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French CIOs' analysis and vision

# 2018 IT MARKET TRENDS





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## French CIOs' analysis and vision

October 2018

Cigref is a network of major French companies and public administrations set up in order to develop its members' ability to acquire and master digital technology. It is a key player and federating body in the digital society, thanks to its high-quality thinking and the extent to which it represents its members.

Created in 1970, Cigref is a not-for-profit body in accordance with the French 1901 Law of Associations. It counts among its members some 150 major French corporations and public administrations across all business sectors. It is overseen by 15 board members who are elected by the General Assembly. Its day-to-day work is carried out by a team of ten permanent members of staff.

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## EDITORIAL

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As digital actors, we participate in profound, accelerated transformations. The market is dynamic and becoming more complex every day. We are confronted with multiple sources of data, the lack of an independent tool that summarises it and gives an overview of trends in a European scope. These two observations gave birth to the IT Market Report project launched in 2017 by Magellan Partners, EDF and Cigref.

This IT Market Report compiles several French, European, and American sources and provides a simplified view of major trends in technological developments and investments on issues that structure our large organisations. After the success of the beta version, a second, consolidated edition of the IT Market Report was produced this year. This publication will continue to evolve from year to year in an agile learning approach.

Beyond our community of large companies and government services, at Cigref we felt it was important to share with our ecosystem and with economic decision-makers a few keys from IT directors for understanding and analysis of the major structural trends that French markets and organisations are experiencing. We also wanted to give some perspective on the trends highlighted by the various studies from institutes and firms with conclusions from working groups and studies led by Cigref.

This is the Report analysis for the wider public that we are presenting here for the first time. We hope it will help to raise awareness of some major topics. The goal is to contribute to our ecosystem's monitoring of digital issues and its strategic studies while hoping to serve organisations' economic performance.

**The Publishing Committee** made up of three Cigref Board members: Jean Michel ANDRÉ, CIO of SEB Group, Bruno BROCHETON, CIO of EURO DISNEY and Christophe LERAY, CIO of Groupement Les Mousquetaires-Intermarché

*Document written by Vanessa DEWAELE, Cigref Mission Officer, based on the results of the 2018 IT Market Report and supervised by the publishing committee.*

## Notices

### Methodology

This document repeats and adds to the main trends in the IT Market Report, co-produced by Cigref and Magellan Partners, which compiles figures from freely available French, European, and American sources and surveys. It analyses them through the experienced lenses of Cigref IT administrators and studies already conducted within Cigref with help from its member companies and government services.

### Organisation of the report

The major structural trends of the IT market (derived from the 2018 Report), reported and analysed by French IT departments, are broken down into two parts:

- **Strengthening trends:** these refer to technologies and usages that are now part of companies' daily life and which will continue to get stronger in the coming years.
- **Emerging trends:** still far away from organisations' daily life, these trends are rarely integrated into workloads and budgets, but they are harbingers of upcoming transformations (in terms of use, information systems, etc.).

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# 1. Strengthening trends

## 1.1. Long live talent...both female and digital

As digital technologies transform society, our professional and personal lives and how we work, collaborate and communicate, organisations are looking for skilled backgrounds from an increasing number of people to steer and carry out digital investments. Companies' needs are increasing as business units "digitalise", and these units require more specific digital skills in turn. Companies' digitalisation entails **three challenges in terms of skills: including digital technologies in business units, evolving skills, and attracting women to digital jobs.**

For all organisations, the lack of resources is keenly felt in the fields of data science, systems integration, architecture, agile methods and DevOps. This shortage, estimated at 80,000 jobs by 2020 in a report by the firm Empirica conducted in 2017 for the European Commission, causes delays to projects and ramps up the "war for talent" between start-ups, traditional companies, GAFAM (Google, Apple, Facebook, Amazon, Microsoft) and digital service companies. To better understand the changes to digital jobs and spread common HR practices, Cigref has updated its [Nomenclature of information systems roles \(in French\)](#), which is now a reference at the European level. Enriching and diversifying the talent pool is becoming a lever for performance and innovation.

While the need for specific skills is real, spreading digital culture in companies also entails significant efforts in change management. The help and investment needed to successfully adopt new digital tools and services on a daily basis are heavily underestimated, particularly when it comes to the digital workplace and the increasing automation of certain tasks which transforms roles and interactions within companies.

Our organisations' digital transformation also entails changing our mindset and management methods that rely on talent. Soft skills, open-mindedness, employees' and managers' ability to innovate, think outside the box and reinvent working relationships, thanks notably to the digital workplace, are key to traditional organisations' future success. Technology also plays an essential role, but it's the ability of men and women to use it better that allows us to derive all of the value for businesses.

In a context of global resource shortages, the feminisation of digital roles becomes essential to the balance of talents needed for success. Can we imagine digital solutions designed only by men? The question is particularly significant given that businesses' and government services' ability to hire and keep a sufficient number of well-trained employees of both genders is becoming critical. Currently, only one-third of digital jobs are filled by women. To overcome this lack of women and take on the challenge together, in late 2017 Cigref launched an eponymous group of associations, an initiative and foundation: [Femmes@Numérique \(link in French\)](#).

*THE transversal underlying issue behind all of the trends described below is digital skills.*

## 1.2. Flying into the cloud

Businesses' growing adoption of the cloud is materialised by an increasing use of public and private SaaS solutions and IaaS services. There are an increasing number of cloud projects, and new offers (*Backup as a Service*, *Serverless*) are being developed.

The SaaS/IaaS market has been growing quickly since 2016 and is concentrating in the hands of a small group of American leaders - led by Amazon with a third of the cloud provider market - whose business is growing at a dizzying rate (up to 50% growth per quarter). This growth brings with it an entire cloud-centred ecosystem comprised of integrators and infrastructure management solutions providers.

The cloud's strong growth is a background trend that only a major crisis (security flaw, data leak, quality of service disruption, etc.), constrictive regulations or a change of business model can diminish or slow. With 95% of IT departments stating having applications in the cloud, the trajectory for large companies is clear and the competition fierce. Trust in the actors and their services has become a strength despite the lack of credible alternatives in France and Europe.

The cloud entails several major challenges for IT departments: defining a clear strategy with business services, developing expertise in the cloud, guaranteeing security, independence and reversibility, controlling costs, optimising the management of the software base and continuing to manage interactions with essential legacy software.

Unlike the cloud market, **the data centre market shrank significantly by -6.5%**. This is undoubtedly not a long-term trend but a **market adjustment**. Providers are in the midst of a crisis in how they position themselves against GAFAM companies that build and buy server capacity, but, in the long-term, they must also call on existing telecoms players positioned in the data centre market. The latter will progressively find business through the cloud.

### 1.3. The industrialisation of artificial intelligence

The development of artificial intelligence (AI) technologies comes in a context of strategic interests in the international economic and political spheres. Europe and France have the ambitious goal of catching up to the giants in the field: the GAFAM companies and IBM in the United States and the BATX (Baidu, Alibaba, Tencent, Xiaomi) companies in Asia. With this in mind, Emmanuel Macron presented France's AI strategy based on the report by Cédric Villani on 29 March 2018.

Beyond the fantasies of strong AI and all-automated, IT departments are approaching artificial intelligence as a way to implement three levels of strategy or projects: first, pure probability processing and grouping characteristics (data mining) through a so-called "supervised" AI; second, predictive analysis and machine learning via a so-called "unsupervised" AI; and, finally, data analysis with deep learning.

Like the Internet of Things (IoT), AI relies on mass data collection and processing and adds to businesses' data strategy. **While AI is a significant driver of productivity, particularly through automation and solving internal problems, deploying it is hampered** by two phenomena: on the one hand, businesses' still-frequent **silos mentality** that prevents sharing data sources, and, on the other hand, **legacy IT** that makes it considerably harder to implement a self-learning system. **Data management** is indispensable, as is a **sufficient level of maturity** for systems and actors. This is the meaning of the call from the French Secretary of State for Digital Technologies, Mounir Mahjoubi, on 18 September that called on French companies to increasingly open and share their data to stimulate innovation in artificial intelligence.

The Villani report placed open data as an issue of sovereignty for France and Europe: *"The first act of the Battle of AI involved personal data. Big platforms won this battle. The second act will involve sectoral data: this is where France and Europe can stand out. First, the objective is strategic for French and European players*

*since it is a way for businesses in the same sector to rival the global giants in the field.* For example, the CPAM (French primary healthcare insurance) has one of the largest databases of health administration data in the world. According to the government's road map, this data pool could result in a healthcare data hub in January 2019.

To mature quickly in the AI field, IT departments must tackle three challenges internal to their organisations: developing skills (internal expertise) and partnerships (external expertise), helping business units better understand the value of data inherent to any AI project, and integrating these technologies into the business units' existing procedures and architectures, to take a project from prototype to industrialisation (see the Cigref report: "L'IA en entreprise : stratégie, gouvernances et challenges de la *data intelligence*", also available in English: [Artificial Intelligence in companies: strategies, governance, and challenges of data intelligence, October 2018](#)).

The spread of AI in businesses and private lives will also happen through IoT. **Through connected everyday objects and automation, AI is revolutionising industries and work** (its content, execution, environment, interpersonal relationships, etc.). It is a fundamental component of the economy's digitisation, but it raises crucial technical (data security, etc.), ethical (confidentiality) and social (changes to jobs and business) questions - see the report [Cigref - Syntec Numérique : Ethique et Numérique, October 2018](#) (in French).

## 1.4. The vital importance of cybersecurity

Cybersecurity now plays an essential role within French companies. The sophisticated hacking and massive theft of financial data at British Airways in early September 2018, the source of which remains a mystery, were a brutal reminder to companies of their need to be vigilant.

In 2017, the World Economic Forum estimated the average cost of a cyberattack at \$3,620,000. The total cost is expected to exceed \$6 billion by 2021. Therefore, cybersecurity is a sector experiencing strong growth in France. It represented €5 billion in expenditures in 2017, and is expected to reach €6.3 billion in 2021.

While 59% of IT directors stated that their cybersecurity budget increased over the past 12 months, 87% want to increase it by over half of their current budget. Only 4% of respondents feel they have correctly assessed the impact of their current

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strategy on information security, meaning that their risk map takes account of cyber threats and critical vulnerabilities (source: survey from firm EY conducted among 1,200 professionals and experts in the sector). Three-quarters of French businesses state that they have weak and low-quality defences against traditional and future attacks, proof of cybersecurity programmes' lack of maturity in most French businesses.

Today, the obstacles to this sector's development are closely linked to, on the one hand, budgetary arbitrations versus more visible subjects for the business and, on the other, a lack of qualified resources. See the report [Cigref - Cybersécurité : Visualiser Comprendre Décider, October 2018](#) (in French).

## 1.5. The GDPR after the May 2018 call to arms

On 25 May 2018, the General Data Protection Regulation on personal data came into force in France and Europe (see the Cigref - AFAI - Tech In France report: [Les clés d'une application réussie du GDPR, November 2017](#) (in French)).

Now that the major inventory project stage - listing processing, maps of data, updates of policies - is over, companies must go into "operating" mode. They must **integrate regulatory control processes in all business units in a continuous improvement approach and prepare for their first audits.**

Now that the regulatory deadline has passed, and with it the the general and frantic race to come into compliance, it is not certain that future IT budgets will account for the workload that maintaining a high level of compliance entails. For now, the legislator is being conciliatory, and warnings are few in number. Will the fear of the law bring about investment? Unless it is citizens' requirements for transparency regarding the collection and use of personal data during the big data era, as shown by the Facebook/Cambridge Analytica scandal.

## 2. Emerging trends

### 2.1. What is the timeline for 5G in France?

The 5th generation of mobile communication, called 5G, promises the rise of an ultra-connected world with uses that remain to be invented in the "smart city" of the future. By drastically increasing the speed and processing capacity of very high mobile bandwidth (5G is 20 times faster than 4G and uses 100 times less energy), 5G will revolutionise usages and widely go beyond the telecoms sector. Major impacts are expected in all business sectors (intermodal transport, healthcare and remote healthcare, financial transaction processing, self-driving vehicles, energy smart grids, etc.). If operators speak of a "revolution", it's also because 5G is a change in model; telecoms will no longer be B2C but B2B as well.

This is a real opportunity for IT departments, but it requires foresight and preparation by supporting business unit executives in raising awareness of this technology, identifying use cases, and experimenting.

With the finalisation of 5G standards in June 2018, IT departments must include upcoming infrastructure expenses in their budgets and identify breakthroughs related to the use of 5G in their companies. Japan, Korea and China are ahead in the 5G market, followed very closely by the United States. The timeline is being timidly specified in France with experiments by telecoms operators planned until 2019 and sales starting in 2020-2021.

While some iconic French executives among telecoms providers are communicating on 5G ahead of time, **the French and European rollout schedule remains opaque and far-off. This is yet another risk to falling behind** the United States, for example, who have announced complete coverage by 2019. There is a real impact of the mobilisation and transparency of public authorities and operators concerning the rollout schedule for French businesses and government services.

## 2.2. *Blockchain*: toward a packaged offer?

After the decentralisation of telecommunications (the birth of today's internet) followed by the decentralisation of information (the information system distributed by hypertext links), blockchain is the third breakthrough that allows us to envisage a **decentralisation of transactions** in a transparent and secure way without a central control organisation.

Blockchain is not a "technological" innovation because it implements technologies that are known and controlled (data storage, cryptography, web services, etc.). It is a clever assembly of these technologies in an extremely innovative information exchange protocol that has significant industrial potential in terms of removing all of the middlemen who act as trusted third parties, lowering costs, increasing security (a blockchain is inalterable by design), and speed of service (by design, there is no wait time in private or consortium blockchains).

Blockchain technology saw a lot of press through its use in cryptocurrencies, and is now part of IT departments' toolbox. Several industries like food processing, banking, insurance and logistics that have significant needs in long-term traceability, certification, and archival are adopting it to develop packaged B2C or B2B2C offers for the future. However, since there is no turnkey offer or clearly identified players on the market, this technology cannot yet realise its potential.

This is what the Cigref report [Blockchain : passer de la théorie à la pratique - Les enjeux de la transformation pour l'adoption de la blockchain par les grandes entreprises \(October 2018\)](#) (in French, [coming soon](#) in English) highlights. Four hindrances are identified in the cultural, legal, and technological aspects (including securing the development environment and stabilising the actor ecosystem) and issues related to management (defining the consensus, operating rules and economic model).

While investment in blockchain solutions is still low, it is expected to see "phenomenal" growth of 73.2% per year and be multiplied by 7.8 by 2022 to reach 11.7 billion dollars, according to estimates by American firm IDC.

Our companies must prepare for the impacts of widespread use of the blockchain protocol, the use of which may disrupt many sectors. Whether it is seen as a threat (by the risk of removing middlemen or making business models obsolete) or as an opportunity (by simplifying exchanges with direct, simplified transactions), blockchain could be the catalyst to implementing true interoperability between

connected objects (IoT). It is highly likely that blockchain will revolutionise business models and relationships between companies in the coming years.

### 2.3. From "Green IT" to "Green by IT"

The subject of IT activities' environmental impact brings us back to the **question of the sustainability of the "digital factory" model** that our businesses (and society) are following. This issue is rarely discussed in the existing literature provided by the various firms and institutes and is not present in the 2018 edition of the Report. Perhaps this absence reveals **the lack of business and market opportunities?** And yet, Cigref, with the help of its members, tackled this question very early.

Beyond "Green IT" that seeks to reduce the footprint of ICT players as part of their CSR initiatives, for example, it's about developing **"Green by IT" strategies that take into account sustainable development issues from the design stage of digital transformation projects.**

The stakes are high: the industrialisation of AI and IoT supplied by gigantic data pools, the mass rollout of on-demand services (notably software and applications), the automation of tasks, virtualisation, etc., result in increased energy needs to capture and store data and manage flows. The rise of voice commands in businesses in the coming years and the mass use of video and holographic media will amplify this phenomenon.

The generalisation of nomad, multi-site work practices that require portable equipment with reduced lifespans, energy-hungry videoconference systems, etc. also beg the question of controlling IT's environmental footprint at all business levels in terms of resources, chemical pollution, energy consumption and waste generation through the hardware's (all-to-short?) lifespan - from manufacture (extraction of raw materials, etc.) until recycling (that requires great improvements) via transport, use and maintenance.

Or, this ethical and environmental aspect is increasingly important to public opinion. So there are stakes in both economics and image for organisations.

The environmental challenge for IT is even greater given that **the take-up of mobile devices has expanded geographically with rebound effects** that were often poorly anticipated in the past, and **ever-more energy-hungry software ("bloatware") that speeded up hardware obsolescence** (for example, due to the superposition of application layers on smartphones). In this respect, hardware made greater progress

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in efficiency in its design than software. Thus, one of the challenges in Green by IT for many large companies currently lies in simplifying algorithms resulting in significant economies of scale.

In its report [Du Green IT au green by IT : exemples d'application dans les grandes entreprises \(January 2017\)](#) (in French), Cigref insists on the need to bring a true change of culture to businesses centred on the opportunity that Green by IT offers rather than anxiety- or guilt-inducing arguments. The difficulty lies in **finding positive incentives** for employees to adopt responsible behaviour while offering them real added value. The Green IT and Green by IT approaches represent **indispensable and powerful levers** for businesses to reinvent themselves and make the necessary transformation. IT departments are central to these efforts.

## Conclusion

Historically, the growth of ITC has always been associated with a transformation or the destruction of jobs, but also, and above all, the creation of value. It is the same thing with artificial intelligence which, like at the start of automation, carries the promise of a new opportunity for progress via more elaborate algorithms and the mass processing of data. New activities with greater added value will be born from the industrialisation of AI.

With the experience we have acquired, we can have a rational, realistic look at the profound changes caused by digital technologies in our companies. This examination is also optimistic since we also hold the conviction that AI will never replace humanity, its perception, and its interpretation. It is essential to understand that, in all of the digital technologies and transformations, humanity has remained at the core.

Thus, the GDPR is nothing less than the legal translation of European countries' attachment to the sovereignty of their data. Since 25 May 2018, EU law has brought greater transparency and security to EU citizens in the collection and processing of their data. In businesses, the cloud, software-as-a-service and, soon, 5G, are tools with boundless potential. Their benefits are visible directly in employees' daily lives, whose lives at work have improved (remote working, the accessibility and performance of tools, smoother user journeys, etc.). Finally, new blockchain protocols that take out middlemen are based on a fundamental business value: trust.

Our role and responsibility, as IT executives, are to support these trends to continue to progress in our organisations' digital transformation while tackling social and environmental challenges.

## **ABOUT CIGREF**

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Cigref is a network of major French companies and public administrations set up in order to develop its members ability to acquire and master digital technology.



### **NETWORK OF MAJOR COMPANIES**

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### **DIGITAL PLAYER**

It is a key player and federating body in the digital society, thanks to its high-quality thinking and the extent to which it represents its members.



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