

Artificial intelligence in business applications



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Artificial Intelligence and Robotics

Business functions that can/cannot be automated

INTRODUCTION

Computer systems today are a part of almost all businesses; this is because they provide us, along with the added use of the Internet, with a variety of means that made business operations easier, productivity higher, and communication processes faster. Computers and the programs (or the software applications that are installed on them) along with the robotic systems do a great amount of the tasks that were previously performed by the employees and/or workers themselves. This transformation, towards an automated work environment, saved businesses a lot of unwanted expenses, a lot of time, and caused profits to increase steadily. Computers substituted, in different business structures, classical machines and tools, such as the calculator, the fax, the telephone, the photocopier and many more. The automation of different business functions led many organisations and companies to a higher level in what concerns production and management.

But the point that should be understood is that even though many processes and functions related to businesses and organisations have been automated, there are still many aspects that are not, or that cannot be, automated for a wide range of reasons.

BUSINESS FUNCTIONS

The main objective of any business is to achieve success. To be able to reach success, an organisation needs to have an effective structure because any entity depends exclusively on two factors which are management and use of

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information. An efficient use of information systems can allow an easier and faster access to data that are essential for the workflow and for the quality of that work and, therefore, can assist the management in performing its duties in the best possible manner and in making the right decisions at the right times. In order to achieve such objectives, specific business functions should be established and specific tasks should be performed.

Every kind of business and every organisation, depending on the nature of their operations, the products or services that are provided by them, their geographic location, and depending on the management and production schools that they relate to, have different business functions, but there are certain generic functions that apply to all kinds of businesses all over the world. These functions are usually general management, information management, operations management, marketing, finance and accounting, and human resources.

Lan and Unhelkar (2005) identify the various generic business functions by stating that they are the function of Management and Administration which is the department whose tasks are to “ corporate resources, corporate image, quality in all aspects, industrial relations, stakeholders relations, productivity, [and] promotion,” the function of Human Resources that should deal with “ job analysis, position classification, employee training, employee selection, employee auditing and promotion” in addition to other related tasks, the function of Finance and Accounts that is responsible for “ the capital operations required by the entire enterprise activities... the funds required by management, administration, sales, marketing, human resources, [and] purchasing,” the function of Purchase and Procurement, the <https://assignbuster.com/artificial-intelligence-in-business-applications/>

function of Sales and Marketing, and the function of Customer Care or Customer Support.

According to another source, “ business functions are universal and apply to every type of business. The most essential business functions are marketing, operations (production of goods and services), finance, and human resource management” (Plunkett, Attner, and Allen 2005). Here, we find a view according to which all functions are the same regardless of the type of business.

The main question is to understand whether the above mentioned functions can be in whole or in part automated and/or computerised. In other words, can all the tasks concerning the business functions be transferred to intelligent electronic or robotic agents reaching the level of efficiency and proficiency in which humans are capable of performing them?

AUTOMATION AND ARTIFICIAL INTELLIGENCE

In order to understand if all (or only some) business functions can be automated, it is important to understand the meaning of the concept itself. According to MSN Encarta (2005) automation is a “ system of manufacture designed to extend the capacity of machines to perform certain tasks formerly done by humans, and to control sequences of operations without human intervention. The term automation has also been used to describe non-manufacturing systems in which programmed or automatic devices can operate independently or nearly independently of human control. In the fields of communications, aviation, and astronautics, for example, such devices as automatic telephone switching equipment, automatic pilots, and

automated guidance and control systems are used to perform various operations much faster or better than could be accomplished by humans.”

For us to reach such a system, a certain computerised aspect should be developed; an aspect which enables machines to execute given tasks according to the desired level. For such an objective, experts and programmers should be able to produce information systems that possess some of the characteristics of intelligence; this is why such systems are referred to as systems of artificial intelligence, or simply intelligent machines; in other words, computerised systems that are pre-programmed to perform a certain mission with the same level of accuracy of a trained human being. It is the science of creating machines that are intelligent, and in a more specific context, intelligent computer software-programs functioning according to the present hardware. It attempts to comprehend the mechanisms in which human intelligence works and then imitates it in the way the prospective intelligent machines should work, avoiding the limitations of biologically related weaknesses.

Bailey (1992) describes his understanding of intelligence as the ability to reason or have a logical thinking, and to have an effect on the environment; this will require a good level of knowledge that should be acquired. To be able to simulate humans, machines should possess the capability of understanding the world. Computers, or intelligent machines, should be knowledgeable on a level that is even deeper and more detailed than we are. Depending on knowledge, intelligent machines (or computers or robots) will be in a position to answer any of our questions, they could perform any task

efficiently, and they can solve complex and difficult problems much more rapidly.

Bailey also states that another important feature that intelligent machines should have is connectivity to each other all around the world through the use of networks, which will make it even easier for them to gain more knowledge and to communicate it to one another. Then there is another feature that is the ability to establish an effective level of communication between intelligent computers and humans through both written and verbal means and not through commands typed through a keyboard and a screen. Finally Bailey puts the physical qualities, such as vision, hearing, as the final of his desired intelligent computer or robot through the use of visual and auditory sensors similar to, or better than, those of humans.

AUTOMATING BUSINESS FUNCTIONS

The organisational structure is the setting that defines all the departments of the organisation, identifies the responsibilities and duties of each department, regulates the relationship between the various departments and explains how each of them should interact with the others in the way that guarantees the achievement of the desired outcome.

As Clarke and Anderson explain, “ an organizational role is defined as a set of functions together with a set of obligations and authorities. The same human or artificial agent can play several roles” [within that specific organisation] (187).

The various tools of Information Technology can assist the company in gathering, elaborating, processing, storing/documenting, and distributing all

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the information that is needed for planning, decision making, and control. The use of computers and the simplicity they offer are important elements in what concerns the enhancement of all the mentioned processes. This fact explains how information technology influences the way in which organisations tend to arrange the tasks and processes within them. Ross (2003) explains that “ information technology (IT) has progressively become key link integrating the business enterprise and its logistics capabilities with its customers and supplies... Simply, the organization’s ability to create, collect, assimilate, access, and transfer information must be in alignment with the velocity of the activities necessary to execute effectively supplier, customer service, logistics and financial processes.”

As mentioned earlier, many aspects related to the various tasks of businesses are now computerised and/or automated. Accounting and financial processes, for example, are not done only on paper as they once used to be; instead complete computer systems that rely on software applications are those that elaborate, document, communicate, and distribute the various pieces of information among different employees working in different departments. Another example is that related to the processes of sales and marketing which depend heavily on the Internet and the means of communication offered by it. “ Sales force automation modules in CRM [Customer Relation Management] systems help sales staff increase their productivity by focusing sales efforts on the most profitable customers, those who are good candidates for sales and services. CRM systems provide sales prospect and contact information, product information, product

configuration capabilities, and sales quote generation capabilities” (Laudon and Laudon 2006).

For what concerns the accounts and finance function, there are clear indications that many of its tasks have been computerised. “ Large and medium-sized businesses are using ASPs [Application Service Providers] for enterprise systems, sales force automation, or financial management, and small businesses are using them for functions such as invoicing, tax calculations, electronic calendars, and accounting” (Laudon and Laudon 2006). Another form of automation in this context is presented by Sanghvi (2007) as he states that “ online technologies have enabled payroll services to become a popular way for accounting firms to improve client service, enhance loyalty, and gain incremental business... Many small business owners turn to their accountant for back-office services while they focus on growing their businesses,” and this means that, through online systems, they can provide the external accountants with all the information needed in order to produce their legally accurate and acceptable financial documentation.

Concerning human resources management, there are certain computerised systems that are capable of performing the main parts of the process that are related to that function. Torres-Coronas and Arias-Oliva (2005) refer to what they define as e-recruiting; which consists of the “ practices and activities carried on by the organization that utilizes a variety of electronic means to fill open positions effectively and efficiently. The e-recruiting process consists of the following iterative steps: identification of hiring needs; submission of job requisition; approval of the job requisition via a job

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database; job posting on the Internet; online search of the job database by job seekers, online pre-screening/online self-assessment; submission of applications by applicants directly into an applicant database; online search of the applicant database for candidate selection; online evaluation of résumé/application; interviewing by recruiters/hiring managers; online pre-employment screening; and job offer and employment contract”

Another example of a computerised business function, which is auditing, is presented by Caster and Verardo (2007): “ The increasing prevalence of complex computer information systems and electronic data interchanges has made most business transactions electronic in nature... Technological advances have altered not only the actual form of evidential matter required to be obtained by auditors, but also the competence of this evidence. Technology has had a significant impact on audit evidence, and existing auditing procedures could be improved in many ways.” The authors indicated that new technologically related regimes of audits have been created to automate the auditing process.

Laudon and Laudon (2006) explain that certain businesses took enormous steps towards the automation of the entire processes related to their core activity: “ The management of UPS decided to use automation to increase the ease of sending a package using UPS and of checking its delivery status, thereby reducing delivery costs and increasing sales revenues The technology supporting this system consists of handheld computers, barcode scanners, wired and wireless communications networks, desktop computers, UPS’s central computer, storage technology for the package delivery data, UPS inhouse package tracking software, and software to access the World <https://assignbuster.com/artificial-intelligence-in-business-applications/>

Wide Web.” The author indicates that the various processes of UPS have improved substantially thanks to the computerisation and inter-connectivity of their functions.

When we study the potentials of automation for what concerns business functions, it should be clearly stated that each function is a separate case with its own factors and qualities, which can allow or limit the possibilities of full computerisation of its different processes and tasks.

Dorf and Kusiak (1994) state that almost every aspect of the manufacturing process can be automated: “ Most manufacturing operations can be automated. Given the large number of manufacturing processes and assembly operations used in industry (the number is in the thousands) and the many possible ways in which any given operation can be automated.” The authors give different examples of automated systems, such as the Automated Production Lines (which is “ a production system consisting of a series of automated workstations connected by an automatic parts transfer mechanism”), Position and Motion Control Systems (which are required to position “ a work head or tool relative to a work part to accomplish a process”), and the Industrial Robotics (which are “ general-purpose programmable machine possessing certain anthropomorphic characteristics”).

When the other business functions are examined, we find that almost every single task within the realm of each function can be automated: Information concerning the major issues related to the business as a whole can be produced by computer systems on regular basis, and passed on to

management for examination and study before reaching the right decisions in what concerns the survival and progress of their organisation.

Accountancy and financial processes can be completely handled by intelligent systems that can, for example, calculate wages according to working hours, process payments to institutions and banks through electronic means over the Internet, can produce invoices and receipts to customers and suppliers, and can also manage shareholder's issues. In the human resources function, information and requests can be effectuated electronically, but the final step, which is employees selection, cannot be performed by automated systems; because here the human factor and the human inter-activity is, and most probably will always be, the determining point. This is also valid for what concerns sales and marketing, the computerised system can perform all that is needed except the stages related to policy making and to physical delivery of products, as here the human factor is still required.

There are certain missing parts if the desired objective is to reach a total automated business; such parts can be overcome only if (or when) we manage to solve deep and important problems in what concerns artificial intelligence. Creating systems that can 'think' as humans and can perform tasks related to the human factor will not be a fast endeavour, as we are still in the beginning of what concerns understanding and imitating intelligence.

CONCLUSION

As mentioned earlier, most of the tasks that are related to virtually all business functions can be computerised and/or automated, but the most important element is still the human factor. At the present level of

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technology, we are unable to create a fully automated business and we cannot transform an existing business entirely into a computerised one. Some business functions, such as accountancy and information management can be fully automated, some other functions, such as human resources and sales and marketing, can be computerised to a very high level, while other functions, such as general management, cannot be automated.

Another reason, beside the technological limitations of the field of artificial intelligence today, is that people (whether customers or suppliers) are still not accustomed to dealing solely with machines.

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