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The Open Source market

-

France & Europe

2022 Edition

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Open Source is now making its mark in all innovative digital technologies and is becoming highly Europeanised!

At the heart of the most dynamic areas of digital technology, Open Source is continuing its progression, which began more than 20 years ago, and by 2022 will represent a market worth almost 6 billion euros in France.

This growth is set to continue. Having increased 40-fold in less than 20 years, the Open Source industry in France is set to grow even faster than the overall digital software and services market over the next five years. France also confirms its European leadership, neck and neck with the German and UK markets.

The study thus confirms the good overall dynamics of Open Source software in Europe. Open Source is becoming more and more Europeanised, with companies, communities and user organisations making it the core of their development strategies. The main reasons for adopting Open Source remain cost savings and strategic leverage, but also, increasingly, ease of collaboration and skills development. The support of the European Commission, announced since the publication of our last study in 2019, is gradually being accompanied by the implementation of national policies in many member states, and is contributing to the dynamism of our sector.

This growth is also generating a massive recruitment need within the industry and the entire ecosystem, which will have to train and recruit more than 26,000 new full-time equivalents (FTEs) between now and 2027, who will join the ranks of the 64,000 employees who currently develop and integrate Open Source solutions. Developers, DevOps or marketing profiles, architects or business consultants: the need for Open Source skills is numerous and varied, as can be seen by browsing the recruitment sites.

Beyond training, it is a real industrial policy that must be defined and implemented, in France and in Europe, to take full advantage of the contribution of Open Source software to innovation, technological independence and a more ethical and responsible digital environment.

Stefane Fermigier – Co-President, CNLL

Philippe Montargès – President Hub Open Source, Systematic Paris-Region

Marc Palazon – President of the Open Source Commission & Administrator, Numeum



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Open Source as a driver of digital innovation

In just 20 years, Open Source has established itself in the global digital landscape to become a must-have. In France, in 2022, the Open Source software market will be worth 5.9 billion euros, i.e. 40 times more than 20 years ago!

Open Source developed with the Internet. Today, the use of Open Source solutions by companies is accelerated by the rise of the cloud and innovative technologies. The developer communities are considerable, and in France alone we estimate that 64,000 employees work on integrating and developing these solutions.

Open Source at the heart of emerging technologies

Whether in artificial intelligence, the Internet of Things (IoT), the Cloud, security or communications, Open Source occupies a central place at the heart of the most dynamic fields. On the other hand, with increasingly high levels of adoption and a growing number of mature solutions, Open Source software is a driver of innovation in digital usage.

For several years, Open Source software has been actively involved in the development of Cloud solutions (infrastructures, platforms, applications). It is the basis of these environments and is developing strongly. In particular, they simplify the adoption and management of the Cloud by being natively designed to work in it.

Open Source also promotes software quality. With active and open communities of developers, concerned about established norms and standards, this software is readily judged to be efficient, well documented and with a high frequency of delivery of updates and security patches. In addition, CIOs point to better control of information systems with Open Source.

Finally, price is no longer the primary argument in favour of Open Source software. Security is now paramount, and Open Source is being integrated into the security strategies of companies and service providers alike. For all these reasons, Open Source software is better perceived than before and is increasingly used by organisations.

There are still obstacles to be overcome

There are still concerns about the levels of support offered around these solutions, a technology ecosystem that is still considered more limited than that of proprietary software, and concerns about compatibility between proprietary and Open Source solutions. Finally, IT managers face a lack of skills to manage these solutions. To keep up with the growth of the Open Source market by 2027, nearly 5,000 new IT professionals will need to be recruited and trained each year!

Ronan Mevel – Managing Director, Markess

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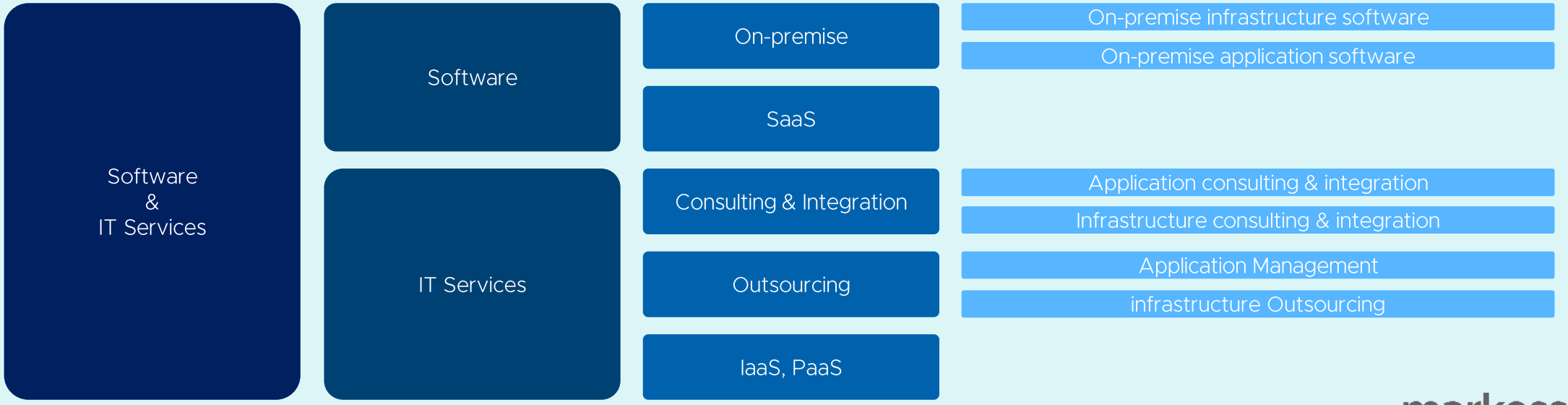
Definitions & segmentation

Definition of Open Source

Open Source combines copyright with a licence to ensure that users have the freedom to run the software, study it, modify it and share the code and modifications with others. It promotes collaboration, innovation and agility.

Open Source revenues correspond to revenues generated by the paid features and support contracts of Open Source software, as well as a share of licences and subscriptions to paid software based on Open Source technologies. Revenues from **Open Source services** correspond to a share of the revenues generated by service contracts based on Open Source technologies or hosting and operating contracts for Open Source solutions.

Segmentation used in the study



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Définitions & segmentation

Software

On-premise application software: Licences and maintenance of application software deployed on site: accounting/finance, CRM, HR, ECM, office automation, BI, collaboration, etc.

On-premise infrastructure software: Licensing and maintenance of on-site infrastructure software and middleware: operating system, network, cyber security, middleware, etc.

SaaS: Subscriptions to software deployed in cloud mode.

IT Services

Application consulting & integration: consulting, integration and development of application software, training.

Infrastructure consulting & integration: consulting, integration and development of IT infrastructure, training.

Application Management: Application management, third-party application maintenance.

Infrastructure outsourcing & hosting: Infrastructure management, infrastructure hosting.

IaaS, PaaS: Infrastructures and platforms deployed in Cloud mode.

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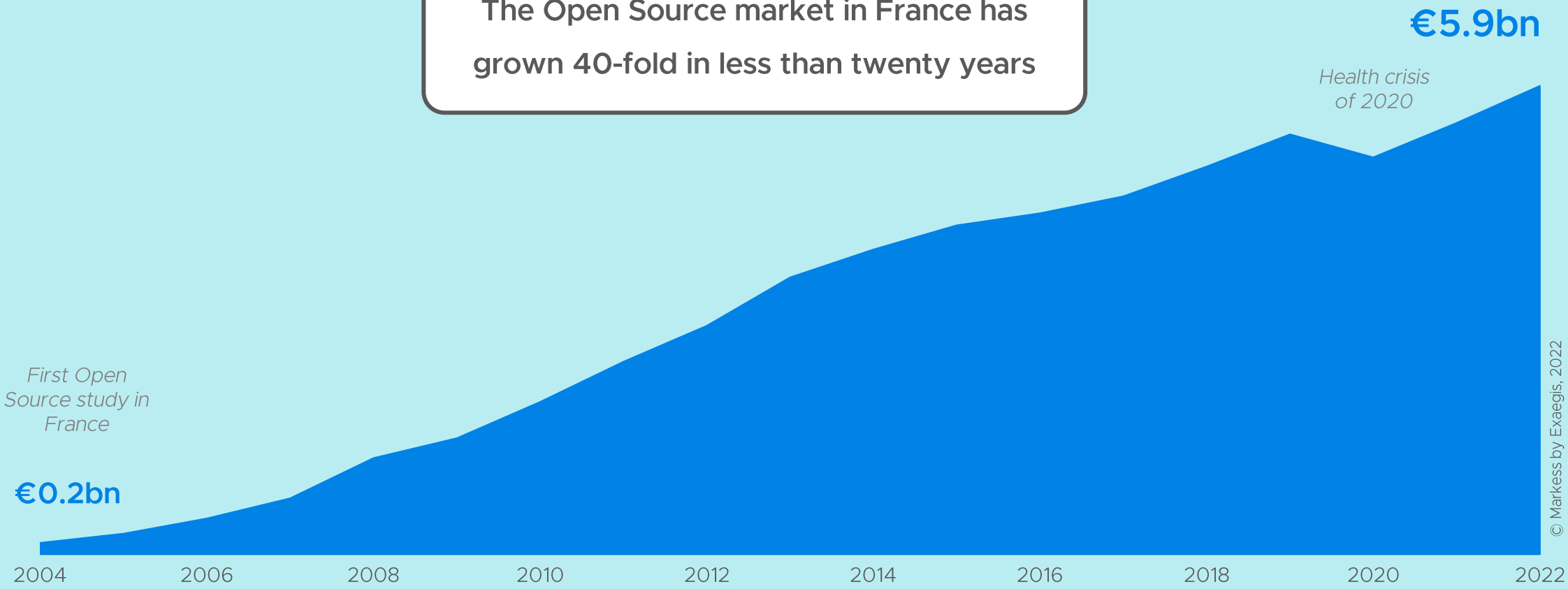
01

What does the Open Source market represent in France?

A historic rise in power

The Open Source market in France has grown 40-fold in less than twenty years



Open Source Software & IT Services Market in France - 2004-2022

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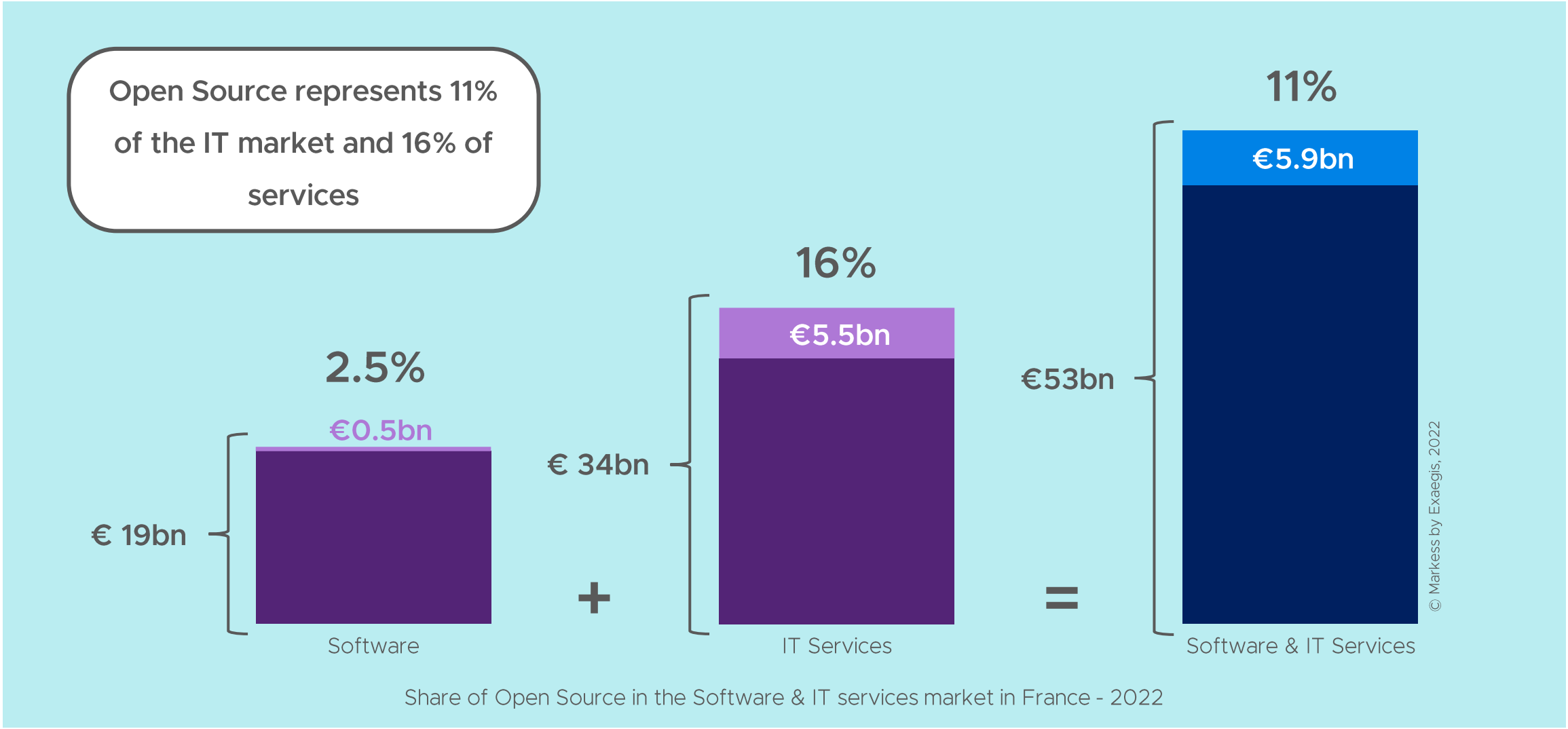
Open Source in France in 2022



Share of Open Source in the Software & IT services market in France - 2022

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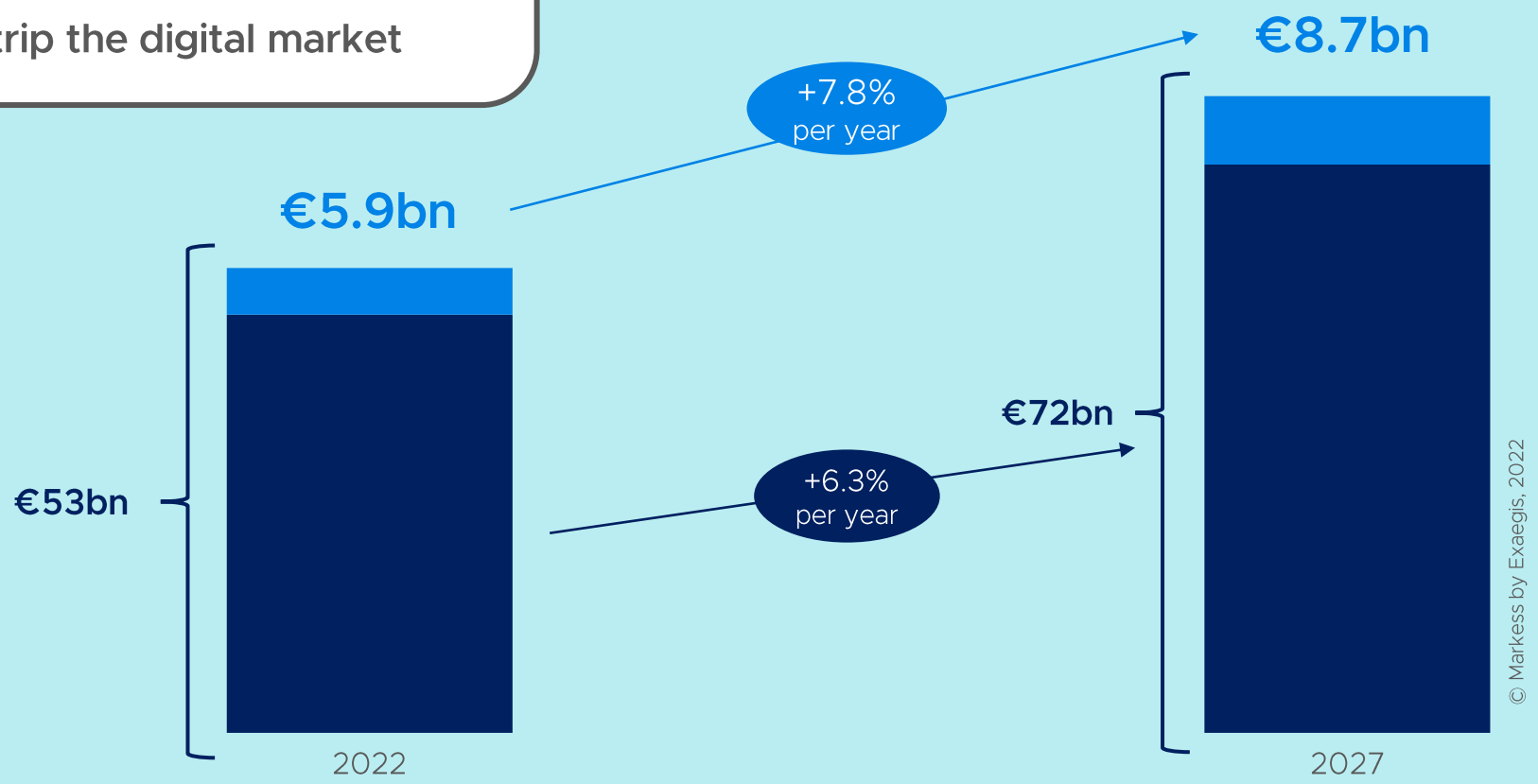
Market outlook to 2027

The dynamics of Open Source outstrip the digital market



Share of Open Source in the Software & IT Services market in France - 2022-2027

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Evolution of Open Source from 2019 to 2027

€ Millions	2019		2022		2027	CAGR 19/22		21/22		CAGR 22/27
Software	16,480	...	19,088	...	26,725	5.0%	...	7.3%	...	7.0%
of which Open Source	**425**	...	**485**	...	**651**	**4.5%**	...	**6.6%**	...	**6.1%**
Share of Open Source	2.6%	...	2.5%	...	2.4%		...		...	
IT Services	32,300	...	34,060	...	45,518	1.8%	...	6.5%	...	6.0%
of which Open Source	**4,895**	...	**5,450**	...	**8,009**	**3.6%**	...	**8.8%**	...	**8.0%**
Share of Open Source	15,2%	...	16,0%	...	17,6%		...		...	
Software & IT Services	48,780	...	53,148	...	72,243	2.9%	...	6.8%	...	6.3%
of which Open Source	**5,320**	...	**5,935**	...	**8,660**	**3.7%**	...	**8.6%**	...	**7.8%**
Share of Open Source	10.9%	...	11.2%	...	12.0%		...		...	

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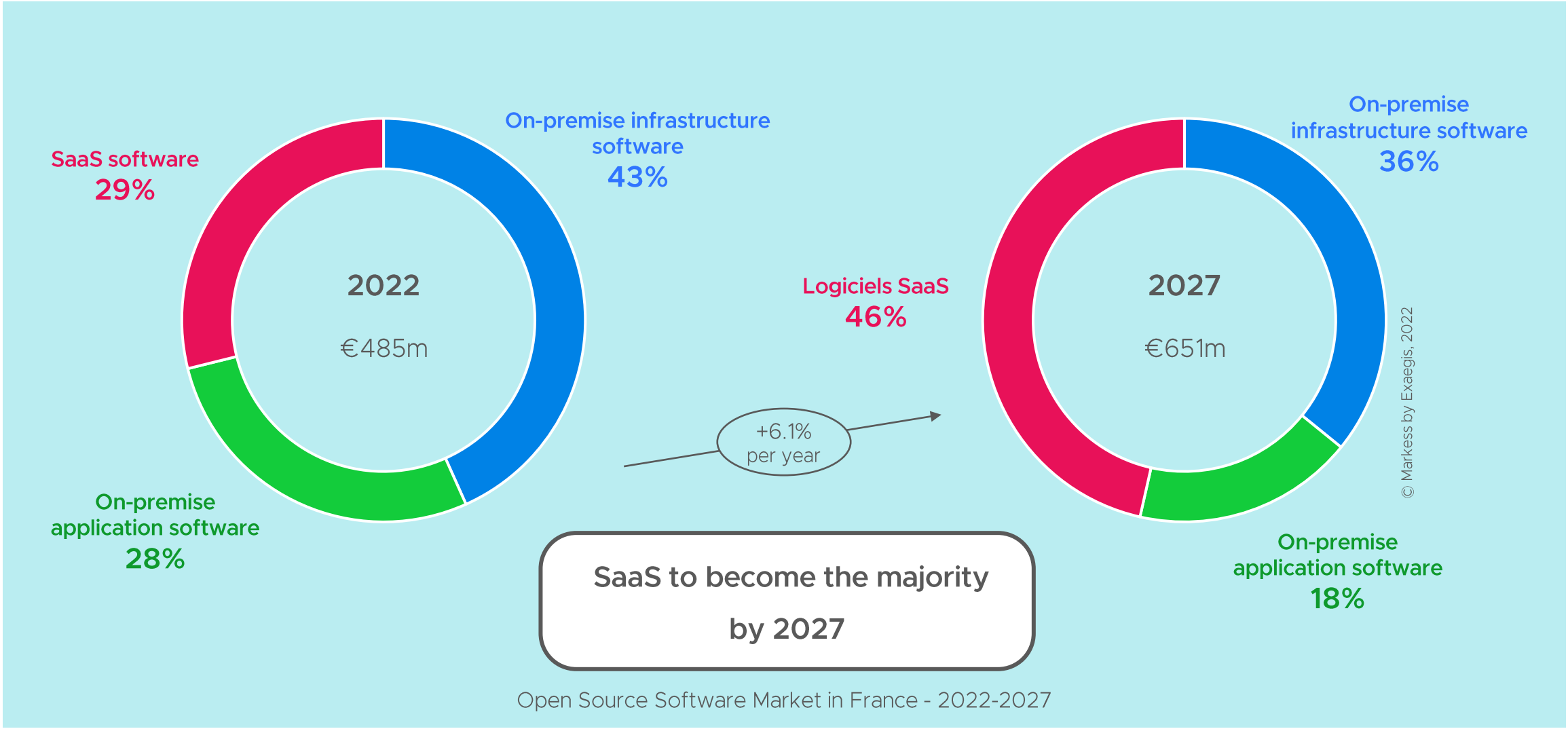
Open Source software



Open Source Software Market in France - 2022-2027

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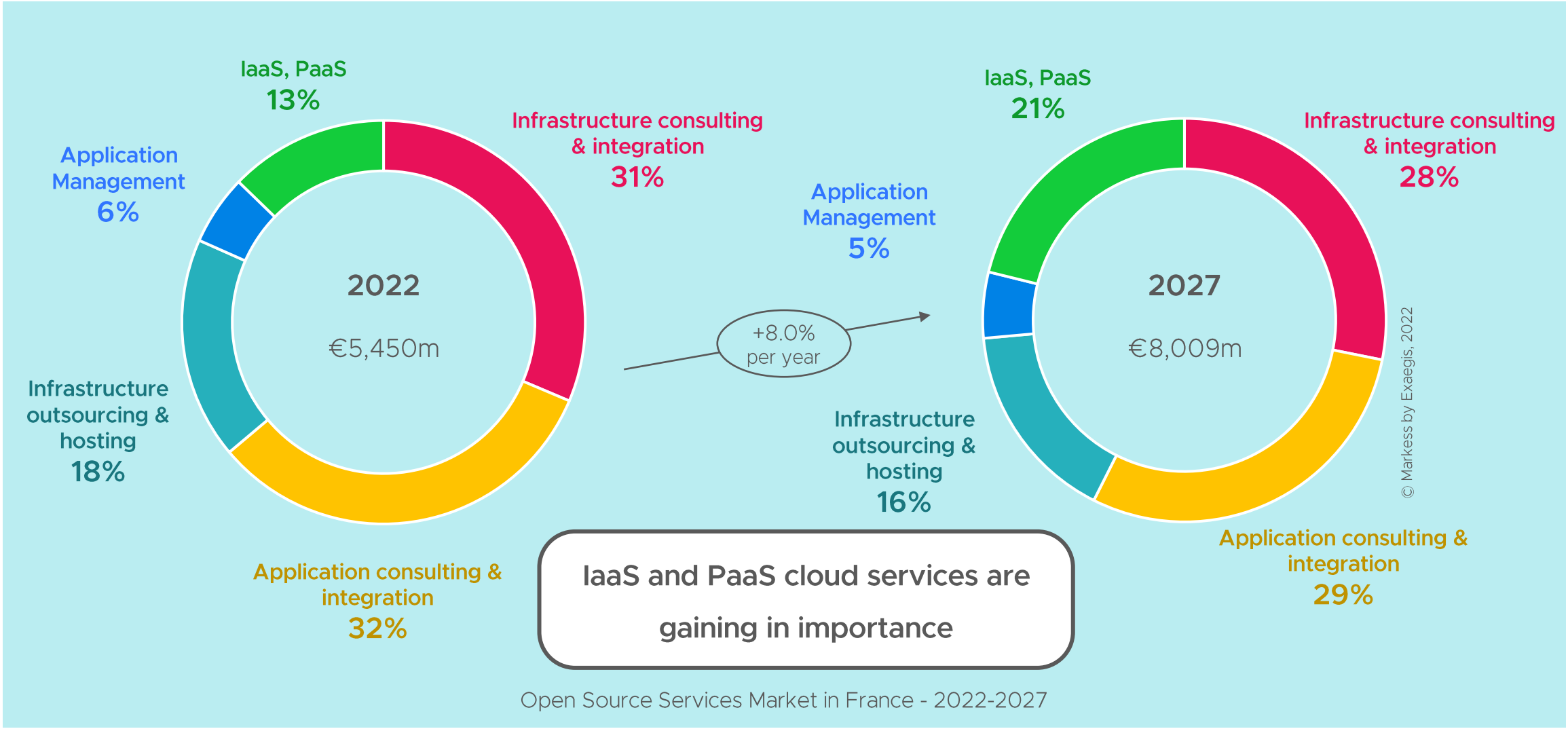
Open Source services



Some service providers who are experts in Open Source software: Groupe Smile, Linagora, Atos, Teclib, etc.

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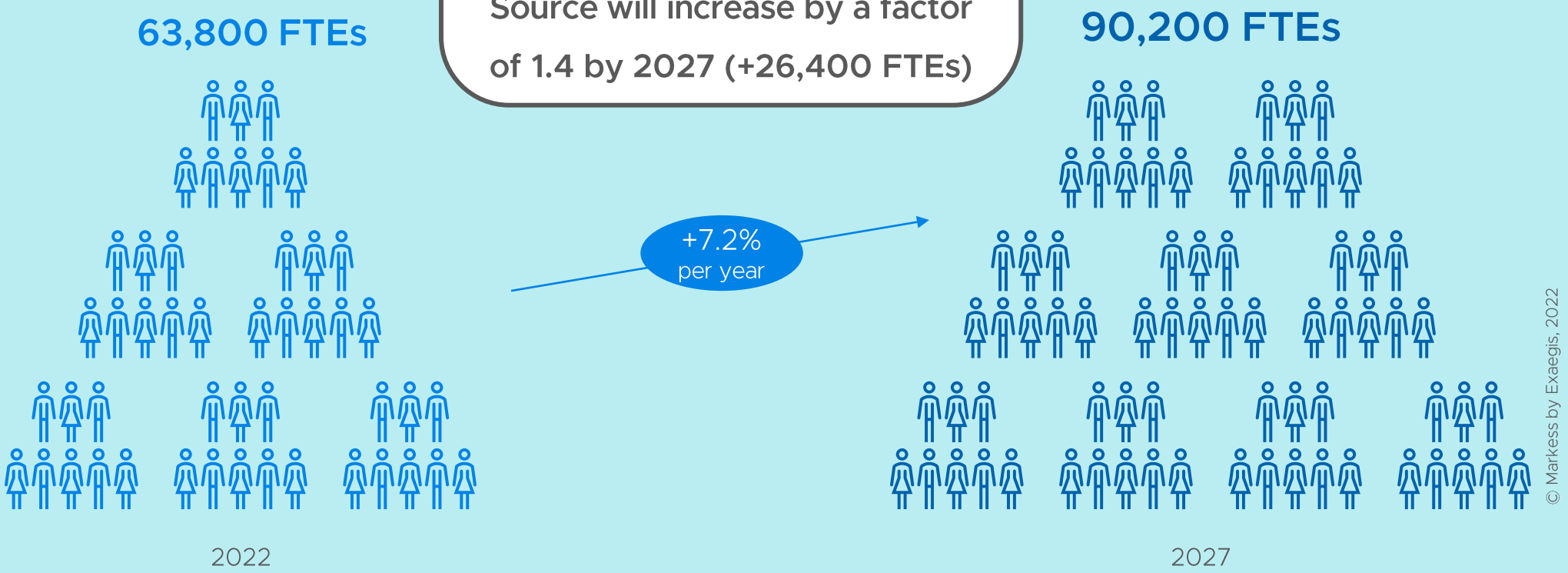
Jobs generated by Open Source

The number of full-time equivalents generated by Open Source will increase by a factor of 1.4 by 2027 (+26,400 FTEs)



FTEs in Open Source Software & Services in France

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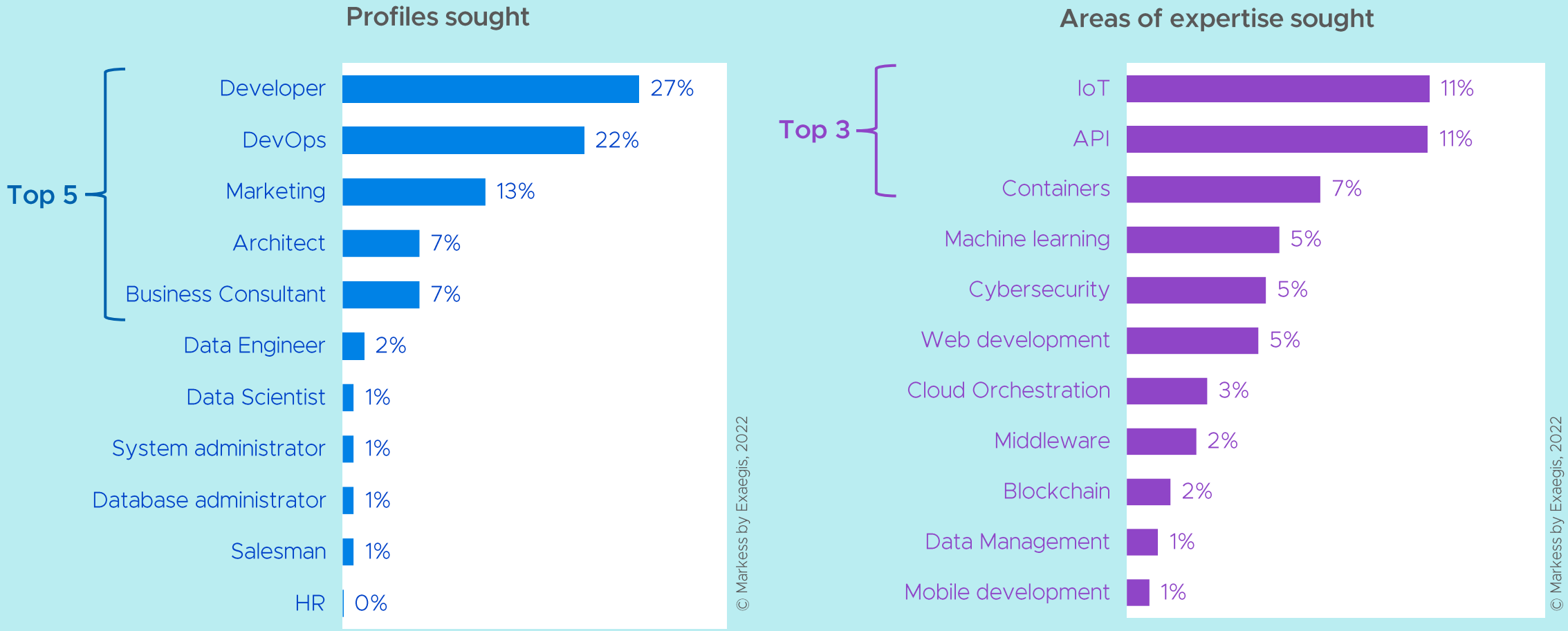
Open Source skills needs



Number of occurrences of the profile or area of expertise among 3,329 job ads containing the keyword "Open Source" on Indeed.com as of 13 October 2022

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Open Source skills needs

Number of occurrences	Technology skills sought after in developers
More than 5,000	Java, Javascript
2,000 to 5,000	PHP, Docker, Python, Linux, MySQL, Symfony, Gitlab
1,000 to 2,000	PostgreSQL, Kubernetes, C++, MongoDB, Android
500 to 1,000	Kotlin, Drupal
100 to 500	Swift, Wordpress, MariaDB, Spark, Magento, Prestashop, Scala, Hadoop, RedHat
Less than 100	OpenStack, Odoo, Ethereum, Asterisk, Cloud Foundry, Dolibarr, Hyperledger

Number of occurrences of technology skill among developer job ads on Indeed.com as of October 13, 2022

Key findings

An Open Source market in France of nearly €6bn by 2022

⇒ A historic rise in power: the Open Source market in France has increased 40-fold in less than twenty years.

⇒ While Open Source represents 11% of the software and digital services market in France, its footprint is even more significant in the services segment with 16% of the market, or €5.5bn in 2022.

⇒ Open Source will grow by an average of 7.8% per year by 2027, which is more dynamic than the total market of 6.3%.

Use of Open Source reinforced by the spread of the Cloud

⇒ In Open Source software, SaaS already represents 29% in 2022 and will become the majority by 2027, as opposed to on-premise software, which is steadily losing ground in the applications field.

⇒ Among the services linked to Open Source, IaaS and PaaS Cloud services are taking a growing share, from 13% in 2022 to 21% in 2027, to the detriment in particular of Infrastructure Management.

Increased need for Open Source skills

⇒ The number of full-time equivalents generated by Open Source will increase 1.4 times by 2027.

⇒ The skills sought are focused on developer, devops, marketing, architect and business consultant profiles, and in the areas of IoT, APIs, containers, machine learning, cyber security and web development.

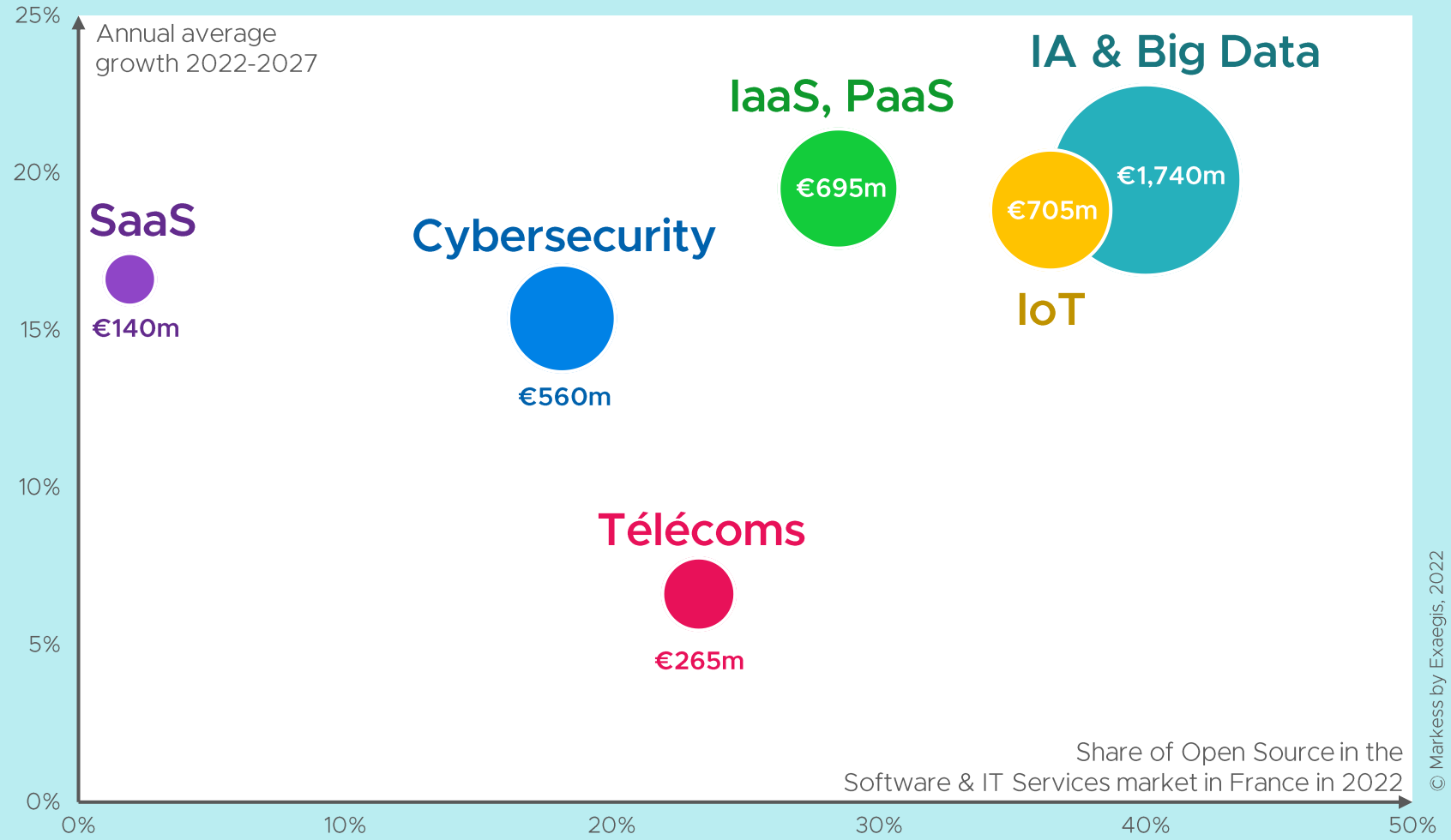
⇒ There are strong demands in terms of programming languages (Java, Javascript, PHP, Python, etc.), technological solutions (Docker, Drupal, etc.), and databases (MySQL, PostgreSQL, etc.), but also in terms of Open Source business applications.

02

Open Source is at the heart of the most dynamic fields

The growth drivers of Open Source

Open Source is a key component in the most dynamic areas of IT



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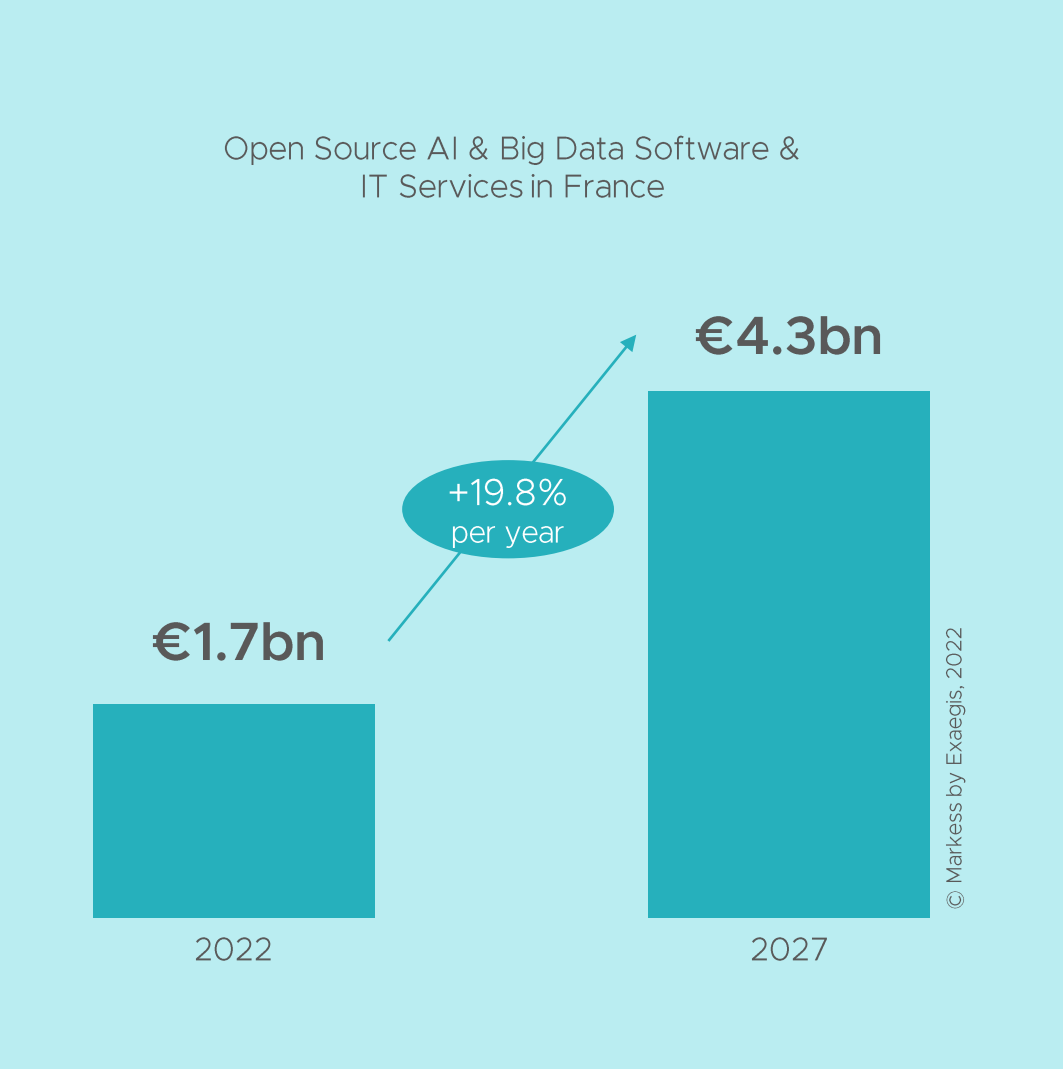
Open Source in AI & Big Data



AI & Big Data spending using Open Source will more than double by 2027

- In recent years, big data, and then AI through machine learning in particular, have become **the main subject of technological innovation** in all sectors of the economy: chatbots for customer relations, intelligent network management, predictive maintenance, autonomous driving, etc.
- **With more than 40% of expenditure linked to Open Source**, AI and Big Data are largely based on open technologies (Hadoop, MapReduce, Spark, etc.). Even more than other dynamic fields, these new fields of R&D are essential for the pooling and dissemination of knowledge at the global level, and for developing the state of the art.
- Spending on AI & Big Data using Open Source will more than double by 2027 to meet the demand from both enterprise users and digital suppliers.

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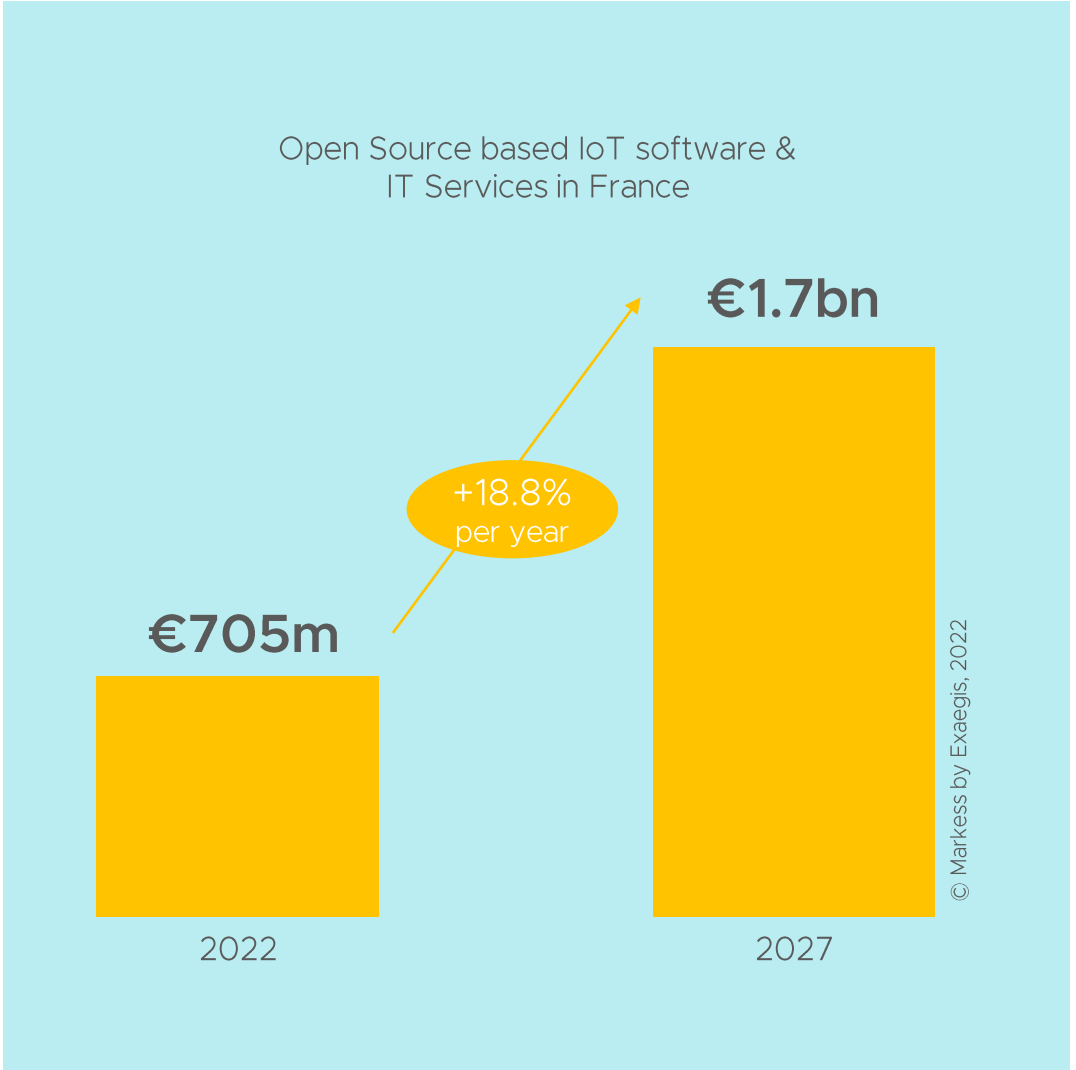
Open Source in the IoT

IoT software & services based on Open Source technologies will generate €1bn in additional spending by 2027

- The particular environments of the Internet of Things (IoT) are conducive to Open Source solutions. Indeed, **they call for connected solutions that are energy-efficient, reliable and fast**, subjects in which Open Source software has proven its worth. All the more so when the IoT requires standards to be established and respected in order to develop in terms of usage.

- **The Open Source IoT market will more than double** in the next 5 years to reach €1.7bn in revenues. Some areas will be particularly dynamic such as traffic management, energy management in buildings, connected health, autonomous vehicles and industry 4.0.

- Platforms and tools such as Node-RED (low code programming), ThingsBoard (platform used by Bosch, Engie or Prosegur), Arduino (platform combining hardware and software to create sensors), Open Remote or Kuzzle IoT (platform used by Eiffage, Veolia, SNCF, Geodis) **are among the most recognised today**. Smile, an Open Source services specialist, has created an Embedded & IoT practice dedicated to the subject.



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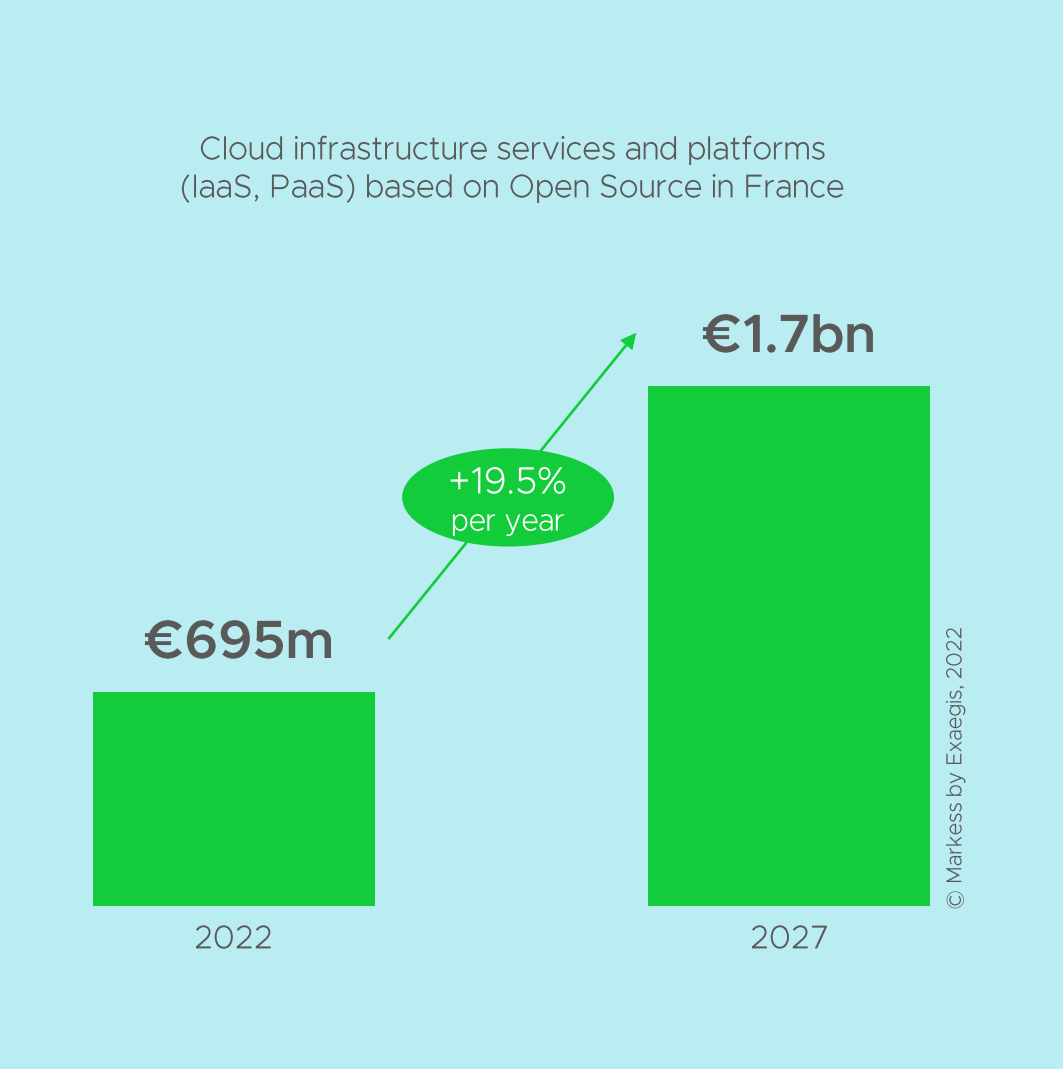
Open Source in IaaS & PaaS Services



Open Source IaaS & PaaS to generate €1 billion in additional spending by 2027

- The trio of Amazon Web Services, Microsoft Azure and Google Cloud account for 70% of the infrastructure and platform Cloud services market (IaaS & PaaS) and more than 80% of its growth, ahead of IBM Cloud and Oracle Cloud. The main French companies positioned in the segment are OVHcloud, Orange Business Services, Scaleway and Outscale. New players such as Platform.sh are also emerging.
- Whether it is American providers or European and French providers, **Open Source technological solutions are the basis of many Cloud services sold**. These include CloudStack, Docker containers, Kubernetes, Prometheus for monitoring and Cloud service management platforms, Keycloak for access and identity management, PostgreSQL, MongoDB or MariaDB for databases, and Parse for serverless solutions with a promising future. Alter Way, an Open Source services specialist, has thus focused on the implementation and management of Cloud infrastructures.
- Google, Microsoft and RedHat remain the biggest contributors to Open Source projects, although AWS is following the trend. Groups of Chinese origin such as Alibaba Cloud, Tencent Cloud or Huawei Cloud are investing massively in Open Source solutions for the creation of their service bricks. These groups are almost absent from the French market, but this should change in the coming years.

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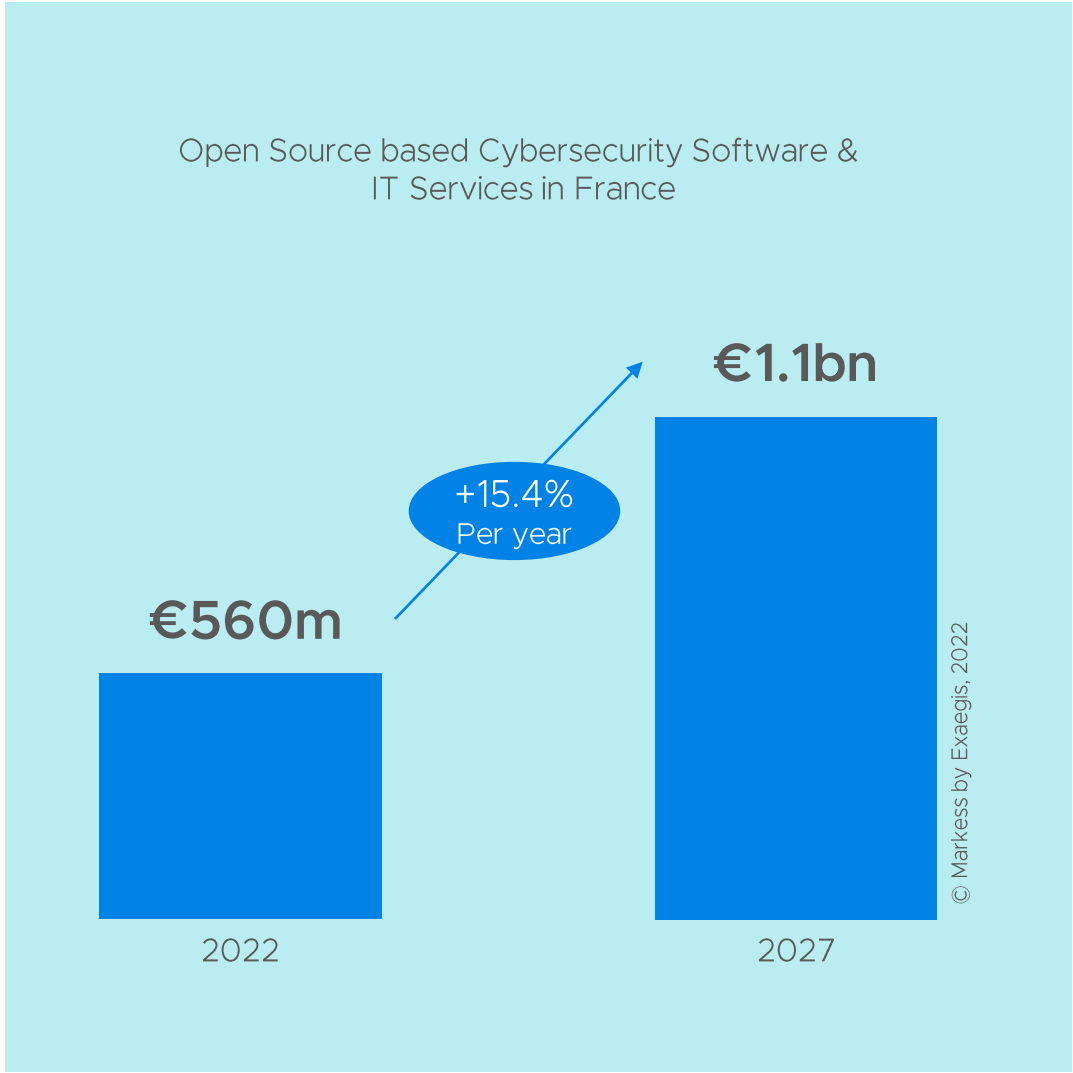
Open Source in Cybersecurity

Cybersecurity software & services based on Open Source technologies to experience double digit growth

- For several years, Open Source has been an excellent alternative for cybersecurity solutions and the market is expected to grow significantly by 2027.
- From now on, **Open Source software covers almost all security needs**: password management, authentication, application firewalls, intrusion prevention and detection systems, infrastructure supervision, log collectors and remote control.
- More and more companies see Open Source **as a way to continuously improve** their response to certain threats, to gain agility and to reduce certain vulnerabilities more quickly.
- The market includes European software and hosting companies such as Alinto, Crowdsec, FactorFX, Mithril Security, Passbolt, Patrowl, Rudder, Worteks, etc.



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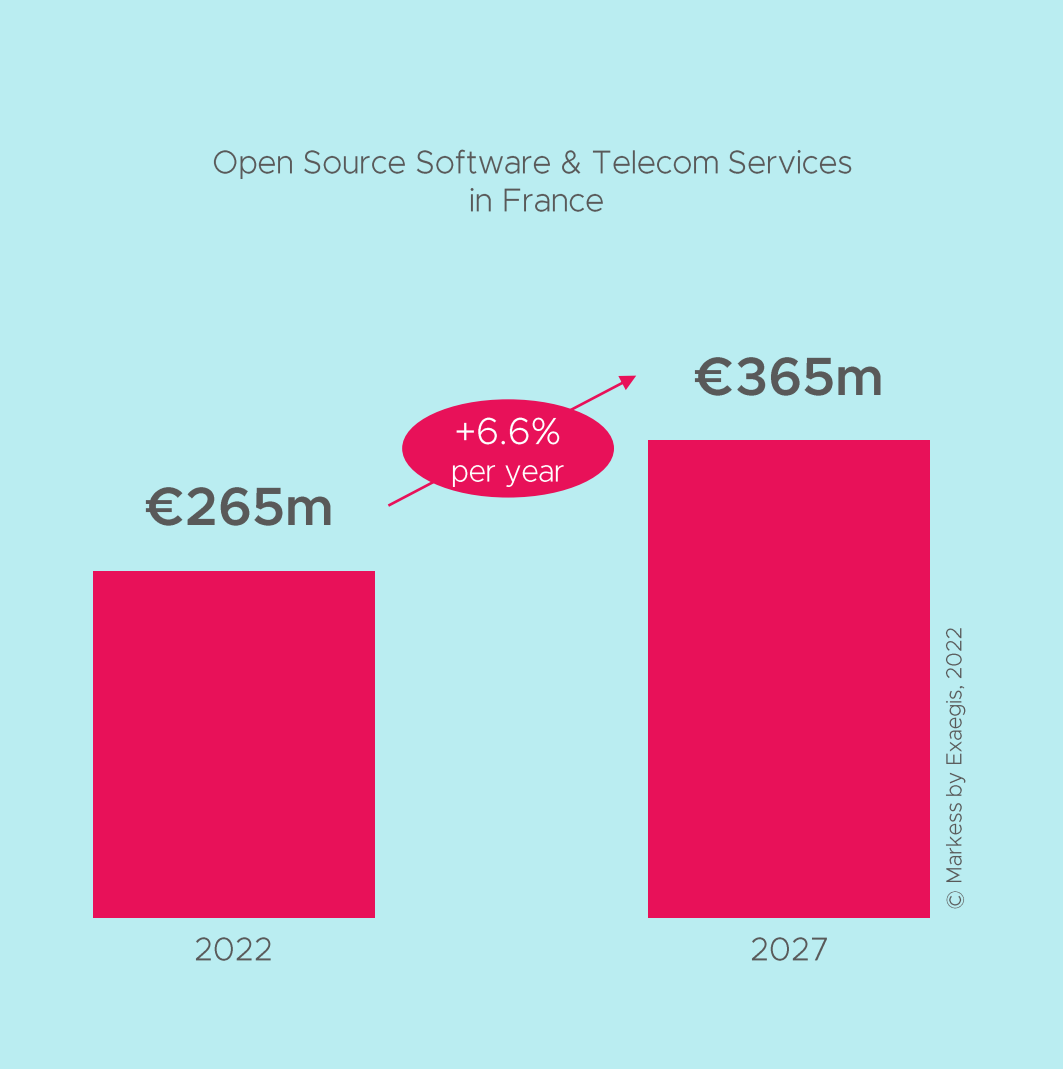
Open Source in Telecoms



Open Source telecom software & services to generate €100m in additional spending by 2027

- Long based on proprietary hardware solutions, telecom services **are increasingly moving towards software solutions** and this movement benefits Open Source software.
- Beyond that, Open Source software is now entering the management of **operator networks** with SDN (Software Defined Networking), NFV (Network Functions Virtualization) solutions coupled with the Cloud. The development of the Open Network Automation Platform (ONAP) is supported by Orange, AT&T, Verizon and Vodafone.
- Many French alternative operators use the Asterisk platform to develop convergent VoIP solutions for their customers.

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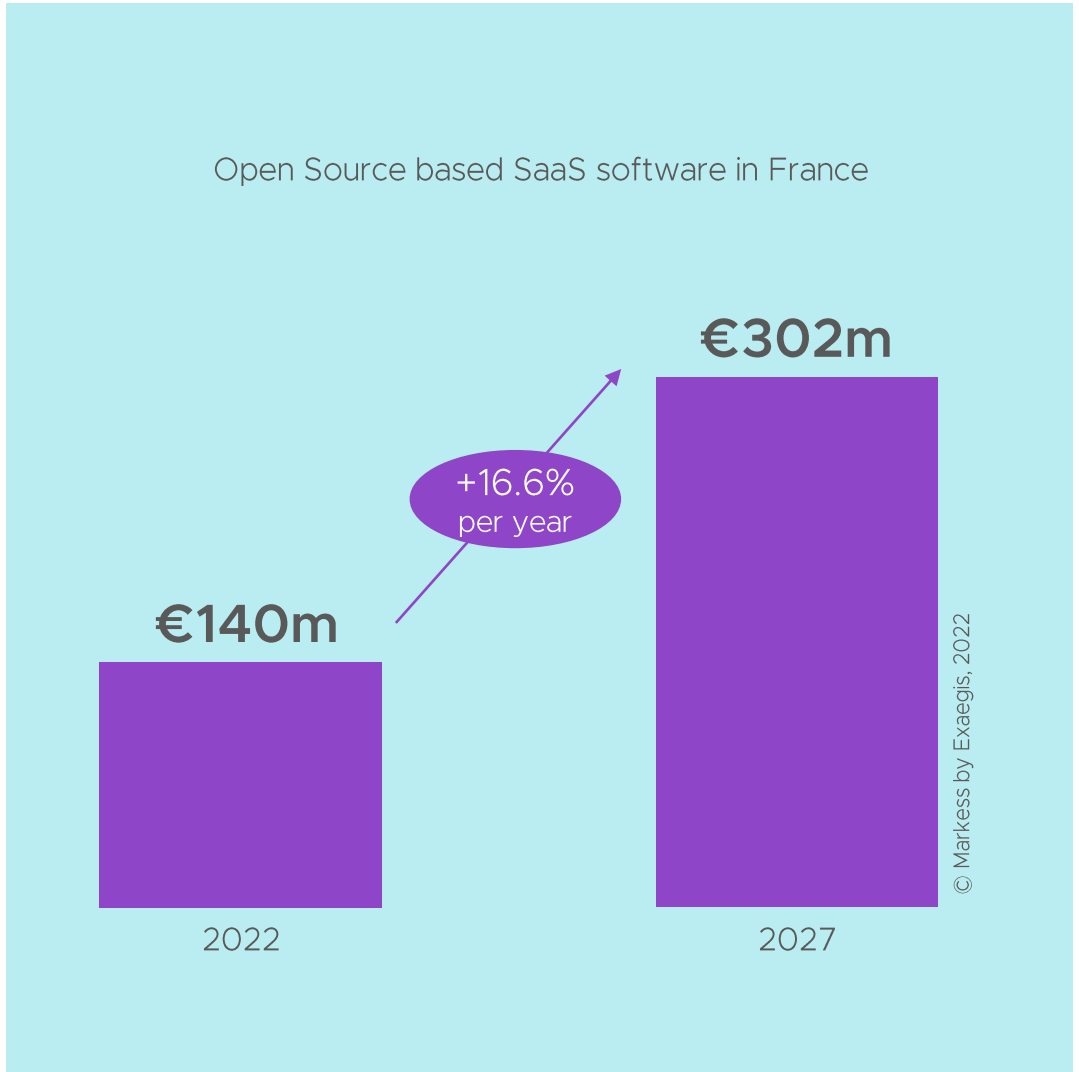
Open Source in SaaS

SaaS software based on Open Source technologies will more than double between 2022 and 2027

- SaaS will **become the dominant model for Open Source business applications** used by companies by 2027, a paradigm shift that represents an opportunity for Open Source players.
- This market is driven in particular by the strong growth of **digital commerce** (up 15% in 2021), an area where Open Source solutions are popular for CMS platforms (Drupal, eZ Publish, Jahia, Joomla, Melis Technology, Wordpress, Xwiki, etc.) and for e-commerce platforms (Drupal Commerce Magento, Prestashop, etc).
- Software publishers also **offer business applications on an Open Source model** for ERP (Axelor, Compiere, Dolibarr, ERP5, ERPNext, Metasfresh, Odoo, etc.), CRM (Abilian, OroCRM, SuiteCRM, Vtiger, etc.), collaboration (Bluemind, Liferay, Zextras, etc.), databases (JasperSoft, Jedox, Pentaho, etc.), ECM (Alfresco, CEO-Vision, Maarch, Nextcloud, Nuxeo, etc.) and office automation (Collabora, CryptPad, OnlyOffice, etc.).



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Key findings

Open Source plays a key role in the most dynamic areas

⇒ Open Source is omnipresent in the most dynamic areas of IT, with essential technological building blocks, particularly in the areas of transformation towards Cloud infrastructures or the use of Big data and machine learning.

⇒ Open Source technologies represent a means of continuous improvement for digital players and user organisations to meet their need for agility and to cope with cyber threats.

A correlation between Open Source and innovation

⇒ Emerging areas of digital innovation, such as AI and IoT, rely heavily on Open Source, which accounts for between a third and a half of spending on software and IT services.

⇒ Open Source helps to stimulate innovation by accelerating collaboration and the sharing of technological knowledge between different actors such as software and IT services providers, companies, higher education and research.

A use that extends to new issues

⇒ Telecom services are increasingly using Open Source software solutions, especially for the management of operator networks and the development of VoIP solutions.

⇒ SaaS applications, which are gradually overtaking the traditional on-premise model, are also seeing a growing number of Open Source alternatives to proprietary applications, due to the flexibility and customisation possibilities they offer.

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03

Open Source on a European level

The Open Source market in Europe in 2022 (vs 2021)

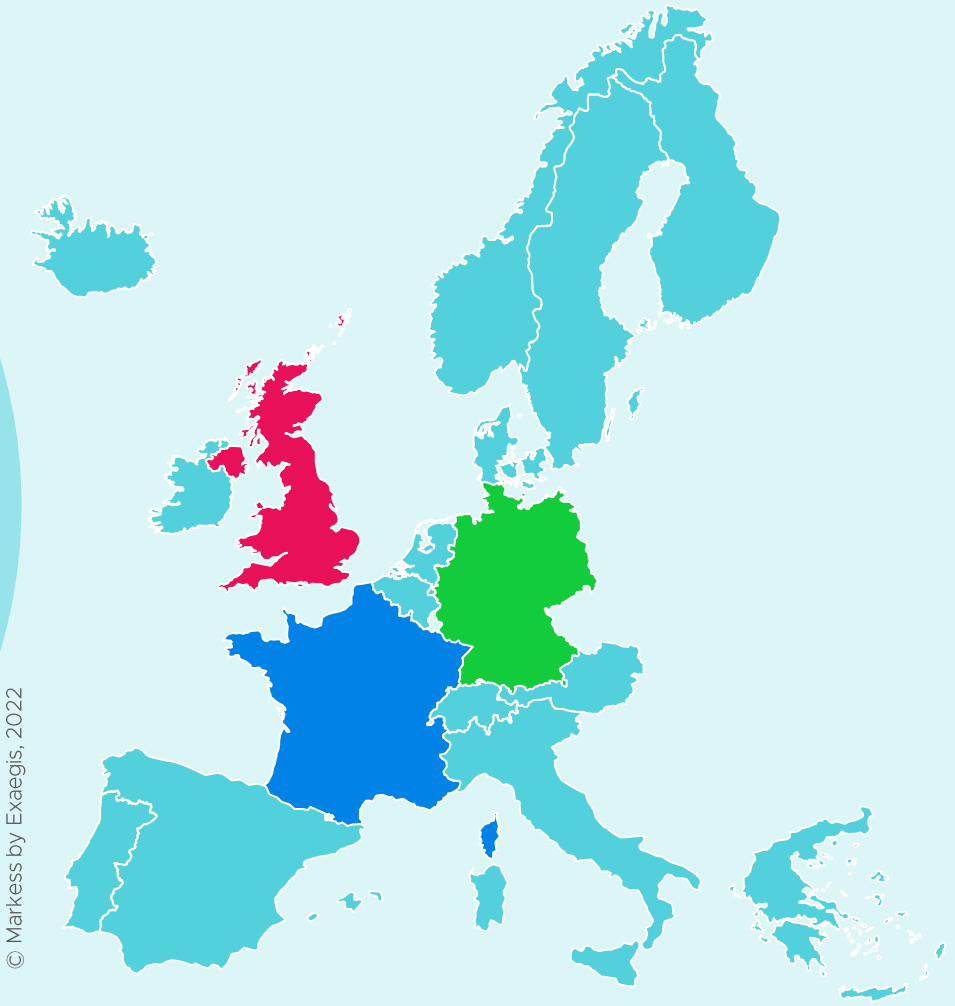
France, the driving force behind Open Source in Europe

United Kingdom
€5.5bn
+8.2%

France
€5.9bn
+8.6%

Germany
€5.2bn
+6.9%

Western Europe
€26.1bn



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The Open Source market in Europe from 2019 to 2027

€ Millions	2019		2022		2027	CAGR 19/22		21/22		CAGR 22/27
France	5,320	...	5,935	...	8,660	3.7%	...	8.6%	...	7.8%
Germany	4,685	...	5,210	...	7,450	3.6%	...	6.9%	...	7.4%
United Kingdom	4,979	...	5,530	...	8,030	3.6%	...	8.2%	...	7.7%
Rest of Western Europe	8,398	...	9,430	...	13,960	3.9%	...	8.4%	...	8.2%
Open Source Software & Services in Western Europe	23,382	...	26,105	...	38,100	3.7%	...	8.1%	...	7.9%

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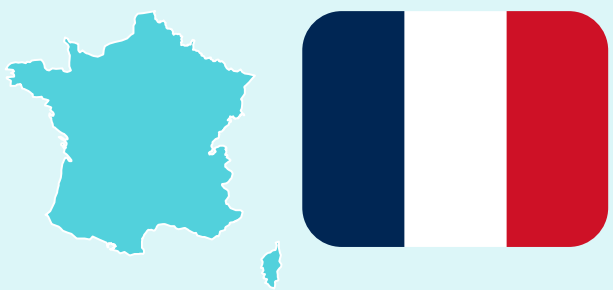
Country specificities



- France is **the European market leader** for Open Source.
- Open Source suppliers and service providers are **mostly very mature micro enterprises and SMEs** and most of them seem to be able to expand internationally
- The Open Source sector will see its **workforce grow by almost 7.2% per year between 2022 and 2027** to reach 90,000 FTEs. However, the industry is likely to face **a skills shortage in the coming years.**
- **An Open Source Software and Digital Commons Action Plan** was presented in November 2021 with the aim of strengthening the use of Open Source software in the administration, developing the opening up of public source codes, and using Open Source software to strengthen the attractiveness of the State as an employer.

- Open Source is growing strongly in Germany both in industry and in the public sector. The main drivers are **the growth of commercial offerings** as well as public cloud-based services mainly powered by Open Source software.
- Successive governments have launched Open Source **initiatives to meet the demands of government** in terms of functionality, openness, security and data protection. Support for initiatives such as "Public Money - Public Code" or the creation of a centre for digital sovereignty are solid foundations for future engagement.
- Several funding projects have been announced by the German government in favour of Open Source.
- Furthermore, IT is still dominated by closed source software and this legacy weighs heavily, but politicians have particularly recognised Open Source as a driver for the digitalisation of the state.

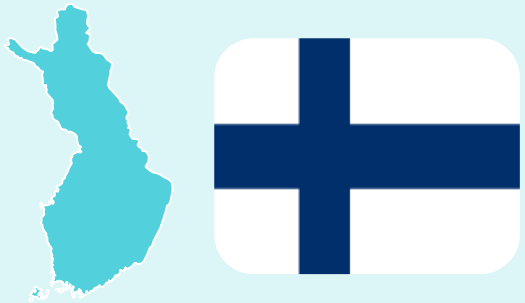
Country specificities

- The Open Source market continues to grow in the UK and is gaining market share in Europe and globally.
- The main reasons for adopting Open Source remain **cost** savings but also ease of collaboration and **skills development**.
- Its use has been widely democratised within companies and some heavy industries give priority to its use.
- **The public sector** is turning to Open Source for skills development, but too few organisations are actually using it.

- Italy is well engaged in the Open Source market. More than two thirds of companies use these tools, but it is in **the public sector** that this type of software is most widely used, since the vast majority of new projects are published under an Open Source licence.
- **The Agency for Digital Italy (AgID)** is the main governmental actor in charge of coordinating, promoting and drafting Open Source policies in Italy.
- Since 2017, **Developers Italia**, an AgID project working in collaboration with the Ministry of Technological Innovation and Digitisation, have been forming a community dedicated to the development of Open Source software supporting the delivery of digital public services in Italy.

Country specificities

- Spain provides many examples of the adoption of Open Source software by **local, regional and national authorities**. The city of Barcelona, for example, has chosen to migrate its information system to Open Source software.
- Nevertheless, Open Source software **is still not widely used by companies.** This is due in particular to a lack of local players to drive the market upwards.



- Finland is **a leading country for Open Source**. The use of Open Source software is a **priority for public administrations.**
- The government has also required open interfaces to its suppliers when procuring new systems in the public sector.
- On the business side, the market is made up of small specialized services providers but also large players.

Country specificities

- Portugal was **the first European country to adopt a national Open Source law** to encourage the use of Open Source alternatives in the public sector. However, the administration is still largely dependent on proprietary technologies.
- The Agency for the Modernisation of Administration (AMA) has just published a blueprint for the whole of public administration that promotes a non-partisan approach to technology and more Open Source.
- SMEs know little about Open Source solutions, whereas most large companies already use them extensively.
- The academic world uses Open Source for teaching and research, but does not yet use it for organisational purposes.

Focus on Open Source in the EU

- The Open Source market in the European Union (EU) is worth between **€25 and €30 billion by 2022*** and is **growing in importance within the EU**, both in business and in government institutions, and the EU is making a significant contribution to its development worldwide. The reasons for this appetite for Open Source are not only the lower costs of solutions but **also the EU's digital sovereignty issues.**
- In the "*Strasbourg Declaration on Common Values and Challenges for European Public Administrations*" of 2022, the Ministers of Public Administration of the Member States committed themselves **to promoting Open Source software within public administrations** by recognising its many advantages: mutualisation of investments, transparency, interoperability, technological independence, intra-EU collaboration.
- These measures are the result of a **strategic line** announced by the European Commission in 2020, which aims to increase the sharing of Open Source projects among EU states and to extend their collaboration on the deployment of Open Source software.
- The European Commission considers that progress still needs to be made in public administrations, even though some Member States are examples in this field. This can be explained by **the partial or total absence of public directives in some countries** and by a lack of concrete implementation of these.
- According to the European Commission, it is rather SMEs and micro enterprises, both on the supplier and the user side, that are contributing to the growth of Open Source in the EU, which marks a difference with the United States where the subject is driven by large companies such as GAFAM.

* Rough estimate by Markess by Exaegis

Key findings

Strong and growing use of Open Source in Europe

⇒ Open Source is identified as a strategic lever not only to foster innovation through its collaborative power, but also to develop digital sovereignty on a European scale.

⇒ The EU encourages the use of Open Source alternatives within the administrations of its Member States through a strategy of promoting and making available Open Source software developed within the EU. The promotion to businesses remains to be developed.

⇒ Policies to support Open Source software in the different countries analysed are more or less marked. However, there is a strong awareness of public authorities since the last study and a stronger investment from the European Commission regarding Open Source strategies.

France is the European leader in free software

⇒ 5.9 billion, France is Europe's largest and most dynamic Open Source market, benefiting both from its Open Source ecosystem and the role of supportive public policies.

⇒ The other two major Open Source user countries, the UK and Germany, are also experiencing government initiatives in favour of Open Source, with interest reinforced by the need to digitise government services.

Initiatives across Europe

⇒ Open Source is identified by most governments as a lever for sovereignty and modernisation of public services.

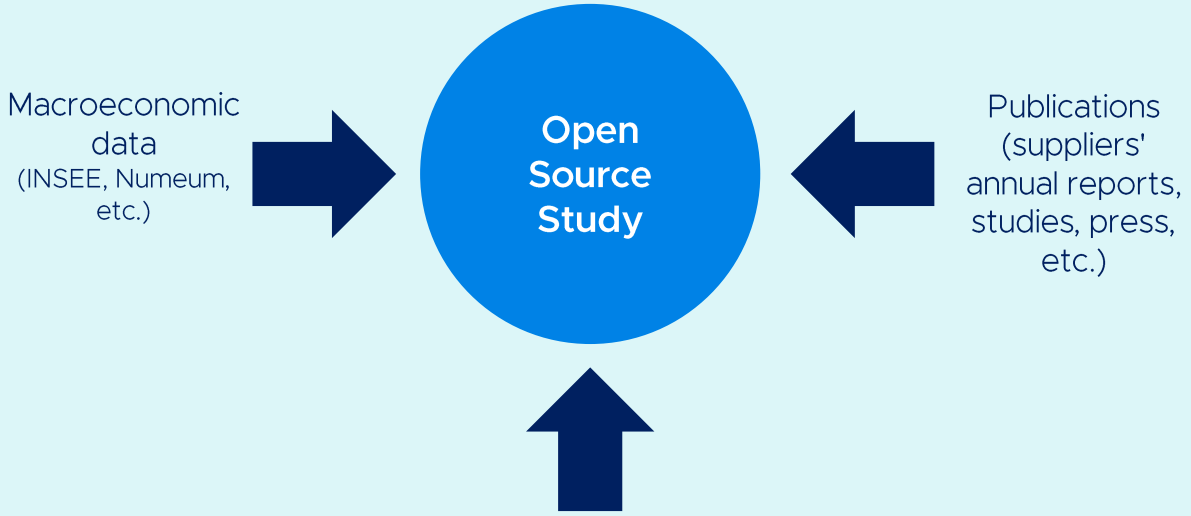
⇒ The adoption of Open Source technologies by companies remains a common challenge in most countries. The requirement for open technologies in public procurement is a possible way to reinforce this diffusion towards private actors.

Methodology

Quantitative analysis

The market estimates and growth forecasts presented in this study are based on the analysis of the revenues of the suppliers present in the different market segments analysed and on available public data (macro-economic data, publications).

Analysis model



Qualitative analysis

The analyses and comments presented in this study are based on interviews with software vendors and IT services providers in the market segments analysed, on the publications of these players, and on available public studies (see Contributors & sources s.37).

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Contributors & sources

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Founded in 1997, Markess by Exaegis is the leading research and consulting company on IT and digital topics in France. The foundation of continuous research, combined with customised studies and consultancy, enables the leaders of companies and public organisations as well as solution providers to obtain the information, support and essential tools they need to grasp the major challenges and issues of their digital transformation and achieve their objectives.

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