

# Is KM just a game?

## The knowledge management interactive training system

The KITS (Knowledge management Interactive Training System) project is a three-year programme aimed at developing a web-based game that will support acquiring knowledge management expertise in a safe environment, without needing to learn by making mistakes in real-life. [Andrew Haldane](#), [Gertjan van Heijst](#), [Noam Shalgi](#), [Robert de Hoog](#), and [Ton de Jong](#) describe its achievements in its first year, and its plans for the future.

No, off course not, you would probably respond to the title of this article. Knowledge management is a serious business. It is a discipline in its own right, and the proper implementation of knowledge management in an organisation requires a deep understanding of the concepts and methods that knowledge managers have at their disposal. Knowledge management requires knowledge and skills.

But how do you acquire this knowledge and these skills? How do you become a 'senior' knowledge manager? Many of the ideas and concepts that underlie the most common approaches to knowledge management can be learned through reading books and articles on the subject (at the time of writing, Amazon.com listed 293 books on KM). Further, a plethora of knowledge management training courses are offered on the educational market (both organisations of the authors, as well as the publishers of this journal, offer such training courses as well). Training courses add value to the books because they allow direct interaction with experienced knowledge management practitioners (the trainers).

Still, many of the insights and skills that are needed for proper knowledge management can only be learned in practice. Learning by doing, so to speak. You try something out, evaluate how it works and if it doesn't, you change your intervention until the original objectives are met. Now if you are working in truly unknown territory, this exploratory way of discovering how to do knowledge management is indeed the proper way. What else could you do? But if the territory is only unknown to you because you are new to the field, this way of working may be unnecessarily costly to your organisation. Why put the organisation at risk by experimenting in an area where others have already figured out how to do things in an effective way? Why only allow some employees to acquire knowledge management skills?

In such situations, organisations typically resort to hiring external consultants. This does

solve the immediate problems facing the organisation, but the more general issue remains. After all, external advisors do not know the organisation as well as you do, and sooner or later they will leave, leaving you once again all alone to deal with knowledge management by yourself. So how can you acquire knowledge management skills that can only be learned in practice without creating unacceptable risks for the organisation? 'Fortunately', the problem is not unique to knowledge management. Other management disciplines are facing similar problems, and we can learn from how these have been tackled.

This is where gaming comes into play. In many business-related disciplines, game playing has proven to be a useful technique for getting hands-on experience in a 'safe' environment. The first business game was introduced by the American Management Association in 1957. Since that date, the number and type of business games has grown exponentially. In particular, there has been a widespread increase in the availability of business games in which participants assume the role of decision-makers within organisations. Games provide simulated environments for participants to learn and practice the art of corporate planning and decision-making.

### The Coltec game

In order to see whether such an approach could also work for skill-acquisition in the knowledge management field, in 1997 CIBIT developed a web-based knowledge management game. The players of the game were part of a knowledge management team that was set the task of suggesting KM interventions to the management of a fictitious organisation called Coltec, a manufacturer of tiling adhesives. The game was played in simulated time (four to six time cycles). In every cycle the players were confronted with an event and were asked to suggest counteractions. The 'Coltec game' was played several times between

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1997 and 1999, allowing teams from all over the world to meet virtually and learn together how to apply knowledge management.

When evaluating the Coltec game, most players reported learning effects, but some drawbacks were also identified. The most important of these was that the game only provided very limited feedback to the players. When a team had suggested an action, the description of the Coltec organisation was not adapted to the effects of this intervention. So when an action was taken, the players had no information about the effectiveness of that action.

To be honest, these comments about limited feedback did not come as a surprise to us. When developing the game, we already realised that this caveat would be a severe hindrance for learning, but we did not really have a choice at the time (just remember what a different stage of development knowledge management and web-technologies were in back in 1997!). To provide feedback on the effects of knowledge management interventions, the gaming environment would need a simulation engine that could compute the new state of the organisation, based on the effects of interventions. To put it another way, this would require a computational model of how knowledge management interventions affect knowledge processes and how knowledge processes interlink with other processes within an organisation. In 1997, knowledge management theory did not offer such a model – and it still doesn't.

## The KITS project

The need for a tool that would allow knowledge management practitioners to experiment with knowledge management interventions has not disappeared. Actually, it has increased because of the heightened interest in knowledge management in general, the rapid development of KM and the increasing number of valuable knowledge management experiences.

To respond to this need, the University of Twente (NL), CIBIT (NL), ECLIO (represented by Learning Futures [UK]), the University of Amsterdam (NL), Aerospaciale CCR (F) and TecnoPolis CSATA Novus Ortus (IT) decided to join forces and embark on a partially EC-funded research project called KITS. KITS stands for 'Knowledge management Interactive Training System'. The objective of this project is to develop and evaluate a learning environment that comprises an educationally supported, distributed simulation in the domain of knowledge management. The project started in May 2000 and will last for three years. In the remainder

of this article we will set out the general approach taken by the KITS project.

## The KITS approach

Like the Coltec game, KITS will be a web-based game and will consist of a series of time cycles in which the players react to external events. A cycle consists of the following steps:

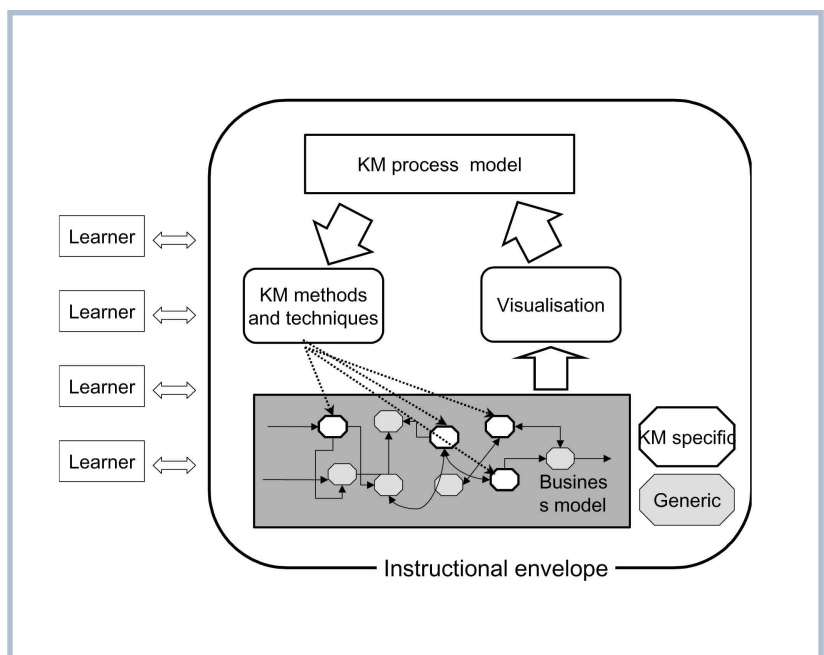
- An event occurs that might be important from a knowledge management perspective;
- The teams that play the game inspect the current situation of the organisation and the possible challenges and opportunities that the event offers;
- The teams discuss if – and which – action should be taken in response to the events;
- The action or actions are implemented, resulting in a new state of the organisation.

The general architecture of the KITS environment is shown in *figure 1*. We will now discuss each of the components of the environment in some more detail.

## The knowledge management process model

Players of the game are guided in their behaviour by a knowledge management process model. This is a normative model that explains how knowledge managers should tackle KM challenges. The model is a knowledge management-oriented adaptation of a very general 'think before you act'

Figure 1 – the architecture of the KITS environment



model of problem solving. It distinguishes between several phases:

- Analysis phase – In the analysis phase, the current situation is inspected from a knowledge management perspective (What is going well and what is not, and to what extent this may be attributed to knowledge-related causes). This leads to a list of potential knowledge management objectives;
- Focusing phase – In this phase, a decision is made on which of these knowledge management objectives are the most important or the most urgent. This leads to a decision regarding the focus of the current knowledge management cycle;
- Implementation phase – During this phase, the participating team discusses the possible actions that could be taken in order to realise the objectives that came out of the focusing phase. This phase ends with a decision on the action to be taken;
- Evaluative phase – In the evaluative phase, the effects of the actions are compared to the envisaged effects when the actions were selected.

The purpose of having such a knowledge management process model is to help the game players tackle knowledge management issues in a structured way. We envisage that in the ultimate

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environment, games can be played in several modes, depending on the proficiency level of the players. Players that are new to knowledge management – and perhaps even to management in general – will be forced to go through the phases of this knowledge management process model step by step. More experienced players will be allowed more liberty.

**Actions: using knowledge management methods and techniques**

When a team has analysed the current situation

from a knowledge management perspective, the team might decide to take a course of action. We distinguish in KITS between two types of actions:

- Information-buying acts – These do not really change anything in the organisation; they merely provide more information about the current situation to the team. These can be a one-time action (e.g. performing some kind of quick scan) or continuous monitors (e.g. the introduction of a monthly report on customer complaints);
- Interventions – Interventions are actions that change something in the organisational context. These could be the introduction of a lessons learned collection system, a new training programme for machine operators, an intranet and so on.

In the KITS environment, players select the actions that they want to take from a predefined list of actions. They are not allowed to come up with new information-buying acts or interventions themselves. The system also provides background information about the prerequisites, the costs and the possible effects of a particular action. The idea is that players can this way get a feeling of the possible effects of some well-known knowledge management interventions and compare these with alternatives.

As mentioned, each action has a price attached to it. The teams that play the game have a fixed budget, and they should therefore be cautious in selecting knowledge management actions. Spending all your money on knowledge management is not good knowledge management; not in reality, and not in the KITS game either!

#### The business model

The business model is the engine that drives the KITS environment. At any moment in time, the business model represents the current state of the organisation. Furthermore, it encompasses the dynamics of the organisation. That is, the business model knows how to compute the state of the organisation at time  $T+1$  from the state of the organisation at time  $T$ , plus the interventions selected at time  $T$ .

As mentioned earlier, knowledge management theory does not provide such a model at the moment, although fragments of it can be found in the literature. Therefore, we have to design such a model ourselves in KITS. Our current idea is to model business as layered sets of variables with

relations between variables of neighbouring layers. We distinguish four layers:

- The organisational effectiveness layer – Variables at this layer reflect how good the organisation is performing given the mission and the strategic objectives of the organisation. In commercial organisations these could be shareholder value, profits, market share, customer satisfaction and so on. The point is that variables on this level relate directly to the existential objectives of the organisation;
- Internal process layer – Variables at this layer reflect the quality of the internal processes in the organisation. They will typically reflect the efficacy of production processes, logistic processes marketing processes, and so on. Variables at this level influence variables at the organisational effectiveness layer. This reflects the idea that if internal processes are well-organised the organisation will perform well;
- Knowledge variables – These variables reflect the knowledge-related issues that influence the value of the internal process variables. For example, the skill level of machine operators would influence the effectiveness of production processes. Knowledge variables influence variables at the internal process level. This reflects the idea that internal processes can only work well if the right knowledge is available at the right time in the right place;
- Contextual variables – These variables have no relation with the other variables, but are important because they partially determine the applicability of specific knowledge management actions in particular situations. For example, the availability of advanced computer hardware and software would determine whether a computer-based training programme could be used to improve the skill level of machine operators.

## Visualisation

The business model described above is not visible to the game players. Hidden to the players, the events and interventions will change some of the internal variables (for example, organising training for machine operators will increase the proficiency level of the operators), which will in turn change the value of other variables. To find out about the value of a variable, the game players have to buy access to it by means of an information-buying act. So one part of the role of the game players is to design their own knowledge management dashboard. The role of the visualisation component of the KITS

architecture is to allow the game players to organise this dashboard and to visualise the information they requested in a meaningful and intuitive way.

## The instructional envelope

From the above, the reader may deduce that the KITS environment is a knowledge management

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simulation engine. We want to go further than that, however. KITS should produce a true learning environment where players are gently introduced to the field of knowledge management, learning in an exploratory way in what circumstances particular interventions are appropriate. This is realised through the 'instructional envelope' module, which provides guidance, cases, unexpected events, structured feedback, and assignments.

## For more information...

As mentioned, the KITS project is still in its first year, and many of the facilities described above are yet to be implemented. The system should be operational somewhere in 2003. However, if you are interested in the game and would like to be informed about our progress, please don't hesitate to contact the authors. □

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