In a professional environment, traditional training approaches are of doubtful value and very cost-intensive; training must therefore be seen in the global context of the whole organization.

We use the Maturana and Varela approach to describe organizations as self-aware metasystems with self-learning competence.

The key to corporate self-learning is the availability of a corporate knowledge base, allowing the whole organization and its member units to learn from each other.

Today, the corporate knowledge base is implemented in computer systems and accessed through automatic agents; we present in more detail assistance agents, simulation agents and training agents.

10.1 Introduction: the Limits of School Learning in a Professional Environment

The socio-economic and technical environment of companies is changing so quickly that the educational system of most countries is unable to provide companies with a skilled workforce who are aware of the latest developments and techniques for the narrow field of activity of a determined company. Therefore, there is a tendency to split professional training into two separate parts: the more general skills and basic subjects remain in the field of public education, whereas the more specific, context-sensitive skills and associated knowledge are assumed more and more by companies themselves or by organized groups of companies. A good example of these developments is provided by the Luxembourg Bankers’ Association, which is organizing a training institute for its member banks providing two types of training (Krier 1991): a) insertion training, providing new bank employees with the basic banking skills, and b) continuous training, aimed at informing banking professionals of the latest developments in their field.
It is interesting to note that very often companies try to imitate the school model of goal-oriented learning (guided learning), which has been developed over centuries in a school context. A teaching agent (tutor) uses various channels of information and subtle ways of influencing a learner in order to modify his behavior with respect to a planned goal (curriculum or corporate model). The system is completed by some feedback mechanism (monitoring or examination), which estimates the distance to the planned goal and proposes recovery measures in order to reduce this distance. Finally, the training system certifies that the distance to the planned goal is less than a given threshold. This very general model is slightly adapted in the professional environment, by replacing classroom activities with more individual channels, referred to as self-studying: computer-based training (CBT), distance learning, self-studying courses. Sometimes these individual channels are supported by group activities: seminars, group tutoring and tests (Ant and De Cilla, 1991).

This model, applied to a professional context, can be criticized in many respects:

- Very often one observes little if any long-term effect in goal-oriented learning. If the planned goal of training is not very close to the personal goals of the learner and if the acquired skills are not used frequently after the training phase, the benefit of training is lost very quickly. As an example, consider the effects of word-processing training: the majority of trainees never uses the advanced skills acquired during training, even if these advanced possibilities could increase productivity considerably. The effort of reviewing the subject is often greater than the estimated gain in productivity and a problem can very often be solved in a more cumbersome way, using simpler means.

- Goal-oriented learning is generally organized into separate subject areas; teachers observe a partitioning of knowledge in the skills of their students and it is very difficult to apply the result of one knowledge compartment to an activity related to another knowledge compartment. The same phenomenon is observed during the transfer of learned knowledge to practical work in the everyday professional environment.

- There are other, more efficient learning mechanisms, observable in all situations outside school: children learning before going to school and subsequently learning a lot outside school. In a professional environment workers and employees learn every day at their jobs: they learn how to make a correct diagnosis of the breakdown of a technical device; they acquire problem-solving skills by solving everyday problems; they recognize familiar situations and see where the problems lie. These learning mechanisms are often referred to as "self-learning competence" (Nyhan 1991).

- Goal oriented learning, organized in a professional environment, is a cost-intensive function and it is difficult to assess whether this activity is a profit or a loss factor. This is an important question because it is not clear if traditional goal-oriented learning is the