

Digitization at the service of competitive intelligence

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Abstract: Digitization is central to many development strategies. It is a major growing trend that requires ongoing adaptation on the part of companies and public administrations. Many organizations regard digital technology as a godsend, allowing them to be more reactive, optimize costs and gain market share, while also contributing to the facilitation of competitive intelligence and all its component parts. There is no doubt that new technologies play a major role in the monitoring, processing, and protection of information. This is the subject of our paper, which first examines the opportunities and challenges of Digitization for organizations in the context of economic intelligence and addresses the new technologies that are likely to strengthen its role and accelerate its development.

Keywords: Competitive intelligence, Digitization, Digital economy, Competitiveness, New technologies, Public organizations

1. Introduction

The world and humanity are changing because of Digitization. Two watchwords: Reactivity and adaptation. Indeed, the phenomenon is becoming increasingly rapid, and the players are sometimes overwhelmed, we are inclined today to follow the trends and to face up to the ruptures, in our habits, our ways of thinking and acting, we must adapt to keep up with the change. In the past we were in the reception business, and we have evolved towards interaction. Due to circumstances, the first was rather closed, and the second is more open.

Because of the benefits and risks involved, Digitization is gaining a lot of international attention. Some people advocate for greater freedom, while others denounce new forms of virtual and intellectual imprisonment. Borders have become porous, raising several questions. All of society is now affected by the rise in power of new technologies: "The rapid growth of information and communication technologies and innovation in digital systems are at the origin of a revolution that is disrupting our ways of thinking, behaving, communicating, working and earning (GUILHON and MOINET, 2016).

It is critical to consider information in a new light against this background. Digitization introduces new aspects to the dissemination of information, as well as to the production and creation of knowledge. Strategic information must also be safeguarded against the growing threats that are emerging and will become more aggressive in the future (cyber-attacks, hacking, etc.). This is the entire purpose of competitive intelligence, whose missions may be aided by new technologies (Big data, open data, artificial intelligence, etc.).

It is essential to consider the role of Digitization in the development of competitive intelligence because the two are inextricably linked, and organizations must follow and even anticipate developments to maintain their competitiveness. Today, digital technology is a solution for organizations that stand to gain by making it a priority.

Scientific research in this field (with well-defined theoretical frameworks) can therefore provide a foundation for experts and practitioners to build on, as both are necessary to drive change and development.

Thus, the main objectives of this work are to :

- demonstrate the benefits and risks of Digitization for organizations.
- demonstrate how technology improves competitive intelligence of organizations.

This bibliographical search is aimed at synthesizing knowledge on the subject. As a result, we will present the main findings of the literature reviewed, along with a comparison of the objectives, problems, and theoretical approaches. This synthesis will allow us to provide a clear and current understanding of the relationship between Digitization and competitive intelligence, as well as lay the groundwork for future reflection. Perspectives will be presented according to the real need for research identified in this field.

Therefore, this paper is divided into three sections. The first section is discussing the concepts, risks, and advantages of Digitization for organizations, as well as to the relationship between the digital world and competitive intelligence. The second section focuses on the new technologies that are likely to help organizations improve their competitive intelligence.

2. Competitive intelligence and Digitization: what are the advantages and risks for organizations?

a. Conceptualization

Digitization, also known as digital transformation, can be defined as *"the integration of digital technologies into everyday life, or in the strict sense as the conversion of an electrical signal or information into digital data"* (GUILHON and MOINET, 2016).

According to the Royal Institute for Strategic Studies (IRES), several factors contribute to the transformational nature of digital technology. It is transformational when it results in a change in the organization's classic *modus operandi*, the need to acquire new skills and fundamental changes in the tasks carried out on a daily basis (BOUNFOUR, 2017). To demonstrate this, we can cite the public order platform, which has changed the way public contracts are managed, and the electronic payment of the car tax through which the Directorate General of Taxes has allowed citizens to pay the car tax without having to go anywhere, putting an end to endless waiting lines and endless disagreements.

Digitization is therefore seen as a process leading to a radical change. This transformation paves the way for the third industrial revolution : the digital revolution. The latter *"refers primarily to the development of the Internet and more generally to all information and communication technologies (ICTs), which are based on the Internet Protocol (IP) allowing the processing and exchange of information between individuals, machines and companies"* (GUILHON and MOINET, 2016). It is viewed as a new stage in human history with the distinction of five mutations that are likely to disrupt our lives and which are linked to knowledge and opportunity gains (here the example given of smartphones is convincing because they make everyday life much easier and save a great deal of time), to the success of the collaborative approach embodied, for example, by the free encyclopedia *Wikipedia*, and to *big data* with the overabundance of data and the profusion of sensors (FAYON and TARTAR, 2014).

In the modern world, institutions are confronted with the omnipresence of digital technology at the strategic and sectoral levels. Public decision-making is influenced by the digital sphere and there are numerous examples in Morocco. The "E-Government" project is a manifestation of the desire to integrate this new situation into the various procedures and to make it a lever for the country's competitiveness. E-government aims to promote the use of information and communication technologies (ICTs) by public administrations to improve the internal operations and make public services more accessible to users. As a result, Digitization is therefore an undeniable solution for both administration and user, allowing the former to simplify procedures, pool efforts around the core business and drive change. It also enables the latter to gain access to a broader range of services (improved Internet access, one-stop shop, etc.) and benefit from better communication. We also recognize the critical role of social networks in reorienting public decision-making.

b. Digitization : a necessary condition for a successful competitive intelligence approach

Competitive intelligence can only be implemented in an organization through dedicated digital platforms, customized software, and adapted information systems. The acquisition of data to be

transformed into strategic information can only be done through digital tools, which currently allow organizations to access the information they need according to the objectives they have previously set.

We can mention RSS feeds, social networks, Google alerts, newsletters and press releases, and specialized software. These are tools that serve the first component of competitive intelligence : monitoring, with all its typologies.

The information collected needs to be stored and analyzed, and this can also be done by digital tools and web services such as Evernote, which allows to store text, images, and links by generating notes. On the application's web site, it is stated, for example, that the idea of Evernote is based on the three actions that the brain performs, namely: storing items from the past in memory, building links, and creating perspectives for the future (Official web site of the Evernote application, 2023). One of the most important aspects touted by Evernote Corporation, a privately held global company headquartered in Redwood City, California, is the ability for professionals to focus on what really matters to the organization. Other tools also allow information to be processed for use in decision-making.

The security or protection of information is also part of the core business of competitive intelligence, as an organization that is not capable of protecting its strategic or sensitive information from external threats (cyberattacks, hacking, etc.) or sometimes internal threats (a public servant who does not respect information security instructions and who uses, for example, his or her professional computer for personal purposes) cannot claim to be efficient. Information security tools are multiplying and are now part of the budgets of public bodies, where the stakes are higher, especially in certain departments such as the interior, national defense, or finance. Information protection software is becoming more and more effective in this respect to preserve the nation's informational potential (technical, scientific, economic, etc.) against recurring threats. Obviously, the role of the information systems departments within the various entities is essential in terms of awareness and support. Digital tools therefore make it possible to strengthen the role of competitive intelligence in organizations by optimizing costs and saving time. This also benefits the decision-making process, which is improved by the availability of relevant and controlled information.

c. Opportunities and challenges of digitization for organizations

Digitization marks the transition from one way of working to another, which requires a great deal of adaptation. During a growing craze for new technologies, organizations are forced to integrate digital into their business models. It is not a question of betting on the technical aspect but of taking up the challenge of participation in economic and social development. Technological innovation has generated considerable time savings for all economic agents. Since the introduction of various technologies, the state has been able to lighten a not-inconsiderable number of its administrative procedures through dematerialization; companies have gained new market share; they have been able to develop new activities; and consumers can make their purchases or payments online with one click, with no constraints whatsoever.

Many activities can be done remotely, reducing unnecessary travel, and allowing greater freedom. New needs are created, for which new products and services are developed, increasing the efficiency of each economic agent. All this contributes to an optimization of costs that can be deployed in new investments or in research and development, for example.

However, Digitization could have negative repercussions on the labor market and create more inequalities (BRYNJOLFSSON and MCAFEE, 2014), as labor will give way to Digitization and automation. The need for relevant skills and training will increase exponentially, which may not be easy to manage for all organizations (cost of training). At the same time, new jobs will be created.

Table 1. Technological breakthroughs and trends (Ducrey and Vivier 2017)

Breaks	Technological impacts	Opportunities
Exponential computing capacity at decreasing cost	More computing speed	Smaller, more powerful processors. Faster and more accurate calculations. Faster R&D. The creation of predictive or real-time models. We are moving towards more personalization, artificial intelligence, deep machine learning and the exploitation of Big Data.
	More autonomy	Computers that consume less and can become mobile, Electric cars and drones that travel further, renewable energy that can finally be stored.
	More data	A multiplication of sensors, connected objects, and massive and cheap storage with the Cloud.
	More automation	More productive and cheaper robots and virtual assistants, faster and more personalized service, drones, and self-driving cars.
Faster, permanent internet connection	ATAWAD (<i>Anything Anytime Any device</i>) access	Worldwide, instant access to all services, information, content...with mobile and broadband. Democratization and acceleration of the spread of education and innovation worldwide. We are moving to the " <i>On demand economy</i> " where everything is just a click away.
	Dematerialization or connected objects.	Everything around us that has not been digitized (videos, information) is becoming connected (objects, vehicles, smart cities, etc.). Interoperability between objects, and platforms is becoming key to reinventing value chains.

In Morocco, Digitization is facing a major challenge in terms of adapting public authorities and supporting businesses (an economic fabric made up mainly of small and medium-sized companies). Morocco has opted for openness and liberalization in the face of an increasingly globalized and connected world and is therefore obliged to align itself within international trends if it wishes to join the club of emerging countries. The issue of cybersecurity in the face of the ubiquity of connected objects must also receive all possible attention from the public authorities. These challenges, if met, represent real development opportunities in terms of entrepreneurship and innovation. Morocco must also face up to the risks associated with digitization (of the administration, the economy, etc.) and anticipate its impact on employment, work, society, etc. The most important risk is falling behind other nations (BOUNFOUR 2017).

3. New technologies and competitive intelligence : what is the link ?

Organizations are witnessing an unprecedented influx of data. New technologies contribute to an increased production of data that needs to be structured and analyzed so that it can be used for decision-making. With the emergence of mega data and the multiple analysis tools, competitive intelligence preserves its core business but is inevitably undergoing changes in its three pillars: intelligence, information protection and influence. In this paper, we highlight the main technologies likely to improve the competitive intelligence function.

a. Web 2.0

Web 2.0 refers to *"communication based on interaction between Internet users, which is based on contributory and community principles, at the origin of a collective intelligence. These aspects naturally lead to others: the absence of hierarchy in the communication relationship, the absence of borders and a permanent questioning of the applications which evolve rapidly for the benefit of communicational relationships"* (QUONIAM and LUCIEN 2009).

Web 2.0 is developing through two interdependent aspects : on the one hand, networking and linking information through metadata, and on the other hand, facilitating encounters between individuals who want to engage in editorial activity or social interaction. Thus, in recent years, Web 2.0 has seen a rise in the power of the contributory web and social networks (QUONIAM and LUCIEN 2009).

b. The contributory web

The 2.0 tools have opened the way to interaction, several collaborators can now produce information or knowledge on a common virtual platform. Work is facilitated and productivity is increased. These tools can therefore contribute to the collective intelligence of organizations. The most popular applications are wikis and blogs (QUONIAM and LUCIEN 2009).

c. Social networks

The community web has given another dimension to competitive intelligence. The amount of information voluntarily shared daily on social networks is a real mine that giants like Facebook or the professional network LinkedIn can exploit for commercial purposes. These networks collect data from Internet users, store it, and analyze it (according to pre-established algorithms) to be able to influence them or respond more effectively to their needs. Facebook is known for adapting advertisements to profiles. In this sense, profiling on these networks can be compared to the marketing segmentation practiced by companies. However, this raises the issue of personal data protection and the veracity of information (it is impossible to verify certain information shared on these networks), which calls into question the ethical side of the practice.

d. Web portals

Web portals are an undeniable communication tool, and some of them offer, in addition to information, the possibility to interact with organizations and share experiences. In France, for example, faced with the problem of listing job vacancies, mainly in the so-called short-age occupations (occupations for which no candidates can be found), Pôle emploi has set up a new monitoring system, namely a web-based document monitoring platform through which the public

employment operator aims to identify job opportunities in the various territories. This portal, called "Alexandria", is deployed through "Kentika" technology. The alert tool draws its sources from the local media, company websites and chambers of commerce and industry, etc., to anticipate new hires and continually update company files (identity of the new manager, new contacts, etc.).

e. Web 3.0 or semantic web

The Semantic Web is *"The Semantic Web is "an infrastructure enabling the use of formalized knowledge in addition to the Web's current informal content, even if there is no consensus on how far this formalization should go. This infrastructure must first and foremost enable resources to be located, identified and transformed in a robust manner, while reinforcing the Web's spirit of openness with its diversity of users"* (LAUBLET, REYNAUD, and CHARLET 2002).

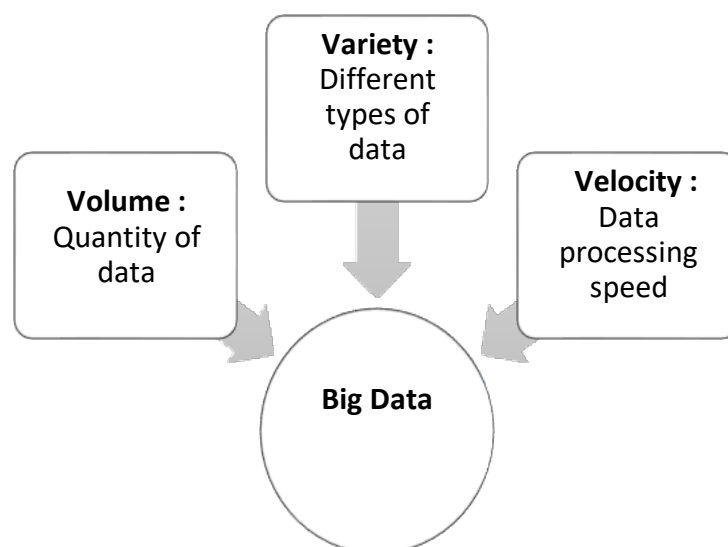
The structuring of this data is done through metadata. Nowadays, web users face great difficulties, the most poignant of which are the diversity and heterogeneity of information sources. The integration of these difficulties should be the basis for the installation of applications in the semantic web infrastructure. In the longer term, it will be necessary to implement software capable of reasoning from a variety of resources. The purpose of the semantic web will be to concretize and facilitate the integration of information from various sources. It can be said that it is a form of intelligent web. The semantic web favors human and social intervention in the framework of collective platforms. The information collected can be viewed by several users via a subscription. This is done through RSS (Really Simple Syndication) technology. Agents can create a kind of watch around their interests.

f. Big data and open data

i. Big data

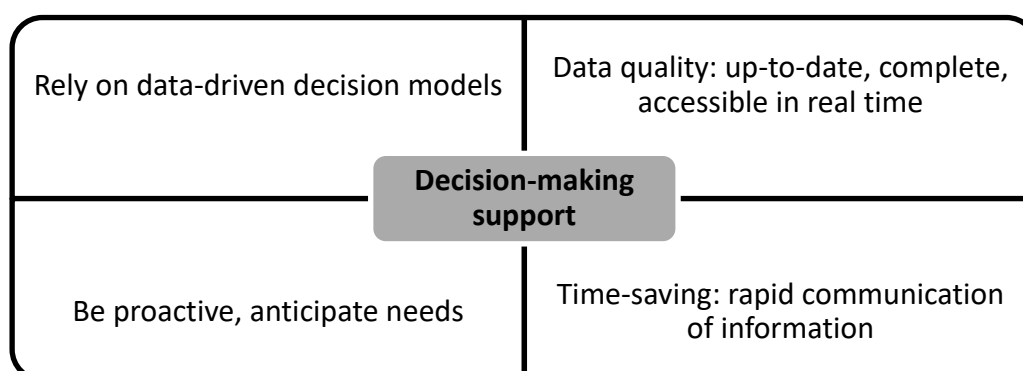
"Big Data is not a single technology but a combination of old and new technologies that helps companies gain actionable insight. Therefore, big data is the capability to manage a huge volume of disparate data, at the right speed, and within the right time frame to allow real-time analysis and reaction" (HURWITZ et al. 2013).

Figure 1. Characteristics of big data (hurwitz et al. 2013)



Organizations are currently faced with a spectacular influx of data that needs to be managed in an optimal way. Big Data technology gives value to this data for more effective decision-making. The quality of the information is generally high (up-to-date, instantly accessible information), time is saved, and the anticipation of needs is facilitated.

Figure 2. Big data and competitive intelligence (Pepin 2015)



Thus, the efficient management of information (from its production to its dissemination) enables the creation of value for organizations. It is based on a step-by-step evolution, namely:

- Moving from data to information : by organizing and compiling data.
- Identifying strategic information : by analyzing and synthesizing information.
- Transforming information into value for decision making : by selecting and disseminating relevant information (GUILHON and MOINET 2016).

However, mass data raises a major problem in terms of information security. It is a delicate balancing act between openness, development imperatives, and the need to secure information.

ii. Open data

The aim of open data (also known as public data) is to encourage structures, including public administrations, to make electronic data available free of charge.

Two basic principles govern the concept of open data and promote the intelligent use of data. Public administrations can, for example, access the public data of other administrations in the course of their duties, whether at the national or international level:

- First principle : Quality and creativity in the use of data : it is not the availability of data or its possession that creates wealth but the way it is deployed.
- Second principle: The data produced by public bodies are the property of the citizens who fund those same public bodies (“Moroccan Administration Open Data Website” 2023).

The open data made available to the public can be reused in complete security because it is mainly data produced by public institutions (ministerial departments, local authorities, and various public bodies) :

- Data from surveys conducted by the various institutions.
- Statistics and indicators developed.
- Data on the location of the infrastructures managed by these institutions.
- Data making up the repositories maintained by the institutions mentioned (“Moroccan Administration Open Data Website” 2023).

In Morocco, the administration's open data website makes information available to the public in several sectors. This data is now a necessity for any nation that aspires to develop by involving all stakeholders in the development process. Access to objective and relevant information is fundamental for decision-making and for the consecration of the democratic transparency to which Morocco aspires.

4. Conclusion

In this paper, we have discussed the role of Digitization in the development of the competitive intelligence function. We have highlighted the main advantages and risks of digital technology for organizations and the main technologies that can facilitate, support, and ensure the sustainability of competitive intelligence. Digitization will strengthen the role of competitive intelligence. New technologies will bring about a major change in the way relevant information is selected and used. Strategic information that will be used to inform the decision. The quality of this information will therefore determine the quality of the decisions taken. The more the quality of the information is verified, the greater the influence. This verification will obviously be carried out according to a certain number of parameters, including objectivity, the origin of the information, its credibility, etc. The protection of information will also have to consider other dimensions and integrate the new and increasingly powerful threats of the web, and the security of information systems and data is a problem that is becoming increasingly acute. Thus, data is the cornerstone of influence, and its role in strategic decision-making cannot be disputed. Some authors speak of CI 2.0. Thus, competitive intelligence and new technologies are today inseparable. Obviously, not all technologies have been mentioned in our paper; others may have an impact on the competitive intelligence approach, such as cloud computing or blockchain technology, which will also revolutionize the way organizations exchange and preserve valuable data.

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