

# Strategic Information Systems and Artificial Intelligence in Business

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**Abstract:** Information systems are defined as systems that consist of a group of people, data records, and some manual and non-manual operations. These systems generally handle data and information related to each system, and it can also be defined as a set of elements that overlap with each other to collect, process, store and distribute information on a specific topic. Systematically, in order to support the organization, control it, and the analysis, and form a clear current and future vision of the topic in question. Information systems are a group of programs that are used to archive, manage and organize data, and process them with specific procedures established according to the workflow mechanism in the organization, in order to obtain the final outputs. It is noteworthy that information systems are completely different from information technology, as information systems use information technology techniques which were created to serve its based business.

**Keywords:** Information systems, Development, Technology, Artificial intelligence.

## 1. INTRODUCTION

The science of information systems originated as one of the branches of computer science, in order to try to understand and understand the philosophy of information technology management within organizations and institutions of all kinds, and then developed into a field in itself in management, as it is an important focus of research in management studies, and it is noteworthy that information systems are taught in major universities and business schools around the world.

Information systems, along with information technology, financial resources, raw materials, and machinery are one of the five basic resources available to managers of organizations, and the position of chief information officer has been created in many companies, which is equivalent in importance to many other positions such as CEO, head of finance, and head Operations, and Chief Technology Officer.

Artificial intelligence is one of the main rules upon which the technology industry is based at the present time, and what is meant by the concept of artificial intelligence, which was abbreviated as (AI), can be clarified as the ability of the machine and the digital computer to perform specific functions that simulate and resemble those performed by intelligent beings, such as their ability to think or Its ability to learn through past experiences or other processes that need to be implemented as mental operations, and artificial intelligence seeks to reach systems that are intelligent and behave like what a person does in terms of learning and understanding.

## 2. ROLES OF THE INFORMATION SYSTEM IN THE ORGANIZATION

The functions of the information system can be summarized in four:

- collect data,
- store the data,
- process the stored data,
- transmit data outside and inside the company.

The primary objective of the information system is therefore to reduce uncertainty in the face of complexity and environmental changes [1].

To this end, three roles are assigned to IS within organizations:

### A. Operations support (functional level):

This role corresponds to the use of IS in the major areas of business management (Commercial management, production management, accounting and financial management, personnel, stock management), the latter materializes at company level by reporting tools represented in the form of ERP.

In this logic, we can say that the very existence of the IS is even more linked to its use at operational levels which must supply the latter with data, and therefore the associated management tools. The IS is therefore the informational support for management tools allowing the exchange of information flows between entities.

*B. Support for management and decision-making (tactical level)*

In this case, the purpose of the information system is to provide operational staff, managers, leaders of the organization relevant indicators to take decisions.

*C. Support for strategic actions (strategic level)*

Several studies suggest that IS have a strategic dimension [2] in the sense of being a resource that can generate an advantage sustainable competitive, have assisted in the making of choice decisions organization, day-to-day management but also strategy taken individually or collectively, whose information system plays an important role.

**3. TYPES OF INFORMATION SYSTEM**

*A. Company operating information systems*

These systems are designed to process the data resulting from the operation of the company, their mission is to facilitate commercial transactions, to control industrial processes, increase the productivity of administrative work and update company databases.

*B. Management information systems (MIS)*

The main task of these systems is to provide managers with the information they need in decision making.

The GIS, facilitate decision-making by managers (strategic level), by executives means (tactical level), and by supervisors (operational level).

*C. Strategic information systems (SIS)*

H. Tardieu and B. Guthmann [3], define the strategic information system as being “a completely conventional information system which will allow to memorize, process, communicate "fatal" information on an activity considered by the company as strategic, in the sense that this activity will, within the framework of the chosen strategy, to provide a sustainable competitive advantage”.

So, we can say that any information system that has an impact on the strategy can be thought of as a strategic information system.

In this case it is necessary within the framework of our research work to distinguish strategic information systems (SI-S) and strategic information systems (SIS).

Some operational IS can be considered as Strategic Information Systems (IS-S) because the information they manage is of strategic importance for the company. This means that the SI-S is an information system allowing automation of company activity used for strategic purposes.

The strategic information system (S-IS) is an information system that manipulates strategic information to help decision-making and review of strategies implemented.

We can see a significant change in the roles accorded to information, which has led to the emergence of several types of information systems, including the Strategic information system, or discovers that the information system in the company plays a strategic importance in the definition of the strategic approach of the company and at the same time it is defined by the strategy of the company, which we indicates the existence of a dynamic loop between information system and process strategic thus produced: each element of the loop evolves under the influence of the other.

The IS, beyond its functions of processing, memorizing and communicating information becomes a strategic tool. Thus, the design of SI faces a challenge new issue. This first part laid the groundwork for examining the role the system can play of information regarding the company's strategy. This review is presented in the second part of our thesis or the strategic dimension of the information system is highlighted.

**4. ROLE OF A STRATEGIC INFORMATION SYSTEM**

A strategic information system must make it possible to: perfect knowledge of its organization to identify its potential, its strengths and weaknesses, to position its organization in its environment to identify threats and opportunities.

The strategic information system is a memory that collects information related to the production run to make the decision. So, we can say that the strategic information system intervenes mainly in two levels: on the one hand by helping decision-makers to anticipate the consequences of change and make faster decisions, based on a history of data in order to analyze trends and build models using parameters external environment. Then as a tool for steering the company towards the implementation of its strategy. These functions of the strategic information system then depend on its collection capacities and information processing.

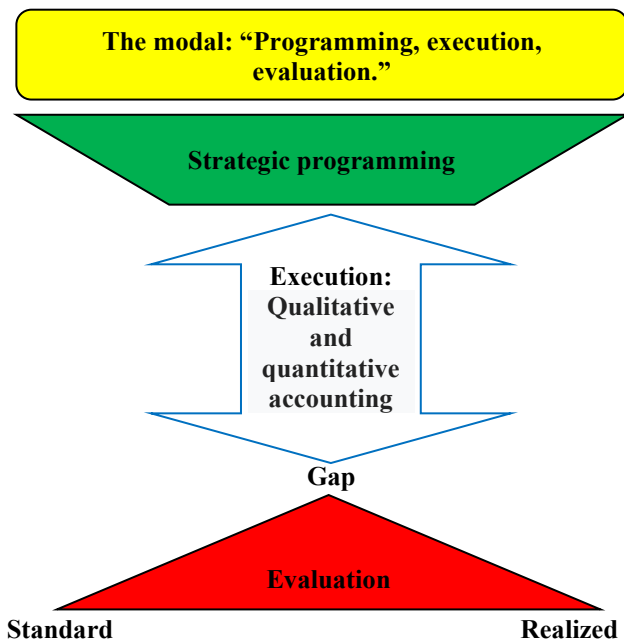


Figure 1. The modal : "Programming, execution, evaluation".

This vision does not take into account the effects of emergence in relation to phenomena learning as mentioned by procedural rationality [4]. Assimilate the procedural rationality information system consists of making the latter an element organizing a business that gives actors the means to reduce the ambiguity of their situations [5].

### 5. URBANIZATION OF INFORMATION SYSTEMS

#### A. From town planning to the urbanization of information systems

Urban planning is defined as the science, art and / or technique of the spatial organization of human settlements.

It is thanks to town planning that we can implement urban policies (housing, housing, transport, environment and commerce ...) and urban planning based on management of the city by maximizing the geographic potential for a better harmony of users and the well-being of users [6].

The urbanization of information systems is defined as "All the means enabling the Information System and the IT System to evolve same rhythms as strategy and organization. It consists in describing the structuring the target system and how to achieve it".

The approach to urbanization of information systems is adapted to meet the needs to reduce IT costs, gradually control the evolution of information systems taking into account changes in business strategies and structural changes that are needed.

#### B. The process of urbanization of information systems

The urbanization approach refocuses the management of the evolution of the information system on the strategy and business needs of the company or organization concerned. She is based on a model in four successive layers: Business, Functional, Application and Technical.

From clearly identified strategic objectives, the business processes to be implemented work are then identified. Then the functions and information used by the processes are then detailed and finally, the applications and technical architecture allowing to implement these functions are specified.

We can then speak of a "top-down" approach, namely a design approach descending. Urbanization then consists of moving from an existing information system to a target IS by successive stages of description or construction.

To ensure the adequacy between the strategic issues, the functional needs, the business and process consistency and technological requirements, the designer of architecture embraces several and different levels of abstraction.

In our case we will adopt cartography as a central urbanization tool:

#### C. Cartography

Cartography is a central tool in the urbanization process. Each architecture of the urbanization process can be described by a map representing its POS (table1).

TABLE I. PLAN LAND USE

Architecture	Cartography	Elements represented on the cartography
Functional architecture	Process map	Stratigical objectives Process/Tasks
Functional architecture	Functional map	Information system Functional fields Referential and flow
Application architecture	Application map	Information system Applications/ Software packages Component, business object, flow
Technical architecture	Technical map	Equipments (servers, workplace...) Software (operating system, DBMS...) Network architecture

For more detail, we can discuss the different types of maps:

#### A. Cartography of business architecture

The business mapping represents a view of the business architecture through a formalization of the business by answering the questions of what, who, or and why. The objective is to define the needs of the business

vis-à-vis the information system. Business mapping or process mapping describes the business processes (PM) of the company in the form of diagrams. Each process can then be detailed by presenting the sequence of activities using workflow diagrams or by using UML diagrams (Use Box and activity diagram).

The description of activities therefore implies the specification of OMs: business objects (what), organizational entities (who) and processes that meet objectives (why). Finally, the existing business mapping can be associated with a target mapping if business developments are considered in response to new strategic objectives.

#### *B. Cartography of functional architecture*

Functional mapping describes the functions implemented to carry out the activities described in the business architecture. It is about describing the added value functions regardless of the implementation. The goal is a logical organization of functions, strongly decoupled and without redundancy [7].

The functional architecture is divided into Zones, which are themselves divided into Neighborhoods then independent and autonomous islands or functional blocks. The island, which contains the functions, is the smallest entity in the split. Take the example of a bank functional area commercial area, several districts make up this area including the savings management district and the credit management district. The savings management district can be broken down in different blocks according to the types of liquidity: checking accounts, home savings, liquid savings ... The data handled by these functions is also described. In Indeed, a functional block is the sole owner of the data it handles, in order to facilitate a modular organization. Urbanization rules have been defined to help breakdown of functional architecture. The cutting consists first of separating the repository management areas (data), exchange (communication with the outside), internal management (finance, HR, IT, etc.), strategy and decision rules, and the areas operational (business) [8-10].

#### *C. Cartography of application architecture*

The application architecture is an IT and dynamic view of the information system described in the functional layer. The objective is the distribution and reuse of application functions. The application architecture is described by the mapping of all application blocks or components (software components, software packages, etc.) and their exchanges responding to the functional organization specified above. In absolute terms, a functional block should correspond to an application block. The existing and its integration do not always allow this constraint to be respected. An integrated software package will correspond to an island or application block (element of the lowest granularity, not "cuttable").

Data structures are also described at the application architecture level. Access to this data as well as the

management of its persistence (backup, security) are also described at this level. UML or Merise offer models and diagrams useful for description of the application architecture [11-14].

#### *D. Cartography of technical architecture*

The infrastructures necessary for the deployment of permanent components in the layer application as well as the way in which they communicate are described at the architectural technique. The main goal when designing the diaper technique is the pooling of technical platforms in order to achieve savings of scale. The modeling of the technical layer is mainly made up of diagrams that show the connection between servers.

### **6. THE ARTIFICIAL INTELLIGENCE OF INFORMATION SYSTEMS**

Artificial intelligence (AI) has become an overused term, the extent of which we no longer measure true value, and which can engender fear. In question certainly, it's on media coverage and the announcement effects that follow one another continuously. Under the name artificial intelligence, however, there are many scientific advances and recent techniques that irrigate and gradually reshape many areas of life economic and social. Born over half a century ago, AI has entered a phase of acceleration, from scientific discipline to operational application, and little by little, from a theoretical issue to a civilizational and geostrategic issue [15-16].

The digital company continues to transform thanks to unprecedented convergence, combining computing power, miniaturization, storage power and power networks. This confluence is at the origin of significant breakthroughs in data science and of deep learning, considered to be the engines of the exponential development of AI. It is therefore in this interweaving that we must think about and monitor the impact of AI in the company. Thanks to this convergence, AI fully expresses its potential through various functionalities: it optimizes existing processes, automates (data processing mining for example), allows assisted piloting (or augmented), detects, predicts, and interacts more and more "naturally" with men, thanks to changes in treatment automatic natural language. Its added value is now mainly found in its ability to detect, predict and interact with humans [17].

The reality of AI in the company is not reduced to a simple process optimization: it introduces new organizational schemes, new ways of working, new services, other ways of thinking about interactions with customers and therefore a renewal of the business model. It thus reshuffles competitive data, opening up new opportunities for innovators [18]. In addition, AI renews certain questions geostrategic, because those who have the data, but also the skills and technologies to process them through the design of intelligence algorithms artificial, have in their hands "one of the keys to the power of tomorrow in a digital "(Villani report" Making sense of AI "- March 2018).

## 7. ARTIFICIAL INTELIGENCE AND STRATEGIC INFORMATION SYSTEMS

The AI strategy is logically found in the Strategy departments, but it irrigates more Directions. For some companies, AI, previously brought to the level of Strategy Department is now at ISD level. Some participants underline the capital nature of the support of their General Management to set up a governance of AI [19-21].

If the General Management is aware of the fact that it is necessary to transform the company's IS, build a data lake, equip teams and train them to develop AI, then means and budgets will follow. We see that the dynamic around AI is often very well initiated when there have already been acculturation programs Big Data aimed at arousing the interest of the professions.

Other companies prefer the trail of an AI referral. At Renault for example, a leading AI expert has been appointed: his role is to guide research and innovation, to be in support of the various businesses of the company in the use of AI, to help them endow the necessary skills, and build partnerships with them with the outside. To do this, it relies on an internal network of experts and specialists.

Other organizations are making the decision to be led by the professions on AI projects. Speeches are organized by the main carriers of AI in the company (startups, professions) so that the employees of the business departments take ownership of the subject.

In other cases, such as at Orange for example, the focus is on creating a competence center dedicated to AI which will be shared with the one already existing in the big data.

Today, integrating AI into business strategy requires rethinking business strategies, but also the overall consistency of data governance. Setting providing a platform for testing AI applications or designing internal algorithms in the company is one of the recommendations of company's members of the IA Circle.

## 8. CONCLUSION

In the last decades of the last century, information systems have undergone radical and rapid changes, as new applications of information systems and modern standards for designing these systems have emerged, and this development has been helped by many factors, the most prominent of which are: the tremendous technical revolution, especially in the field of information technologies, the explosion of knowledge, the progress of thought Administrative and organizational, development of business organizations, openness of the legislative and regulatory environment, and increased competition between organizations, ..., and others.

If the applications of artificial intelligence are important in many fields, then it represents for business organizations an urgent necessity that cannot be dispensed with, as many previous studies and researches, Western and Arab alike,

have emphasized the importance of these applications in business organizations, which enables them to achieve many The advantages, most notably: improving the decision-making process, solving all administrative problems, reducing costs, improving quality, ..., and other advantages that contribute directly to enhancing the competitiveness of business organizations and ensuring their survival and growth.

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