

Intelligent Organizations: Building Core Competencies Through Information Systems

'Intelligence' has been described as a prerequisite for an enterprise's success in the turbulent environment of the decades to come [1]. In the following we will define briefly what is understood by the term 'intelligent enterprise'. Furthermore we will show that information systems make a crucial contribution to those core competencies that render organizations intelligent. This will be illustrated by an up-to-date case from the service sector.

The cybernetic concept of intelligence centers on two aspects: the capability of an organism to adapt to its environment and the capacity to learn from experience.

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While adaptation has usually been understood as a behavior that is driven by external forces, intelligence, from a cybernetic point of view, has a lot to do with actively exercising an influence on the environment and even with finding new environments. Sternberg [2], for example, subsumes under the term intelligence the capability to do three things: (1) to transform or change oneself by adapting, developing and learning, (2) to influence or change the environment, (3) if necessary, to find a new environment. These basic characteristics can be transferred to enterprises. In order to make the concept of an intelligent enterprise operational we will class an enterprise that effectively combines adaptation, learning and development as 'intelligent'. This definition requires the following specifications:

- 'Adaptation' signifies self-transformation in order to meet requirements from outside.
- 'Learning' signifies an increase in the ability to take effective action [3].
- 'Creation' signifies the growing ability of an organization to meet its own and others' needs [4].

Core Competencies

Here the terms 'core competencies' and 'core capabilities' are being used synonymously. The concept of the core competencies [9, 10, 11] is based on the realization that the conventional strategic business units in many industries no longer guarantee enduring success in the market. Core competencies reflect fundamental characteristics of enterprises, capabilities that enable them to not only succeed in existing SBUs (Strategic Business Units) but moreover to build up the SBUs of the future. This task is especially difficult because core competencies are usually hard to put a finger on. Often these core competencies cannot be expressed directly in products but 'only' in functions or in competitive advantages

gained. The difficulty to grasp and describe core competencies is true expressly for the trades in the service sector which dominates the creation of wealth in the industrial countries of today. In the US the service sector today comprises more than 80 % of the gross national product, in Switzerland after all 63 % [5]. Anyhow, Quinn [5] was able to show clearly that intelligent enterprises open up considerable value potentials and in particular gain competitive advantage by clearly recognizing which key activities they command better than all other enterprises, if possible contracting out those activities that are mastered better by others; purposefully grooming and extending their core competencies, in particular by concentrated use and leverage of resources.

Quinn illustrated that such core competencies are usually based on a combination of 'soft' - cultural, human - factors such as customer orientation, excellent service, expertise etc., on the one hand, and 'hard' - instrumental, technical - factors such as structures, systems etc. on the other hand. In both areas it is possible to attain high capabilities that are based on many years of continuous efforts and large investments and can only be imitated with difficulty or not at all.

An Exploratory Study: The Case of Worldlink Technology

Global trends in traveling behavior, a more intense competition and technological progress have changed the environment of today's travel companies fundamentally. Consequences of these 'change drivers' are an increasing individualization, globalization and telematization that prove to be a big challenge to the traditional tour operators and travel agents. In the face of new possibilities to employ electronic media, the automatization of existing structures still practiced today is no longer acceptable.

Interorganizational networks and exchange of information are beyond the scope of conventional structures and demand new competitive strategies. Through the emergence of electronic ubiquitous markets the distance between the end customer and the service provider is shortened drastically on the one hand. On the other hand, the customer is presented with 'multi access' to the system through co-operations and consoli-

dations of existing reservation systems to GDS - Global Distribution Systems (see Figure 1). While today access to a reservation system to book a holiday package is usually only possible via a travel agent or an airline, in future this will be possible via each linked-up service provider (e.g. a car rental company or a hotel). Through trans-network connections mutual 'direct access' to other systems will be possible.

For the customer this results in more up-to-date information, greater flexibility and lower prices through savings in profit margins. To the service providers new electronic modes of distribution are opened up. In future market-like structures similar to the stock exchange will dominate because of the networking of the service providers. Access to the market is possible at various points. The prices are then formed by supply and demand. Only those service providers can survive that position themselves strategically by producing an additional benefit in the generating process of tourist services. This is especially true for travel agents that are not in direct contact with their customers. They have to decide which core capabilities in the present business are sufficient or have to be extended as a basis for success in future markets in view of the developments described above.

Core Competencies through 'Destination Management'

As a result of these changes, a comprehensive 'destination management' will be possible in the future. Its implementation has only partly been realized by a few service providers and still constitutes a challenge for the future to many others. This concept guarantees as a possible new core competency an integral - because of the regional base of these companies - handling of *product development, purchasing and customer services* at the site of the core service (i.e. the services provided at the destination), with the commercialization of their services in the source area. Thus conventional travel agents can turn, in principle, into tour operators. Travel agents who want to position themselves successfully in the electronic markets as DMCs (destination management companies) have to attain:

- innovative product development with active commercialization
- leadership in quality and price
- closeness to end consumers and service providers through strategical management of relationships

The Role of Information Systems

The new approach to 'destination management' is enabled by the technological development: on the one hand, the prod-

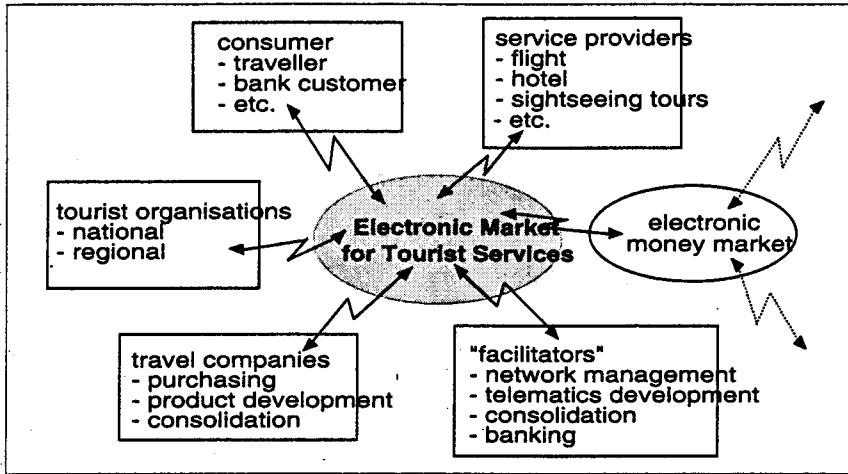


Figure 1: New distribution structure

uct know-how of the DMC can be entered into an electronic data base and thus be anchored structurally, on the other hand, electronic reservation systems open up new paths to the world-wide distribution of the services. In view of the technological possibilities such as multimedia and *electronic publishing*, local presence at the customer's home base is no longer imperative or can be exercised by partners on the market side. Marketing measures can be planned at the destination and largely executed in an electronic way.

The landscape of electronic reservation systems lately saw the appearance of the system 'Worldmaster' by the Australian company *Worldlink Technology* which overcomes major deficiencies of conventional systems and permits the electronic realization of the DMC idea. *Worldlink Technology* is a joint venture of the biggest Australian travel company Jetset Travel and the American communications enterprise EDS (Electronic Data Systems).

While local services such as excursions or transfers are still considered secondary products in airline GDSs, the 'Worldmaster' system offers the whole range of tourist services on the same level and with full booking functions. The system's strong point is that because of direct links to the service providers ('Reslink' module) the booking and confirmation process can be accelerated dramatically. On top of that, an extensive products data base is available that supplies the sales personnel with detailed information and ultimately with sales arguments vis-à-vis the customer. It is also highly significant that the system features multiple functions in the areas of product planning and assets management (accountancy, controlling). The integration of the 'Moneydirect' system to handle EFT and credit card transactions increases efficiency on the financial side. The use of the system is not limited to operations but supports the executives through extended management information sys-

tems in strategic product and finance planning as well. So it is appropriate to call the 'Worldmaster' system a management system in the wider sense [6]. To the participating DMCs the co-operation with *Worldlink Technology* offers the opportunity to outsource their technological resources in order to concentrate on their core competencies in the field of product management. *Worldlink Technology* assumes the function of a 'facilitator' that takes care of network management.

Supporting Learning Processes

In view of the extent of strategic re-orientation, it is necessary to pay the greatest attention to the management of change through adequate management capacity. Existing mental models and patterns of action on all levels of an enterprise have to be questioned and adaptation processes have to be initiated. The following four aspects of organizational learning can be differentiated (numbers indicate reference to Figure 2).

1. Learning in the Operational Team

The clerks' interventions into the service provision process are usually limited to functions of supervising, trouble-shooting and co-ordination which, on the whole, leads to an upgrading of the job. The employee has more time for the internal optimization of the proceedings and the further development of the product. Networking with external partners creates structures that permit fast feedback on product changes at the right level.

2. Learning in the Strategy Team

Conversations at executive level concentrate on possible trends in the tourism area, alternative strategy options and the definition of fields of co-operation against the background of operational co-operation. Differing approaches or points of view of the parties involved lead to a sensitization and enhancement of the knowledge of possible trends in the environment, as well as corresponding design options.

3. Learning of the Enterprise as a Whole

Through the high level of integration in the system, stocks of knowledge can be made available to other departments. This increases the action repertoire of the organization and strives to balance the external complexity. Different function areas such as purchasing, accountancy or marketing are incorporated and integrated by each single booking. Because of the extensive electronic integration of the partners on the customer's as well as the service provider's side, there has been a marked increase in the ability to react to troubles in the environment.

4. Interorganizational Learning

Through the joint work on the system both sides of the co-operation can make progress in their knowledge. The DMC is learning the efficient system-based transaction of the business by way of established process structures; *Worldlink Technology* on their part can profit from market experience on DMC's side. Quite a few of the system expansions that are of direct benefit to the end customer as well as future system users have been created on the initiatives of partners.

From a strategic point of view we can state that an important step towards the strengthening of the core competencies can be taken with the aid of a new information system (IS). Even today users of the *Worldmaster* system are seen to shift from merely operational to more strategically orientated activities such as *product development*, *data base management* and the *managing of co-operations*. This shift has the effect that they can apply themselves to core capabilities with more net value added. Only by concentrating on 'intelligent' capabilities, i.e. those based on a combination of human and technological factors, can future business activities of travel agents be placed on a firm and promising footing.

On the Way to the Virtual Enterprise

The example of *Worldlink technology* features attempts to structurally support learning processes within and between enterprises. The example refers to an environment that is marked by far-reaching change processes. The increasing networking of independent organizations gives rise to structures that show global features. While the structural preconditions to globalize enterprises today are existing in principle, the strategic approaches are lagging far behind these developments. Strategic programs are still based on the implied presumption of fixed enterprise limits and hierarchical structures. What is required, however, are sound approaches that take account of the new parameters. Enterprises can meet the pressure to globalize in various ways:

- expansion through acquisition
- global co-ordination via the market in the shape of exchange relationships
- setting up a network of independent partners in the sense of a 'global virtual organization'

Organizations can be called virtual when conventional enterprise limits increasingly disappear and service provision processes are carried out through the spontaneous coalitions of independent units. The basis of this co-operation is a hierarchically structured net of enterprises. That may be characterized as a hybrid form between integration and market co-ordination. Individual travel organizations (e.g. Rosenbluth Travel), consultancy and other service enterprises as well as some high-technology companies - following the pattern of the virtual organization - have built up core competencies, in the course of years, that could hardly be realized by a single enterprise acting in isolation.

Conclusions

In the following, based on the theoretical explanations and the findings from the cases illustrated, we shall discuss recommendations for the design of intelligent enterprises with special regard to the IS. These recommendations will be formulated in the form of theses that have to be checked and adapted according to the circumstances in each individual case.

Core Competencies through IS: IS can contribute considerably to the build-up of core competencies. Certain core competencies and also certain systems, however, can only be acquired via strategic partnerships. This is particularly true for core competencies that are based on interactions with partners and joint learning processes. Platforms for these 'information partnerships' [7] are interorganizational information systems that are supposed to lead to common competitive advantages. In this context it is also becoming obvious that core competencies

are something dynamic and not static and that human factors play an essential part in their build-up.

Knowledge Management and Learning through IS: The identification and promotion of knowledge-intensive capabilities is crucial in an increasingly more competitive environment of global exchange and competition. In attaining knowledge relevant to competition, however, enterprises have to rely more and more on the knowledge compiled by other enterprises. Should they fail to manage a transfer of knowledge within a reasonable period of time, the outsourcing of functions is often a more promising alternative that will gain strategical significance in the future. Such measures can drastically change the identity of an enterprise. Thus the management of change is becoming a priority task for the management. It requires a careful balance between the integration of stakeholders and 'time-based management'. Learn-enhancing systems enable qualification and empowerment of employees concerned, by creating a medium for individual and organizational learning. Moreover, these systems contribute to the synchronization of the various changing processes by serving as an 'organizational bridge' between the places of change [8].

The Organization of Intelligent Enterprises: Intelligent organizations require structures that guarantee autonomy and local problem solving capacity. This is made possible through a sophisticated connection of imitable human factors and abilities (e.g. unique identity, shared vision, corporate culture) with high-performance IS. This is why, from a strategic stance, structures and systems can only be adequately regarded in conjunction with the dimension of human behavior. The build-up of core competencies is not first of all the consequence of short-term major investments but of experience accumulated in the long term. The new developments in the environment imply a new culture of leadership. This is why intelligent organizations develop a ca-

pacity for cultural transformation towards more openness and participation.

Implementing new structures and systems always has to be accompanied by communicative and symbolic measures in order to create a relationship to what is already there. To ensure effective implementation and to maximize knowledge-creation, all members of the organization should have an opportunity to engage in designing the future of the enterprise and finding ways of bringing it about. ■

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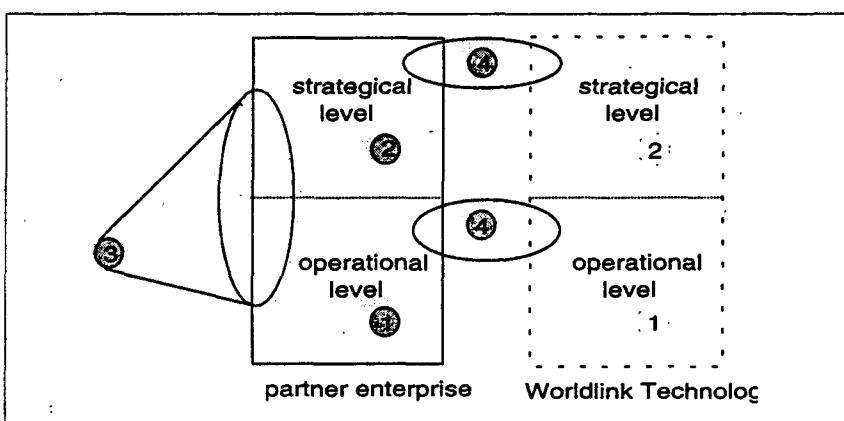


Figure 2: Aspects of organizational learning

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