

## SHAPING E-LEARNING FOR COMPANIES

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### Abstract

The use of the Internet and Web technologies lead to E-Learning activities which are offered by many universities in order to meet students needs. But only a few companies – mostly the big ones – established E-Learning for their vocational training. One cause could be that they do not believe that E-Learning is shaped for helping them to make judgements and take decisions about their business and their future.

When considering the future of ICT generally there is no shortage of material. They include global scenario projects, national foresight studies, etc. Such information sources are also necessary in order to shape the E-Learning particularly for small and medium-sized companies (SMEs). In the following we present the methods of scenarios and foresight studies and give some examples.

### 1. INTRODUCTION

New emerging Information and Communication Technologies (ICT) are leading to the development of many new opportunities to guide and enhance learning. For example the use of the Internet and Web technologies lead to E-Learning activities which include online learning, Web-based training, virtual universities and classrooms, digital collaboration and technology assisted distance learning. There are already about one million courses on the Internet.

Web services descending more from text processing as binary communication protocols are an efficient help within E-Learning (Mateosian 2002). The core Web services standards SOAP, WSDL, UDDI have received widespread adoption and generated tremendous interest (Bunell, 2002).

The acceptance of E-Learning is due also to growing availability of commercially available Learning Management Systems such as WebCT, BlackBoard, Learning Space, IntraLearn, Top Class, eCollege, Click2learn, Authorware, LearnLinc, Virtual-U, Web Course in a Box, IniLearn and WebBoard (Abernathy, 2001).

Over the last two decades the number of students from colleges and universities over age 40 has more than doubled and most full-time college students work part-time. They need innovative ways to help them study and work more efficiently in the global and competitive work. To meet students needs many universities offer E-Learning courses.

The use of E-Learning can be also a solution for small and medium sized companies (SMEs) to meet new staff qualification requirements and make possible a learning process linked with the work tasks.

But performance and reputation of E-Learning have not lived up to the lofty expectations set by the early

realization of the enormous potential benefits of this marriage of learning and technology. For example, in 2000 the American Society for Training and Development (ASTD) prognosticated optimistically that the world of vocational training would change within 1000 days making the transition to the E-Learning age. But the reality in companies shows another picture: In the last years it seems that the quality standards of the E-Learning products are likely to decline and the use of E-Learning decreases. Only a few companies – mostly the big ones – established E-Learning for their vocational trainings.

It is one point of interest of the authors' observatory project "ARIEL" ([www.ariel-eu.net](http://www.ariel-eu.net)) to identify the reasons. Some of these reasons could be that SMEs have no interest in the project (either because of a lack of incentives or a lack of commitment to the project goals), have no time for the project (due to conflicts with regular work duties, deadlines, or personal schedules), the wrong SMEs were selected for the project (they lacked the necessary knowledge or were not star performers) or they do not believe that such projects could help them to make judgements and take decisions about their business and their future.

The results of a monitoring of projects funded by Leonardo da Vinci programme show a shift in the orientation of the E-Learning projects: "During the first years of using the internet and ICT, most of the E-Learning projects, even those aiming to design learning processes, were focused on technical innovation to create technology based learning environments. There would appear to have been a change in thinking on E-Learning in the past three to four years, with a new focus in the discussions on E-Learning. Rather than the emphasis on technology, the new focus of thinking on E-Learning is increasingly on the learner him/herself and on methodologies and didactics. This is seen as more important in developing the quality of E-Learning provision and ensuring the success of ICT supported learning processes" (Attwell et al. 2003).

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In the following we present the methods of scenarios and foresight studies and give some examples.

## 2. SCENARIOS

To know the future development in E-Learning for companies is crucial for decision making for all involved actors (companies, developers and distributors for E-Learning applications, consultants, politicians etc.). The high complexity of the field, preventing us from making reliable prognoses, is a serious problem. To cope with this challenge different methods are used. One of the most promising methods is the use of scenario planning. Scenario technique has its origin in the use of military planning of WW II. Its civil breakthrough came with a study produced by the Royal Dutch/Shell Oil Company under the guidance of Pierre Wack at the beginning of the 1970s. (<http://www.shell.com/>). In nowadays it is used in the strategy departments of big companies as well as for decision making in the political system.

Until now there is no legal definition what a scenario is or how to build it up. Scenarios are described as "Narrative descriptions of assumptions, risks and environmental factors and how they may affect operations. Scenarios attempt to explore the effect of changing several variables at once with objective analysis and subjective interpretations" (Wikipedia 2005).

Ogilvy (2004) said: "Scenarios are narratives of alternative environments in which today's decisions may be played out. They are not predictions. Nor are they strategies." The basic idea about scenario planning is to mix up all known facts and use possible developments in these factors to describe "wanted" and "unwanted" futures. Based on this scenarios strategies can be found to avoid negative impacts in an "unwanted" future and to promote the way to a "wanted" future.

Referring to the future of ICT many global scenarios have been developed within a variety of different contexts, e.g. for military planning, business strategy or health policy. While they identify many key drivers of change (e.g. demographic change, environmental sustainability), there is also consensus that science and technology and, more specifically, **ICT** will be a fundamental driver of change in the **future**.

A useful overview of these global scenario studies is provided in the report [Strategic futures thinking: a meta-analysis of published material on drivers and trends](#) which was prepared by the Defence Evaluation and Research Agency (DERA) of the United Kingdom's Ministry of Defence for the Performance and Innovation Unit

One example of scenarios for shaping the future of ICT are the [Madingley Scenarios](#) generated for the UK's National Health Service Confederation. The Madingley Scenarios identified four main drivers of change:

1. new technologies;
2. new organisational forms;
3. sustainability;
4. changing relationships between family members, generational groups, genders, ethnic groups and nations.

Madingley Scenarios contain two scenarios.

In the first scenario, 'Find My Way', there is a great deal of individual choice, very little trust of institutions, wide diversity of lifestyles, an excluded group who cannot access information and cannot easily communicate their views to others. There is a general sense of excitement coupled with an anxiety among individuals who fear that they have chosen the wrong options and who lack any trusted reassurance.

In the second scenario, 'Trust Their Guidance', social institutions manage to revamp themselves in response to a wide spread loss of trust in experts, scientists, and professionals. They become trusted again because they have transparent protocols, they keep the public well informed, and they save individuals the time-consuming and frustrating experience of endlessly searching and choosing. However, this is also a world that limits individual choice and creates the nagging suspicion that perhaps these powerful organisations are not as open and altruistic as they pretend.

In the following we give an example of a scenario within the project ARIEL.

## 3. THE "ARIEL"-SCENARIOS AS AN EXAMPLE FOR SCENARIO BUILDING

The "ARIEL" (Analyzing and Reporting the Implementation of Electronic Learning in Europe) project uses the scenario technique to build up scenarios for the question: "*Can E-Learning support European SME's to be successful and to integrate into the European market?*" In a first step the project group, consisting of experts from five countries, arranged a workshop to find the factors playing a decisive role in the use of E-Learning for SMEs. These factors, later used as indicators or sub-descriptors, were grouped in five clusters:

- Vocational system
- Cost-incentive structure
- Technology
- Content
- Business

These issues have been considered as descriptors for the scenarios. The ARIEL team at the IAT in Germany proposes to single out the descriptors “vocational training system” – VET and “business” as being most important for the context of the project.

The factor **VET** is presented here as a complex vector which scores either high or low in two respects: financial investment and trust. The business vector, though presented as a simple parameter, represents multi-layered developments.

The ARIEL consortium decided to develop a small set of four basic scenarios for Europe. At the moment each scenario is linked with the name of a European city: the optimistic scenario has the name of the Lisbon strategy, Manchester serves as an icon for “Manchester capitalism”, the German city Nuremberg represents a highly invested vocational training system as a kind of tradition which is not part of the business success anymore, Naples remembers us this city in the 2nd decade of the 20th century.

For illustration how a scenario could look like we present “working in progress” version of an E-Learning scenario for SMEs in the situation of stagnating economy with a high trusted VET-system (internal named “Nuremberg”).

***"Nuremberg"-Stagnation***  
***A world in which individuals learn but not organizations, esp. not SMEs. Technology is not integrated with VET***

Business

As a consequence of the depressed economy in Europe there is an overall loss of jobs, mainly from bigger companies. SMEs are more important than ever, their number is increasing and they employ higher numbers, both relatively and in total, of the available workforce. But the SMEs cannot compensate for the loss of jobs in bigger companies. Even though they suffer from similar problems resulting from the economic depression they are unable to share knowledge to compete successful in the European and worldwide markets because of a lack of cooperation. Furthermore, they cannot realize economies of scale for vocational training procurement so individual SMEs pay higher prices for poor fit training offers.

Unemployment is a more serious problem than ever because the economy is depressed and shows no foreseeable upturn. Well educated and trained people

become “export goods”. Skilled workers, qualified through the VET-system with high investments, often see no chance of finding a job, so they emigrate. Others try to build up their own businesses, but there is a high failure rate due to the depressed economy, the climate of economic change, and their lack of business training

Vocational System

Despite the move towards flexibility in vocational training, VET institutions in general are still unable to meet the needs of SMEs.

SMEs investment in vocational learning and training is small, compared with big companies, they feel that the balance of incentives and risks is not in their favour and the benefits are not directly visible. Thus the total spending on VET by enterprises is falling so adversely affecting the VET sectors capability to adapt to changing needs.

If SME invest in training it is for specific tasks; increased market specialisation means that SMEs have a broadening band of specific needs but a narrowing band of generic needs. The VET sector can accommodate the generics through public investment but now lacks the resources to meet the specifics.

SMEs are not interested in formal systems of continuous vocational training and certification and actively avoid involvement in them. They do not understand that investment in their workforce through life-long-learning (L<sup>3</sup>) is necessary for competitiveness and in order to be successful in an integrated European (World) market, nor do they accept that E-Learning is an effective way to conduct L<sup>3</sup>.

It seems that individuals understand, better than the SMEs, the benefits of up-skilling and qualification. They are forced to spend time and money on learning and training to obtain new certified skills, because they are afraid of “being fired” as a consequence of depressed business of the companies.

Cost incentive structures

The question who pays is perhaps the most pressing and complex issue in the development of E-Learning for SMEs, their common strategy for formal vocational training is to externalise the costs to the individual or the public and not to pay for it themselves. They see it as a cost not an investment. Also, E-Learning has up to now been promoted more as a cheap or cost effective answer to the policy issue of engendering and promoting L<sup>3</sup> rather than being justified as opening up access to L<sup>3</sup> or in providing richer environments for learning by SMEs.

Forms of learning, Learning culture, E-Learning promotion

For their in-house competence training staff from SMEs use an unplanned and unstructured mix of informal methods such as learn-as-you-do,

discussions with experienced co-workers or suppliers, e-mail consultation, and visits to expo/trade fairs. What's missing is a company learning culture that conducts formal foundation learning first and subsequent learning less formally. SMEs prefer informal learning methods primarily because the costs are not as visible as for formal learning and they perceive (erroneously) that it is less expensive. They also see it as more flexible than formal structures, and they suffer from an absence of suitable formal learning offerings.

The massive promotion of E-Learning by the EU and its member states has not led to a durable use of E-Learning in SMEs. Most of the E-Learning products are not designed for SMEs (though this requirement is stressed in public funding programmes), and there is a poor conversion rate from publicly financed E-Learning-projects to sustainable products.

#### Technology

Typically ICT investment by SMEs is carried out only to fulfil business needs, such systems are often incompatible with the flexibility required for E-Learning. Current E-Learning authoring and packaging lacks the flexibility and adaptability needed to satisfy SME needs, whilst high investment is made in E-Learning platforms with sophisticated functionality that also do not match SME needs. The role of technology as an enabler of new forms of learning (e.g. m-learning) is not understood and changes in the VET system to take account of continual evolution of ICT is not seriously considered.

#### Content

E-Learning is regarded as an issue or aim in itself, it has not been considered within the context of organisational development, including the introduction of new forms of work organisation and new technologies within the SME work place. Multidisciplinary teams developing E-Learning programmes for SMEs with the active participation of SMEs staff for E-Learning content development are missing.

“Bought-in” trainers may know the technology but will lack skills to discover the specific needed content or to capture the knowledge of SME's employees, so even “blended learning” (as the most recommendable kind of E-Learning for SMEs) cannot be successful. The alternative of development and support for SME employees who are competent to become trainers and to author suitable E-Learning content is not commonly recognised.

There is a poor match between the collective and individual learning and training needs of SMEs and their employees and the available E-Learning offerings. Partly due to the misleading public promotion policy, public money goes into unsuitable

products and an unwillingness to invest in content generation by SMEs themselves.

The next steps in ARIEL to be done are a further evaluation for the scenarios, including an estimation of the probability for becoming real, and to find recommendations for suitable strategies to deal with the scenarios.

### 4. NATIONAL FORESIGHT STUDIES

National foresight studies are another particularly relevant source of information. There has been a boom in these kinds of exercises around the world in recent years with many countries seeking to identify national priorities for potential research in science and technology areas. Most EU Member States have engaged in such foresight exercises, although they differ markedly in their approach, methods used and outputs. A useful starting point for us is provided by a review of the outcomes of national foresight exercises regarding information society technologies (IST) or information and communication technologies (ICT), undertaken as part of the [FISTERA](#) programme (Foresight on Information Society Technologies in the European Research Area).

The first FISTERA review and analysis report considers three aspects within these studies:  
technology, in the narrow sense;  
application areas;  
technology related to societal issues.

The initial FISTERA review makes a number of observations about the nature and limitations of national foresight studies that are pertinent to our aim of exploring possible **future** developments of ICT: There is little homogeneity across country studies in terms of scope, motivation, methodology, treatment of ICT, time horizon, method, participation, etc.

A key observation is that national visions are underdeveloped in many studies because their primary motivation is ‘catching up’ or keeping pace with global competition.

In many cases the time horizon was set only in the very near **future**, as little as five years in some cases, and it is unclear how this shaped the thinking of participants in the studies. It is suggested that, particularly with information and communications technologies, it is difficult to escape from zeitgeist, the spirit of the times. For instance, many studies seem to be dominated by issues of the day, e.g. to do with obstacles to e-commerce. As a result, the recommendations and findings are oriented mainly towards short-term policies.

The studies are also criticised for their limited ability to envisage new applications for a technology about which little is known other than it will be important. To some extent, this is in the nature of the ‘foresight beast’- the past is littered with examples of this, e.g. forecasts that the world would only need about five

computers. Similarly, most studies failed to investigate alternative developments or the possibility of unexpected events or 'wild cards', such as unexpected technological breakthroughs, disruptive factors or technology related catastrophes.

## 5. CONCLUSIONS

To be successful with E-Learning in SMEs in the future, it is important to understand that creating new E-Learning software is not the highest priority for the SMEs. It is important that the E-Learning methods are blended with conventional methods and integrated in work- and business environments of the companies. Scenarios and foresight studies can lead to an appropriate design of the E-Learning programmes for the SMEs.

## REFERENCES

- Abernathy, D. J. (2001): Get Ready for M-Learning. *Training & Development*, 55 (2), p. 20-22.E
- Attwell, G./Dirckinck-Holmfeld, L./Fabian, P./Kárpáti, A./Littig, P. (2003): E-Learning in Europe – Results and Recommendations Thematic Monitoring under the LEONARDO DA VINCI Programme. Report. Impuls 010. Bonn, Oktober
- DERA, Strategic futures thinking: meta-analysis of published material on drivers and trends, Performance and Innovation Unit, Cabinet Office, United Kingdom, June 2001.
- E-LEARNING FRAMEWORK TECHNICAL WHITE PAPER FEBRUARY (2003): White Paper E-Learning Framework on the Web sun.com Page 2. Table of Contents Introduction <http://www.sun.com/products-n-solutions/edu/whitepapers/pdf/framework.pdf>
- FISTERA, First report on review and analysis of national foresight: Report on findings on IST from eight selected national foresight exercises, European Communities/IST, 9 April 2003, available at: [http://fistera.jrc.es/docs/D1\\_Final0303\\_CP\\_PDM R.pdf](http://fistera.jrc.es/docs/D1_Final0303_CP_PDM R.pdf)
- Hamburg, I./Lindecke, C. (2004): Blended learning – chance for vocational training in small and medium sized companies. In: Jutz, C./Hirt, M./Rizek-Pfister, C. (eds.): 6th International Conference on New Educational Environments: the know-how hub for blended learning and media didactics; Neuchâtel, Switzerland, 27-30 September, 2004. Berne: net4net, 7 p
- Hamburg, I./Lindecke, C. (2004): E-Learning für kleine und mittlere Unternehmen: eine Untersuchung europäischer Projekte. In: Pangalos, J./Knutzen, S./Howe, F. (Hrsg.): Informatisierung von Arbeit, Technik und Bildung: Kurzfassung der Konferenzbeiträge; GTW-Herbstkonferenz, 04./05. Oktober 2004. Hamburg: Techn. Univ., p. 159-162
- Hamburg, I./Puklus, Z./Ottofi, R. (2005): Problems and issues in E-Learning for SMEs: interdisciplinary development teams. In: 1st International Conference on Interdisciplinarity in Education: book of abstracts. Athens: ICIE, p. 51-52
- Hamburg, I./Lindecke, C. (2005): Lifelong learning, e-learning and business development in small and medium enterprises. In: Szücs, András (ed.)/Bo, Ingeborg (ed.): Lifelong e-learning: bringing e-learning close to lifelong learning and working life; a new period of uptake: proceedings of the EDEN 2005 Annual Conference, 20-23 June, 2005. Budapest: Univ. of Technology and Economics, p. 79-84
- Hamburg, I./Terstriep, J./Lindecke, C. (2005): Analysing interaction with computer of SME staff in E-Learning processes. In: HCI International 2005. Las Vegas, Nev., p. 10
- Leney, T./Coles, M./Grollmann, P./Vilu, R. (2004) : Scenarios Toolkit, Luxembourg
- Mateosian, R. (2002): Enterprise computing. *IEE Micro* 36 (2).c Daniel, O.C. (1998): Strategies for innovation in vocational
- Mc Daniel, O.C. (1998): Strategies for innovation in vocational education and training reform. ETF-AF98-007, Turin: ETF
- Mill, U./Bonnemann, D./Paul, H. (2004): E-Learning in KMU: Stolpersteine auf dem Weg zur Wissensgesellschaft. In: *Institut Arbeit und Technik: Jahrbuch 2003/2004*. Gelsenkirchen, p. 69-82
- Ogilvy, J./Schwartz, P. (2004): Plotting Your Scenarios <http://www.gbn.com/ArticleDisplayServlet.aid=34550>
- Ringland, G. (1998): Scenario planning; managing for the future. Chichester: John Willey & Sons Ltd.
- Schoemaker, P.J.H. (1991): When and how to use scenario planning: A Heuristic Approach with Illustration. *Journal of forecasting*, 10, p. 594-564
- Schwartz, P. (1991): Art of the long view: Doubleday Currency
- Wack, P. (1985a): Scenarios: uncharted waters ahead. *Harvard Business Review*, vol. 63 (5), p. 72
- Wack, P. (1985b): Scenarios: shooting the rapids. *Harvard Business Review*, vol. 63 (6), p. 139
- [www.municipiul-calafat.ro](http://www.municipiul-calafat.ro)