dimensions of success are proposed to be interrelated rather than independent. This has important implications for the measurement, analysis, and reporting of IS success in empirical studies. A temporal, process
model suggests that an I.S. is first created, containing various features, which can be characterized as exhibiting various degrees of system and information quality. Next, users and managers experience these features by using the system and are either satisfied or dissatisfied with the system or its information products.

The use of the system and its information products then impacts or influences the individual user in the conduct of his or her work, and these individual impacts collectively result in organizational impacts.

II.4 System Quality

Main research on system quality is summarised in Table 2.2.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Measurement Approach</th>
<th>Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functionality</td>
<td>Proportion of desired functions supported by the wiki</td>
<td>Maxwell, 2007; Wagner and Bolloju, 2005; Hepp, Siorpaes and Bachlechner, 2007; Majchrzak et al., 2006; Müller and Dibbern, 2006</td>
</tr>
<tr>
<td>Flexibility</td>
<td>Interviews with technicians and Administrators</td>
<td>Wagner, 2004 Wagner and Majchrzak, 2007; Müller and Dibbern, 2006; Raman, 2006</td>
</tr>
</tbody>
</table>
Table 2.2 continued

<table>
<thead>
<tr>
<th></th>
<th>Interviews with technicians and Administrators</th>
<th>Wagner, 2004; Wagner and Majchrzak, 2007, Müller and Dibbern, 2006; Raman, 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customizability</td>
<td>Interviews with technicians and Administrators</td>
<td>Beck, 2007</td>
</tr>
<tr>
<td>Integration</td>
<td>Survey of the users</td>
<td>Hasan and Pfaff, 2006; Maxwell, 2007; Hepp et al., 2007; Raman, 2006; Wagner and Majchrzak, 2007</td>
</tr>
<tr>
<td>Ease of use</td>
<td>Survey of the users</td>
<td>Bharati and Chaudhury, 2004; Lin and Lee, 2006</td>
</tr>
<tr>
<td>Reliability</td>
<td>Survey of the users</td>
<td>Bharati and Chaudhury, 2004; Lin and Lee, 2006</td>
</tr>
<tr>
<td>Response time</td>
<td>Survey of the users</td>
<td>Bharati and Chaudhury, 2004; Lin and Lee, 2006</td>
</tr>
</tbody>
</table>

II.5 Information Quality

Main research on information quality is presented in Table 2.3. Four dimensions, namely, characteristics, diversity, organisation and presentation are presented along with corresponding measurement approach and sources.


Table 2.3

Research on Information Quality

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Measurement Approach</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Characteristics</td>
<td>Analysis of a representative fraction of the article, survey of the users</td>
<td>Hepp et al., 2007;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Majchrzak et al., 2006;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Müller and Dibbern, 2006</td>
</tr>
<tr>
<td>Diversity</td>
<td>No. of articles, proportion of requests failing to yield expected results</td>
<td>Reisberger and Smolnik, 2008</td>
</tr>
<tr>
<td>Organization</td>
<td>Survey of the users</td>
<td>Maxwell 2007; Wagner, 2004,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Majchrzak et al., 2006;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Müller and Dibbern, 2006</td>
</tr>
<tr>
<td>Presentation</td>
<td>Survey of the users</td>
<td>Maxwell, 2007; Wagner, 2004,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Majchrzak et al., 2006;</td>
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<td></td>
<td></td>
<td>Müller and Dibbern, 2006</td>
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</tbody>
</table>

II.6 Use and Satisfaction

Main research on use and satisfaction is summarised in Table 2.4. Six dimensions, namely, number of contributions; number of modifications; frequency of use; time invested; subjective attitude towards Wikis and attitude towards computers are presented along with corresponding measurement approach and sources.
Table 2.4
Research on Use and Satisfaction

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Measurement Approach</th>
<th>Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of contributions</td>
<td>Evolution of the number of articles, survey of the users</td>
<td>Majchrzak et al., 2006; Wagner and Majchrzak, 2007</td>
</tr>
<tr>
<td>Number of modifications</td>
<td>System features and log statistics, survey of the users</td>
<td>Majchrzak et al., 2006; Wagner and Majchrzak, 2007</td>
</tr>
<tr>
<td>Frequency of use</td>
<td>System features and log statistics, survey of the users</td>
<td>Reisberger and Smolnik, 2008</td>
</tr>
<tr>
<td>Time invested</td>
<td>System features and log statistics, survey of the users</td>
<td>Reisberger and Smolnik, 2008</td>
</tr>
<tr>
<td>Subjective attitude towards Wikis</td>
<td>Survey of the users</td>
<td>Reisberger and Smolnik, 2008, Bailey and Pearson, 1983; Müller and Dibbern, 2006; Rushinek and Rushinek, 1986</td>
</tr>
<tr>
<td>Attitude towards computers</td>
<td>Survey of the users</td>
<td>DeLone and McLean, 1992</td>
</tr>
</tbody>
</table>

II.7 Impact on Individuals and Organisations

Main research on impact on individuals is summarised in Table 2.5. Three dimensions, namely, improved professional status; improved productivity and expanded personal knowledge are presented along with corresponding measurement approach and sources.
Table 2.5
Research on Impact on Individual

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Measurement Approach</th>
<th>Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved professional Status</td>
<td>No success measure found</td>
<td>Reisberger and Smolnik, 2008,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Majchrzak et al., 2006</td>
</tr>
<tr>
<td>Improved productivity</td>
<td>Evolution of personal productivity</td>
<td>Reisberger and Smolnik, 2008</td>
</tr>
<tr>
<td>Expanded personal Knowledge</td>
<td>No success measure found</td>
<td>Cress and Kimmerle, 2008</td>
</tr>
</tbody>
</table>

Main research on impact on organisations is summarised in Table 2.6. Four dimensions, knowledge creation; knowledge sharing and storing; knowledge reuse and increased productivity namely are presented along with corresponding measurement approach and sources.

Table 2.6
Research on Impact on Organisation

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Measurement Approach</th>
<th>Source(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge creation</td>
<td>No success measure found</td>
<td>Fuchs-Kittowski and Köhler, 2002;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Raman, 2006</td>
</tr>
<tr>
<td>Knowledge sharing and Storing</td>
<td>Number of articles</td>
<td>Fuchs-Kittowski and Köhler, 2002;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Raman, 2006</td>
</tr>
<tr>
<td>Knowledge reuse</td>
<td>Number of article consultations</td>
<td>Majchrzak et al., 2006</td>
</tr>
<tr>
<td>Increased productivity</td>
<td>Evolution of overall productivity</td>
<td>Reisberger and Smolnik, 2008,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Majchrzak et al., 2006</td>
</tr>
</tbody>
</table>
II.8 Learning in a Digital Age

According to Brown and Adler (2008), social learning, due to the growth of the Internet, has become a method for how we learn together and from one another. In the past, learning was centred in one venue with one target audience. Now learning can occur anytime, anyplace, and with other learners located around the world. As learning avenues transform, the ways in which people learn continue to evolve. New technology is forcing new behaviours and thus new paradigm shifts (Gunawardena et al., 2009). These shifts create pressures of necessity for modifications in professional practices including how individuals and groups embrace the required changes.

Learning has formal and informal spaces. Formal learning is structured, usually prescribed, while informal learning has a flexible, fluid movement that is part of the social world of everyday life. Internet searching provides information on demand. Web 2.0 tools enable shared informal learning to take place. The capabilities of up-to-date hardware, infrastructure, web-based software, and Internet speed provide new spaces for learning within a community.

Participation in online communities provide the means by which many people can join together to share common knowledge, learn new trends, and develop relationships that encourage and support one another. Green and Hannon (2006) enumerated four key components to learning: finding information and knowledge, doing something with it, sharing it with an audience, and reflecting on it. Social media tools provide a pathway for all four components to occur. Russo, Watkins, and Groundwater-Smith (2009) stated, "Social media technologies have broadened learning options, shifting the focus from individual/institutional custodianship to participatory relationships where those involved in the learning process are seeking and sharing new knowledge" (p. 156).
Knowles, Holton, and Swanson (2005) found that adult learners are self-directed and self-motivated, bring their own personal experiences to learning, learn when there is a need to know, and that their orientation to learn is life-centred. The concept of learning together, sharing information and knowledge leads to learning in a community of practice. According to Riel (1996), a community is the interactions and relationships between and among people who gather together. Members of a community of practice must learn the skills and language of the community as they move toward becoming a master practitioner. According to Wenger et al. (2002), a community of practice (COP) consists of a group of people who share specific interests or seek to solve a common problem in ongoing interactions with group members. Groups come in many sizes and structures from a small informal group meeting over lunch discussions to formal structured meeting times and places. Group members come together to share ideas, ask for assistance in solving issues, offer solutions to questions, and help the members of the group. Overtime group members gain new understandings, perspectives, and knowledge as they develop personal relationships.

During the Middle ages, guilds served the role of communities of practice. Masters served as teachers and taught newcomers the skills necessary to master a trade. Communities of practice exist today in schools, at work, at home and in hobbies. Lave and Wenger (1991) explained, "learners inevitably participate in communities of practitioners and that the mastery of knowledge and skill requires newcomers to move toward full participation in the socio-cultural practices of the community" (p. 29). As members grow, share, and learn within the community of practice, they move toward mastery of knowledge. The journey to mastery enables established members to continually begin fresh learning cycles with newcomers to the group community.

Communities of practice share three similar elements that bind the group as a collaborative entity including: (a) a domain of information or knowledge, (b) a group of
people interested in the domain, and (c) the practice that comes out of the domain (Wenger et al., 2002). The domain provides the common interest, knowledge or content of the community. The topic attracts members, who then form a group community. Members are willing to share knowledge, build new ideas, and assist others with learning content as the cycle of learning continues with the addition of new members. As group members continue this cycle of learning, demonstrating knowledge and understanding, the practice of the community emerges from the common interest.

Communities of practice connect people to knowledge, experts and expertise. A strong community spans over time, builds knowledge, and provides human connections in the confines of knowledge that deepen relationships, and respect as the community grows. Wenger et al. (2002) established seven design principles for establishing and maintaining communities of practice. These elements are not considered to be a recipe for success but include overarching ideas that make the cultivation of communities valuable.

The principles include: (a) design for evolution, (b) open a dialogue between inside and outside perspectives, (c) invite different levels of participation, (d) develop both public and private spaces, (e) focus on value, (f) combine familiarity and excitement, and (g) create rhythm for the community.

Building on the work of Wenger (1998) and Wenger et al. (2002), Dulworth (2008) explained that a community of practice has three components: the domain, the topic or area of interest; the community, the people who have a vested interest in the topic; and the practice, the action members take to learn, solve problems, and increase understanding. According to Dulworth, two kinds of networks are effective in solving problems. These are peer-to-peer networks and communities of practice. In peer-to-peer networks, members have similar interests and responsibilities and need to solve similar problems. In a community of practice people join together in collaboration to help others learn something or solve a problem. As
one becomes a practicing member, expertise is developed in the shared interest area. A member joins a community of practice voluntarily and is willing to share knowledge as well as receive new thoughts and ideas.

Gunawardena et al. (2009) defined social networking "as the practice of expanding knowledge by making connections with individuals of similar interest" (p. 4). Learning in a community of like-minded people builds relationships that impact learning. An online community of educators provides a space to come together because they use or are interested in using innovative technology, Web 2.0 tools, social media sites, and collaborative technologies in educational settings. The online community represents a community of individuals who participate in the process of learning from one another as they learn together in legitimate peripheral participation (Lave & Wenger, 1991).

Participation in the community is critical for becoming part of the community and working toward mastery as the community continuously evolves. Time spent in the community provides opportunities for the learners to make the culture of practice their own. Activities, tasks, functions, and understandings do not exist in isolation; they are part of broader systems of relations in which they have meaning. “These systems of relations arise out of and are reproduced and developed within social communities” (Lave & Wenger, 1991).

Russo et al. (2009) argued that informal learning could be understood as "learner-centred, or learner-directed, where the learner has agency over what is being learned, how it is being understood and evaluated, and how it will be used" (p. 158). Green and Hannon (2006) found that informal learning situated in gaming involves self-motivation, ownership, a purpose for doing, and includes peer-to-peer learning. These same elements are found in the legitimate peripheral participation that Lave and Wenger (1991) discuss. For example, one 14-year old interviewed by Green and Hannon said, "My friend showed me how to build a
website and I showed him how to get into World of Warcraft” (p. 48). One has a skill the other desires and finds someone in his world to help him learn that skill and in turn shares previously acquired knowledge.

According to Allan and Lewis (2006), situational learning is a social activity. Human beings are social beings making connections and social interactions, "and that interactions with others are central to learning within a community" (p. 844). Social media sites evolve as technology changes as it maintains a community of users who join to learn about technology and Web 2.0 tools in education.

Social media sites evolve as the community numbers grow and as new technologies appear. Online spaces have discussion areas and forums for members. Sites directed at educators are interested in the educational setting, some with particular emphasis. Experts in specific areas offer suggestions and advice. Questions asked by members address topics of interest and thereby express the value found in the community. An online community may maintain a new members forum and adds new technologies as available. The seven design principles of communities of practice as established by Wenger et al. (2002) (design, input, value, dialogue, multiple levels of participation, the familiar, and the new, all coupled with rhythm), all live within social media sites where members gather to learn and grow in knowledge and skills.

To meet social and economic challenges in the environment an organization must have a broad spectrum of competence, including their ability to foster the acquisition of knowledge. It is through learning that an organisation is able to increase the depth and diversity ‘Learning is seen as purposive quest to productivity and innovativeness in uncertain technological and market circumstances. The greater the uncertainties, the greater the need for learning.’
From a sociological perspective, organizational learning is viewed from the point of effect of power structures and hierarchy, conflict, ideology, and rhetoric (Smith 1999). From a strategy perspective, organizational learning addresses issues of competitiveness on organization–environment interaction, different levels of learning and knowledge networks. Cultural anthropology addresses the system by focusing on culture as the cause and effect of the learning system.

II.9 Virtual Learning and Technologies

Defining Virtual Learning and Technologies: Two discrete meanings are commonly used for virtual. First is to describe the hypothetical or imaginary existence through the mind or indirect experiences. The other, which is relevant to our discussion, is the simulated reality occurring in a computer or computer networks. As for learning, it is viewed as “a basic human activity that takes place everywhere and every day. . . the people who do the work conscientiously are constantly learning” (Rosenberg, 2006). Learning should be purposefully and strategically blended (Rosenberg, 2006; Yoon & Lim, 2007).

Rosenberg (2006) aptly pointed out that the common use of blended learning as the integration of classroom and technology-based learning is too limiting because it defaults to an instructional approach that misses other approaches, which can be more appropriate (e.g., informal guides or personal networks). He suggested that “an expanded view of blended learning includes the combination of (formal) training and (informal) non-training approaches . . . in ways that improve the effectiveness and efficiency of learning” (pp. 83-84). Yoon and Lim (2007) similarly defined strategic blending as a purposeful mix of delivery media, particularly face-to-face (for its supremacy in clarification and clear introduction) and four major forms of Web technologies: (a) web/computer-based training, (b) web/performance support system and knowledge management, (c) web/asynchronous tools, and (d)
web/synchronous communication and collaboration tools to improve learning and performance solutions, which are derived from the goals and needs of an organization.

Defining and studying technology for HRD is important because of rapid changes in workplace learning and performance (WLP) driven by technologies. Benson, Johnson, and Kuchinke (2002) presented a comprehensive conceptual framework of technology for HRD in the digital workplace. They listed major IT tools (e.g., enterprise resource planning systems, learning management systems, performance support systems, instant messengers, email, and so on) around three core domains of HRD: Learning, performance enhancement, and organizational development and change.

Yoon (2008) further developed their work and proposed studying technologies in the domains of learning, performance, and work-affecting life because the domain of organizational development and change overlap with domains of learning and performance, whereas new life practices of searching, posting, and sharing information on the Internet drastically affect WLP. He also suggested that technology should be understood as a systematic treatment of art and craft as well as the application of knowledge in a particular domain using technical processes, methods, and scientific knowledge.

Taken together, it is emphasized that (a) virtual learning and technologies highlight the importance of utilizing computer and network technologies to enhance learning, and (b) context, methodical and systematic processes, creativity, and the effectiveness and efficiency of solutions matter much more than semantic distinctions between forms of delivery technologies.

*Learning and Performance Architecture:* Rosenberg (2006) suggested that a smart enterprise, a high-performing organization where knowledge and capabilities grow and flow by technology, is the result of four major forces: (a) leadership that emphasizes learning and
performance, (b) change management, (c) performance-centric environments, and (d) the learning and performance architecture (LPA). It is the LPA that helps us identify core components and practices of virtual learning and technologies. His concept of a *smart enterprise* is similar to that of a *learning organization*, a term that is more familiar to many HRD professionals. A learning organization is an ideal structure and culture that embeds learning into work routines (Tsoukas & Mylonopoulos, 2004). It acquires, processes, and disseminates knowledge about markets, products, technologies, and business processes based on information, experiences, and experimentations. The learning organization literature has also established essential system characteristics and employee behaviours: Continuous learning, inquiry/dialogue, team learning, empowerment, system connection, embedded systems, and leadership (Yang, Watkins, & Marsick, 2004).

However, descriptions of the *system connection* and the *embedded system*, two components that define the use of technologies in the learning organization literature limit the types and uses of technologies to *skills databases* and *information systems*. The overall status of HRD research on technology between 2000 and 2006 also indicates that the dominant majority of studies (61%) took place within formal instructional settings (Githens, Dirani, Gitonga, & Teng, 2008). To leverage what network technologies truly offer for WLP, a more strategic and integrative framework that aligns major IT tools (from domains of learning, performance, and work-affecting life (See Yoon, 2008) with core practices of WLP, which capture both formal and informal learning and knowledge sharing, is necessary.

The LPA framework suggests that organizations should implement and integrate formal learning (onsite and online training) with informal learning (knowledge management (KM), performance support systems, and mentoring/coaching) making the best use of digital technologies. Two very far-reaching notions are that (a) KM is a combination of information repositories, (virtual) communities and networks, and experts/expertise, and (b) e-learning is
more than e-training and must include online training, KM, and performance support systems. Such conceptualization of informal learning and technologies is in agreement with Marsick’s (2009) observation that informal learning usually happens in the pursuit of a mix of individual and organizationally set goals, and research will be more fruitful if studied in the context of KM within organizations.

Identifying the focus of learning (e.g., acquiring knowledge on newly established procedures/processes or collaboratively determining problem solutions) and learning contributing technologies (e.g., information retrieval, expert identification, virtual conferencing, or real-time collaborative editing, etc.) is vital if we admit that the context of business learning is losing the ground for learning away from work (i.e., formal learning), and instead, favours access to knowledge, data, and others’ expertise at the moment of need. Moving from onsite training to online training, and then to KM or collaboration, and then to performance support systems implies less disruption of work to learn. Rosenberg (2006) stresses that these components are not organized as singular, isolated functions but as part of a broad-based LPA.

**Knowledge over Training-centric Approaches:** When performance problems arise or new initiatives are rolled out, too often training or another learning solution is proposed. For example, when both authors separately taught graduate-level courses in human performance technology, most learners shared the “default” approach to suggesting onsite or online training solutions to diverse issues, such as work-order backlogging, service quality improvement, leadership development for mid-level managers, teachers’ professional development, student enrolment at universities, and developing dealers’ competence.

Knowledge as information extracted or organized from data applied for a productive purpose helps to see how a knowledge-centric view purposefully integrates training with
informal learning and knowledge sharing as a part of comprehensive WLP solutions focusing on the generation of useful knowledge.

Web tools and services, such as blogging, wikis, real simple syndication or rich site summary (RSS), social bookmarking tools, virtual worlds (O’Conner & Menaker, 2008), vCoP (Ardichvili, 2008), KM (Gourlay, 2001), and performance support systems can be purposefully used to support major learning activities and processes within a strategically blended learning environment (Yoon & Lim, 2007). We cannot assume that employees will voluntarily utilize various forms of learning opportunities and technologies. At the same time, training or learning departments are pressured to make selective choices in technologies and be more responsive. Typical training and learning departments alone may not have needed resources, knowledge, and the budget to design and lead the LPA framework without working closely with leadership and business units. Bold-faced items on the figure also indicate that more than one popular Web tool exists, thus in adopting technologies, organizations must examine the administrative demands, technological affordances, and the potential impact of selected technologies to linked components. Informal learning is always contrasted with formal learning in the literature, but in reality, both interact frequently and in important ways.

Attention was drawn to the idea that types of knowledge work differ based on the level of work interdependence and the complexity (routine vs. interpretive work) and suggested that technologies be selected accordingly. For instance, transaction workers whose responsibilities are largely procedure-based will benefit more from the use of information repositories to perform routine tasks than with tools for collaboration, while virtual meetings can be critical for geographically dispersed cross-functional teams to make creative decisions.
Virtual Learning and Technologies and VHRD: Related to the theme of this issue, our preceding discussion of the LPA framework and technology-enabled knowledge-centric approaches to WLP supports definition of VHRD as “a media rich and culturally relevant web environment that strategically improves expertise, performance, innovation, and community building through formal and informal learning” (p. 365). Bennett’s definition is akin to the concept of blended learning proposed by Rosenberg (2006) and Yoon and Lim (2007) highlighting the importance of network technologies. What we add to her proposed definition are that (a) VHRD should not be the sole responsibility of this profession, whether it is called HRD, WLP, training, training development, workforce development, or performance technology,, (b) informal learning consists of multiple forms (e.g., KM, mentoring/coaching, and performance support systems) and its presence will continuously increase due to the increasing needs for less disruption of work, (c) informal learning needs to be part of integrative learning and performance solutions that include formal learning, and (d) web technologies can be purposefully used for multiple formal or informal learning.

A powerful new technology can radically change core assets and activities of any industry, thus technologies that massive audience use or target customers adopt must be scrutinized by organizations (McGahan, 2004). When powerful and promising tools are many (e.g., virtual worlds, blogging, and social networking, and so on), determining positioning to lead or follow the use of emerging technologies can be difficult. An organization will need to make tough decisions at times between double-loop and triple-loop learning. The latter is similar to taking the leading position to explore unchartered paths and tap new possibilities despite uncertainties and higher chances of failure, whereas the former questions existing strategies and assumptions to change norms. If existing development or evaluation practices of onsite or online training are applied to implementing new virtual learning and technologies
with few changes, it is equivalent to single-loop learning, which maintains the status quo, thus it will not simply work.

Given the nascent status of theoretical and conceptual frameworks for guiding or evaluating VHRD, starting dialogues on which formal and informal learning options are critical and which technologies will best enhance expertise, performance, and innovation can be the first step. Examining the organization’s competency and talent management systems as well as its maturity and technology adoption plan (Kopcha, 2008) can further guide and systemize desirable VHRD practices.

Organizational Competency and VHRD: The goals of introducing competency in the workplace are to standardize the knowledge and skills of employees for developmental purposes (Valkeavaara, 1998); to align HR planning and development activities with the organization’s strategic direction through effective recruiting, training, coaching, and rewarding (Moinat, 2003); and to provide more direct information related to business goals and strategies (Schippmann et al., 2000). To determine what types of learning, informal learning in particular, and technologies are most important for the organization, HRD can gather which technology skills and practices employees value the most using an online surveyor by interviewing model performers.

In earlier days, competency was viewed broadly as psychological or behavioural attributes associated with vocational success (McClelland, 1973). Later, it shifted to a more specific view of knowledge, skills, and abilities (Mirable, 1997), a set of behaviours to be competent in the workplace (Woodruffe, 1993) and those determining factors for acting successfully in a job or task situations (Lucia & Lespinger, 1999). Competency can also contain multilevel organizational capabilities at the team and the organizational level.
The importance of competency has been raised to the strategic level as organizations must compete with intellectual assets and capabilities identifiable by others (Prahalad & Hamel, 1990). A core competency is a cluster of extraordinary abilities and specific strengths of organizational members as a whole (Hayton & Kelley, 2006), and it is the main driver of delivering value to the customers. Core competencies are therefore the primary means that enable organizations to respond to their environments. Internally, they also provide operational effectiveness, cultural integration, organizational alignment, and directions for organizational changes (Daniels, Erickson, & Dalik, 2001).

A competency model is a collection of core competencies for successful job performance. In a competency model, the effective and desired characteristics of behaviours are described in broader terms. For instance, traditionally, based on job analyses, experts in most organizations are engaged in actions of performing work routines, troubleshooting, and helping others with occasional responsibilities of documenting work or teaching. Within virtual learning and technology environments, however, where knowledge is frequently tacit or changes fast or the nature of work is new and untested, experts are extremely valuable with validating ideas, locating what is important, and pointing people to additional and reliable knowledge sources (Rosenberg, 2006). Competencies in areas, such as teaching or facilitating e-learning (Aragon & Johnson, 2002), virtual mentoring (Bierema & Hill, 2005), making experience-based knowledge available through online publishing, information repository, or virtual worlds are vital in VHRD. It also signifies that an organization’s selection, utilization, and integration of various technologies are critical for the success of VHRD. Although not specified in that figure, competency in digital literacy and citizenship in terms of netiquette, web safety and security, and individual rights and responsibilities would be increasingly important.
Talent Management and VHRD: If managing organizational competency helps prioritize types of learning and technologies, talent management is to create a system to draw, develop, and retain the talents. The media-rich and culturally diverse environment of VHRD implies that an HR system that swiftly and effectively locates, places, enhances, and rewards experts and expertise in environments, such as information systems and vCoP (Ardichvilli, 2008) is important. Talent management needs to be a part of HRD practices and involves recruiting, selection, development, and career and succession management. It is also a set of processes designed to ensure an adequate flow of employees into jobs throughout the organization (Schweyer, 2004). Talent management contributes to building proactive learning and performance culture, engagement, capability, and capacity through integrated talent acquisition, development, and deployment processes (ASTD, 2009). Its primary focus is on increasing the capacity of high performing and high potential talents committed to the organization (Collings & Mellahi, 2009).

Forward-looking organizations are constantly changing their strategies for building the workforce. Key characteristics of growing organizations include cultivating existing talent rather than recruiting new people, improving employee satisfaction through personal career plans and development opportunities, planning ahead for succession of mission critical positions, and actively acting on performance management. Technologies, such as system analytics, database queries, and user tagging and rating can facilitate these tasks by locating talents based on credentials, interests, or content ownership, filtering active contributors to vCoP or KM systems, or examining the concentration of interactions and information flow within networks. Organizations need to create a unified system that aligns organizational learning with knowledge and performance management (Schweyer, 2004; Yoon & Ardichvili, 2010).
Organizational Maturity and Planning for VHRD: Examining the level of organizational maturity and applying the matrix of technology integration (Kopcha, 2008) can further guide the planning and implementation of VHRD. For organizational maturity, the capability maturity model (CMM) is widely used by many organizational researchers. The structure of the CMM comprises maturity levels, key process areas, goals (of key process areas), common features, and key practices (contributing to the implementation of the key process areas). The CMM is composed of five developmental stages: Initial, Repeatable, Defined, Managed (Predictable), and Optimizing. First, the Initial level is characterized as having difficulties in retaining talented individuals and organizational processes are that are ad-hoc and chaotic.

At the Repeatable level, organizational basic processes are established and the task practices focus on activities at the unit level. At the Defined level, most processes are documented, standardized, and integrated so that the organization shapes a system-wide infrastructure to fully utilize the capability of the workforce. During the Managed (Predictable) level, organizations start exploiting the capability of their workforce competencies and manage their performance quantitatively. Organizations planning to adopt and increase the use of virtual technologies can first identify individuals and work units to support selected LPA components (during the initial and the repeatable stage), but to be adopted and systemized organization-wide, gradual conversion to later stages with defined goals and timeline targets will be needed.

VHRD challenges organizations to simultaneously manage dimensions of mechanics, work environments, culture, and core competencies along differing stages of technology integration: Initial set-up, employee preparation, performance focus, and system-wide communities. Kopcha (2008) developed a matrix for teachers’ integration of technologies in order to overcome past failures of individual- and skills-focused approaches. During earlier stages of initial set-up and employee preparation, they focus on helping inexperienced users
with troubleshooting, basic training, and on-boarding, and gradually, their emphasis moves on to modelling, sharing, leading small communities of practice, enlisting support from the leadership, and forming more peer mentors.

II.10 Generational Diversity

Generational differences span the workplace as multiple generations come together in a work environment. Lancaster and Stillman (2002) and Zemke, Raines, and Filipczak (2000) explained how each generation’s values, experiences and attitudes impacted decisions, expectations, and work ethics.

Zemke et al. (2000) divided the generations into four groups: The Veterans, born from 1922-1942, the Baby-Boomers, born from 1943-1960, Generation Xers, born from 1960-1980, and Generation Nextra, born 1980-2000. Veterans survived World War II, believed in hard work, civic pride, loyalty, and respect for authority. Baby Boomers grew up in optimistic times, believed in growth and expansion, valued teamwork, and had mixed feelings about the Vietnam War. Gen Xers think globally, are self-reliant, have non-traditional orientations about time and space, are technologically savvy, and see authority in a casual manner. Nextra, also known as Millennials or the Internet generation, are technologically savvy, have a tenacious spirit, and display multitasking capabilities.

Lancaster and Stillman (2002) describe four generations with slight differences. The four generations include the Traditionalist, born 1900-1945, the Baby Boomers, born 1946-1964, Generation Xers, born 1965-1980, and the Millennial Generation, born 1981 to 1999. Traditionalists lived through two world wars and the Great Depression and are described as loyal. This generation thrived in a top-down industrial management approach to work and life. Baby Boomers changed everything from music to the supermarket. The booming economy gave them an optimistic viewpoint to everything.
They grew up in a "relatively affluent, opportunity-rich world" (p. 22). Gen Xers are seen as sceptical and are "possibility the most misunderstood generation in the workforce today" (p. 24). This generation was the first to experience the continuous media explosion. They are resourceful yet independent. Millennials, comfortable with technology, demonstrate a keen understanding and acceptance of diversity, and are action oriented yet realistic. Understanding the traits, personality styles, work ethics, and expectations of each of the generations can create a strong workforce where collaboration and fun occur at work.

II.11 Individual Learning

For individual learning to truly affect organizational performance, it needs to proceed from declarative knowledge to procedural knowledge. A novice can regurgitate a principle or a set of rules without knowing the conditions for effective application; an expert, however, can access the knowledge with functional and conditional applicability (Glaser & Bassok, 1989). The progression from declarative knowledge (novice) to procedural knowledge (expert) can take years (Prietula & Simon, 1989). During this process, a higher level of proficiency is developed. As a result, what would require conscious, deliberate, and explicit thought becomes the obvious thing to do, and what has been learned becomes tacit knowledge and intuition (Crossan et al., 1999).

Organizations invest heavily in employee learning and development to make this happen (Tsui, Pearce, Porter, & Tripoli, 1997). In an effort to integrate concepts of individual learning and learning organization cultures, Song and Chermack (2008) theorized that there is a logical progression in organizational knowledge formation from the tacit knowledge of individuals to the applicable knowledge of the organization.

Researchers have found that organizations recognize this progression and invest in congenial learning environments that promote individual learning and reflective experiences.
It is believed that VWs offer tactical capabilities that are uniquely suited to these needs. More specifically, they offer a learning environment that is rich in interaction, visualization, immersion, simulation, and tele-presence. The environment can feel authentic in content and culture and can offer collaborative and collective creation of content (Warburton & Pérez-García, 2009). It offers a structure for connectivity in this virtual environment where the learners can exercise their newly learned declarative knowledge and feel safe because of a shared understanding of expectations and trust in the VW.

In traditional online communication (e.g., email, chat, blogs, etc.) the barriers to employee participation are the fear of misleading other community members and the fear of being criticized (Ardichvili, Page, & Wentling, 2003). The source of these fears is often the inability to gauge online conversation partners’ reactions due to the absence of facial expressions and other nonverbal cues and the impersonal nature of online community (Ardichvili, 2008). However, in VWs, learners can convey their reaction by imitating facial expressions and nonverbal cues through their avatar. Thus the VW environment can mitigate some of these fears. In VWs, individual learners can interact with others in the community, construct learning content, solve problems, and gain firsthand experiences in an environment that closely resembles reality.

In summary, VWs offer opportunities for immersion, engagement, and collaboration. They have been also shown to stimulate creativity and knowledge migration. Hence, they can be expected to enhance learning at the individual level.

Researchers have proposed using situated learning theory and community of practice models to explain how individual learning can be supported by interactions between novices and experts (Brown & Duguid, 2002; Lave & Wenger, 1991; Lohman, 2006). Researchers have also posited that the expert must engage in an interpreting process for learning to occur
(Crossan et al., 1999). Finally, the interaction between novices and experts needs to take place in a context that is familiar to both the novices and the experts (Crossan et al., 1999; Lohman, 2006).

Jarmon et al. (2009) found that VWs offers significant opportunities for interaction between novices and experts to occur. VWs foster a community of practice and support situated learning by offering real-time interactivity, avatar-mediated communication, and electronically enriched interaction. This provides individuals with the flexibility to gather in the virtual space and to construct their own learning experiences. In addition, VWs can be configured to offer authenticated and safe environments for individuals to explore, discover, and express themselves.

The spatial transformation capability of a VW allows the individual to configure their profile and influence their space in the virtual environment to achieve a comfort level that is supportive of their individual learning needs. In addition, they can choose to be involved or to disengage from an interaction (conversation) without concerns of potential future negative consequences.

II.12 Team Learning

Teams are the building blocks of an organization. They allow the organization to synergistically combine and leverage the skills, talents, and perspectives of individuals. A team learns when one member initiates a learning activity and the rest of the team responds to create new meaning, communicate the new meaning, and eventually build consensus (Watkins & Marsick, 1995). Individuals sometimes informally seek co-workers to develop creative solutions (Marsick & Volpe, 1999).

A key requirement for a successful team activity is the ability of its members to collaborate, connect, and interact with other members. The team members should be capable
of collectively generating creative solutions and engaging in problem solving (Peters & Manz, 2007; Van Der Vegt & Bunderson, 2005). The collective learning process of a team is strongly influenced by each member’s tacit and explicit knowledge.

It is also influenced by the quality of relationships and interactions between team members (Hannah & Lester, 2009). By building shared expectations and trust among team members, learners in a team can improve the affective dimension of learning, thus achieving higher quality and quantity of knowledge exchange (Kang et al., 2007).

The tactical capabilities of a VW have been found to enhance team processes, nurture collaboration and problem-solving skills, and foster collective creativity (Davis et al., 2009; Owens et al., 2009).

Using the Second Life platform as an example, Messinger et al. (2009) argue that VWs offer technological capabilities to create self-sustaining “eco-systems” that affect team-level and organizational-level learning. Several other scholars also support the argument that the technological capabilities of VWs, (e.g., real-time interactivity, electronically enriched interaction, and avatar-mediated communications) can be used to enhance learning outcomes at the team level. For example, in an educational environment, Echenbrenneer et al. (2008) found that VW capabilities enhance engagement and learning. Similarly, Kahai et al. (2007) found the extent to which team learning acquired during electronically enriched interactions in VWs exceeded those of other virtual communication options. Finally, Owens et al. (2009) provided an example of team-based activities enhanced by the technological capabilities of the VW because participants could deliberately control their nonverbal communication for the benefit of others.

Thus VWs could potentially provide a team of individuals the opportunity to articulate and share their perspectives and to deal with conflict of opinions in the team. During this process of give and take, a higher order of learning is achieved. Despite the
apparent value gleaned from using VWs, not all organizations seem eager to jump on the VW bandwagon. However, those that have done so claim several benefits have accrued. For example, the U.S. Army uses online group training for new recruits, and IBM uses VWs for training and social acculturation of new hires. VWs have also been used to create a team environment for professional (medical) skills training and production skill training (Watanuki, 2008).

A virtual team can take advantage of the diverse and varied expertise of team members at different locations. Siebdrat, Hoegl, and Ernst (2009) found that successful virtual teams can often outperform collocated teams if they are set up and managed correctly. In particular, performance was found to be enhanced when managers provided teams with tools needed to optimize team performance (Horwitz, Bravington, & Silvis, 2006). In general, a VW can bridge the spatial divide and offer a higher sense of co-location. Fostering a global culture, enabling collaboration training, and providing team-building support are distinct capabilities that can be offered by VWs (Johnson, Suriya, Yoon, Berrett, & Fleur, 2002; Siebdrat et al., 2009).

**Team Learning as Outcome or Process:** In the organizational learning literature, learning has been discussed as both an outcome (Levitt & March, 1988) and a process (Argyris & Schon, 1978). Similarly, team learning has been conceptualized as both an outcome and a process. Edmondson defines team learning as “the activities carried out by team members through which a team obtains and processes data that allow it to adapt and improve” (Edmondson, 1999). Argote and colleagues (2000) define group learning as both the processes and outcomes of group interactions through which individuals acquire, share and combine knowledge to address group concerns. This dichotomous understanding of team learning is reiterated in a recent review of empirical team learning research, which identifies three
distinct research traditions in team learning: learning curves in operational settings, psychological experiments on team member coordination of task knowledge, and field research on learning processes in teams (Edmondson et al., 2007).

Learning curve research (Darr, Argote, & Epple, 1995; Edmondson, Winslow, Bohmer, & Pisano, 2003; Pisano, Bohmer, & Edmondson, 2001) generally defines team learning as an improvement in performance outcome (e.g. decreased cost, less waste, reduced time), an approach highly appropriate for studying improvement in the outcomes of team activities to be enacted repeatedly—for example, those of operations teams. However, this conceptual approach to team learning offers relatively less insight into the challenges of innovation and project-based knowledge work, such as those faced by new product development teams, which do not involve repetition of similar tasks (Edmondson et al., 2007).

Team coordination research views team learning as the outcome of effective communication and coordination that builds shared knowledge by team members about their new task, the context, and the available resources, and which is manifest in mastery of a new, interdependent task. A construct central to this stream of research is the transactive memory system (TMS) (Wegner, 1987), which describes team members’ knowledge of each other’s skills, expertise and task-relevant experience. Studies of the relationship between TMS (and other team-level cognitive constructs) and team outcomes, such as task mastery and group identity, have tested how different interventions—such as collective training, team-building exercises, and discussion of expertise—affect this relationship (Liang, Moreland, & Argote, 1995; Moreland & Myaskovsky, 2000, Stasser, 1995). Insights from this tradition explain how, in teams where diverse member expertise is essential, the shared knowledge embedded in a TMS enables teams to interact effectively and efficiently by ensuring that unique individual knowledge is used, allowing specialization, reducing redundant information, and
developing informal structures for accountability (Edmondson et al., 2007). These team learning studies can thus inform new product development settings where cross-functional involvement from critical organizational areas, such as research, engineering, manufacturing and marketing, has been consistently linked to development process performance (Brown & Eisenhardt, 1995; Dougherty, 1992). NDP teams often are deliberately composed of explicitly recognized functional representatives, and are thus endowed with an initial level of transactive memory predicted to aid team performance (Stasser, Stewart, & Wittenbaum, 1995). Nevertheless, we might also anticipate that virtual NPD teams have fewer opportunities to learn of each member’s non-function-related unique expertise and skills, and thus may suffer in their ability to develop an accurate and complete TMS (Moreland et al., 2000).

Research that emphasizes team learning as a process typically investigates real teams in field settings, with the aim of observing and measuring behaviors that characterize this process (Edmondson et al., 2007). Learning behaviors include seeking feedback and help, gathering information, experimenting, evaluating and responding to feedback, discussing errors and shortcomings, and handling differences of opinion (Brooks, 1994; Edmondson, 1996; Edmondson, 1999). Team learning behavior is associated with features of team climate, particularly psychological safety (Edmondson, 1999) and team leader behaviors (Brooks, 1994; Edmondson, 1996). The present study follows the process perspective, viewing team learning as a series of behaviors through which a team discovers, develops, and applies knowledge to address team tasks and resolve problems that arise during the course of development (Bresman, 2006; Edmondson, 1999; Gibson et al., 2003).

Although research has demonstrated performance benefits for teams engaging in various learning behaviors (Bresman, 2006; Edmondson, 1999), learning behavior does not guarantee positive outcomes thus teams may risk spending more time learning than is
effective (Bunderson et al., 2003). For NPD teams, however, which confront many uncertainties related to their product’s technology, production, and performance in the marketplace, the performance benefits of learning are expected to outweigh the risks.

*Learning as a cycle of reflection and action:* Conceptualizations of learning as a process have long centered on an iterative cycle of reflection and action (Dewey, 1938; Kolb, 1984; Schon, 1984). Dewey described individual learning as an iterative inquiry process of designing, trying out, and evaluating new actions intended to resolve a problematic situation for which one’s habitual responses are found wanting. He noted that a problematic situation is both cognitive and practical, existing in the physical as well as the mental realm. Individual experiential learning theories (Kolb, 1984; Schon, 1984) build on these ideas of learning as a cycle of reflection and action, grounded in firsthand experience. Extrapolating from the work of Dewey, Kolb and others, to develop models of collective learning, Kim (1993) and Raelin (1997) similarly emphasize the same duality: that effective collective learning entails a conceptual, reflective phase and an active, operational phase.

At the group level, Edmondson (1999; 2002) conceptualizes group learning as an ongoing process comprising two basic components—reflection to gain insight and action to accomplish change. Reflection or “thinking” behaviors at the team level includes behaviors such as sharing information, seeking feedback, discussing errors, and analyzing past performance. Action or “doing” behaviors can include making decisions, initiating changes, experimenting, implementing new ideas, making improvements, and transferring new information to other parties. Edmondson’s (2002) findings that more effective teams engage in both reflection and action draw attention to how the virtual environment might enhance or inhibit these behaviors.
For example, group reflection may be hampered by logistical and technological constraints limiting informal spontaneous interaction (Straus et al., 2000) or by misunderstandings created by limited “mutual knowledge” of each member’s technological and local context (Cramton, 2001). Whereas conceptual and reflective activities draw on and develop the mental and intellectual context of team members, action-oriented activities may draw on and reinforce routines operating, by implication, in particular social and physical contexts. Thus group action in virtual teams is expected to be shaped by dispersed members’ abilities to participate in particular social and/or physical settings.

Sources of knowledge for team learning: Team learning research also has focused attention on different sources of knowledge leveraged in the learning processes (Bresman, 2006; Brooks, 1994; Wong, 2004). Much early team learning research, particularly laboratory-based task mastery research, focused on activities taking place within the team. Building on insights regarding the advantages of “boundary spanning” activity for team performance (Allen, 1977; Ancona & Caldwell, 1992), recent research turns more attention to learning from across team boundaries.

Wong (2004) measured “local learning” (learning from interactions within a group) and “distal learning” (learning by seeking help or information from external parties) in 73 teams. Her results show that local learning predicted team efficiency, while distal learning predicted team innovativeness, negatively moderated team efficiency and suppressed local learning, prompting the recommendation that teams should focus on either local learning or distal learning, according to the needs of their task.

Bresman (2006) introduces the concept of vicarious learning—well-established at the level of individual and organizations—into the group learning literature, defining vicarious team learning as the activities by which a team learns key aspects of its task from similar
experiences of others outside the team. Bresman’s study of pharmaceutical “in-licensing”
teams shows that vicarious team learning is distinct from both internal experiential learning
(Edmondson, 1999) and from “contextual learning,” that is, more general boundary-spanning
behavior through which teams gather general information about how to approach their work
(Allen, 1977; Ancona et al., 1992). Further, he demonstrates that vicarious learning offers
distinct performance benefits.

The internal-external (or local-distal) classification of knowledge sources for team
learning implies that team membership is the key boundary factor shaping how and what
teams learn. Virtual NPD teams, however, exhibit multiple internal boundaries marking
differences in functions, locations, or organizational affiliations, for example, which
influence how and with what effect those teams exchange and process knowledge
(Cummings, 2004; Sole & Edmondson, 2002).

Team learning can be distinguished from individual learning because team learning
occurs when one person is engaged with or coordinating with another person or persons.
Unlike individual learning, team learning requires individuals to share experiences with other
team members (Kayes, Kayes & Kolb, 2005). Team learning occurs when individuals
coordinate knowledge and behaviors in order to reach a team goal. As a social process, team
learning differs from individual learning in that it requires interaction and coordination
between individuals.

Specifically, these individuals are members of groups that (i) work interdependently
on a common task or objective, (ii) have defined boundaries, and are 3) identified with a team
which is also recognized as such by others (Hackman, 1987). Whereas individual learning
relies more specifically on cognitive, emotive and behavior of individuals, team learning
emerges as cognitions, emotions and behaviors are shared among individuals. Exposure to
individuals with different expertise and experience is a vital source of team learning.
Interaction with dissimilar others promotes learning by exposing actors to new paradigms and by enabling the cross-fertilization of ideas (Van DerVegt, Bunderson, & Stuart, 2005). The more these aspects of learning are shared, the more the team, rather than the individual, can be said to be learning (Edmondson, 1999).

Team learning can be distinguished from individual learning because team learning:
(a) involves the interaction amongst team members related to gathering, sharing, processing, and acting on knowledge, (b) requires a level of agreement among team members about acceptable patterns of behavior for knowledge sharing, (c) results in performance improvement (or deterioration) for the team that result from this interaction.

II.13 Organisational Learning

The 1990s have seen exponential growth of interest in organisational learning (Crossan and Guatto, 1996; Bapuji and Crossan, 2004), apostrophizing its importance, providing numerous definitions and many perspectives to the field. This is consistent with findings of few early authors. According to Shrivastava (1983), a vast majority of research in the area has been fragmentary and incomplete. Dimovski (1994) adds that research in the field of organisational learning resulted in numerous definitions and models (Nonaka and Takeuchi, 1996; Wall, 1998) that can be differentiated through criteria of inclusiveness, width and focus. Most definitions are partial, because they deal with organisational learning from only one theoretical perspective, disregarding the holistic conceptual view.

To present just a few of them, Senge (1990) defines organisational learning as ‘a continuous testing of experience and its transformation into knowledge available to the whole organisation and relevant to their mission’, while Huber (1991) sees it as a combination of four processes: information acquisition, information distribution, information interpretation and organisational memory. Argyris and Schön (1996) are even less restricting in their
definition, declaring that organisational learning emerges when organisations acquire information (knowledge, understandings, know-how, techniques and procedures) of any kind by any means.

However, the dominant paradigm for understanding organisational learning has taken very much from the information-processing perspective of organisations (Cyert and March, 1963). According to it, the organisations interact with the environment constantly to capture information (Hong, 1999). Dimovski (1994) provides an overview of previous research and identifies four perspectives on organisational learning. His model manages to merge informational, interpretational, strategic and behavioural approach to organisational learning and defines it as a process of information acquisition, information interpretation and resulting behavioural and cognitive changes, which should in turn have an impact on organizational performance.

Successful organizations are structured to capitalize on the learned capability of their employees. Organizational-level learning involves the acquisition, transference, and integration of new knowledge that transcends team or functional “silos” that may exist in the organization (Kang et al., 2007). Typically, the outcome of organizational-level learning is the institutionalization of knowledge and the diffusion of shared understanding or mental models within the organization (Hannah & Lester, 2009). Such learning differs from individual-level and team-level learning and is supported by an organizational culture that (a) empowers individuals to embrace a collective vision and (b) motivates management to establish systems that capture and share knowledge (Swanson & Holton, 2001; Watkins & Marsick, 1995).

Learning at the organizational level can be incremental or transformational. Incremental learning is focused on refining current operations through exploitative learning activities such as continuous quality improvement, while transformational learning attempts
to use explorative learning to alter the current practices of the organization (Watkins & Marsick, 1995). Irrespective of the approach chosen, these are complex and challenging tasks that require commitment and cooperation. An examination of the tactical capabilities of VWs suggests that VWs can support knowledge creation through deep engagement of the learner and collaborative knowledge construction (Paavola, Lipponen, & Hakkarainen, 2004; Thomas & Brown, 2009). Gronstedt (2007) notes that “VWs provide learning organizations with a powerful, unique ability to engage and empower employees in ways that accommodate their digital and mobile lifestyles, adapt to their individual learning needs, and encourage collaboration” (p. 49). Hence VWs offer tactical capabilities that could be employed to encourage a learning culture in a collaborative digital space.

Organizational-level learning occurs when knowledge obtained from external sources is acquired, assimilated, and exploited (Cohen & Levinthal, 1990). In an increasingly dynamic and competitive environment, it is imperative that organizations manage this knowledge absorption process. Otherwise, firms run the risk of falling into one of the many learning traps including familiarity (tendency to employ know solution), maturity (tendency to employ proven solution), and propinquity (tendency to employ solutions close to the known solutions (Ahuja & Lampert, 2001; Bapuji & Crossan, 2004).

Inter-organizational learning could run into roadblocks when actors experience difficulty in recollecting past experiential solutions due to the lack of structure and cognition (shared mindset). This stymies the learning experience. Homqvist also noted that partners of the alliance or joint venture may approach the same experience from different perspective due to the difficulty in balancing the exploitation and exploration orientation toward learning (organizations typically demonstrate a tendency to focus on one orientation as their organizational learning culture); thus preventing learning from occurring. However, if appropriately designed by using a customized combination of technological and spatial
capabilities, the VW environment may offer inter-organizational learning communities the necessary structure, bridge spatial differences, and transcend limitations embedded in organization-specific domains. For example, avatar-mediated communication and electronically enriched interaction—two types of technological capabilities found in VWs—have been found to offer unique opportunities for organizations to facilitate learning and enhancing tele-presence across spatial boundaries (Peterson, 2006).

Team processes are the interfaces between team characteristics and team outcomes. Hence, many researchers ask for a more process-oriented approach when investigating teams instead of simply correlating input factors with team outcomes (Brauner & Orth, 2002). One important team process, especially in environments that change quickly, is learning. Learning is vital for the development of an organization and can be seen as a competitive advantage of organizations (Edmondson & Moingeon, 1998). Thus, it ensures organizational survival. Learning can take place on different levels i.e. the individual, the team and the whole organization (Table 2.7).
### Table 2.7

**Levels of Learning in Organizations**

<table>
<thead>
<tr>
<th>Level</th>
<th>Process</th>
<th>Inputs / Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Intuiting</td>
<td>Experience</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Images</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Metaphors</td>
</tr>
<tr>
<td>Group</td>
<td>Integrating</td>
<td>Language</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cognitive map</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conversation / Dialogue</td>
</tr>
<tr>
<td>Organization</td>
<td>Institutionalizing</td>
<td>Routines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diagnostic systems</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rules and procedures</td>
</tr>
</tbody>
</table>

Source: Crossan et al. (1999)

According to the model of learning in organizations (Crossan et al., 1999), learning is considered to be a multilevel process; different processes that link one level to another take place on each level. The starting point of learning is an individual. During its work, an individual recognizes certain patterns within its experiences and develops insights (intuiting). These insights are then explained to one-self or to other people within the organization (interpreting). In communicating insights to others, and in finding a common interpretation, learning moves beyond individual processes: insights are transferred to other people and
interpreted with the help of language and common knowledge is developed. Thus, interpreting is a social activity that creates and refines common language, clarifies images, and creates shared meaning” and becomes embedded within the workgroup (Crossan et al., 1999). That leads to common knowledge and understanding, changes in ideas, and new actions (“integrating”). During integration, communication is the most important process as only communication enables the development of a shared understanding and a coordination of actions. In the last step of the learning process, insights that occurred at the individual and team level are embedded within the organization. Thus, certain routines and rules are developed.

It should be mentioned, however, that learning is no unidirectional process, but that learning feeds forward from the individual to the team and the organization, but that institutionalized learning also has an impact on the individual or group. Thus, the basic mechanism of learning is the sharing of ideas and the development of a common meaning. Learning at the last level - organizational learning – is a concept of high interest today and many researchers deal with this kind of learning in organizations. Organizational learning means the modification of organizational goals to more realistic ones depending on reflected experience and current perceptions (Argyris & Schön, 1978).

Organizational learning takes place when problems or errors occur; as a consequence, single-loop learning or double-loop learning can emerge (Figure 2.1). Single-loop learning means that employees correct mistakes in applying organizational actions or strategies that fit with organizational goals, values, plans, or rules, but without questioning or modifying them. In contrast, double-loop learning implies an analysis of reasons or causes that led to problems. As a consequence, organizational norms, plans or goals are modified and adapted to new circumstances.
Quite a few studies have emerged in recent times that have scrutinized the relationship between organisational learning process and organisational performance (Adler, 1990; Adler and Clark, 1991; Dimovski, 1994; Simonin, 1997; Lam, 1998; Pisano et al, 2001; Sloan et al, 2002; Vits and Gelders, 2002; Figueiredo, 2003, Dimovski and Škerlavaj, 2005; Škerlavaj et al, 2007).

Previous studies that underline the positive effects that organisational learning has on business performance differ on what they understand by performance. The prescriptive literature consider financial results as business performance (Lei et al, 1999). Although these outcomes are important, there may be more proximate outcomes that may mediate the relationship with financial results. For example, outcomes of organisational learning behaviours may include changes in values and assumptions (Argyris and Schön, 1978), skills (Fiol and Lyles, 1985), systems and structures (Levitt and March, 1988), core competencies (Prahalad and Hamel, 1990), organisational innovativeness and competitiveness (Nason, 1994), corporate success, and employee satisfaction (Bontis et al, 2002).
It has been established, on the base of credit union industry in Ohio (Dimovski, 1994) and Slovenian companies with more than 100 employees in 2003 and 2004 (Dimovski and Škerlavaj, 2005; Škerlavaj et al, 2007), that better developed organisational learning contributes to improved organisational performance in financial as well as nonfinancial terms.

Many authors consider organisational learning as the fundamental aspect of competitiveness and link it with knowledge acquisition and performance improvement. Although links between learning and business performance have often been assumed, there is a little empirical evidence to support this perspective, especially in terms of transitional economies. Positive changes in the way people act (behavioural changes) and perceive their internal and external environments (cognitive changes) are expected to have a positive impact on organisational performance (Thompson and Kahnweiler, 2002; Egan et al, 2004; Kandemir and Hult, 2005). Jones (2000) emphasizes the importance of organisational learning for organisational performance defining it as ‘a process through which managers try to increase organisational members’ capabilities in order to understand better and manage an organisation and its environment to accept decisions that increase organisational performance on a continuous basis’.

Research conducted by Škerlavaj and Dimovski (2006) demonstrated the statistically significant positive and strong impact of organisational learning on organisational performance from the employee perspective. Companies which invest efforts into the systematic approach to organisational learning profit in terms of an augmented level of employee trust in the leadership, improved efficiency of work organisation, a more committed workforce, decreased costs of work per employee, increased employee satisfaction and increased employee flexibility. At the same time, Škerlavaj et al (2007) established a
statistically significant link between organizational learning culture on organizational performance, based on medium and large Slovenian companies.

Figure 2.2 depicts a framework for analyzing organizational learning (Argote & Miron-Spektor, 2011). The figure portrays an ongoing cycle through which task performance experience is converted into knowledge through organizational learning processes. Task performance experience interacts with the context to create knowledge. The knowledge flows out of the organization into the environment and also changes the organization’s context, which affects future learning.

**Figure 2.2**

**Framework for Organizational Learning**

![Framework for Organizational Learning](image)

Source: Argote & Miron-Spektor (2011)
Experience accumulates as the organization performs its tasks. The total or cumulative number of task performances is typically used as the measure of organizational experience. Organizational learning occurs in a context (Glynn, Lant, & Milliken, 1994), which includes the organization and the external environment in which the organization is embedded. The environmental context includes elements outside the boundaries of the organization such as competitors, clients, educational establishments, and governments. The environment can vary along many dimensions, such as volatility, uncertainty, interconnectedness, and munificence. The environmental context affects the experience the organization acquires. Orders for products or requests for services enter the organization from the environment. The organizational context includes characteristics of the organization, such as its structure, culture, technology, identity, memory, goals, incentives, and strategy. The context also includes relationships with other organizations through alliances, joint ventures, and memberships in associations.

II.14 Domestic IT-BPO Scenario

Domestic IT-BPO revenue (excluding hardware) is expected to grow (NASSCOM, 2013) at almost 17 per cent to reach Rs 918 billion in FY2012. Strong economic growth, rapid advancement in technology infrastructure, increasingly competitive Indian organisations, enhanced focus by the government and emergence of business models that help provide IT to new customer segments are key drivers for increased technology adoption in India. The key highlights during 2012 are:

i. Uptake of IT-BPO in India is steadily increasing, with demand coming from both consumers and enterprises, government’s technology infrastructure initiatives, unified communications and availability of world class telecom infrastructure and services
II.15 IT Services

Over the years, Indian IT service (NASSCOM, 2013) offerings have evolved from application development and maintenance, to emerge as full service players providing testing
services, infrastructure services, consulting and system integration. The coming of a new
decade heralds a strategic shift for IT services organisations, from a ‘one factory, one
customer’ model to a ‘one factory, all customers’ model. Central to this strategy is the
growing customer acceptance of Cloud-based solutions which offer best in class services at
reduced capital expenditure levels. Figure 2.3 depicts the IT-BPO’s impact on India’s growth.

Figure 2.3

IT-BPO’s Impact on India’s Growth

Source: NASSCOM (2013)

The key highlights during FY2012 are:

i. IT services exports is the fastest growing segment, growing by 19 per cent in FY2012,
to account for exports of USD 40 billion.

ii. Considerable traction in traditional segments – custom application development,
application management, IS outsourcing and software testing
iii. Increased acceptance from mature segments such as BFSI, US, and large corporations, and emerging segments such as retail, healthcare, utilities, SMBs, Asia Pacific and RoW

iv. Industry re-tooling itself to adjust to rapid change in customer priorities – from SLAs to increased time-to-market

v. Emerging technologies – cloud computing, mobility, social media and big data/analytics unleashing new opportunities for the industry

vi. IT services is the fastest growing segment in the Indian domestic market, growing by 18 per cent to reach Rs 589 billion, driven by increasing focus by service providers.

II.16 Research Gaps

Research Gap 1 (Social Software): To date, a few studies have scientifically investigated single aspects of social software success. Only two reviewed studies have examined social software success in a comprehensive and integrated way, but they either do not provide measures, or they lack a valid theoretical basis (Hester and Scott 2008; Trimi and Galanxhi-Janaqi 2008). Success measurement needs to consider both the tangible and intangible effects of success; this ensures a comprehensive assessment, identification of potential improvements, and justifies present and future investments. *This research alleviates this gap by not only studying utilisation of social software tools and technologies (platforms) but also the quality of systems and information.*

Research Gap 2 (Collaborative Learning): Generally, the dominant model for measuring IS success is the DeLone and McLean IS Success Model (D&M IS Success Model) (DeLone and McLean 1992, 2003). It is considered a sound basis for measuring social software success, since it is a comprehensive evaluation framework with validated measures and
associations; it has also been applied to several types of IS (Urbach, Smolnik and Riempp 2008). However, it has to be adapted to social software’s specific requirements and context under study. This research has adapted the D & M IS Success Model by incorporating modifications. It also attempts to assess impact in an online social media setting.

Research Gap 3 (Impact on Teams): The impact of information systems and related issues has only been studied at the individual and organisational level. This research adds a new dimension, namely, assessing the impact on teams as well.

Research Gap 4 (Various Benefits): Research has only been focusing on capabilities like tactical, technical, and spatial. There has been no assessment of transactional benefits, strategic benefits and informational benefits of organisational learning. This research studies various benefits of organisational learning.

Research Gap 5 (Indian Information Technology Industry): There are studies galore about statistics on projects, revenue, growth and recession, and emerging markets. However, most research has been undertaken mainly by NASSCOM or Rating agencies. There are hardly any studies using causal models and relating to Learning and development.

Research Gap 6 (Human Resource Management / Development): Research on I.T. industry in India has been predominantly in the areas of operations and marketing management. Very few studies have tried to address issues related to Human Resource Management (HRM) except those focusing on outsourcing, payroll management, body shopping shifts, talent management and workforce diversity. This research will focus on new angles to HRM like Online Communities, Social Networking, Collaborative Learning and Virtual HRM (VHRM).
Research Gap 7 (Millennials): The majority of the Indian population comprises youth. This section of the population comprises the major chunk of working professionals in the I.T. industry and are preferred for their updated Knowledge, Skills and Abilities, willingness to work extended hours, willingness to travel around the world and for their agility and diligence. There is also the issue of generational diversity and sometimes incompatibility in terms of thinking and work styles. This research addresses the important need of studying millennials (21 to 32 years of age) and their perceptions.