# The Impact of Web Technologies in Management Learning

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## Abstract

*This paper elaborates on the key issues of e-learning and knowledge management (KM) in the ways in which it could impact management learning and training. It discusses the various stages (technologies) and potential benefits of web-assisted learning in general and as it relates to business and management training in particular. It emphasizes the importance of a strategic approach to introducing web assisted management learning solutions through reviewing some of the success factors and proposing a framework for developing a strategic foundation for technology and web based management learning*

## Keywords

Management Learning, Management Learning Parameters, Web-assisted Learning, Strategic Approach

## 1. Introduction

Majority of educators, educational strategists and educational technologists have been for some times of the view that we are on the verge of a major change in both learning and educational practices. One of the characteristics of the today's digital world is that the knowledge and skills that we acquire are becoming increasingly short term focussed – as rapid advances of technology enables ongoing changes in practices and processes we deal with on a day to day basis. This phenomenon in turn requires us to learn on an ongoing basis. Most traditional approaches (to learning) appear to be inadequate in responding to the new challenges that are mostly focused on increased efficiency and effectiveness in developing, acquiring or disseminating knowledge. It appears that we have sought information and web technology based learning solutions to respond to the need for continuous learning in many fields of knowledge including business and management.

Over the past few years we have witnessed rapid advancements in Information and Communication Technologies. This has in turn contributed towards a staggering growth in global computer networking and the emergence of a globally connected world. The Internet has evolved from being a network for researchers and academics into a platform that has enabled new businesses to find alternative ways in which to offer their products and services. Today, it is expected of any organization (regardless of size and complexity of operations) to have web presence. We have also witnessed a paradigm shift in the ways in which the transfer and management of knowledge is handled. The Internet and Web-based technologies have both had a profound effect on the way(s) in which educational and training institutions in the field of management now operate. Technological advancements have made it possible for many innovative educators/trainers (within ICT enabled nations) to think of new ways in which to use the Internet in order to provide Web-based knowledge management and management training opportunities.

There appears to be significant optimism amongst technologists and strategic planners for learning in that they view global networking and Web-based solutions as catalysts

for addressing today's challenges of knowledge management and learning of management practices. This has become evident with an increasing number of tertiary educational institutions teaching business and management subjects and industry based management training organizations attempting to offer a wide variety of Web-based (online) learning solutions. These institutions have adopted a variety of strategies - some have considered Web-assisted solutions as a supplement to face-to-face communication between management students and educators/trainers, whilst others have used Web-based learning through the Internet as the sole medium for delivery.

A review of digital or electronic learning cases suggests that most tertiary educational institutions and professional training organizations (within ICT enabled and globally networked countries) have acknowledged to some extent the strategic importance of using technology-based management education and learning through Web-based applications. They seem to view Web-assisted (on line) learning as being a fundamental and positive shift in the academic and professional knowledge management world. Yet there is also a danger. If we focus too much on the technology aspect of online learning and less on broader issues and/or strategies, we are unlikely to be able to deliver futuristic solutions of a high quality for management learning. On the whole, some electronically delivered programs/courses for future managers appear to have been developed and implemented in a somewhat reactive manner, and in isolation - more specifically, without much thought being given as to strategic implications; global developments; cultural issues; digital divide and the complexity of today's knowledge management systems. As a result, some of these solutions have proved incapable of meeting the expectations of their potential markets (management students/trainees).

Considering the significance of ongoing learning in today's environment, the development of electronic learning solutions that support management learning needs to be based upon a strategic foundation.

For a number of years different management education and training institutions (some with support from the public sector) have developed strategies for adopting online solutions.

As mentioned earlier, there has been much discussion on learning and education sector reform and improved learning and educational services in learning management practices. However, there is little evidence of review and assessment of online learning projects for management training projects after implementation – in order to determine the real impact of online/electronic learning and whether or not the vision, goals and objectives were actually eventuated. This is more evident in developing and underdeveloped countries. Even though the rationale, strategies for reform in management learning and plans for implementation of solutions look well presented, the outcome and what has been achieved following implementation of solutions may be different from what had been planned. There seems to be little post implementation review of impact of technology on management learning and reflection on outcomes.

This paper discusses the fundamental issues and the overall impact of introducing technology and web-assisted tools in management learning.

## 2. Technology Assisted Learning: The Evolution

The historical background of technology bases learning can be observed over three decades of development in ICT based education (and training).

Various technologies that have been introduced throughout the past few decades (in order to facilitate learning) include:

- Film
- Advanced TV technologies and video tapes
- Mainframe computer based "teaching machines"
- Early microcomputers as a basis for Computer Based Training (CBT)
- Touch screens and interactive videodisks based on "InfoWindows" hardware technology
- Power PCs, CDs and VCDs
- Global networking advancements and web-based solutions

Overall, universities in the US and the army appear to have played a pioneering role in the application of technology and developments which has eventually led to digital delivery of learning solutions.

Today, the online learning industry is diverse. Numerous universities have developed profit orientated e-universities offering courses and degree programs.

It also includes companies that support the establishment of learning infrastructures and networks for higher education institutions (as well as corporations) – such as course management and delivery tools from Blackboard and WebCT that allow customers to create learning programs directly on the Web without investing in their own tools or infrastructure.

In this paper, the focus is on the use of Web-based technologies (and applications) in order to deliver a broad range of learning solutions - whereby learning materials can be accessed from the web or intranet via a computer and educators/trainers can communicate with each other using e-mail, chat or discussion forums.

The key characteristics of web and internet technology based learning solutions (Rosenberg 2001) are as follows:

- It is based on computer networking technologies – so as to make it capable of instant updating, storage/retrieval, distribution and sharing of instruction or information.
- It is delivered to the learner via a computer that is connected to standard Internet technologies. However, there is much debate over the interpretation of the term "computer" and what it actually refers to.
- It focuses on the broadest view of learning. That is to say, it considers learning solutions that go beyond the traditional paradigms of training. E-learning moves beyond training to include the delivery of information and tools that improve performance and competitiveness within the job market.

### 2.2. Management Learning: A Paradigm Shift in the Transfer and Management of Knowledge

Training Magazine's 1999 statistics (Industry Report 1999) demonstrate that companies are shifting some of their training investments away from on-site classrooms. There appears to be growing evidence that in the future, changes to business, society, general attitudes towards learning and the application of technology will limit the effectiveness

of traditional learning/training. Providing effective futuristic learning solutions requires a shift in attitudes and perceptions – including:

- Focussing on outcomes – Learning solutions need to make a positive impact on learners' performance and work-readiness.
- Providing flexible access (anytime/anywhere) – Knowledge solutions must meet the diverse needs of learners concerning time frames and locations.
- Placing emphasis on online rather than paper-based delivery
- Shifting the focus from physical facilities to networked facilities – Networked solutions for knowledge delivery (Internet or Intranet) play a significant role in information sharing, communications, and flexible access to learning material from any location in real time.
- Facilitating real time rather than cyclic learning – Today, the pace of change is extraordinary and the cycle time concerning knowledge is short. There is a need for improved learning efficiency and pace.

Parameters mentioned above are most closely associated with characteristics of management learning and training needs. It is often the case that very busy executives who require ongoing learning and training are unable to allocate time to attend traditional classroom based learning. It has to be emphasised once more, that there is an enduring and important role for traditional classroom instruction (Asgarkhani 2003) even in management training scenarios. Those who believe technology will eventually replace highly skilled teachers within classrooms of highly motivated learners are as misguided as those who consider the Internet as a phenomenon that can be overlooked as its impact will diminish over time.

## 2.3 The Potential Benefits and Drawbacks of using Technology in Management Learning

There has been much debate over the potential benefits and drawbacks where web-assisted learning is concerned (Asgarkhani 2003, Rosenberg 2001, Kruse 2002b, Kruse 2002c, Sitze 2001 and Burns et al 2001). Some of the more obvious advantages and disadvantages that can be related to management learning and training are outlined in Table 1.

| **Potential Benefits (Solution Provider)** | **Potential Benefits (Learner)** | **Potential Drawbacks (Solution Provider)** | **Potential Drawbacks (Learner)** |
|---|---|---|---|
| • Reduced overall costs<br>• Reduced learning time<br>• Consistent delivery of materials<br>• Expert knowledge can be communicated and captured with effective e-learning and knowledge management systems<br>• Proof of completion and certification | • On-demand availability<br>• Self-pacing<br>• Interactivity<br>• Availability of newly updated material in a timely fashion | • The need for up-front investment<br>• Technology complexities and design<br>• Educators' workload<br>• The need for selecting appropriate content and effective instructional design<br>• Cultural acceptance | • The need for access to technology<br>• The need for printed workbooks or reference material<br>• Reduced social and cultural interaction |

Table 1. Benefits and Drawbacks of e-Learning

Overall, after reviewing previously conducted studies, it seems like the strategic values of employing web abd online technologies in educating and training managers can be summarized to be as follows:

| | |
|---|---|
| **Efficiency** | |
| *Time* | Accelerating business processes and activities that are concerned with training and educating managers. |
| *Distance* | Reducing geographical and distance inhibitors/barriers and allowing managers in various regions to eb able to participate in learning practices. |
| *Creativity* | Enhancing existing business processes and activities from the point of view of educators. |
| **Effectiveness** | |
| *Time* | Improving the flow of information and business intelligence throughout the supply and the value chain components. This facilitates both time effective delivery of learning and more profitable learning and educating processes for educators. |
| *Distance* | Enabling integrated control of the supply and the value chain processes. Even though this may be seen as a more business driven val;ue and initiative, it can enhance value of educating and being educated in management courses considerable. |
| *Creativity* | Enabling new (and/or modified) processes to allow innovative and more exciting methods of learning. |
| **Growth** | |
| *Time* | Obtaining early market entry/presence for educators who are seeking internationalization. |
| *Distance* | Introducing new management learning products to new markets |
| *Creativity* | Developing new products and services that are related to educating and learning for managers. |

Table 2. Strategic Value of Web and Networked Education for Managers

## 2.4. General Trends and Attitudes Towards Web Assisted Learning

Many people (e.g. Rosenberg 2001) consider technology-based learning in all fields including management disappointing at its best - as they argue that its impact has been relatively minimal. Others (Kiser 2001, Dobbs 2000, and Kruse 2002a) argue that the benefits of web and technology assisted learining outweigh its drawbacks.

The perceived importance of digital learning has motivated some governments to develop national guidelines and strategies for introducing e-learning solutions (e.g. New Zealand e-Learning Advisory Group 2002). In addition, management education groups at tertiary sector world wide, have developed methods of increasing enrolment and taking management learning to remote places through the introduction of digital and web assisted learning technologies.

Recently, there has been much debate with regards to the state of the e-learning industry (e.g. Dobbs 2000, Industry Report 1999, Kaeter 2000, and Kiser 2001).

Overall, e-learning appears to be taking root in organisations of all sizes - even though there are often different views concerning the ways in which e-learning can benefit individuals or organisations.

The International Data Corporation (IDC) and Online Learning Magazine (OLM) recently examined the general attitudes towards e-learning - as expressed by a group of

OLM readers about training within organisations (Kiser 2001). According to this research, those people who have been responsible for the implementation of e-learning solutions seem to be pleased with the results (80% of the respondents used some form of e-learning and there were indications that this percentage will increase - as more than 40 percent of the respondents whose employers had not yet adopted e-learning were apparently planning to do so within the next two years). Research by the IDC has shown convenience as being one of the most important reasons for employees for using e-learning.

Furthermore, recent studies of learners' attitudes towards e-learning within tertiary educational institutions (e.g. Burns et al 2001, Asgarkhani 2003) indicated that there is an increasing demand for web-assisted courses. A recent pilot study of trends and attitudes within the CPIT in Christchurch, New Zealand (Asgarkhani 2003) suggested that in general, there is an increasing interest in the application of e-learning (despite the fact that most of their learning still happens in the classroom). Even though the results of this study are not considered as being final, it appears that the demand for quality web-assisted courses with multifaceted person-to-person interaction will increase rapidly in the near future.

### 3.3 The Knowledge Management Hierarchy and Management Learning

Rosenberg's (Rosenberg 2001) review of some KM systems/solutions and a review of other studies (Hsieh et al 2003, Zyngier 2003) indicate that KM can be divided into three layers:

- **Layer 1: Document management** – The earliest form of KM has been the use of technology in order to retrieve and access documentation related to management leraning. Today, it is common for organizations to provide access to documents, reports, and forms online.
- **Layer 2: Information creation, sharing, and management** - This is where people contribute information to the system, creating new content and growing the knowledge base. That is to say, users are encouraged to read documents, fill forms, and submit forms online. This would allow for the information to be continually updated
- **Layer 3: Organization or enterprise intelligence** – The ultimate in KM is the development of a robust and interactive KM system so as to accurately represent the organizational "know-how."

As KM solutions are introduced, it is inevitable that we observe changes in the ways in which people in management practices learn and work together.

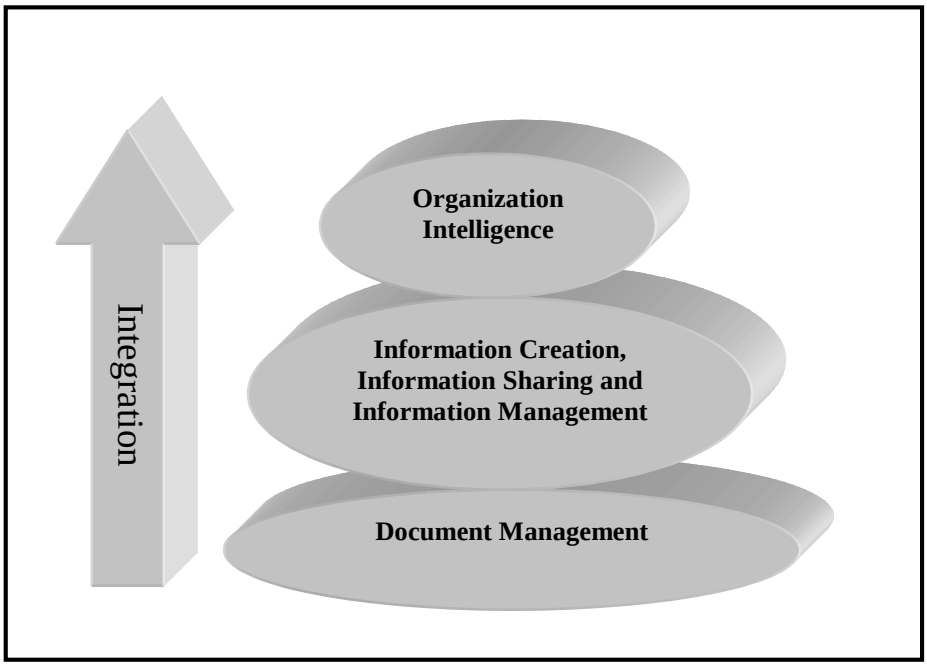


Figure 1. The Knowledge Management Hierarchy

## 5. How Effective Can Technology Based Management Learning Be?

Developing effective digital learning and KM solutions depend on the state of the ICT industry and electronic readiness (e-readiness) where it concerns countries, organizations, societies and so on (e.g. Information Society Index 2001, OECD Workshop 2000, META Group 2000 and Asgarkhani 2002b).

Overall, differences in diffusion and use of technology solutions and ICTs IInformation and Communication Technologies) and electronic networks can lead to:

- Divides between countries
- Social divides within countries
- Divides within countries related to income, education, age, family type, and location
- Business divides related to sector, region, and firm size

There has been much debate over the implications of digital divide on e-learning and KM. In November 2001, the global communications company Marconi (Marconi 2001) called on government and private stakeholders in South Africa to accelerate the introduction of e-learning centres in remote, rural and disadvantaged areas - suggesting that economic and educational benefits would have an immediate and measurable impact on poverty in South Africa. Higgins (Higgins 2002) views e- learning as a tool that can play a significant role in bridging the digital divide in the APEC region.However, the digital divide can also be considered as a barrier to successful rollout of e-learning and KM solutions.

Some of the causes of digital divide that can also limit successful implementation of e-learning and KM solutions can include:

- Lack of telecommunications and network infrastructure
- Limited PC access
- Lack of financial resources for developing an infrastructure
- Lack of ICT literacy

- Limited Internet access
- Cultural resistance
- High access costs to global networks and the Internet
- High cost of business investment
- Strategic business impediments – applicability; the need to reorganise; the need for skills, security and privacy considerations

## 6. A Strategic Framework for Web-assisted Management Learning

Even though technology is a major component of web-assisted learning in management, improving technology and infrastructure is not sufficient to produce outcomes of a high quality – as the components and relationships within today's information society are complex. The development and delivery of quality management learning solutions needs to be viewed as a holistic process, whereby a strategic foundation is developed in order to optimize the application of technology by giving consideration to many aspects of the digital delivery of knowledge such as digital divide, culture, social trends and so on. The process must also consider critical success factors that have been widely discussed over the past few years (Kruse 2002d, Gallagher et al 2002, Hsieh 2003, Rosenberg 2001, and Rossett 2002). These can include:

- establishing a culture of support for ongoing learning for managers
- ensuring support from management
- deploying a nurturing business model
- sustaining the change throughout the organisation for better learning support for managers

Furthermore, it is essential that we view learning needs in a much broader context – one that includes:

- learning as the growth of the intellectual capital of corporations and societies
- learning as enabling higher individual and organisational performance

It is also essential to develop a strategy that can be examined, pilot tested and put in practice at a rate that technology develops and the Internet grows.

A strategic foundation for introducing lerarning solutions should be concerned with the overall direction of technology bases learning for managers whilst providing a framework for tactical and operational issues. A review of some of the most widely used frameworks for strategy development (Robson 1997, Asgarkhani 2002a, Boar 2001, Heath 2003, and Rossett 2002) suggests that it (the process) should consist of at least three specific components/phases: *Analysis*, *Choice* and *Implementation*.

The total strategic process for e-learning/KM (similar to that of any other ICT dependent solution) is anything but linear. Integrating all the components of the strategic process is cyclic – often circling back to itself. The key elements of this cycle (as outlined in Figure 2) are:

- *Strategic Analysis for Management Leraning Siolutions* – involves establishing an understanding of the current situation, including: aspects of the environment; current technology infrastructure; available resources; expectations; broad objectives; and power bases.
- *Strategic Choice for Management Learning Solutions* – involves the formulation of the strategy itself through understanding various options, evaluating options and making a decision on a suitable strategy.

- *The Implementation od Solutions* – involves tactical issues such as resource assessment and planning, identifying human resources and systems, contents, determining organizational structure and so forth.

The first two stages of the strategy cycle outlined in Figure 2 should ideally result in the formulation of a strategy plan. The strategy plan can often be formulated as a hierarchy that clearly outlines the various stages (components) of the strategy process for technology based management learning.

– Figure 3.

There are a number of key questions that can be considered in order to facilitate the strategy development (as outlined in Figures 1, 2 and 3). These can include:

- What are our reasons for pursuing technology based management learning?
- Are we aware of our limitations and the challenges ahead of us?
- What is our clear vision for digital management learning?
- What are the priorities that we have considered?
- What types of management learning are we ready for?
- What specific management learning solutions suit our choice of digital learning?
- Do we have a methodology for selecting, planning and managing technology based learning projects?
- Did we consider a thorough plan for managing change?
- What are the tools and metrics that we have thought of in order to be able to measure progress/success?
- What would be a model (methodology) for managing relationships with other institutions when considering potential strategic partnerships?
- How would our management learning model improve the overall process of learning and managing knowledge within the organization?

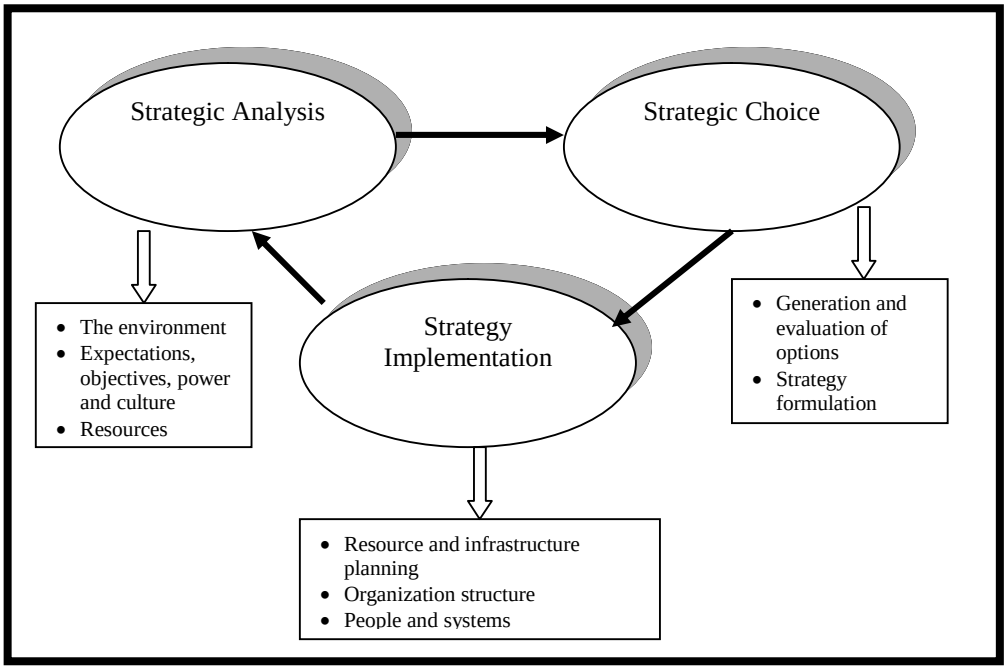


Figure 2. The Cycle of Strategy Development and Implementation for e-Learning and Knowledge Management

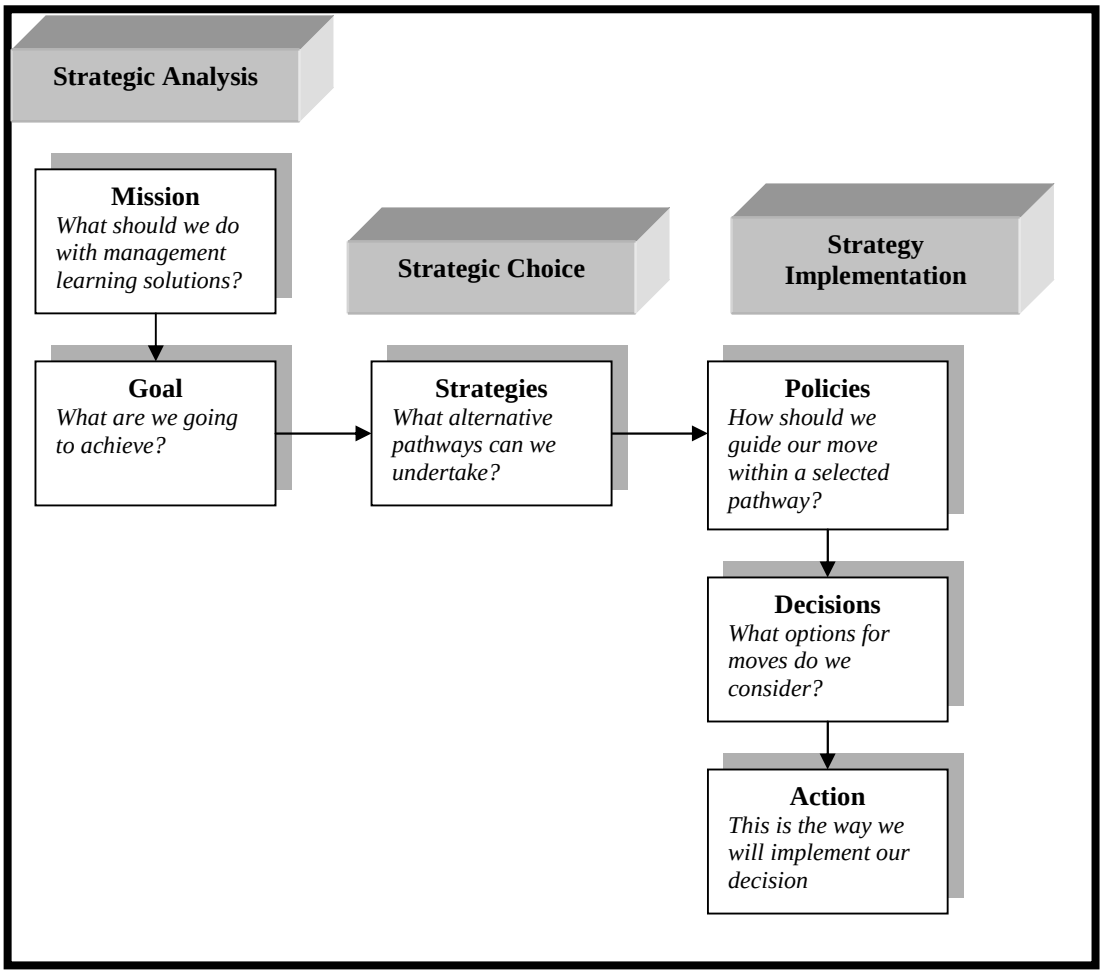


Figure 3. The Hierarchy of Strategy Development for e-Learning and KM

To conclude, strategy development and implementation is an ongoing process. A strategy plan is considered to be a living document. It needs to be:

- redefined and adjusted as the environment and requirements change or new technological options become available, and
- examined on an ongoing basis against the mission and vision of your institution (a solution provider or a learners' institution)

To ignore the iterative nature of any strategy would eventually compromise the quality of the outcome.

## 7. Summary and Conclusions

Today, many educators and educational technologists believe that we are about to witness a major shift in attitudes towards learning and knowledge management. The ICT and web-based solutions have fundamentally altered the technological, social and economic landscape so as to make it possible for quantum leaps to be made in the application of technology for learning in all filds including management training and learning.

Overall there is an increasing interest in the application of e-learning within organisations. However the potential benefits of web assisted and technology based learning can only materialize when the solutions are introduced as part of a well-planned and properly supported education/training environment.

Technical innovation on its own is not enough to drive the process of effective management learning in organizations. More specifically, access to the right technology for delivering learning solutions is essential but insufficient. Successful web assisted learning needs to be reliant on the development of a strategy that optimises the application of technology through giving consideration to learning attitudes in potential markets (e.g. tertiary educational market and corporate training market); organisational culture; organisational business strategies and so on. Furthermore, an effective e-management learning strategy must give consideration to critical success factors such as establishing a culture of support for ongoing learning; ensuring support from management; deploying a nurturing business model; and sustaining the change throughout the organisation.

The strategic process for management learning is cyclic. The key elements of this cycle are strategic analysis; strategic choice; and strategy implementation. The strategy process outlined in Figure 2 results in:

- Compiling a strategy plan that is formulated as a hierarchy of mission, goal(s), strategies, policies, decisions and actions (Figure 3).
- Developing a strategic foundation that depicts the critical components for successful learning.

Overall, the introduction of technology and network assisted management learning solutions needs to be a holistic process – one that addresses fundamental issues in a strategic fashion, taking into consideration:

- Securing management support – through aligning learning goals with business strategies
- Defining an information vision and architecture
- Developing terms of reference and methodologies for project development and management
- Putting together strategic, tactical and operational plans (including a change management plan) for the implementation of the information vision and architecture and the development and delivery of management learning solutions.

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