

## **How Can IT Support LO?**

With the publication of Senge's *The Fifth Discipline*, the term learning organization has become popular. Senge presents an inspiring portrayal of Learning Organization which must be grounded in three foundations: (1) a culture based on transcendent human value of love, humanity, and compassion; (2) a set of practices for generative conversation and coordinated action; (3) a capacity to see and work with the flow of life as a system (Senge, 1990). But he doesn't regard any current organization as a learning organization. In his opinion, this term is referred to a culture or language for developing such a learning environment.

### **The Five Disciplines of Learning Organization (LO)**

As Senge says, systems thinking is the cornerstone of how learning organizations think about their world compels people to see the wholes rather than parts. Systems thinking is the discipline for seeing the "structures" that underline complex situations, and for discerning high from low leverage change. The real leverage in most management situation lies in the understanding of dynamic complexity, not detailed complexity. The essence of the discipline of systems thinking lies in a shift of mind: seeing interrelationships rather than linear cause-effect chains, and seeing process of change rather than snapshots.

Personal mastery is the foundation of learning because individual is the only key and basic component of organization. Organizations learn only through individuals who learn. Individual learning does not guarantee organizational learning. But without it no organizational learning occurs. The ability to focus on ultimate intrinsic desires, not only on secondary goals, is a cornerstone of personal mastery. It is a process of continuing focusing and refocusing on what one truly wants, on one's visions.

Mental model is our image or perspective of an event, situation, activity or concept. Mental models determine not only how we make sense of the world, but also how we take action. As Chris Argyris says: "Although people do not (always) behave congruently with what they espouse theories (what they say), they do behave congruently with their theory-in-use (their mental models)."

Shared vision emerges from personal vision. Personal vision comes from individual's deep concern which focuses on different dimensions of life. When people truly share a vision they are connected, bound together by a common aspiration. Personal visions derived their power from an individual's deep caring for the vision. Shared vision derives their power from a common caring. The energy comes from the creative tension which caused by the gap between our vision and reality.

Team learning is the process of aligning and developing the capacity of a team to create the results its members truly desire. Individuals learn all the time and yet there is no organizational learning. Team learning involves the need to think insightfully about complex issues so that teams may learn how to tap the potential for many minds to become more intelligent than one mind. If teams learn, they become a microcosm for learning throughout the organization. Insights gained are put into action. Skills developed can propagate to other individuals and to other teams.

In short, the term learning organization is attractive, but it is not a natural phenomenon that will happen by itself. A learning organization starts from the strategic intent to learn, a commitment to continuous experimentation, and an ability to learn from past success and failures to enhance the learning capability.

### **Information Technology (IT)**

According to Laudon & Laudon (1998), multiple perspectives on information systems reveal that information technology or information system is a multidisciplinary field; no single theory or perspective dominates. In general, the field can be divided into technical and behavioral approaches. Information systems are sociotechnical systems. Though they are composed of machines, devices, and “hard” physical technology, they also require less tangible factors such as substantial, social, organizational, and intellectual investments to make them work properly.

Globalization, transformation of industrial economies, and the transformation of organization itself are the main drivers of increasing needs for IT. In this highly interdependent world, organizations are operating in a seamless “networking” environment which is composed of two groups. One is business strategy, rules, and procedures. The other is information systems software, hardware, databases, and telecommunications. All these run as a system that any change in any of these components requires changes in other components. This relationship becomes critical when management plans for the future. Furthermore, change in the relationship of information systems and organizations results from the growing complexity and the scope of system projects and applications. Contemporary systems bring about managerial changes (who have what information about whom, when, and how often) and institutional “core” changes (what products and services are produced, under what conditions, and by whom). In order to manage all these changes, nobody can afford to overlook the effect of IT.

Human beings learn best through firsthand experience. The ‘dilemma of learning from experience’ is that we learn best from experience, but we never experience the consequences of our most important decisions. All organizations learn, but some of them don’t learn fast enough to survive. IT & IS play a very important role in gaining sustainable competitive advantages in all learning organizations. Supercomputers will augment the capability of organizations to produce and to learn. Organizations that know how to harness technology to enhance their learning capability will possess a decided competitive advantage.

The technological subsystem of the learning organization includes the supporting, integrated networks and information tools that allow access to and exchange of information and learning. It includes technical processes, systems, and structure for collaboration, coaching, simulation, or computer-supported collaboration, creating “knowledge highways”.

### **A. Basic IT Functions and New Management Rules**

Marquardt (1996) suggests that IT provides new strategic opportunities for organizations to learn on a corporatewide basis. It enables companies to automate, informate, and transform themselves. IT helps to realize the redistribution of power, function, and control to wherever they are most effective. Production, coordination, and management can be accomplished better, easier, and quicker. IT also allows us to

break the old rules of management, change, development, and learning. He also identifies the new rules including:

- Information can appear simultaneously in as many places as needed.
- A generalist can do the work of an expert.
- Organizations can simultaneously reap the benefits of centralization and decentralization.
- Decision making is part of everyone's job.
- Field personnel can send and receive information wherever they are.
- Plans can be revised instantaneously.

### **B. IT and the Flow of Knowledge**

IT can be a key mechanism for transferring knowledge and enabling free information flow throughout organization. First, IT can provide powerful communication channels for individuals. Second, IT makes it possible for people to communicate directly with one another across time and space. Third, it helps to flatten the organizational hierarchical structure. Finally, IT contributes to flexibility with mobile work stations, relational databases, and the storage of knowledge in open databases. IT is a powerful tool for improving knowledge flow and learning. A computer-mediated communication system utilizes the storage, processing, and retrieval capabilities of an organization's information system for internal and external communications. Database, texts, articles, reports, manuals, and directions can be held for quick and easy access by all employees. In addition, current client/server networks enable remote access to national and global networks which make knowledge is available within the organizations at any time.

### **C. Impact of IT on organizations**

IT changes the organization's operation and how business is done. It also may affect organization's structure, culture, politics and work patterns. All these will changes should be planned for, anticipated and acceptable.

Michael Morton, an editor of *The Corporation of the 1990s*, identifies six major impacts of IT upon the workplace and working learning:

1. IT changes the way work is done. Basic changes result in production, coordination, and management because of information technology.
2. IT enables integration of business function. Integration of business function enables at every level within the organization and between organizations.
3. IT causes shifts in competitive climates. IT adds considerable importance to the function of scanning and environment monitoring.
4. IT presents new strategic opportunities. New strategic opportunities emerge for organizations to reassess their missions and operations. IT demands basic changes. Successfully applies, technology calls changes in management and organization structure. In this way, IT increases the rate at which information moves and decisions are made.
5. IT forces transformation. It forces managers to lead their organization through a complete transformation process if they hope to prosper in a globally competitive environment.

### **Information Technology (IT) and Learning Organization (LO)**

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experience the consequences of our most important decisions. All organizations learn, but some of them don't learn fast enough to survive. IT plays a very important role in gaining sustainable competitive advantages in all learning organizations. Supercomputers will augment the capability of organizations to produce and to learn. Organizations that know how to harness technology to enhance their learning capability will possess a decided competitive advantage.

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From the normative perspective, Garvin (1993) defines: A learning organization is an organization skilled at creating, acquiring and transferring knowledge and at modifying its behavior to reflect new technology (p. 80).

Nevis, DiBella and Gould (1995) suggest that the learning process includes three basic stages: knowledge acquisition, knowledge sharing and knowledge utilization.

Pedler, Boydell and Burgoyne (1989), list a set of conditions include:

- Individuals, groups and departments exchanging and sharing information on expectations and feedback on satisfaction to assist learning;
- Information system that enable members to question current operating assumptions and seek information for individual and collective learning;
- Culture and management style within the organization encourages experimentation, learning and development from success and failures.

### **A. Individual Learning**

All kinds of technology-based learning help individuals to cope up and master the new flow of knowledge and skills. The new learning aids include computers, multimedia, and distance learning. The corporate learning environment will be: modular, multisensory, transferable, interruptable. This new technology is under the control of the employees. Employee will learn more from technology or self-directed learning than from the formal training programs. Employees have greater freedom to initiate their learning experiences to meet their individual needs. Most jobs are getting more complex and require higher levels of skills that requires higher level of skills within personal mastery which refers to the proficiency of every aspect of life. High-tech provides convenient, timely, on-line learning environment but it doesn't guarantee the satisfactory learning results. The successful factor of individual learning lies in the learner himself or herself. The new high-tech learning machines are being called the most powerful learning tools after the invention of the book. It becomes possible for ideas and mental images to float in and out of a person's consciousness. As a general rule, computer-based training and CD-ROM are generally more effective for knowledge-based skills, whereas interactive technology may be most effective in behavioral training. Artificial intelligence, which involves replicating the thought process of the human brain, can observe, guide, and coach each user and modify its instruction accordingly.

### **B. Team, Departmental Level Learning**

IT communication software, including electronic mail, bullet boards and conferencing, allows for one-to-one interaction and for interaction among dispersed

groups. It also provides an electronic learning environment where all members have equal access to data and able to communicate freely. IT enables the communication between or among people across time and space so that people can work together as a team or group despite their geographical locations. As teams are the fundamental units in organizations, besides the advantages of teams, technology also improves the effectiveness and the coercion among team members. For example, the Internet provides user-friendly electronic conference, chatting, bullet boards, news, and “surf engine”, etc. that enables anonymous entry or a certain group discussion or conference. Virtual organization is, of course, one of the outcomes resulted by IT. But IT doesn't mean all teams or groups will be successful because of the advantages of technology. People who can manage and master the technologies to pursue the common tasks are the key successful factor of all teams. The success of teams depends on the emotion, enthusiasm, personality and other psychological issues besides the technological bases and individual's excellence. Anyway, IT is a powerful enabler.

### **C. Organizational, Cross-organizational & International Learning**

Networked computers facilitate rapid communication around the world, and global learning organizations use extensive electronic mail networks. Learning organizations will employ various technologies to enhance learning. The key, according to Joel Montgomery, is to “allow intuitive entry into the technology system from multiple perspectives. It is also important to use technology to facilitate learning rather than merely automating a reference system.” IT is the organization's powerful tool of the future. Organizations across the world are finding new ways of integrating multimedia to provide learning that is more efficient, less costly, and more flexible than ever thought before. New technologies and innovative use of them have enable learning organizations to quickly leapfrog over competitors. The beauty of marrying interactive learning technology with learning has resulted in improved retention, increased flexibility, and a greatly enhanced learning. Therefore, the same as individual learning, the organizational learning process is a lifelong practice that should be a up forward learning spiral from concrete experience to reflective observation, to abstract conceptualization, to active experimentation, and, go back to higher level of concrete experience and start again.

The real learning organizations are able to learn effectively, think creatively and react accordingly based on their learning experiences. By continuously summarizing the previous success and failure, they will be able to enhance their learning capabilities. In this learning course, they move forward from the beginning with the aspiration of share vision, to shaping their mental models, and to practice of systems thinking. The winners will be those both individuals and teams in the organizations are actively take part in this course so that the knowledge gained from learning can flow freely among individuals and teams, even to other domestic or international organizations. The feedback of their action or decisions are reflected in the their later actions. They are also good at learning from the experiences of others and retaining the learning environment and learning culture. The lifelong, continuously enhanced learning capability is the only decided, key, sustainable competitive advantage.

### **IT Infrastructure Strategies**

According to Broadbent & Weill (1997), decision on investment in IT are both critical and contentious. With a thorough understanding of a company's strategic context,

managers can identify business and IT maxims that can help them determine the IT infrastructure capabilities necessary to achieve their business goals. Changing business demands, roles, and relationships are critical to making infrastructure decisions. All organizations are operating in a condition of high uncertainty. To clarify infrastructure requirements, companies also need to understand the current strategies and strategic intents of each business unit, the synergies between units and the firm's experiences and beliefs in the value of leveraging these synergies. Firms may take any of the four views of IT infrastructure: none, utility, dependent, and enabling. Each view anticipates different benefits and investments. None of the views is best for all firms, but one is more appropriate for a particular firm, according to its strategic context, business and IT maxims.

- When a company decides to forgo synergies or IT economies among its businesses, it does not invest in infrastructure services at the firmwide level (a "none" view).
- A utility view implies that expenditure on IT infrastructure is primarily a way to reduce costs through economies of scale and sharing. IT is a utility that provides a necessary, unavoidable service that incurs administrative expenses.
- A dependent view implies that infrastructure investments primarily respond to specific current strategies. Dependent infrastructure investments are derived from business plans that specify or imply information and IT needs.
- An enabling view implies an overinvestment in IT infrastructure- in terms of current needs. The purpose is to provide flexibility in achieving the firm's long-term goals and to enable quick development of new products.

## **Four Practical IT Methodologies**

### **A. Grand plan**

In traditional theories of how IT is applied, grand plan begins with business strategy, then choose the structure and management process, align IT and ensures that employees are trained and their roles are well designed. Traditional change model revolves around a strategy vision and the implementation of large-scale change, where is inherently high risk. Some resist the change of their traditional work practice and stick to their long-term decided work patterns and mental models. So unlearning is the first step of higher level of learning which requires changing the way of thinking, being prepared to absorb new thoughts, and continuous practice based on new information and knowledge. This is shown in Figure 1.

### **B. Incremental**

Incremental methodology begins with tactical and incremental adoption of technology. In turn, that becomes the catalyst for changes in individual roles and skills, followed by structured adaptation, and change in the firm's management processes, which embedded and reinforces organizational learning. From the new configuration, a business strategy and vision begins to emerge, as a range of new strategic options becomes apparent. In this way, the IT strategy and subsequent business transformation gradually evolved out of tactical response to operational needs. This methodology is shown in Figure 2.

Figure 1. The traditional path-Grand plan methodology

Source: from Philip W. Yetton et al., Sloan Management Review/ Summer 1994:  
*Computer-aided architects: A case study of IT and strategic change* (p.62).

Figure 2. The incremental methodology

Source: from Philip W. Yetton et al., Sloan Management Review/ Summer 1994:  
*Computer-aided Architects: A case study of IT and strategic change* (p.63).

As Yetton et al put it, The strategic value of the firm's gradual transformation is not simply a direct consequence of the application of IT but a function of the particular interaction of organizational, individual, and technological factors, for which IT is the initial catalyst. This interaction creates strategic fit and embeds processes of learning in the firm. At each incremental step, learning occurs and creates an awareness of different opportunities for action, which in turn affect the next step. Thus, in many

cases, it is not rational, planned strategies but the interplay of small-scale, tactical decision making with ongoing experience that shapes outcomes.

Ciborra comments, "Incrementalism, muddling through, myopic and evolutionary decision-making processes seems to prevail, even when there is a formal adherence to (the rational models of strategy formation). Ciborra also suggests that this incremental and evolutionary organizational learning can form the basis of a sustainable competitive advantage for a firm, where the innovation is embedded and emerges from a unique set of conditions and experiences that is not easily replicated. In short, this kind of IT change found that incremental, tactical responses to operational considerations, rather than formal strategic planning, were successful. It also reduces business and financial risk while standardization on a common technical platform maximized accumulated learning over time. The continual adaptation of technology through individual mastery and organizational learning was central to achieve the a strategic fit in which IT become embedded in the firm's core business processes, contributing to the firm's high performance and the development of competitive advantage. Practicing professionals, rather than IT specialists, led to the move to adopt and implement the technology.

#### C. Deal

According to Broadbent and Weill, the deal-making process, which focuses on the more immediate needs of each business, is the free market of IT infrastructure formation. The free market often means that powerful, successful, and rich business units are far better serviced by the firmwide IT infrastructures that are in place. This approach may work for them when there are no business imperatives to exchange and access data or do business electronically with other parts of the firm. However, this approach leads to islands of automation that difficult to integrate later if strategic needs change. Overall, the critical successful factor in this approach lies in how to select the best to meet current needs and will be able to fit into future needs, at the same time, avoid the problems of connectivity among various kinds of hardware, software and communication applications.

#### D. Outsourcing

Outsourcing becomes popular because of both the cost-effective analysis of organizations and the endeavour of outsourcing service providers. The advantages include relatively economic, good service quality, predictability, flexibility, etc. This requires the least end user involvement. Some may argue that it doesn't encourage learning. If we consider it from different way: because of the shortage of qualified IT professional within the organization, while spend some, maybe large amount of money, this strategy enables the organization to focus on key business factors which are regarded much more important than the management of IT issues. The disadvantages include the loss of control, vulnerability of strategic information, and the dependence on external computer agents, etc.

#### **Is IT a Cure-all Solution in LO?**

All organizations, especially learning organizations may gain advantages by appropriately applying IT into reality. But IT is not a panacea. Information and technology can only be utilized to service the purposes. In the systemic world view, if you change or cut down a part of the system, the whole system will be changed. If the future direction and strategies are misled, IT can be of little help, on the contrast, IT

may speed up the tragedy. IT is also dangerous! It seems unbelievable. Let's have a look at the pitfalls of improper application and misuse of IT:

1. Drown in the ocean of information. Because of the powerful IT, it is possible to search and store vast of information. But how to select and analyze valuable information?
2. It dilemma. From the adequate future IT capability, it always tends to require overinvestment while the organizations may wonder about the durability of the huge investment.
3. IT security, legal rights and ethics. How to get the necessary information legally and protect one's own or organization's business secrets? How to decide the boundary of shared information and confidential files and technologies?
4. Information distortion. According to Larson & King, information distortion can be traced back to the natural tendency for human beings to desire favorable information and be defensive in the face of unfavorable information. Systemic information distortion in organizations comes from our very real need to reduce uncertainty and promote unity.
5. The decrease of job opportunity. Probably IT will decrease more jobs than it creates. Is it the common problem of development? How to solve the problem?
6. Most current IT application are still at the automate age. How to evolve to the informate and transformation stage?

### **Conclusion**

Of course, by continuous learning, genuine learning organizations will be able to learn from the previous feedback, success and failure and to harness what they have learned and adapt themselves to focus and refocus on the truly desired individual and collective visions and goals. What matters is not only what they have learned but their learning capability so that they can not only survive but also prosper. The learning organizations are able to gain advantages from the IT capability and avoid the pitfalls appropriately. IT is not the only way to build learning organizations. Besides IT, contingency theory, psychology, and system dynamics, etc. complement each other in the big whole system. There is no one best way for all organizations to learn. No matter how perfect the communication technology is, from the basic human needs, face-to-face communication still remains as the most intensive channel of communication, especially when conflicts arise.

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