BoR (22) 184

Study on Communication Services for Businesses in Europe: Status Quo and Future Trends

FINAL REPORT

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A study prepared for the BEREC by:

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Acronyms

Acronym	Definition
ADSL	Asymmetric Digital Subscriber Line
CDN	Content Delivery Network
Centrex	Central exchange
CRM	Customer Relationship Management
DDoS	Distributed Denial of Service
ERP	Enterprise Resource Planning
FTTH	Fibre To The Home
FTTO	Fibre To The Office
GPON	Gigabit passive Optical Network
IaaS	Infrastructure as a Service
IoT	Internet of Things
M2M	Machine to Machine communication
Mbps	Megabit per second (Mbit/s)
MPLS	Multi-Packet Label Switching
PBX	Private Branch Exchange
QoE	Quality of Experience
QoS	Quality of Service
SaaS	Software as a Service
SASE	Secure Access Service Edge
SDSL	Symmetric Digital Subscriber Line
SD-WAN	Software Defined Wide Area Network
SLA	Service Level Agreement
SME	Small and Medium Enterprise
SOHO	Small Office - Home Office
TTR	Time To Repair
UCC or UC&C	Unified Communications & Collaboration
VDSL	Very High-Speed Rate Digital Subscriber Line
VHCN	Very High Capacity Network
Xdsl	Generic to replace ADSL, VDSL, …

Executive summary

The vast majority of business users (enterprises and public administrations) in Europe has adopted fixed high-speed broadband based on Very High Capacity Network (VHCN) connections, as shown by the last Digital economy and society statistics. In parallel, the digitalisation of businesses has intensified, and even more during the Covid-19 crisis. This increased usage is accompanied by the migration of IT (Information Technology) services toward the "Cloud", defined as flexible and on demand access to services like Software as a Service (SaaS), computing power, storage capacity, etc.

European National Regulatory Authorities (NRAs) regulate wholesale markets which are upstream of the business services retail markets[1] (mainly wholesale markets 1 and 2 of the European Commission Recommendation from 2020[2]) with the goal of promoting investment and competition at the retail level. In order to effectively regulate these wholesale markets, a thorough view and understanding of both business users' demand, operators' offers and the dynamics on the business retail markets is key.

To have a global vision of the market, both the demand side and the supply side have been investigated in five large countries among the BEREC members, namely France, Germany, Italy, Poland, and Spain (66% of the European population). To analyse the demand side, a pan-European survey among business users, with 1,000 respondents (200 in each country), was conducted. The analysis of the supply side was based in a large part on qualitative interviews with operators in the same five countries as the demand-side analysis. In addition, desk research was carried out to identify trends and statistics that have already been documented.

The demand side survey first shows that the actual provided bandwidth is not an issue for many business customers as the speed enabled by fibre fulfils and exceeds their needs. More largely, these users appear to be mostly satisfied with their ECS (Electronic Communication Services) solutions: more than 90% are satisfied with the quality of service provided and 78% are satisfied with the prices (however, 7% of large organisations are dissatisfied on that point).

Business customers also appear in majority satisfied with their suppliers on all the other subjects addressed by the questionnaire: contractual relationship, duration of the contracts, ability to choose their supplier, etc.

[1] See also BoR (22) 185 BEREC report on regulatory treatment of business services

[2] Commission Recommendation (EU) 2020/2245 of 18 December 2020 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation

The fear of difficulties in switching operator described in the literature and mentioned by suppliers in the qualitative interviews was not clearly borne out by the demand-side survey, where respondents did not report any significant difficulties, except for a minority of them reporting technical complexity related to migration (up to 33% for large organisations) or costs issues (up to 18% for Small and Medium Enterprises -or SMEs-).

Among operators, a variety of positioning on the market was observed. First, large operators, well established in the consumer market, address all the range of business consumers from SOHO (Small Office - Home Office) and SMEs to large enterprises and often also trans-national organisations. Others commercialise a variety of ECS and IT services and insist on their ability to customise solutions, a positioning that matches rather large organisations' needs. Finally, some suppliers focus on the largest organisations or even the trans-national ones, considering that their needs are specific enough to justify the implementation of solutions dedicated to them.

With regards to the bundling of services, the survey shows that the practice is well established, with 90% of them buying a bundled telecom subscription and 50% a telecom/IT bundle. Furthermore, 30% of organisations feel that they have no choice but to subscribe to a bundled offer. The electronic communication services that are found in bundles are fixed and mobile access as well as VPN. IT services bundled with ECS are mainly security (firewalling, anti-DDoS), cloud storage or server hosting, UCC (Unified Communications and Collaboration) or SD-WAN (Software Defined - Wide Area Network). However, it should be highlighted that the frontier between pre-defined bundles and customised solution is not always clear for end-users.

Regarding the contractual relationship, it appears that the specifics of contracts generally satisfy both parties. Minimum contract duration seems to be set between 2 and 3 years, but contracts last generally significantly longer. Business users and suppliers appear to have long-established relationship typically spanning from 2 to 10 years on average. At the expiry of contracts, smaller organisations usually negotiate the contract renewal with the same supplier, while larger ones make more frequent use of competitive tendering.

Reflecting on future trends, all operators agree on the fact that traditional electronic communication revenues will decrease, while IT-services have the greatest potential for development in the coming years. SD-WAN should be particularly highlighted as many operators mentioned that it as a "game changer". Likewise, UCC become more widespread and blur the lines between services to be provided by traditional ECS operators or new suppliers.

ECS providers increasingly include IT services in their offers. Most operators consider that even though the two segments are moving closer together, convergence should not be expected as they both have their specificities and require specialised skills. Therefore, they will most probably continue to collaborate, particularly on specific or highly technical offers. The customisation of offers to match the need of all type of business users and be able to differentiate themselves from competitors becomes always more important. This customisation now includes ECS and IT services.

1 Business market in Europe

On 9 March 2021, the European Commission presented a vision and paths for Europe's digital transformation by 2030. Infrastructure is one of the four axes identified, with Gigabit for all and 5G everywhere among the associated objectives. As stated in its 2022 DESI report, European Commission announces an "unprecedented" financial support to respond to the increase in needs.[3]

Business users continue to switch massively to fibre optics. For example, 59% of French companies not equipped with fibre optics want to adopt it within three years.[4] However, the switch to fibre varies greatly according to the size of the company: the smaller the company, the lower the adoption rate.[5] The last Digital economy and society statistics (

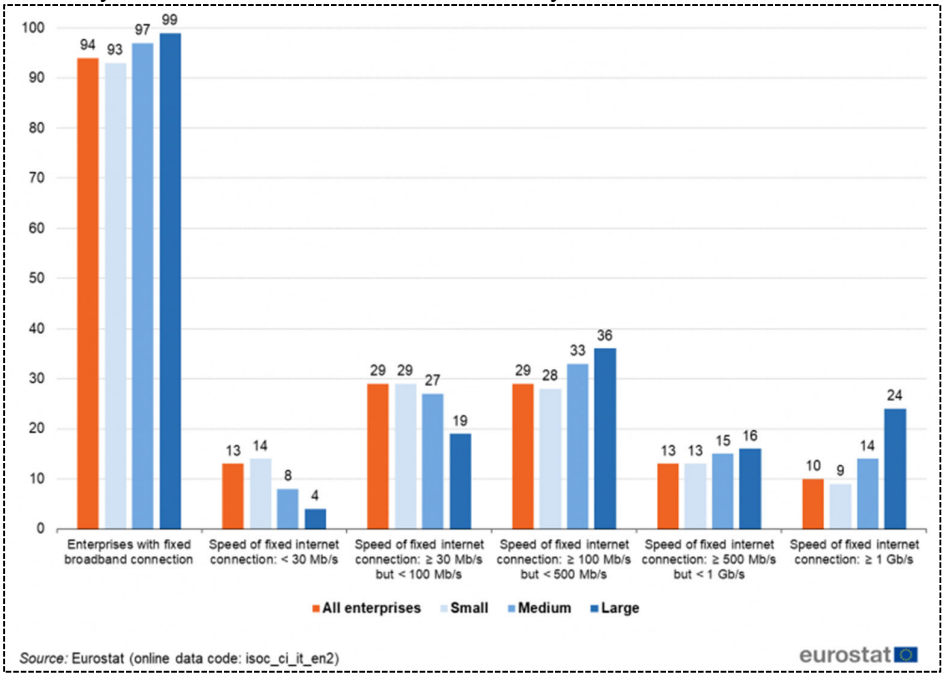


Figure 1.1) shows that the vast majority of organisations among Europe has adopted fixed broadband and even superfast broadband (more than 30 Megabit per second -or Mbps-).

[3] European Commission, *Digital Economy and Society Index (DESI)*, 2022.

[4] Les Echos, *Pour la première fois, plus d'une entreprise sur deux utilise la fibre*, 7 Sept 2022.

[5] *Id.*

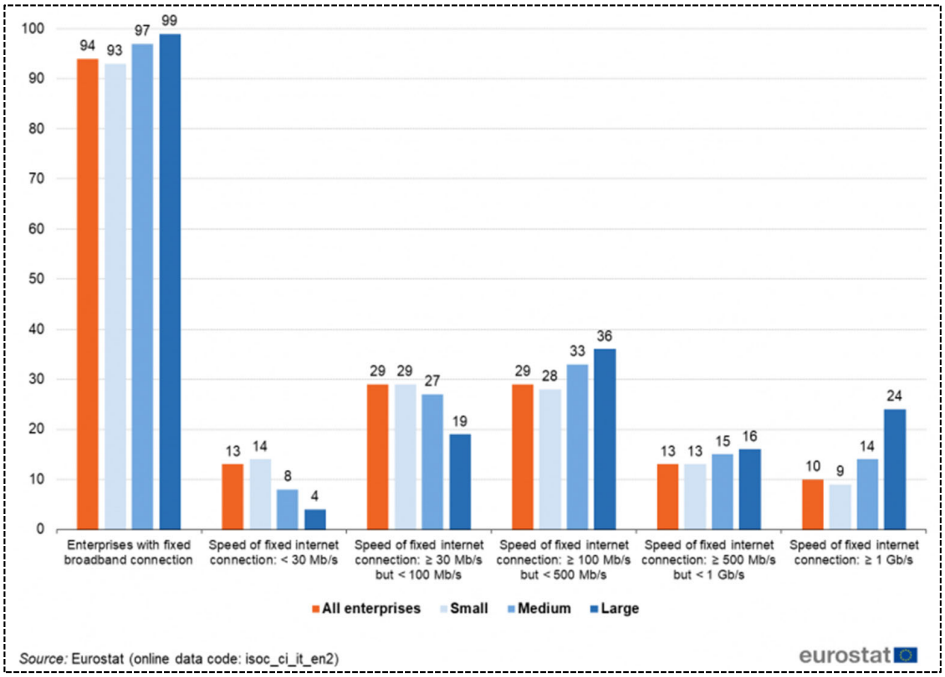


Figure 1.1: Enterprises with fixed broadband connection, by size class and speed, EU, 2021 (% of enterprises) - Source: Eurostat, Digital economy and society statistics

Beyond infrastructure, the Covid-19 crisis has had, for the second year in a row, a considerable impact on the telecommunications sector.[6] Surveys show that 70% of SMEs worldwide have intensified their digitalisation in response to the health crisis.[7] This intensification can be seen by the increasing number of web sites (78% of EU enterprises in 2021) or the use of e-business solutions such as ERP (Enterprise Resource Planning) or CRM (Customer Relationship Management) applications (38% of EU enterprises of which 81% of large enterprises). This increased usage is accompanied by the migration of IT toward the “cloud”, defined as flexible, on demand access to services like software, computing power, storage capacity, etc. (Figure 1.2).

[6] Autelsi, *XIII encuesta de satisfacción de usuarios de servicios de telecomunicaciones*, 2021.
[7] OECD, *The Digital Transformation of SMEs*, 2021.

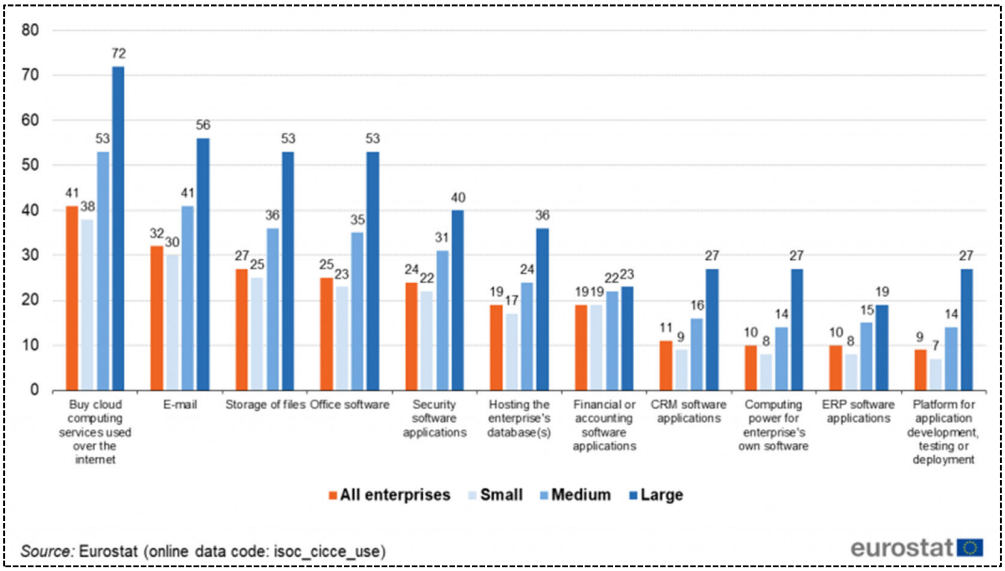


Figure 1.2: Use of cloud computing services in enterprises, by type of cloud service and size class, EU, 2021 (% of enterprises) - Source: Eurostat, Digital economy and society[8]

There are still significant differences in digital adoption between small companies (10-49 employees) and larger ones, with the gap even widening.[9] This is a cause for concern, as digitalisation is an important driver of productivity, therefore such a gap can increase inequalities.[10] Large companies spend half of their digital budget on IT applications, whereas the budget of SMEs and small businesses is currently directed towards voice and data services for the main part.[11]

New usages, such as making a call via a videoconferencing application and not with a fixed phone (more generally known as UCC, Unified Communications and Collaboration), even to a client, are taking hold.[12] The growing place taken by the electronic communications and IT is also demonstrated by the rising interest in 5G networks and the development of technologies it supports, such as the Internet of Things -or IoT- (according to Eurostat[13] 29% of all EU enterprises used IoT devices in 2021) and others with which it is enriched, such as artificial intelligence.[14] 5G

[8] Eurostat - Digital economy and society statistics – enterprises (data extracted January 2022) https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Digital_economy_and_society_statistics_-_enterprises#Access_and_use_of_the_internet

[9] OECD, *The Digital Transformation of SMEs*, 2021.

[10] *Id.*

[11] Deloitte, *B2B, igniting the new telco value engine*, 2016.

[12] Les Echos, *Nouvelles règles du jeu marché télécom entreprises*, 24 Aug. 2022.

[13] Eurostat - Digital economy and society statistics – enterprises (data extracted January 2022) https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Digital_economy_and_society_statistics_-_enterprises#Access_and_use_of_the_internet

[14] Autelsi, *XIII encuesta de satisfacción de usuarios de servicios de telecomunicaciones*, 2021.

and IoT are considered among the technologies with the most development potential.[15]

These changes are here to stay, given the benefits that companies are reaping from the new model, and there is still a strong need for advice, support and guidance to cement the transition, manage the risks and exploit the full potential of the tools.[16] One of the main obstacles to overcome is the lack of awareness of the potential of digital technologies and the lack of skills and technical expertise among employees to integrate basic or advanced digital technologies into business operations.[17]

Businesses' needs are therefore evolving towards incorporating IT services, but the path to transforming telecom operators' offerings is complex.[18] Large telecom operators have often struggled to position themselves in the business segment because this market involves smaller volumes and more complex products to sell,[19] and they are not responsive enough, according to some analysts.[20] Operators do so either through internal transformation or acquisition but have often failed to evolve their combined offering.[21] Telecom operators are often relegated by integrators to the status of an extra.[22] Telecom operators seek to develop IT offerings, especially cloud, around core telecom offerings, but find themselves in direct competition with domain experts.[23]

The stakes are high, as business services consisting of electronic communication services or based on them are a key input to ensure that European companies and public administrations can benefit from the digital economy, allowing for a better provision of new innovative services for citizens, an increase of productivity, efficiency and for competing in a globalised world.

Most National Regulatory Authorities (NRAs) regulate wholesale markets which are upstream of the business services retail markets[24] (mainly wholesale markets 1 and 2 of the European Commission Recommendation from 2020[25]) with the goal of promoting competition and investment at the retail level. In order to effectively regulate these wholesale markets, a thorough view and understanding of both business users' demand and operators' offers but also of the dynamics on the business retail markets is key.

To this purpose, the Body of European Regulators for Electronic Communications (BEREC) decided to conduct a study that aims to bring new insights on European

[15] Accenture, *B2B growth in the communications industry: from network to networth*, 2019.
[16] OECD, *The Digital Transformation of SMEs*, 2021.
[17] European Commission, *Digital Economy and Society Index (DESI)*, 2022.
[18] Deloitte, *B2B, ingniting the new telco value engine*, 2016.
[19] *Id.*
[20] PWC, *Unlocking growth in the B2B telecom segment*, 2018.
[21] Deloitte, *B2B, igniting the new telco value engine*, 2016.
[22] *Id.*
[23] *Id.*
[24] See also BoR (22) 185 BEREC report on regulatory treatment of business services
[25] Commission Recommendation (EU) 2020/2245 of 18 December 2020 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation

business services. The findings of this study are presented in this report, which provides a European view on the characterisation of the business demand for electronic communication services[26] (ECSs) and their relations with and IT services,[27] considering both the current situation and the future trends in the next 2-3 years.

The present report characterises the nature and evolution of demand for different types of business customers (SMEs, large firms, public administrations, multinational companies) and trends in competition among traditional ECS providers and competition/cooperation between ECS providers and relevant service providers offering IT services. Furthermore, it gives a comprehensive view on how the demand is sensitive to the size of the business and the number of sites to be connected.

Finally, the study provides a European view on the typologies of the demand side and key supply-side actors present in the business market and the way their product portfolios are evolving.

[26] ECS are services normally provided for remuneration via electronic communications networks, which encompasses the following types of services: internet access service, interpersonal communications service and transmission services used for the provision of machine-to-machine services and for broadcasting

[27] IT Services cover solutions such as of computers to store, retrieve, transmit and manipulate data or information, typically used within the context of business operations as opposed to personal or entertainment technologies. In this report, the main IT services cited are cloud storage and computing (incl. IaaS, PaaS, SaaS), UCC, Security and firewalling.

2 Methodology

In order to get a comprehensive vision of the business markets in Europe, this study considered both the demand and the supply side. Investigations were carried out in five large countries among the BEREC members, namely France, Germany, Italy, Poland, and Spain. This focus gives a view on major countries with regards to their GDP with a broad geographical scope (Western, Southern and Eastern Europe) and various maturity of digital integration. For the demand-side survey, it allows building robust samples per country with diverse profile in terms of company size and sectors and excludes too specific smaller countries. Consequently, the results of this report provide a general vision at the European level, but the situation of specific countries may differ from the aggregated view.

In addition, desk research was carried out to identify the trends and statistics that have already been documented in the literature (reports, press articles and white papers). The available literature proved to be heterogeneous, on the one hand, because few reports deal with the topics that are of direct interest to BEREC in the context of this study. This work on the existing literature has nevertheless made it possible to contextualise and discuss the results obtained through the interviews.

2.1 Demand side survey

The demand side was investigated by conducting a large and pan-European survey among business users with 1,000 respondents, decision-makers or co-decision makers in the area of ECS and IT services in their organisations (managers, IT managers, purchasing managers, CEO, etc.).

The sample was structured as follows in order to have a lecture per company size:

- 10-100 employees: 412 interviews
- 100-250 employees: 290 interviews
- 250-500 employees: 149 interviews
- 500 employees and more: 149 interviews.

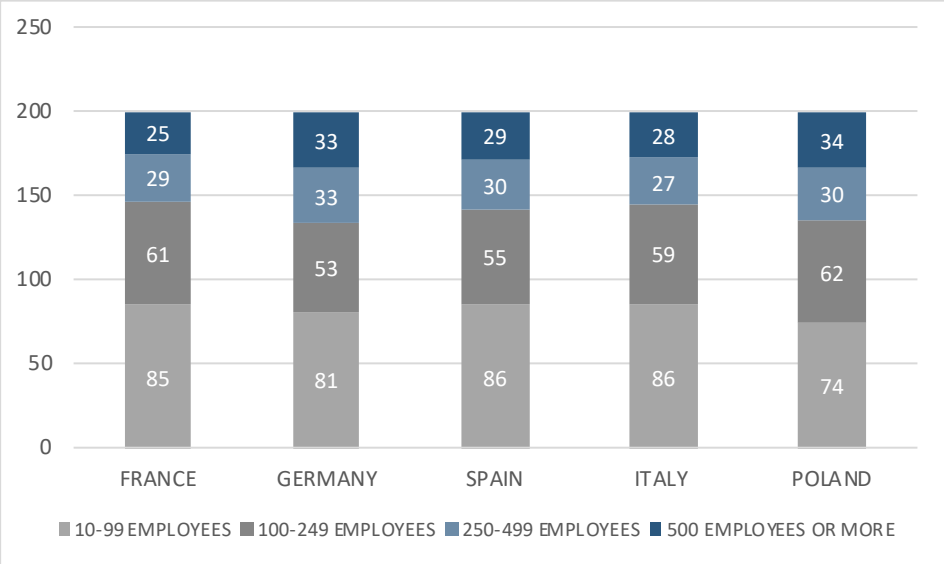


Table 2.1: Number of interviews, per country and per organisation‘s size

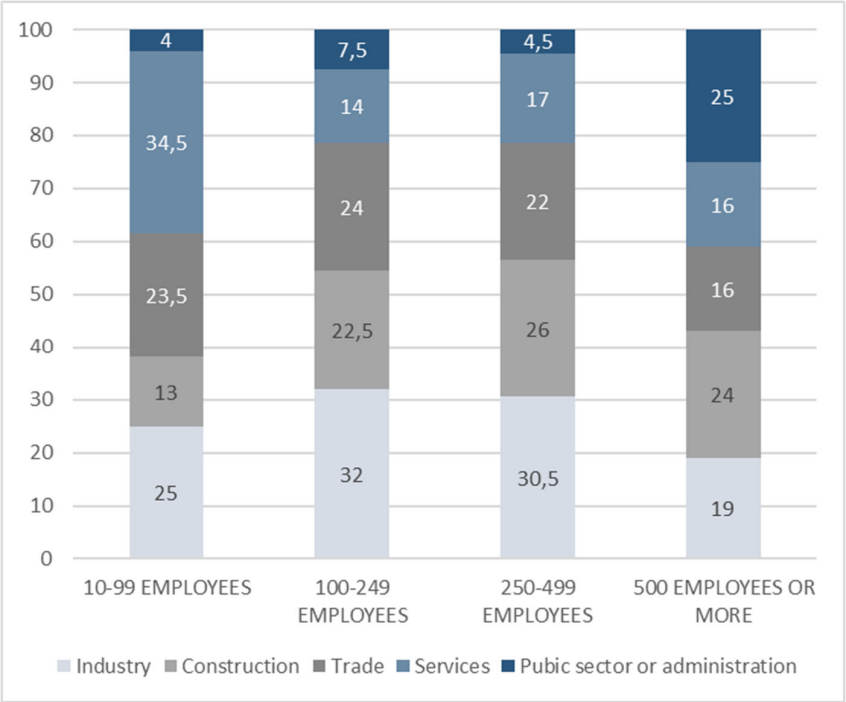


Table 2.2: Percentage of interviews, per sector and per organisation‘s size, before weighting

Note: the samples are not homogeneous in terms of sector, as such, comparisons between them are to be considered with care, especially for the “Public sector or administration”

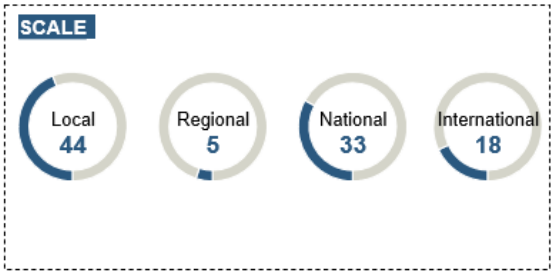


Table 2.3: Scale of the organisations (in%)

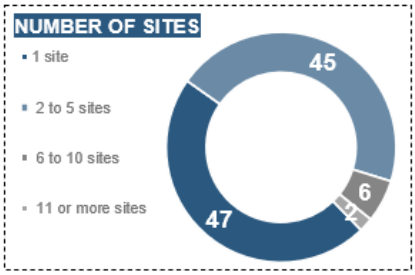


Table 2.4: Number of sites per organisation (in%)

Following the field work, a weighting was implemented in order to ensure representativity of the sample in terms of size and sector. Hence, for each organisation size range, the number of respondents in each sector is representative.

Scripted interviews were conducted exclusively by phone (CATI) and fieldwork was carried out from June 13th to August 12th, 2022. Questionnaires were designed to last 15 minutes on average (see section 8.2). They were initially reviewed by the BEREC and further adjusted to a pilot phase done with 20 respondents. Categories of ECS and IT services selected for the study were agreed with BEREC.

In the report, results are systematically presented by organisation size split, according to the definition in use in the European Union.[28] Enterprises or administrations with less than 250 employees are referred to as small and medium organisations (SMEs). Enterprises or administrations with more than 250 employees are referred to as large organisations. Businesses with less than 10 employees are referred to as SOHO (Small Office - Home Office). The terms “business users” and “organisations” in this report both refer to companies and public administrations together.

More details about the survey methodology can be found in Annex (see section 8.4).

2.2 Supply side interviews

The analysis of the supply side was based in a large part on qualitative interviews with operators in the same five countries than for the demand-side analysis. In this way it was possible to balance and enlighten answers by using inputs from the other side of the market.

[28] https://single-market-economy.ec.europa.eu/smes/sme-definition_en

In order to have a view from different angles in each country, the following typology of market players has been contacted: the incumbent operator, a large operator who has its own infrastructure, a large- or middle-sized operator relying mainly on third party infrastructure and a niche operator, from the perspective of the type of services offered, were contacted. These qualitative interviews did not intend to be representative in statistical terms, but they enriched the understanding of the market trends.

The interview guide covered questions about their positioning, their offers and the associated contracts, their technical solutions and their vision of the trends on the market for the coming years (see section 8.3).

Table 2.5: List of supply side interviews

				
Adista	BT	Fastweb	Evolutio	Chopin
Linkt	Deutsche Glasfaser	Irideos	Orange	Netia
Orange	Deutsche Telekom	Wind Tre	Telefónica	OBS Polska
SFR	Vodafone		Vodafone	

The interviews were completed from June 27th to September 22nd, 2022. Most of the respondents were head of regulation, often together with head of product management or marketing. In general, the discussion duration was one hour, and some operators preferred to provide written answers.

Some quotes from the interviews with operators are included in this report. They have been chosen either for their capacity to illustrate a general situation or to shed light on a specific point commented on in the body of the report.

3 Characterisation on the main ECSs and IT services for businesses

Compared to the residential market, the ECSs and IT services offering for the business market is much more complex. On the one hand, it is distinguished by a much wider range of services and, on the other hand, by technical characteristics, such as quality of service, which make it possible to offer a virtually infinite number of variations, making tailor-made offers possible.

In addition, while sometimes the fixed electronic communications market is usually described as being organised differently for residential and business users, it could rather be considered as a continuum. First, the services required by SOHOs are very similar to those of the residential with basic double play (internet connection + telephony). Then, SMEs may have additional requirements, either for supplementary services (e.g., VPN access, IP Centrex) or for enhanced quality of service (e.g., guaranteed bandwidth, backup connection). At last, large business users require more comprehensive solutions, as well as even higher QoS (Quality of Service), including redundant accesses.

This chapter intends to describe and characterise the main ECSs and IT services for businesses, depending on the organisation size, measured in number of employees.

3.1 Main services used

3.1.1 Internet access

Internet access for a company is of course among the most important electronic communication service required by business users (more than 95% of business users have one, regardless of their size), the first one being telephony. Depending on the size and activity of the organisation, it may or not have a higher bandwidth than the residential offers, it may come with a guaranteed bandwidth or quality of service, and it might be provided with additional services.

Table 3.1: Electronic communication services used by the businesses

Read: 97% of the 100 to 249 employees companies use mobile services/cell phones

	TOTAL	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:	(1000)	(412)	(290)	(149)	(149)	(702)	(298)
Total Telephony	99	99	100	100	100	99	100
Mobile services/Cell phones	93	93	97	100	100	93	100
fixed phones	87	86	90	86	94	86	91
Total Internet	96	95	100	100	99	96	99
Standard broadband internet access	85	85	82	86	87	85	86
Internet offer dedicated to business	73	72	83	92	86	73	88
Multi-sites Virtual Private Network (VPN) services	63	61	74	83	90	62	87
Leased lines	21	20	36	56	49	21	52
Other telecommunication services	18	17	23	41	41	17	41

In % - Base: Total
Q1 Which telecommunication services does your organisation currently use? (Several answers possible)

As can be seen in Table 3.1, a large proportion of organisations (>85%) declare using standard broadband access but also 73% of small and medium organisations and 88% among large organisations declare having an internet access dedicated to businesses. Surprisingly, these statistics would suggest that most businesses have both kind of access. Some of them might indeed have implemented a backup solution in this way. However, it is possible that the distinction between these two solutions was not well understood or perceived by the respondents, because they are not fully aware of the technical differences or because the way it is presented on the market does suggest an alternative between the two possibilities.

As expected, the larger the company, the more variety of services dedicated to businesses are used. Most sectors largely subscribe to internet offer dedicated to businesses, particularly in the trade sector (81% for small and medium trade sector business users, and 92% for large trade business users). However, in the construction sector, less technology-intensive, only 53% of SMEs have an internet solution dedicated to businesses.

Table 3.2: Physical infrastructure used for broadband services (by organisation's size)

Read: 91% of the 100 to 249 employees companies have fibre

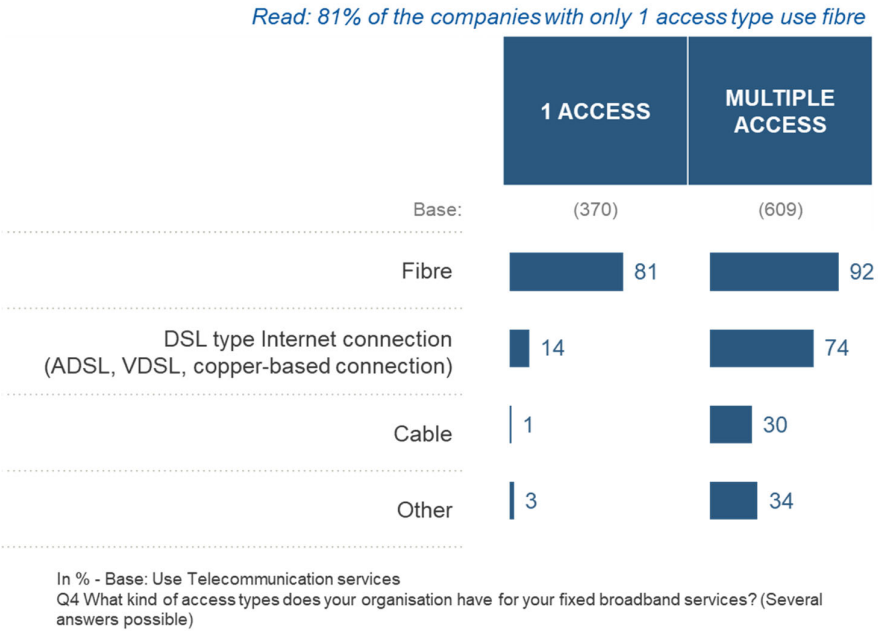
	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:	(397)	(287)	(149)	(147)	(684)	(296)
Fibre	86	91	93	99	86	96
DSL type Internet connection (ADSL, VDSL, copper-based connection)	44	48	66	62	44	63
Cable	16	19	14	15	16	15
Other	18	38	33	41	19	37

In %
Base: Use Telecommunication services
Q4 What kind of access types does your organisation have for your fixed broadband services? (Several answers possible)

Most business users are connected with fibre: 86% among SMEs and up to 96% among large organisations (see Table 3.2). As only 41% of households have access at least to 100 Mbps in the EU[29], these statistics could be explained by the fact that most businesses are located in dense areas or in business parks, where fibre availability is higher, and where it is easier to get dedicated connection. It is also possible that it could include DSL connections marketed in certain countries as “fibre”, as they are fibre-based, even if only for part of the connection.

xDSL is also widely used, especially among large organisations as 63% of them declare having a DSL connection (vs. 44% of SMEs). The multi-sites enterprises appear to also use DSL (62% among 6-10 sites and 72% among more than 10 sites organisations), as a mix with fibre to cover all their needs and situations. After xDSL comes cable access, in a more limited use, as only around 15% of businesses, regardless of their size, rely on this access technology.

Table 3.3: Physical infrastructure used for broadband services (by number of accesses)



Among organisations with a single internet access type, only 14% use DSL (and 81% use fibre), while among organisations with more than one access type, 74% use DSL and 92% use fibre (Table 3.3).

[29] European Commission, *Digital Economy and Society Index (DESI)*, 2022.

Table 3.4: Redundancy solution for the main internet access

	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:	(397)	(287)	(149)	(147)	(684)	(296)
Main internet access Redundancy solution	36	64	68	69	37	69

% Yes
Base: Use Internet access / Q8 Has your organisation contracted a redundancy solution for the main internet access?

When questioned specifically on backup solution for access, 69% of large enterprises answer they indeed have at least a double connection, where only 37% of SMEs give the same answer. DSL is often used as the backup solution (Table 3.5).

Table 3.5: Specific SLAs included in access contracts

Read: 91% of the 100 to 249 employees companies have guaranteed bandwidth

	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:	(397)	(287)	(149)	(147)	(684)	(296)
Guaranteed bandwidth	88	91	96	98	88	97
Guaranteed availability	81	87	89	97	82	93
Guaranteed restoration time (GRT)/ Time To Repair (TTR)	77	82	89	92	77	91
Other	8	18	15	21	8	18
DK / Refused to reply	7	4	0	0	7	0
Base:	(397)	(287)	(149)	(147)	(684)	(296)

In %
Base: Use Internet access / Q5 Does the main internet access of your organisation include the following options? (Several answers possible)

As for Service Level Agreements (SLAs) associated to contracts, organisations' answers lack accuracy on those more technical topics. Therefore, these results should be considered with caution for SMEs (Small and Medium Enterprises), especially since such SLA levels for SMEs have not been confirmed by operators during the supply side interviews (see section 0). Nevertheless, their declarations show the following characteristic trends (Table 3.5):

- Guaranteed bandwidth and guaranteed availability are the most widespread options with 8 to 9 organisations out of 10 subscribing.
- Guaranteed restoration time is also quite widespread, especially among large organisations (91% vs. 77% among SMEs). The feedback from operators confirms these figures. According to them, this is an important feature for business customers: they often do not put as much importance on the bandwidth availability as on the certainty that their connection will remain available or at least restored in a minimum amount of time.

3.1.2 Voice service

The share of business users using voice services is fairly similar in all organisations regardless of their size, as can be seen in Table 3.1:

- Fixed voice services are broadly used: 86% for SMEs and 91% among large organisations. The subscription rate is high across all sectors, although lower for public organisations (72%).
- Mobile voice services are also widely developed among SMEs (93%) and reach 100% among large organisations.

All contacted organisations probably have fixed voice for historic reasons. However, fixed voice in the office is less used since 2020 for various reasons: remote working, lines forwarded to mobile phone, growing usage of UCC solutions to make phone calls. Thus, UCC users probably account for a proportion of respondent who say they do not use a voice service.

3.1.3 VPNs and leased lines

Table 3.1 illustrates also that when it comes to virtual private networks (VPNs) and leased lines, quite uneven levels of use of these services are observed. While a vast majority of large organisations used VPNs (87%), a lower number of SMEs (62%) used them. The same applies for leased lines, which remain less widespread than other telecommunication services: 52% among large businesses but only 21% among other organisations.

3.1.4 Security services

As can be seen in Table 3.6, a vast majority of organisations contract security services. This appears logical, with regards to increasing crucial security concerns for businesses, and the need to protect confidential data. Indeed, 8 out of 10 organisations have already subscribed to a security service, with similar level across company sizes, and nearly all large organisations use them (97%). The remaining 20% that do not subscribe are generally not considering subscribing in the future (less than 5% consider subscribing this service within the next 24 months).

Table 3.6: IT services subscription (current or planned)

Read: 50% of the 100 to 249 employees companies already subscribe to Cloud storage, and 10% consider subscribing to it in the next 24 months

	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:	(412)	(290)	(149)	(149)	(702)	(298)
Cloud storage						
Already subscribe	58	50	50	49	58	49
Consider for next 24 months	7	10	16	20	7	19
Collaborative solutions (Teams...)						
Already subscribe	63	69	68	88	63	80
Consider for next 24 months	7	5	12	7	7	9
Security services (for example firewall)						
Already subscribe	80	81	76	86	80	82
Consider for next 24 months	4	4	8	-	4	3
Dedicated server hosting						
Already subscribe	66	52	45	68	65	59
Consider for next 24 months	3	6	8	3	3	5
Cloud computing (virtualised servers on the cloud- IaaS / Infrastructure as a Service)						
Already subscribe	33	27	40	34	33	36
Consider for next 24 months	7	11	6	15	7	11
Purchasing of software in the Cloud, also referred to as Software as a Service or SaaS						
Already subscribe	42	44	55	63	42	59
Consider for next 24 months	10	7	11	9	10	10

In %
Base: Total
Q27 Does your organisation subscribe or plan to subscribe the following services within the next following months?

3.1.5 Dedicated server hosting

Table 3.6 shows that 65% among SMEs and 59% among large organisations have a relatively important level subscription to dedicated server hosting, with a limited potential growth to be expected in the near future: 3-5% intend to subscribe within the next 24 months.

3.1.6 Collaborative solutions

Some differences are observed across organisations regarding collaborative solutions, such as videoconference services, (also defined as UCC):

- Among large and public organisations, this kind of solution has now become a standard (80% among large organisations, 82% among public organisations).
- Among SMEs, most of them are currently contracting them (63%), and an important part do not consider it for the future (29%).
- Multiple-sites organisations are logically more adopters of these solutions (67% of users vs. 59% among single-site organisations) with certainly a need to provide smooth communication solutions for employees across different sites.

3.1.7 Cloud Storage

Cloud storage is more adopted by SMEs (58% already subscribe vs. 49% among large organisations), with yet some shift to be expected in the future for large organisations: 19% of large organisations are considering subscribing to these solutions in the next 24 months. Public (72%) and construction (65%) organisations are the ones using it the most. Quite intuitively, multiple-sites organisations use these solutions more than single-site firms (64% vs. 50%).

Table 3.7 shows that small and medium organisations rely less on big hosting solutions providers than large organisations (Microsoft/Azure: 35% among small and medium organisations subscribe to Cloud solutions vs. 58% for large organisations, Amazon: 6% vs. 19%). Google is the only exception (19% among small and medium organisations vs 12% among large organisations). In particular, small and medium services organisations are users of Google (25% of usage).

Table 3.7: Cloud storage provider (top 5)

Read: 49% of the 100 to 249 employees companies use Microsoft / Azure / Microsoft Azure for their Cloud storage

	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:	(224)	(141)	(76)	(75)	(365)	(151)
Microsoft / Azure / Microsoft Azure	34	49	51	62	35	58
Google / Google Cloud Platform	20	4	6	15	19	12
Amazon / Amazon web services / AWS	6	7	12	24	6	19
Orange (Orange Business Services)	3	1	-	-	2	-
OVH	3	1	1	-	2	0
Other provider	44	29	29	13	43	19

In %
Base: Already subscribed for cloud storage
Q28 Which provider do you use for cloud storage? (Several answers possible)

Interviews with operators have shown that many of them offer their own storage solutions. According to them it is a differentiating factor for organisations that have concerns about the proximity of their data, or of independency. Nevertheless, all operators try to have partnerships' agreements with the largest cloud service suppliers (namely AWS, Azure, and Google).

3.1.8 Cloud computing

This kind of solution is less used than other solutions, whatever the organisation size (Table 3.6 shows that 36% of users among large organisations and 33% among SMEs), with limited potential of development for the short term compared to other services. Business users seems to be more interested in acquiring cloud storage than cloud computing solutions, even though it is more used in the services sector's organisations, mainly large ones (50%).

3.1.9 *Software as a Service (SaaS)*

SaaS is more used by large organisations (59% vs. 42% among SMEs) with equal perspectives of development whatever the organisation size: 1 out of 10 plans to use it by the next 24 months. It is however a lot less used by construction organisations, with only 24% using it. Multiple-sites organisations tend to use it more than single site organisations (48% vs 36%).

3.2 Analysis per activity sector

This study distinguished five sectors of activity of the organisations surveyed. The size of the sample does not allow to provide relevant statistics for each question asked. Nevertheless, trends emerge showing that some sectors are more or less inclined to subscribe to digital services compared to others.

Table 3.8: Inclination to subscribe to digital services by activity sector

	Industry	Cons-truction	Trade	Services	Public
Telecommunications services					
Telecommunications services bundles					
SLAs (guaranteed level of service)					
Redundancy solutions					
Additional IT services					
IT services bundles					
Share of multiple providers organisations					
Share of multiple sites connections					

Left pointer: below other sectors on that dimension –
Right pointer: above other sectors on that dimension

Overall, the trade sector appears as one of the most advanced sectors in terms of ECSs, and SLAs adapted to business use probably in relation with a profile of business users with more sites. Conversely, construction sector is the sector that has a more standard ECSs and IT additional services.

3.3 Supply side vision of ECS and IT for businesses

On the supply side point of view, the range of ECSs offered by an operator depends on its commercial strategy, which can be very different from one another. It appears, in particular, that as some of them describe themselves as company-size agnostic, while others will adapt their offer to one specific market or have different services package for small and large businesses. The large operators who address also the residential market are capable to offer a continuum with products similar to mass-market for SOHO and progressively enhancing their solutions for larger businesses.

As mentioned in an interview with the French CDRT,[30] an association that gather companies involved in IT and telecommunications convergence, a lot of local digital service providers have a role of telecommunication provider for their customers but do also deliver general IT services, like an outsourced IT department with a broad range of services: equipment supply, servers' configuration, architecture definition, operators' selection, etc. The following figure illustrate the various positions that business operators might have.

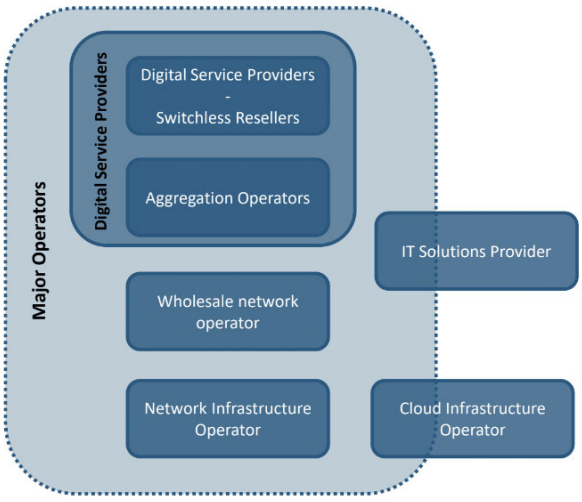


Figure 3.1: The different roles of operators on the business market. Source: authors

[30] Club des Dirigeants Réseaux et Télécoms - www.cdrt.fr

Some of the operators positioning is also structured by the size of the customers. The commercial approaches with SOHOs and SMEs on one hand and enterprises and administrations on the other hand are extremely different. Hence, some operators do not address the two categories. Thus, for example, an operator declares that business users with less than 250 employees is a threshold below which it is not relevant for them to work. On the opposite some digital services providers are only capable to address small business users with a panel of services.

Supplier quote: *"this need is driven more by usage (less criticality of the site) than by the size of the company or its business sector. For example, for VPN solutions, we can have for the same multi-site customer accesses without quality of service (ADSL, FTTH) and accesses with quality of service (SDSL, FTTO/FTTE). For example, banks and retail companies have several types of sites - headquarters vs. stores - with different needs."*

The 18 interviewed operators were first asked to identify which of the proposed list of 8 retail business services were in their portfolio (Figure 3.2).

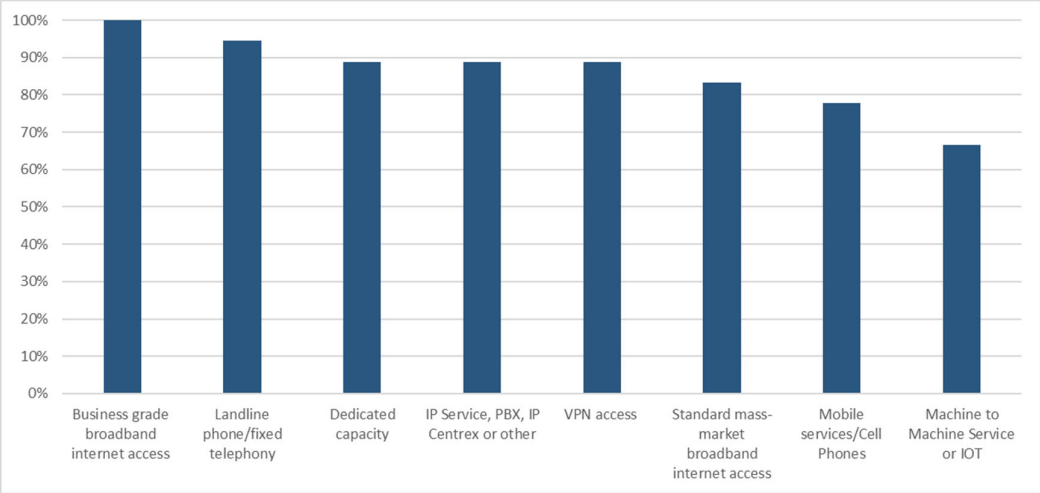


Figure 3.2: Presence of services in the interviewed operator's portfolio

Most of the interviewed operators (10 out of 18) answered that they include all suggested services in their portfolio. Obviously, business grade broadband internet access is offered by all of them, followed by IP services (16 out of 18). M2M (Machine to Machine communication) and IoT services is the category of service

that is often considered out of the business scope of the interviewed players, mainly fixed operators. Some consider that their customers do not demand them.

Interviews with operators show that here is not a particular set of characteristics dedicated to small businesses and another for large enterprises:

- Some operators emphasize their ability to customize their solutions and therefore insist on the fact that all services and SLAs depend on the demand of the customer and are adapted, as the customer organisation size does not always entirely determine its needs.
- Other operators specifically target 250+ employee's businesses, as, according to them, smaller organisations are not generally able to dedicate a person or a service with the sufficient technical knowledge to define their needs. Furthermore, the added value of many operators comes from their ability to propose tailor-made solutions, when smaller organisations often only request pre-packaged offers.
- The rest of the interviewed operators only differentiates between the SME segment (5-100 employees) and Corporate/Public Administrations, and, rather than differentiating SLAs, offer specific product portfolios for one or the other segment.

Supplier quote: *"There is no difference between residential and business fibre. We offer the same service to both segments, although it is true that business customers can contract advanced network maintenance and extra security services, depending on their needs. If companies have more specific requirements, they can contract dedicated fibre with higher bandwidth, specific QoS within the network, maintenance and security services at the customer's choice, since our offers are fully configurable and tailored to the needs of each customer."*

It appears that when operators also have a residential market offer, they address the smallest businesses with solutions very similar, if not the same, to the mass-market ones (i.e., bundles gathering internet access, fixed and sometimes mobile voice service, WiFi router and basic features). Those focusing on larger customers do not include these residential offers in their portfolio.

Whereas it is clear that the smallest businesses, typically SOHO-type, use the same connection than the residential ones, SMEs might require differentiated characteristics according to their activities, such as managed bandwidth services. Hence, there is rather a continuum from the lowest to the highest level of services.

Nevertheless, operators associate most frequently small businesses to offers similar to residential market, such as best-effort/low guaranteed quality and bandwidth, more flexible guaranteed repair time… In details, interviewed operators have listed the following characteristics:

Table 3.9: Services most frequent features according to the business customer's size

Feature	SMEs	Large organisations
Bandwidth	10 Mbps to 2,5 Gbps, peak or guaranteed bandwidth (10%, 50% or 100% of the peak)	Up to 10 Gbps, 100% guaranteed
SLA	No or minimum	High or customer specific SLA (24/7) and QoS
Time-to-repair	Up to one day or even no commitment	Down to 4h
Availability	95.5% to 99,9%	Typically, 99.9%
Traffic priorities	Best effort	High
Time to deliver	Best effort	Commitments
Additional solutions	PBX (Private Branch Exchange)	Leased lines/VPN Specific architectures and/or solutions (Palo Alto, Checkpoint, Aruba, Cisco, etc.).

Supplier quote: "*In the SME segment, two categories of offers are proposed:*

a) *"Pro" offers with no guaranteed bandwidth, nor very advanced SLAs, but with additional services:*
   i) *Single-line Broadband "business" offers, similar to the consumer offers, without guaranteed bandwidth but including additional services (up to 2 fixed telephone lines, 8-hour response time guarantee, fixed IP, publication in the professional directory, professional messaging service with domain name, assistance in getting started with services, call forwarding to a number in the event of Internet malfunction) and which can be associated with mobile lines (up to 10 lines) in its convergent format.*
   ii) *Enriched Connectivity "Pro" offers that provide, in addition to the services described above, up to 20 fixed telephone lines, professional telephony and reception services, and enriched communication services (screen sharing, telephone bridge, etc.)*

b) *"Business" offers with guaranteed, symmetrical (up/down) bandwidth, more important SLAs (e.g.: guaranteed recovery time, Maximum Service Interruption)."*

Regarding IT, some suppliers provide their own IT services, combined with third parties IT services, and some work with partners that can provide IT services upon customer's request.

It should be noted that the frontier between electronic communications and IT services is sometimes blurred. As an example, Figure 3.3 shows that SD-WAN straddles the two sectors.

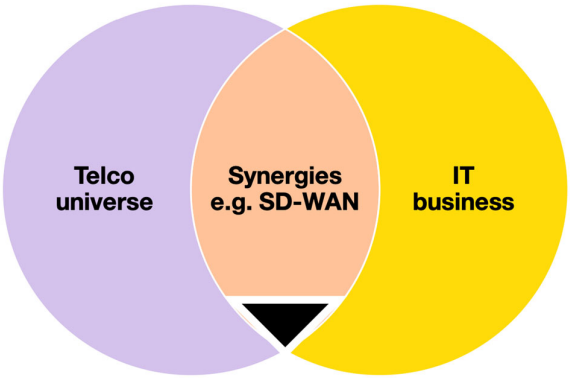


Figure 3.3: A service like SD-WAN straddle ECS and IT universes. Source: Orange's "Engage 2025" strategic plan

4 Bundling of ECSs among them and with IT services

Bundling of services is a common practice of operators to combine in a single product at a fixed price several services that could have been sold separately. The advantage for the operator is to increase its turnover. Business customers may appreciate having only one contact person or one contract for several services, as well as benefiting from a price reduction. The aim of this chapter is to characterise the bundling practice, from the point of view of suppliers and customers.

4.1 Bundling of ECSs

Interviewed suppliers consider that large organisations look for best of breed for each product and do not necessarily consider a single provider, and/or their needs are too complex for a bundle offer to address them properly (different types of sites to connect, for instance). Small organisations are probably keener to subscribe to bundles as they are more likely to value “one-stop shopping”.

Supplier quote: *“Large accounts really tend to separate fixed and mobile in their tenders. Sometimes they even retain several operators for fixed connectivity. The larger the customer, the less bundling you have, because service control is important to these customers, and they need to be able to deconstruct it. Bundling doesn't work with these customers. They want to know how much each account costs. For smaller accounts (less than 250), they prefer a single point of contact.”*

Nevertheless, 12 out of 18 interviewed operators have ECSs bundled offers, most frequent ones being:

- Internet + fixed voice services
- Internet + voice + WiFi connectivity (these two first bundles being so obvious for operators as well as their customers that they are often not even mentioned)
- Internet + security solution
- Business VPN and flexible SD-WAN
- Fixed + mobile services
- Fixed + mobile + PBX.

The demand side survey confirms that around 90% of organisations do subscribe bundles, regardless of their size. Business grade broadband internet access is generally subscribed within a bundle by 8 business users out of 10 (whatever the organisation size). Business users declare having on the average 3.6 services bundled together for SMEs, and 4.5 services bundled together among large organisations. It is not clear if their answers, business users make a clear distinction between having a single bundle offer or several services as a customised contract, as it seems contradictory to the operators' statement.

Table 4.1: Telecommunication services – bundled contract / combined offer

Read: 78% of the 100 to 249 employees companies that subscribe to Business grade broadband internet access do so in a bundled contract

	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:	(412)	(290)	(149)	(149)	(702)	(298)
At least one	90	88	91	88	90	89
Base:	(311)	(236)	(131)	(128)	(547)	(259)
Business grade broadband internet access (professional options available, quality of service and SLAs	84	78	84	83	84	84
Base:	(359)	(261)	(133)	(135)	(620)	(268)
Fixed telephone services	83	76	78	80	82	80
Base:	(353)	(238)	(128)	(128)	(591)	(256)
Standard mass-market broadband internet access	80	74	71	80	80	76
Base:	(384)	(281)	(149)	(148)	(665)	(297)
Mobile services	80	75	82	85	80	83
Base:	(81)	(111)	(67)	(74)	(192)	(141)
Leased lines	57	63	73	74	58	74
Base:	(252)	(220)	(123)	(129)	(472)	(252)
Multi-sites Virtual Private Network (VPN) services	42	55	54	59	43	57
Base:	(74)	(65)	(50)	(52)	(139)	(102)
Other telecommunication services	51	50	61	51	51	55

In % - Base: Use Telecommunication services
Q2 Among these services, which ones has your organisation subscribed within a bundled contract or combined offer? (Several answers possible)

In details, business customers declare that 4 out 5 of the subscriptions for internet and voice services are made in bundles, regardless of the organisation size.

Table 4.2: Telecommunication services – bundled contract / combined offer (top 10)

Read: 58% of the companies with less than 250 employees subscribe to both Landline phones and Mobile services/Cell in a bundled contract (/!\ not necessarily the same bundle)

	TOTAL	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Fixed telephone service AND Mobile services	59	58	70
Standard mass-market broadband internet access AND Mobile services	58	57	64
Standard mass-market broadband internet access AND Fixed telephone service	56	56	56
Business grade broadband internet access AND Fixed telephone service	50	50	61
Business grade broadband internet access AND Mobile services	50	50	70
Standard mass-market broadband internet access AND Business grade broadband internet access	47	47	56
Mobile services AND VPN	23	23	46
Business grade broadband internet access AND VPN	22	21	44
Fixed telephone service AND VPN	22	21	42
Standard mass-market broadband internet access AND VPN	21	21	38

In % - Base: Use Telecommunication services
Q2 Among these services, which ones has your organisation subscribed within a bundled contract or combined offer? (Several answers possible)

Most common pair of telecom services bundled together are all combinations of mobile services, fixed voice service and standard mass-market broadband internet access.

4.2 Bundling of ECSs with IT services

From the supply side interviews, it can be inferred that operators do often propose IT solutions together with their electronic communication services. Microsoft 365 is used by most businesses and is often supplied together with the ECS as the standard package to run a business. A basic cloud storage solution is also frequently proposed. Often, operators indicate that they propose these additional IT services as a customisation to match their customers' needs, rather than a pre-set bundle. Some suppliers explain that on the business market, each offer must blend with existing services the company has already subscribed.

Supplier quote: *"It is even more difficult to bundle IT services with other telecom services. Corporate customers ask for solutions that may include or not IT and communication services but are not prepacked bundles."*

All operators that have been interviewed propose hosting services for their customers data and applications. However, even when the ECS operator has its own datacentres, some IT services do come with an integrated cloud solution. Therefore, it constitutes a bundle of two IT services (applicative solution + hosting). This bundle is not created by the operator, but by the supplier of the IT solution. Thus, Microsoft 365 is by default bundled with Azure (both owned by Microsoft) or Salesforce is linked with AWS hosting (global partnership between both companies).

According to operators, the most frequent ECSs + IT bundles are:

- Internet + security solution
- Internet + voice + security + SD-WAN + cloud storage
- Internet + specific options (mailboxes, anti-DDoS protection….) and/or options allowing mainly access to partn'rs' clouds
- Business VPN and flexible SD-WAN
- Internet access + UCC (Unified Communications & Collaboration).

A specific example of bundling is the announcement in September 2022, by Deutsche Telekom of a solution call“d "Mobile für Microsoft Teams"".[31] It is based on the integration of business customers' mobile phone numbers in Teams, making possible to make calls directly in Teams regardless of their locations and device.

The above trends are confirmed by the demand side survey results shown in Table 4.3 hereafter. Business customers declare having subscribed to a bundle including ECSs along with collaborative solutions and/or cloud storage for 40-50%, regardless of the company size. All other IT services are declared to be subscribed within an ECS bundle for 30-40% of them.

Table 4.3: IT Services bundled with telecommunication services

Read: 41% of the 100 to 249 employees companies that use Collaborative solutions have this service as part of a bundle

	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:						
	(256)	(210)	(108)	(121)	(466)	(229)
Collaborative solutions (Teams...)	46	41	45	49	45	48
	(224)	(141)	(76)	(75)	(365)	(151)
Cloud storage	43	46	34	57	43	48
	(275)	(167)	(81)	(98)	(442)	(179)
Dedicated server hosting	39	41	39	31	39	34
	(142)	(91)	(59)	(63)	(233)	(122)
Cloud computing (virtualised servers on the cloud- IaaS / Infrastructure as a Service)	39	57	41	38	39	39
	(329)	(235)	(124)	(129)	(564)	(253)
Security services (for example firewall)	37	33	41	40	37	40
	(173)	(137)	(74)	(91)	(310)	(165)
Purchasing of software in the Cloud, also referred to as Software as a Service or SaaS	33	40	39	26	34	31

In %
Base: Already subscribed for telecommunication services
Q29 Which IT services are part of a bundle with telecommunication services? (Several answers possible)

The survey then focused on the reasons why such bundles were subscribed (Table 4.4). It appears that 71% of SMEs and 67% of large organisations had no problem with bundling ECSs and IT services, either because they asked for it or agreed to the supplier proposition. On the opposite, 29% of SMEs and 33% of large organisations felt they had no other choice than to subscribe to bundled products, as the given service could not be removed from the bundle.

[31] https://www.telekom.com/de/medien/medieninformationen/detail/telekom-bietet-in-kuerze-mobile-fuer-microsoft-teams-an-1014628

Table 4.4: Organisation situation regarding bundles of IT services with ECS

Read: 37% of the 100 to 249 employees companies that have their Cloud storage service as part of a bundle do so because their organisation asked their provider to integrate the service in the bundle. For 48%, it was because the provider proposed to integrate the service in a bundle, and the organisation agreed

	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:						
Cloud storage	(96)	(66)	(28)	(36)	(162)	(64)
You requested the bundle	32	37	*	*	32	48
You accepted the bundle proposed by your supplier	40	48	*	*	41	34
You couldn't remove the IT service proposed	28	15	*	*	27	19
Collaborative solutions (Teams...)	(110)	(92)	(50)	(58)	(202)	(108)
You requested the bundle	27	40	62	37	27	45
You accepted the bundle proposed by your supplier	52	35	21	33	51	29
You couldn't remove the IT service proposed	21	25	17	30	22	26
Security services (for example firewall)	(118)	(79)	(49)	(49)	(197)	(98)
You requested the bundle	42	45	35	67	42	55
You accepted the bundle proposed by your supplier	36	42	56	13	36	29
You couldn't remove the IT service proposed	22	13	10	20	22	16
Base:						
Dedicated server hosting	(104)	(66)	(32)	(32)	(170)	(64)
You requested the bundle	43	51	*	*	44	50
You accepted the bundle proposed by your supplier	34	33	*	*	34	43
You couldn't remove the IT service proposed	23	15	*	*	22	7
Cloud computing (virtualised servers on the cloud-IaaS / Infrastructure as a Service)	(51)	(47)	(22)	(25)	(98)	(47)
You requested the bundle	43	51	*	*	43	58
You accepted the bundle proposed by your supplier	32	37	*	*	32	35
You couldn't remove the IT service proposed	26	12	*	*	25	7
Purchasing of software in the Cloud, also referred to as Software as a Service or SaaS	(55)	(50)	(31)	(31)	(105)	(62)
You requested the bundle	30	56	*	*	32	43
You accepted the bundle proposed by your supplier	35	22	*	*	34	47
You couldn't remove the IT service proposed	35	22	*	*	34	10

In %
Base: Already subscribed for telecommunication services in bundle
Q30 For each of these bundles, which sentence best reflects your organisation situation?

* Base too small for interpretation because this question was filtered on the respondents that answered "Yes" for Q29 (which was already filtered itself on those "Already subscribed" in Q27)

Overall, there are limited differences in bundle subscription levels per product regardless of the organisation size, but large organisations are more often directly requesting to integrate the different services in a bundle.

Table 4.5: Reasons for buying IT services as part of a bundle with fixed telecom services

Read: 55% of the 100 to 249 employees companies prefer to buy IT services as part of a bundle because they think it is better integrated this way

	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:	(208)	(147)	(72)	(83)	(355)	(155)
Because it is better integrated	50	55	66	56	50	59
Because it simplifies the purchase procedure	46	46	62	43	46	50
Because it is less expensive	46	44	63	45	46	52
Reduces fixed costs (capex) in favour of variable costs (opex)	39	38	61	47	39	52
Other	17	19	25	10	17	15
None of these reasons	4	3	3	3	4	3

In %
Base: Already subscribed for telecommunication services in bundle
Q31 For which reasons would your organisation prefer to buy IT services as part of a bundle with fixed telecom services? (Several answers possible)

This proactive attitude from large organisations is fostered by some advantages that are more perceived notably regarding costs and integration (Table 4.5):

- 59% of large organisations choose bundles because they considered that it is better integrated (vs. 50% among small and medium organisations). The organisations with multiple sites are also more likely to be motivated by this potential benefit (53%, versus 46% for single site organisations).
- Large organisations are explicit on the subject and also driven by cost optimisations when choosing bundles:
    - 52% mention the reduction of fixed costs in favour of variable costs vs. 39% among small and medium organisations. This is also a reason for 46% of single sites organisations (vs. 33% among multiple-sites organisations).
    - 52% reckon the bundle is less expensive as whole vs. buying each separate service, versus 46% for small and medium organisations. Price is however more of a consideration for small and medium trade organisations, with 60% choosing this as a reason.
- 50% would prefer buying their services in bundles because it simplifies the purchase procedure, similar to what is observed for small and medium organisations.

4.3 Future trends on bundling

According to interviewed operators, pre-packaged bundles tend to address specific markets, such as SOHO or SME, where a very replicable model can be defined (1 - 4 people with an average need, redundancy, WiFi, warehouses, headquarters and agencies, etc.) and business customers who prefer to have a single supplier.

Larger business users prefer managing the various services individually, for technical and economic reasons. They want to be able to analyse separately the prices and services of the proposed products. Some suppliers conclude there is no place for bundle offers in the future. Several market players note that solutions such as SD-WAN are an opportunity for IT departments in company to regain control on their network architecture and its evolution, or the overlay, without being dependent on an operator.

Supplier quote: *"We think the companies rather need customised offer than bundles. We are preparing a bundled offer that would provide telecom, security, and nomadism."*

On the contrary, some providers think telecom/IT bundles will remain in the future (ECS including IoT, M2M connection, 5G services with cloud storage and computing…) to better match the customers' needs and to offer end-to-end solutions. Moreover, fibre tends to replace DSL and the available bandwidth is not really a limiting factor anymore. Therefore, it becomes easier to provide as well additional services such as UCC (Unified Communications and Collaboration) and IT.

Some even think that the joint provision of internet access with other IT services will become a new standard, even if it is not pre-packaged in a bundle. The most common services would be IT security, unified communications & collaboration tools, cloud storage capacity, cyber security, backup, and disaster recovery. They expect a growth in the selling of managed solutions and connectivity link, up to 100 Gbps jointly with solutions of SD-WAN (that can be considered as an MPLS -Multi-Packet Label Switching- evolution) and SASE (VPN evolution granting more security). The concept might evolve and be flexible to address the needs, high combination of different bricks, which is closer to customisation.

The demand-side survey has shown that most organisations are planning to keep the share of bundle subscription unchanged for the future (Table 4.6): 68% among large organisations and 62% among small and medium organisations. Small and medium industry (70%) and public organisations (72%) are particularly unlikely to change anything. Last, 14% of the organisations plan to subscribe more bundles in the future, and 20% less.

Table 4.6: Organisations' anticipations for future ECS and IT services bundling

Read: 12% of the 100 to 249 employees companies plan to subscribe to bundles more often than today

	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:	(412)	(290)	(149)	(149)	(702)	(298)
Subscribe more often to bundles than today	14	12	8	11	14	10
Subscribe as often to bundles as today	62	64	74	64	62	68
Subscribe less often to bundles than today	20	22	14	18	20	16
Don't know	4	2	4	7	4	6

In %
Base: Total
Q32 What is your organisation most likely to plan with regard to bundles of telecom and IT services?

5 Specificities of contracts

5.1 Multi-providers

As the business telecom and IT market is increasingly complex, given the infrastructures and offers diversity, it may be more difficult to have all the services provided by a single supplier, or put another way, customers could prefer having several operators for better prices and service.

5.1.1 Number of providers

The survey shows that approximatively half of the business customers with 100 and more employees only work with one provider, the other half having several of them (Table 5.1). This statistic differs only for the business users with less than 100 employees where the ratio is closer to 60/40%, which is consistent with the fact that they have, in the average, more modest needs that can be easily fulfilled by one provider.

Considering the number of providers, it appears that nearly all (96%) SMEs work with a maximum of 3 providers. The number is lower for large organisations (84%) meaning that 16% work with 4 providers or more.

Table 5.1: Number of providers for fixed telecommunication services

Read: 52% of the 100 to 249 employees companies have only 1 provider

	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:	(412)	(290)	(149)	(149)	(702)	(298)
1 provider	62	52	43	50	61	47
Several providers	38	48	57	50	39	53
1 to 3 providers	97	91	84	85	96	84
4 providers or more	3	9	16	15	4	16
Average of providers	*1,6*	*1,8*	*2,5*	*4,9*	*1,6*	*4,0*

In % - Base: Total
Q11 How many providers for fixed telecommunication services is your organisation currently contracting with?

Our analysis reveals that only 28% of single-site organisations (vs. 49% of those with several sites) are working with more than one provider. This can be related to the fact that connecting multiple sites requires relying on multiple providers but also to the fact that multiple-site organisations may have more employees and more

complex needs and therefore rely on several suppliers to efficiently address these needs.

5.1.2 Reasons for selecting more than one provider

When asked for what reasons did the business users choose several providers (Table 5.2), the most frequently selected answer is the will to pick up the provider that best meets the needs depending on the service (36% among SMEs and 32% among large organisations).

Table 5.2: Reasons for selecting several ECS providers

Read: 41% of the 100 to 249 employees companies that have more than one provider do so because they selected the provider that would best meet their need depending on the service

	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:	(154)	(142)	(86)	(73)	(296)	(159)
You selected the provider that best meets your need depending on the service	36	41	33	31	36	32
You would have preferred one single provider, but none could cover all your sites	22	17	28	35	22	32
It's the group strategy	18	15	14	18	18	16
You can more easily adapt each contract features (price, length, options)	16	11	25	16	16	20
You selected the cheapest provider for each service	12	13	16	13	12	14
Your main provider does not propose some specific services needed	12	11	10	33	12	23
You prefer to let each site choose its own provider	5	1	3	5	5	4
You, as a public administration, have to organise a public tender with different lots			4	3		3
Others	26	44	38	28	27	33

In % - Base: Multiple providers
Q13 For which reasons does your organisation call to more than one fixed services provider? (Several answers possible)

Large organisations logically also have to face situations where they do not find a provider able to cover all their sites: 32% declare their organisation would have preferred to select one single provider but no provider was able to cover all sites. For trade organisations, this lack of a single suitable provider for all sites is also true for SMEs, as 35% give this answer.

Looking for more than one provider can also be explained by a need to access a specific service not offered by the main provider, especially among large organisations (23% vs 12% among small and medium organisations). When discriminating between situations, it appears that about one third of SMEs and more than a half of large enterprise answered that their choice was forced (no single provider was able to cover all sites or deliver all needed services). Further analyses would be required to extract more precise figures because multiple answers were possible for this question

5.1.3 Competitive situation

As previously explained, in some situations, business customers are not always able to choose their provider among several candidates. To check whether the competition is strong enough, they were first asked whether they had been able to choose among several providers (Table 5.3).

A large majority of them (87% of SMEs and 89% of large organisations) answered that they were indeed able to choose. It is also the case for the vast majority (91%) of business users with an important number of sites (11 or above). Only 1 out of 10 couldn't choose and has been compelled to choose a specific provider as it was the only one able to cover all their sites or meet all their requirements.

Table 5.3: Competitive situation – Possibility to choose among several providers

Read: 90% of the 100 to 249 employees companies were able to choose their provider among several providers

	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:	(412)	(290)	(149)	(149)	(702)	(298)
Yes	87	90	93	86	87	89
No	13	10	7	14	13	11
No, it was the only provider that was able to cover all/my site/s	6	8	2	5	6	3
No, it was the only provider that proposed all the services I needed	7	2	6	9	7	8

In %
Base: Total
Q14 When choosing a unique fixed services provider, was your organisation able to choose among several providers? / When choosing your main fixed services provider, was your organisation able to choose among several providers?

The question of the perception of the variety of offers was then analysed, in order to evaluate if organisations have multiple offers and can compare them (Table 5.4).

Table 5.4: Business users' feedback on the variety of offers available

Read: 30% of the 100 to 249 employees companies strongly agree that the competitive set is strong

	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:	(412)	(290)	(149)	(149)	(702)	(298)
Agree	**70**	**74**	**62**	**74**	**70**	**69**
Strongly agree	30	30	29	34	30	32
Somewhat agree	40	44	33	40	40	37
Disagree	**30**	**26**	**37**	**26**	**30**	**30**
Somewhat disagree	20	19	25	15	20	19
Strongly disagree	10	7	11	11	10	11
DK / Refused to reply	**0**	**-**	**2**	**1**	**0**	**1**

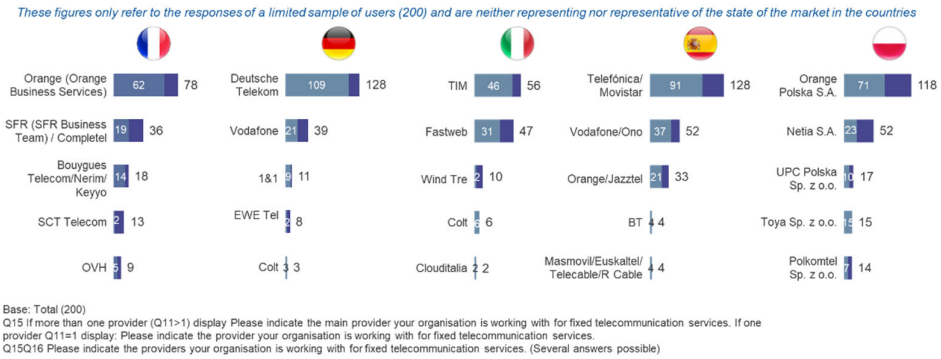
In %
Base: Total
Q22 Generally speaking, would you say that the competitive set is strong, which means you have a lot of offers you can compare for fixed telecommunication services?

Responses show that even if most organisations reckon that the variety of offers available is large enough (7/10 with same pattern regardless of the organisation size), 3/10 is not fully satisfied with it. Surprisingly, those perceiving the competitive set not strong enough are those working with at least 3 providers (37% disagree), which may be interpreted as a will on having in any case more options to choose from, or on relying on several suppliers to meet all their needs at the right price for them.

5.1.4 Main providers per country

Table 5.5 hereafter highlights the five most mentioned ECS providers in each country according to the responses. Note that the numbers are based on a small sample of respondents for each country and are neither representing nor representative of the state of the market in the corresponding countries. The data should therefore be interpreted as an overview of the main providers of the respondents, and in no way as the providers' market shares. Moreover, the data strongly varies across company sizes.

Table 5.5: Main fixed telecommunication services provider of the respondents (Top5)



Base: Total (200)
Q15 If more than one provider (Q11>1) display Please indicate the main provider your organisation is working with for fixed telecommunication services. If one provider Q11=1 display: Please indicate the provider your organisation is working with for fixed telecommunication services.
Q15Q16 Please indicate the providers your organisation is working with for fixed telecommunication services. (Several answers possible)

5.2 Switching from one operator to another

According to literature, the churn rate is still significantly lower for business users than on the residential market.[32] The literature suggests the main reasons thereof: fear of a negative impact on the business, difficulty in understanding the offers and players, fear of costs associated with changing operators, commitment period or

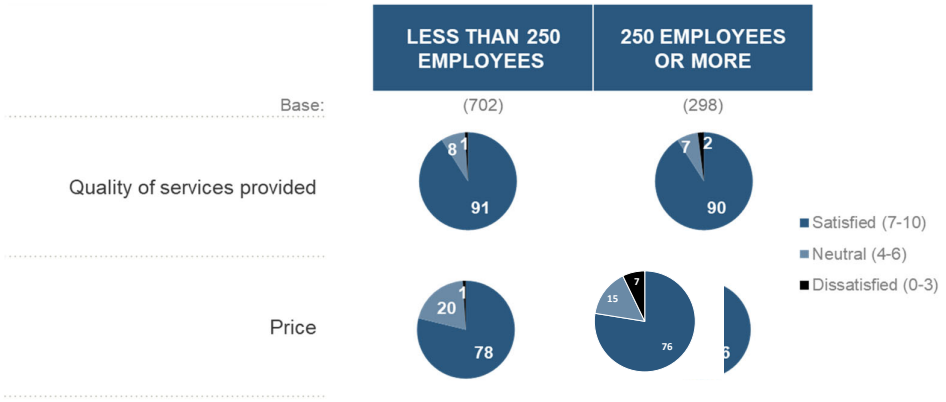
[32] Les Echos, *Nouvelles règles du jeu marché télécom entreprises*, 24 Aug. 2022.

dissuasive termination conditions.[33] Most sources, literature and qualitative interviews confirm that in the business market, organisations do not change operators to get small savings, but because they are not satisfied by the service provided. As electronic communications are often one element in a larger solution and therefore an essential part of business processes, any change might indeed result in a direct impact on the ability to operate.

When considering demand-side feedback, it is first interesting to underline that business customers satisfaction regarding the main aspects of the quality and price for the services they have contracted is rather high (Table 5.6).

Table 5.6: Satisfaction with main provider for fixed telecommunication services

Read: 91% of companies with less than 250 employees have rated the Quality of services provided between 7 and 10



In %
Base: Total
Q17 Based on your experience with your main provider for fixed telecommunication services, how would you rate your main provider for fixed telecommunication services on the following aspects…? Please give a rate from 0 to 10.

Indeed, 91% of SMEs and 90% of large organisations say they are satisfied with the quality of service (note of 7-10) and even pricing has a high satisfaction rate although significantly lower (78% and 76%).

To try to understand if operators tend to lock their customers in, the survey directly asked business customers if they changed their fixed operator and if so, what triggered their decision (Table 5.7).

[33] ARCEP, *Accès fixe à haut et très haut débit - Consultation publique sur le bilan du cycle en cours et les perspectives pour le prochain cycle d'analyse des marchés*, 2019.

Table 5.7: Change of fixed telecommunication services provider

Read: 35% of the 100 to 249 employees companies have changed one of their fixed telecommunication services providers over the last 3 years
And 36% of the 100 to 249 employees companies have changed because the previous provider was more expensive than their current one

	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:	(412)	(290)	(149)	(149)	(702)	(298)
Have changed one of its fixed telecommunication services providers over the last 3 years	25	35	31	42	25	37
Base:	(112)	(87)	(44)	(47)	(199)	(91)
Triggering of change						
The previous provider was more expensive than the current one	42	36	50	45	42	47
Your organisation was not satisfied by its previous provider level of services	35	30	44	25	35	31
Your organisation had some technical issues with the previous provider	20	16	26	41	19	36
Other reasons	38	47	34	46	39	42
No major problem was encountered	2	2	1	1	2	1
Main impediments to the change						
Complexity and issues related to migration	20	35	17	42	21	33
Costs, for example for new equipment or infrastructure	19	7	3	11	18	8
Previous provider reluctance to Collaborate in the transition	5	9	12	15	6	14
Previous provider reluctance to end the contract	6	1	-	1	6	0
Other	19	5	21	1	18	8
No major problems were encountered	44	50	54	49	45	50

In %
Base: Total / Q24 Did your organisation change one of its fixed telecommunication services providers over the last 3 years?
Base: Changed fixed telecommunication services providers over last 3 years / Q25 What triggered the change? (Several answers possible)
Q26 What were the main impediments to the change? (Several answers possible)

Answers show that over the past 3 years, the smaller the company, the less often it switches providers. Indeed, 25% of SMEs, 37% of large organisations and up to 42% among enterprises with more than 500 employees changed provider. This is predominant among the following categories:

- 45% among organisations with more than 5 sites
- 36% among organisations with 3 providers or more
- 40% among public organisations.

Many organisations answered “other reason” for changing operator (39% of SMEs and 42% of large organisations). This may include systematic re-tendering processes in public as well as private organisations.

Price is the main motivation for changing provider that is mentioned, whatever the organisation size: 42% of SMEs, and 47% of large organisations declare that they changed because “the previous provider was more expensive than the current one”. Nevertheless, this does not mean this is the only reason that triggered the decision, since several answers were possible.

The survey also shows that approximately one third of the business users justify the switch by a lack of satisfaction regarding the level of services, and 19% of SMEs and 36% of large organisation by technical issues. These last figures are consistent with the gradation of complexity of ECSs according to company size which may lead to a higher problems rate leading to switching provider.

Multiple-site organisations also highlight specific reasons for changing:

- Dissatisfaction regarding the level of services provided (37% and up to 48% for more than 5 sites organisations) vs. 40% for the price.

- Technical issues are also more mentioned, as the deployment of services on several sites may generate more technical complexity (and thus, dissatisfaction): 24% among multiple-sites organisations vs. 15% among single-site organisations.

Regarding more specifically the question of potential customers lock-in, answers presented in Table 5.7 last line, seem to disprove the fear of lock-in for half of interrogated enterprises consider that no major problem were encountered during the change process (45% among SMEs / 50% among large organisations). For the remaining ones, main difficulties were related to:

- Complexity related to migration issues especially among large organisations (33%, vs 21% among SMEs).
- Costs issues for new equipment or infrastructure was also a specific issue for SMEs (18%, vs 8% among large organisations).

Reluctance of the previous provider to collaborate in the transition is minor overall, yet more important among large organisations (14% vs. 6% among small and medium organisations).

Operators that have been interviewed insist on the sensitivity of ECS for the general operating processes of the business users and consequently on the reluctance of the latter to make changes. Another point that was mentioned was the provisioning time of products supplied by the incumbent. An operator highlighted that, due to the fact that VPN connections are not transferred from an operator to another, but that new ones have to be created, the process of switching for a multiple-site business users could take months.

5.3 Provider's selection process

The way business customers choose their supplier may also illustrate the level of satisfaction they have with their supplier. For this purpose, the organisations were asked to select the model of provider's selection process that best match their own process (Table 5.8).

Table 5.8: Choice method of fixed telecommunication services provider

Read: 40% of the 100 to 249 employees companies choose their providers with a direct negotiation with different providers

	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:	(412)	(290)	(149)	(149)	(702)	(298)
There was a direct negotiation with different providers	37	40	46	37	37	41
There was a comparison of several providers based on their standard catalogue	35	31	23	19	34	21
A standard catalogue was consulted for one provider	7	3	3	5	7	5
A call for tenders was set up	5	11	11	33	5	24
Other	9	8	6	2	9	4
Don't know / You were not in the organisation when the operator was selected	8	7	10	4	8	7

In %
Base: Total
Q18 How did your organisation choose its providers for fixed telecommunication services?

The most frequent process for selecting a provider, regardless of the organisation size, appears to be consulting more than one provider, either by engaging “direct negotiations with different providers” (37% among SMEs / 41% among large organisations) or “comparing the offers based on a standard catalogue” (34% SMEs / 21% large organisations). Only large organisations can afford organising call for tenders (5% SMEs / 24% large organisations).

When a contract expires, there is often a negotiation at the contract renewal (Table 5.9). This was confirmed by discussions with operators who mentioned the fact that prices in the telecommunication sector are decreasing so rapidly and technology changing so fast that even loyal customers renegotiate to benefit from the best solution.

Table 5.9: Procedure when expiry of contract

Read: 34% of the 100 to 249 employees companies choose to renegotiate the contract terms with their provider but do not put their current provider back in competition when a contract expires

	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:	(412)	(290)	(149)	(149)	(702)	(298)
Renegotiate the contract terms with the provider but do not put your current provider back in competition	42	34	27	24	41	25
Always put your current provider back in competition even if you are satisfied by your provider	29	47	51	62	30	58
Reconduct the contract with no specific negotiation unless you are dissatisfied with your current provider	28	18	20	11	28	15
DK / Refused to reply	0	1	2	2	1	2

In %
Base: Total
Q21 When a contract expires, what does your organisation most often do?

Nevertheless, the process varies depending on the organisation size:

- Regardless to their satisfaction, 58% of large organisations always put their supplier back into competition. Public organisations are also more

accustomed with systematically putting back the provider in competition (46% vs. 30% among private organisations).

- Small and medium organisations prefer, when they are satisfied with the current provider, to renegotiate their contract on expiry (41%), rather than systematically open competition among potential providers (30%).

This result is quite intuitive as larger organisation have the ability to enter more complex selection process and have more to gain from competition in absolute terms. Nevertheless, as will be seen later (cf. Chapter 5.5), larger organisations also tend to keep their provider for longer duration.

These trends seen from the demand side are confirmed by the interviews completed with suppliers. When mentioning their activities with enterprises or administrations, suppliers note that this is often based on tenders.

Business customers were also asked how satisfied they were, compared to the previous ones (Table 5.10).

Table 5.10: Satisfaction for fixed telecommunication services

Read: 43% of the 100 to 249 employees companies declare that their satisfaction regarding received offers for fixed telecommunication services has globally improved

	10-99 EMPLOYEES	100-249 EMPLOYEES	250-499 EMPLOYEES	500 EMPLOYEES OR MORE	LESS THAN 250 EMPLOYEES	250 EMPLOYEES OR MORE
Base:	(412)	(290)	(149)	(149)	(702)	(298)
Improved	34	43	41	30	35	35
Remained the same	55	47	52	66	54	60
Deteriorated	10	9	6	3	10	4
DK / Refused to reply	1	1	1	0	1	1

In %
Base: Total
Q23 Over the last few years, would you say that your satisfaction regarding received offers for fixed telecommunication services has globally…?

The survey shows that the new offers are rarely disappointing but rather remain the same for more than half of the organisations, as they better satisfy 35% of organisations, whatever their size.

5.4 Minimum contract duration

Minimum contract duration, if too long, may typically be a concern to regulation authorities, as it may hinder competition by limiting the ability of customers to switch operators.

When questioned, operators declare setting their minimum contract duration, if any, from 1 year to 5 years on the average. Our data collection shows that the average minimum contract length is 2 to 3 years (Figure 5.1).

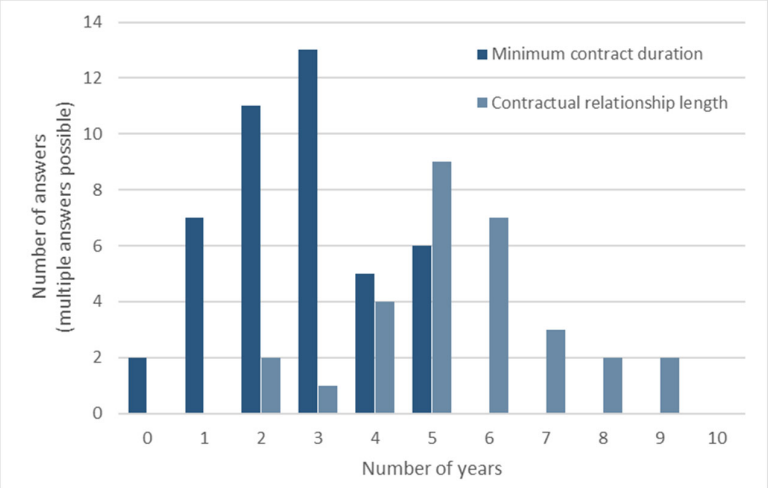
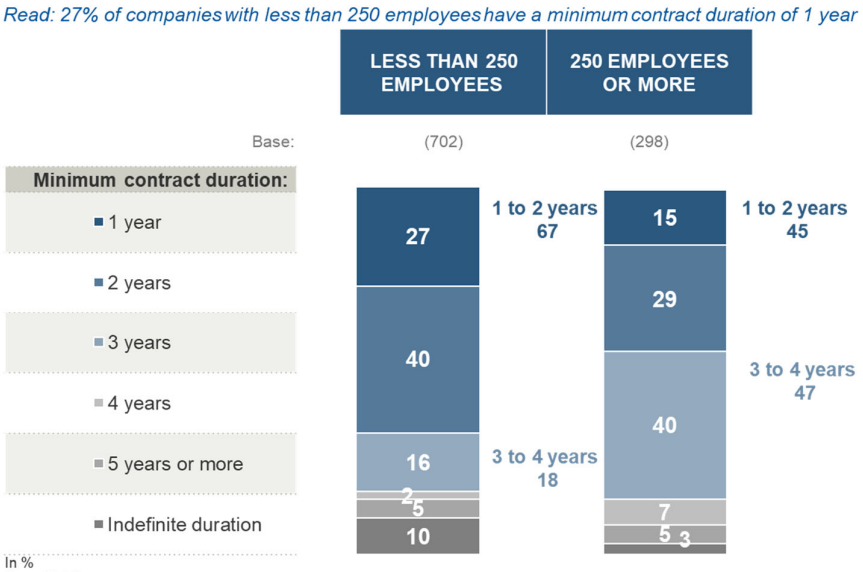


Figure 5.1: Minimum contracts durations and actual contractual relationship length as presented by providers (supply-side)

According to the demand side survey (see Table 5.11), 83% of small and medium organisations and 85% of large organisations declare that the minimum contract duration generally does not exceed 3 years, which is consistent with suppliers' declarations.

Table 5.11: Minimum contracts duration



In details, operators set the minimum contract duration according to:

- The contract type: it is longer for public administration (typically set in the terms of reference of the tender) than for private companies.
- The complexity of the services: integration contracts are usually longer than those for more traditional services. This also translates into longer contracts for larger business users.
- The need to use an expensive wholesale product or to build a specific connection.
- The price level: the minimum duration length can be adjusted according to the price discount. Some suppliers do not set predefined minimum contract duration as it is part of the pre-sale negotiations.

5.5 Typical lifetime of contracts and relation with specific providers

Even though the minimum duration of contracts is relatively short, the contractual relationship between the business customer and its supplier is longer (see Figure 5.1). The typical lifetime of contracts varies from 2 to 9 years, according to operators. The data on the demand side confirm that they generally have long-

established relationship with their main provider with contracts being often renewed at expiry:

- 43% of large organisations have been working for more than 10 years with their oldest provider, and 24% between 5 and 10 years.
- SMEs have generally less established relationships as only 28% have a more than 10-years relationship with their oldest provider.

These figures may be interpreted as follows: it is easier for a small company to change its operator, when, in a larger organisation, the ECSs and IT services are highly intricated with the company strategy, complicating the switch from a supplier to another.

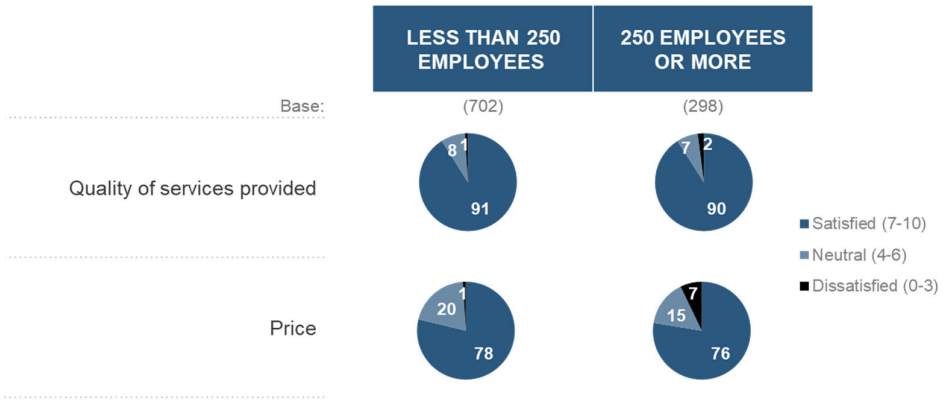
Table 5.12: Actual contracts duration with oldest provider

This long-term contractual relationship is understood by suppliers as being linked either to a high customer loyalty, to difficulties to introduce a new supplier due to complex interconnection of the services, or high number of connected sites. In this line, some operators explain that SOHO have the same churn rate as residential consumers, while large organisation tend to remain with the same operator for very long durations.

This trend is confirmed by the demand side survey, as the contract length is considered as highly satisfying (note 9-10) for 38% of small and medium organisations and 34% of large organisations.

Table 5.13: Main provider for fixed telecommunication services rating (mean)

Read: 91% of companies with less than 250 employees have rated the Quality of services provided between 7 and 10



In %
Base: Total
Q17 Based on your experience with your main provider for fixed telecommunication services, how would you rate your main provider for fixed telecommunication services on the following aspects…? Please give a rate from 0 to 10.

Nevertheless, customers tend to shorten their contract duration to take advantage of price evolution and/or technological changes, say some operators. In detail, survey shows that small and medium organisations currently have 2 years-long minimum contract duration (40%), whereas large organisations have 3 years-long minimum contract duration (40%).

Supplier quote: *"The typical lifetime of a contract for large account is 8 years or more. The effort to move from one provider to another is very high. Mobile services are easier to move. SME have less constraints and contracts duration are about 4 years. SOHO have the same churn rate than residential consumers. On the opposite, M2M contracts can last for 10 to 15 years."*

6 Suppliers' view on the business market

6.1 Potentially missing wholesale products

The operators were questioned about the potential wholesale products that would be missing in the market. Most of them do not mention any lacking product. For those who considered that improvement should be brought, the claims are rarely convergent, and the complaints often reflect specificities of the country.

In Spain, two operators consider that prices for the highest throughputs (more than 1 Gbps) should be also regulated. The capacity for the incumbent to propose specific SLAs or to implement new products more rapidly than its competitors is also questioned. One operator also expressed a desire to access dark fibre to replace Ethernet in the first mile active product.

In France, FTTH (Fibre To The Home) networks were deployed and initially regulated in view of addressing the residential customers. Their use on the business segment still raises questions like the possibility to have enhanced QoS (Time To Repair - or TTR- 10h and 4h) or the availability of wholesale passive and active solutions in dense areas.

In Germany there was a complaint that some products that are not regulated are overpriced. An alternative operator complained that they do not have access to Deutsche Telekom's ducts. The commitments on SLAs by the incumbent do not seem to be fully satisfying either for one operator. On the opposite, a large operator mentioned the fact that smaller ones do not always have standard API to order and provision their product, making the process extremely cumbersome.

In Italy an operator mentioned the fact that the incumbent prioritises the mass-market connectivity before the business market, which introduces latency.

Interviewed Polish operators did not mention any missing wholesale product.

6.2 ECS operators and IT providers competition

According to them, telecom providers are under pressure due to competition (especially on mobile and fibre-based services) and a decreasing ARPU on voice services. An interviewed operator believes that, by the end of 2022, 24% of French large enterprises were planning to replace fixed voice services with collaborative applications. COVID-19 has accelerated the penetration of collaborative solutions that include voice. Operators are looking for new ways to increase their revenue. In addition, there is a strong trend to address telecom and IT needs at the same

time as many business users are looking for a unique supplier that can deal with both as one whole service. In this context, telecom providers tend to also provide IT services and compete with IT services suppliers.

On the IT side, there are many players in cloud telephony and collaborative applications: traditional operators, cloud service providers and integrators. Some foresee increasing competition from cloud service providers such as Microsoft, Zoom or Google. Initiatives from cloud players aim to disintermediate operators by putting the voice offers of different operators on the same marketplace (e.g., Microsoft's Operator Connect).

However, the high specialisation and the different needs of the business users make it very difficult to provide all of them, so the cooperation is unavoidable, as explained by an interviewed operator. For cybersecurity, for instance, some suppliers take the technology from important international players in a customer-supplier relationship. Other see more opportunities for cooperation as they define their partners as technology companies, not service companies. Datacentre providers invest heavily in CDN (Content Delivery Networks) that are especially useful for providers of massive internet contents (primarily, video). However, for electronic communication operators, using third-party datacentres can save costs.

Telecom and IT services markets appear to be in an increasing competition, with a high number of actors. There is no consensus on whether those actors are to converge or remain competitors. It appears on one hand that no one is capable of serving all needs, even if boundaries are less marked. On the other hand, being active on both markets is clearly an asset.

Supplier quote: *"We note a swap from the telecom providers to the IP services providers. Less hardware, more software solutions."*

In general, operators foresee a strong increase of IT services, up to double-digit growth. IoT is expected to have also strongest increase, but this trend in volume may not be reflected on the revenue as unit prices tend to decrease. Traditional telecom services are expected to decrease, in volume when the needs evolve (e.g., telephony) or in revenue for bandwidth (increasing needs at lower tariffs).

Table 6.1: Operators' vision of the ECSs and IT services' future trend

Increase		Decrease
Progressive migration of accesses to All Gigabit using either FTTH or dedicated fibre		Access market revenue, as some operators underline the constant need of growth to deliver bandwidth-hungry services. This telecom market will at least decrease in terms of value (tariffs decrease rather than usage) ("The bandwidth demand is increasing, but the revenue is decreasing")
Focus on QoS rather than infrastructure		Fixed telephone services (-8.2% according to FR-Orange), due to the end of PSTN technology and to a regular shift of the customer behaviours, moving to UCC/mobile solutions by an 10%-15% average per year.
IT services in general ("double-digit growth", "6.6%/year in France until 2025 compared to an average of 1.2%/year for telecom services (source Gartner)."), more specifically:		VPN up to 15 to 20% per year, as business users tends to prefer broadband accesses
Collaborative solutions		Housing
Hosting in the cloud		Everything based on physical infrastructure
IoT will increase in terms of usage, but this is still unclear whether revenues will also grow because the individual value shrinks. Market is expected to grow by +500%/year		MPLS
Cybersecurity ("30%/year" is foreseen in Poland)		Every access product based on copper like xDSL or EFM, SDH, PSTN, ISDN. In no more than 3 years' time, the full migration from copper to fibre will be completed in Spain.
SD-WAN at the expense of MPLS		
UCC (Unified Communications and collaboration): +4.3%, according to FR-Orange		

Increase		Decrease
Wireless services (5G network) to deliver similar services as GPON but with a lower cost by Mb/s.		
4G and 5G as a back-up solution for landlocked sites, or medium remote sites		
Edge computing (distributing computing power across the country)		

Some operators expect that these evolutions will accelerate, as decommissioning of copper lines is engaged everywhere in Europe at medium/long term. A large part of the xDSL access (for voice, data or IP Centrex solutions for example) will indeed have to move to FTTH or FTTO (Fibre To The Office) connectivity. FTTH will be the most often used technology for bringing all kind of business services in a company in the future.

Finally, suppliers sense an appeal for higher service level. According to them, business customers are demanding more gigabit access, even very high capacity like 10 Gbps or even 100 Gbps for critical sites, and datacentres. SLAs are always the most critical element. The demands for more reliability (TTR) and low latency become more important. Again, the development of FTTH network will increase migration from dedicated lines to VHCN services with similar features and much lower price. Dedicated lines will be reserved for datacentres and very large offices. Many suppliers also foresee the democratisation of SD-WAN and SASE (SD-WAN + security).

7 Conclusions

The present study illustrates a changing market with growing, more complex demand and networks gradually evolving from copper to fibre, opening the door to the generalisation of high-performance services. Operators adapt to this new demand by blending IT services with electronic communication services. The study also exemplifies the diversity of the market, with suppliers trying to cover the entire market, others focusing on the largest organisations with customised solutions.

The need for digital services for business users has accelerated with the COVID crisis, and providers are being able to fulfil this demand thanks to the availability of high-quality infrastructures made possible by the advent of fibre access networks. The survey shows that the actual bandwidth provided is not an issue for many business customers as the speed enabled by fibre exceed their needs.

The segmentation of the market has been explained from the supply side perspective but also highlighted and confirmed by the demand side survey. Unsurprisingly, responses from small businesses show that they have more basic needs, and therefore simpler contracts, than large organisations. However, since they more frequently have a single supplier and are not in a position to set up tendering processes or renegotiate, they often renew their contract with the same operator. Large organisations have more complex expectations with higher quality services, SLAs, backup solutions, advanced IT tools, etc. Consequently, they encounter more technical problems or suffer more migration problems.

On the other hand, business users, whatever their size, share the same satisfaction with the variety of competitors and duration of their relationship with operators. Again, without distinguishing between sizes, most of them replied that they had not had any problems with their previous supplier and that they appreciated the new offers received.

Other cross-analyses also confirm predictable conclusions, particularly when comparing business users with a single or with multiple sites (the latter work with more operators than the others, for example), or business users by sector of activity (the construction sector subscribes the least to digital services in contrast to the trade sector). It appears that the provision of international services represents a very specific segment of activity and that apart from the very large operators who are by nature present in various countries, those who address this segment specialise in it.

It is notable that the demand-side survey shows that business customers are in majority satisfied with their suppliers. Indeed, a large majority of organisations declare themselves satisfied on all the subjects addressed by the questionnaire: quality of service provided, contractual relationship, duration of the contracts, price, ability to choose their supplier, etc. The nuance to this picture is that 30% of organisations feel they have no choice but to subscribe to a bundled offer. Finally, it should be added that the fear of difficulties in switching operator described in the

literature and mentioned by suppliers in the qualitative interviews was not clearly borne out by the demand-side survey, where respondents did not report any significant difficulties. Hence, the study did not reveal evidence of a customer lock-in issue.

From the perspective of operators, the evolving market highlights the different positioning choices. There are the classical ones like operators well established in the consumer market who also address all the range of business consumers from SOHO and SMEs to enterprises and often also trans-national organisations. Others propose a variety of ECS and IT services and insist on their ability to customise solutions. They consider that any customer can select the ones that match their needs, whatever their size. Nevertheless, statistically, high-performance, or highly integrated products are more likely to be subscribed to by large organisations. Finally, some suppliers focus on the largest organisations or even the trans-national ones, considering that their needs are specific enough to justify the implementation of solutions dedicated to them.

This study also shows that there is no consensus among operators with regards to bundling. Some state that it is difficult to sell bundles to the organisations they target, while others identify specific markets (typically small businesses) as well as products that are easily sold together (as a minimum, access, and voice, often fixed and mobile). Nevertheless, the demand side analysis carried out with the survey proves that the practice is well established, with 90% of them having subscribed to a bundled telecom offer and 50% to a telecom/IT offer. The frontier between pre-defined bundles and customised solution is not always clear for end users and is likely to become increasingly so, as tailored offers to meet business customers' needs tend to represent a commercial advantage. According to suppliers, they expect that bundling in the near future will focus on one hand on basic offers more adapted to very small businesses that are willing to have as turnkey solutions, and on the other hand on larger organisations but with basic packages.

Regarding the contractual relationship, no specific issues were raised by both the demand and offer side. Minimum contract duration seems to be set between 2 and 3 years. Some operators consider that this duration is part of the negotiation process (lower prices for longer contract duration, typically), which is therefore not imposed to the customer. Longer contract durations are also related to the operator's investment levels to deliver the services, which are often higher for large organisations than for SMEs. This is reflected in the customers' expectations: the smaller ones anticipate shorter contract duration than larger ones. In any case, large organisations know that due to the strong impact that switching their supplier implies for their global system, they tend to contract for many years.

At the expiry of contracts, smaller organisations usually negotiate the contract renewal with the same supplier, as larger ones make more frequent use of competitive tendering processes. Over the past 3 years, these negotiations turn into a change of provider for 25% of small and medium organisations and up to 37% of large organisations. Only half of organisations conclude that the change process was relatively smooth. This may reveal potential difficulties related to

migration issues especially among large organisations (33% vs 21% among small organisations) and costs issues for new equipment or infrastructure. Some alternative operators highlight the sometimes-prohibitive lead times to obtain wholesale products from the incumbent. Nevertheless, business users and suppliers appear to have long-established relationship typically spanning from 2 to 10 years on the average.

Reflecting on future trends, all operators agree on the fact that traditional electronic communication revenues will decrease while IT-services have the greatest potential for development in the coming years. SD-WAN should be particularly highlighted as many operators mentioned it as a “game changer”. Likewise, UCC become more widespread and blur the lines between services to be provided by traditional ECS operators or new suppliers.

Service catalogues from ECS providers increasingly include IT services, in response to changing demand, as business users make less use of traditional ECS, such as fixed voice services. Most operators consider that even though the two types of services (ECSs and IT services) are moving closer together, convergence should not be expected as they both have their specificities and require specialised skills. Therefore, they will most probably continue to collaborate, particularly on specific or highly technical offers. Several partnerships agreements are concluded between them, the most common being for cloud hosting but some other imply a tight integration of services like UCC. ECS suppliers fear that they might be downgraded to a support service, and that they would not be in a position to compete with market players that do have a significant financial power.

The study confirms the dynamics of the business market, with tensions on the operator side and evolving demand from the end-users. The demand-side survey shows that business users generally don’t raise concerns related to the solutions they get from their operator. ECS providers have a role to play to accompany their customers with their IT solutions. The customisation of offers to match the need of all type of business users and be able to differentiate themselves from competitors is increasingly important. This customisation now includes ECS and IT services.

8 Annexes

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8.2 Demand Side – Questionnaire

BEREC – DEMAND SIDE QUESTIONNAIRE

Scope: France, Germany, Spain, Italy, Poland

Target: (co-) decision-makers in the area of telecommunications or IT services (managers, IT managers, purchasing managers, CEO, etc.) in companies or administrations with 10 or more employees.

Sample: 1000 interviews across the 5 countries (= 200 interviews per country). In order to read the results per organisation size (at a cross country level), the sample will be structured as follow:

- **10-99 employees: 400 interviews overall (= +/- 80 per country)**
- **100-249 employees: 300 itws overall (= +/- 60 per country)**
- **250-499 employees: 150 itws overall (= +/- 30 per country)**
- **500-999 employees: 100 itws overall (= +/- 20 per country)**
- **1000 employees and more: 50 itws overall (= +/- 10 per country)**

Note about acronyms used in questionnaire:
DK = don't know [redacted]his response option is not explicitly mentioned by the interviewer.

COUNTRY (NOT ASKED)

1. France
2. Germany
3. Spain
4. Italy
5. Poland

SECTOR (NOT ASKED)

1. Industry
2. Construction
3. Trade
4. Services
5. Public sector or administration

COMPANY SIZE

Qx How many employees (full-time equivalent), including yourself, does your company currently have?

1. 10 to 99 employees
2. 100-249 employees
3. 250-499 employees
4. 500-999 employees
5. 1000 employees and more

Xx One of the telecom providers (from list master Q15 or Q16)

99. Other

999. DK / Refused to reply

Q29. Which IT services are part of a bundle with telecommunication services?

SHOW ITEMS TICKED "ALREADY SUBSCRIBED" IN Q27

99. None of these IT services

Q30. For each of these bundles, which sentence best reflects your organisation situation?

	Your organisation asked your provider to integrate it in a bundle	Your provider proposed to integrate it in a bundle, and your organisation agreed	This IT service was part of a bundle and your organisation did not have the possibility to remove it
Show items ticked in Q29			

Q31. For which reasons would your organisation prefer to buy IT services as part of a bundle with fixed telecom services?

1. Because it is less expensive
2. Reduces fixed costs (capex) in favour of variable costs (opex)
3. Because it simplifies the purchase procedure
4. Because it is better integrated
5. Other
6. None of these reasons

Q32. What is your organisation most likely to plan with regard to bundles of telecom and IT services?

1. Subscribe more often to bundles than today
2. Subscribe as often to bundles as today
3. Subscribe less often to bundles than today
4. DK

This survey is now finished. Many thanks for answering to it!

DECISION - KANTAR

Q25. What triggered the change?

1. The previous provider was more expensive than the current one
2. Your organisation had some technical issues with the previous provider
3. Your organisation was not satisfied by its previous provider level of services
4. Other reasons
5. No major problem was encountered

Q26. What were the main impediments to the change?

1. Costs, for example for new equipment or infrastructure
2. Complexity and issues related to migration
3. Previous provider reluctance to collaborate in the transition.
4. Previous provider reluctance to end the contract.
5. Other
6. No major problems were encountered

PART 3: ADDITIONAL IT SERVICES

Q27. Does your organisation subscribe or plan to subscribe the following services within the next following months?

	Already subscribe	Consider for next 24 months	Do not consider	DK
1. Cloud storage				
2. Collaborative solutions (Teams…)				
3. Security services (for example firewall)				
4. Dedicated server hosting				
5. Cloud computing (virtualised servers on the cloud- IaaS / Infrastructure as a Service)				
6. Purchasing of software in the Cloud, also referred to as Software as a Service or SaaS				

Q28. Which provider do you use for cloud storage?

101. Google / Google Cloud Platform

102. Amazon / Amazon web services / AWS

103. IBM

104. Microsoft / Azure / Microsoft Azure

105. Oracle cloud

Q20. How long has your organisation been contracting with the oldest/your main provider?

1. Less than 2 years
2. 2 to 5 years
3. 5 to 10 years
4. More than 10 years
5. DK / Refused to reply

Q21. When a contract expires, what does your organisation most often do?

1. Renegotiate the contract terms with the provider but do not put your current provider back in competition unless you are dissatisfied with your current provider.
2. Reconduct the contract with no specific negotiation unless you are dissatisfied with your current provider.
3. Always put your current provider back in competition even if you are satisfied by your provider
4. DK / Refused to reply

Q22. Generally speaking, would you say that the competitive set is strong, which means you have a lot of offers you can compare for fixed telecommunication services?

1. Strongly agree
2. Somewhat agree
3. Somewhat disagree
4. Strongly disagree
5. DK / Refused to reply

Q23. Over the last few years, would you say that your satisfaction regarding received offers for fixed telecommunication services has globally…?

1. improved
2. remained the same
3. deteriorated
4. DK / Refused to reply

Q24. Did your organisation change one of its fixed telecommunication services providers over the last 3 years?

1. Yes
2. No
3. DK / Refused to reply

Q15. Please indicate the main provider your organisation is working with for fixed telecommunication services.

Precoded list of providers

98. DK / Refused to reply

Q16. Please indicate other providers your organisation is working with for fixed telecommunication services.

Precoded list provider in excel sheet

99. DK / Refused to reply

Q17. Based on your experience with your main provider for fixed telecommunication services, how would you rate your main provider for fixed telecommunication services on the following aspects…? Please give a rate from 0 to 10

	0	1	2	3	4	5	6	7	8	9	10	99. DK / Refused to reply
Price												
Quality of services provided												
Length of contract												

Q18. How did your organisation choose its providers for fixed telecommunication services?

1. A standard catalogue was consulted for one provider
2. There was a comparison of several providers based on their standard catalogue
3. There was a direct negotiation with different providers
4. A call for tenders was set up
5. Other
6. DK / You were not in the organisation when the operator was selected

Q19. For the contracts your organisation signs with your fixed telecommunication services providers, what is generally the minimum contract duration in years?

1. 1 year
2. 2 years
3. 3 years
4. 4 years
5. 5 years or more
6. Indefinite duration

DECISION - KANTAR

Q8. Has your organisation contracted a redundancy solution for the main internet access?

1. Yes
2. No

Q10. How many sites does your organisation have in <COUNTRY>?

_____ sites

PART 2: FIXED TELECOMMUNICATION SERVICES PROVIDER AND DECISION PROCESS

Q11. How many providers for fixed telecommunication services is your organisation currently contracting with?

_____ providers

Q12. Do you have the same fixed telecommunication services provider for all sites?

1. Yes
2. No

Q13. For which reasons does your organisation call to more than one fixed services provider?

1. It's the group strategy
2. Your organisation prefers to let each site choose its own provider
3. Your organisation would have preferred to select one single provider, but no provider was able to cover all your sites
4. Your organisation selected the provider that best meets your need depending on the service.
5. Your organisation selected the cheapest provider for each service.
6. Your organisation main provider does not propose some specific services needed.
7. Your organisation can more easily adapt each contract features (price, length, options).
8. Your organisation, as a public administration, has to organise a public tender with different lots

Q14. When choosing a unique/your main fixed services provider, was your organisation able to choose among several providers?

1. Yes
2. No, it was the only provider that was able to cover all sites/No, it was the only provider that was able to cover my site.
3. No, it was the only provider that proposed all the services I needed.

Q0. Are you in charge of telecommunication and related services for your organisation…

1. only at a local scale
2. At a regional scale
3. At a national scale
4. At an international scale

PART 1: ACCESSES AND SERVICES CONTRACTED

Q1. Which telecommunication services does your organisation currently use?

1. Standard broadband internet access
2. Internet offer dedicated to business
3. Landline phones / fixed telephony
4. Mobile services/Cell phones
5. Multi-sites Virtual Private Network (VPN) services.
6. Leased lines
7. Other telecommunication services

Q2. Among these services, which ones has your organisation subscribed within a bundled contract or combined offer?

SAME LIST AS IN Q1 WITH ONLY ITEMS TICKED YES

Q4. What kind of access types does your organisation have for your fixed broadband services?

1. Fibre: Yes / No
2. DSL type Internet connection (ADSL, VDSL, copper-based connection): Yes / No
3. Coaxial cable: Yes / No
4. Other to list: Yes / No

Q5. Does the main internet access of your organisation include the following options?

1. Guaranteed bandwidth Yes / No
2. Guaranteed availability Yes / No
3. Guaranteed restoration time (GRT)/Time To Repair (TTR) Yes / No
4. Other Yes / No
5. DK / Refused to reply

Q6. What is the maximum download speed in Mbit/s?

_____ Mbit/s

99999997. Don't know

DECISION - KANTAR

8.3 Supply side - Interview guide

DECISION
ETUDES & CONSEIL

BEREC

Study on Communication Services for Businesses in Europe: Status Quo and Future Trends

The aim of this interview is for BEREC, the Body of European regulators for electronic communications, to have a better understanding of the electronic communication services (ECS) landscape in Europe. In the last years business services have evolved and are expected to evolve even more to include new innovative services supported by the deployment of very high capacity fixed and mobile networks. The BEREC wishes to obtain a thorough view and understanding of both business users demand, operators offer and the dynamics on the business retail markets

1

Positioning

- What is the geographical scope of the business market that you address: regional, national or multinational?
- What type of business customers are you addressing (SMEs, large companies, public administrations, all of them?). If only a specific set of business customers, please explain why.
- Are you also commercialising services for the residential mass market?

Overview of the services

1. Are you offering the following retail business services? If so, could you provide an estimation of their repartition (in revenue)
    a. Standard mass-market broadband internet access (basic offer, no specific quality of service) provided to business users
    b. Business grade broadband internet access (professional options available, dedicated quality of service and SLAs)
    c. VPN access
    d. Landline phone/fixed telephony
    e. Dedicated capacity
    f. Mobile services/Cell Phones
    g. Machine to Machine Service or IOT
    h. IP Service, PBX, IP Centrex or other
    i. Other

2. For business grade broadband internet access offered to SMEs, please describe the main characteristics of these services: technical (throughput, QoS, availability, etc.) and commercial SLA (e.g. Time to Repair). Please, highlight differences compared to standard residential mass-market broadband internet access.

3. Are you offering specific products for large companies/organisations not used by SMEs? If so, describe differences in terms of SLAs and QoS.

Bundled services

4. What are the typical bundles of electronic communication services that you propose for business services? What are the main differences depending on the buyer's size?

Contracts

5. When contracting with an organisation, what is the standard minimum duration that you apply, if any? What are the main differences depending on the service and/or the contract size or characteristics?

6. And what is the typical lifetime of contracts?

7. Are you in a position to compete for multi-site contracts on a national scale? If not, explain why. *To be skipped for incumbent operators*

Technical considerations

8. Do you rely on third parties' infrastructure to access end-user locations? For which access types and to what extent? How many wholesale access suppliers do you buy service from?

9. Do you use mass-market infrastructure (typically FTTH or ADSL) to address the business/enterprise sector? Please provide details by company size and by type of needs.

10. Are there wholesale products that would be necessary (e.g. to provide certain services, or segment your services differently) that are not available today on the wholesale market? If so, specify.

Questions about IT Services

11. Are you offering the following services?
    a. Cloud storage
    b. Collaborative solutions (Teams…)
    c. Security services (for example, firewall)
    d. Dedicated server hosting
    e. Cloud computing (virtualised servers on the cloud-IaaS / Infrastructure as a Service)
    f. Software in the Cloud, also referred to as Software as a Service or SaaS

12. If so, do you propose these IT services bundled with electronic communication services? Please describe which ones of the previous list (or any other).

13. For IT services, do you provide them based on your own IT infrastructure/software, or do you rely on other providers (Amazon, Alphabet or Microsoft, for instance)? Please describe according to the type of services.

Future trends (2-3 years)

14. For which services (telecom and IT) do you see increasing demand in the future (2-3 years). For which (if any) decreasing? Would you be able to assess these trends in percentage of demand (*i.e. expectation is more in volume than in revenue*)?

15. How do you see the trend (2-3 years) with regards to the fixed access solutions requested by business users?

16. How do you see the evolution of competition and/or cooperation with IT services providers? Could you share specific plans or examples for your organisation?

17. According to you, what are the future trends (2-3 years) in the bundling/combination of electronic communication services and IT services?

8.4 Demand side survey – Specific methodology details

8.4.1 Preparation of the samples and data processing

The organisations contacted for the survey have been selected randomly among a database provided by Sales.Rock[34] combined with public organisations directories. The database has been supplemented with phone numbers and categories details.

For the fieldwork, the sample was voluntarily stratified by company size to guarantee a reading on each size. Indeed, if the sample was representative from the start, a reading would not have been possible for the large business users given their weight in reality. The sample was then weighted for each size.

Following the field work, a weighting was implemented. The purpose of weighting the results is to ensure that the sample surveyed is representative of the population structure.

In this survey, in order to have reading keys for the size of the companies while optimising the total number of interviews, the sample was "stratified". This means that certain organisation sizes, such as large companies, were over-represented in the total sample (30% of the total sample = 298 interviews out of 1000) compared to reality (on average, large organisations only represent 2-3% of companies). To avoid over-representing the views of large companies in the final results, we then applied a weighting.

Thus, the tables hereafter show the actual distribution of organisations per size and per sector, which has been used for the weighting.

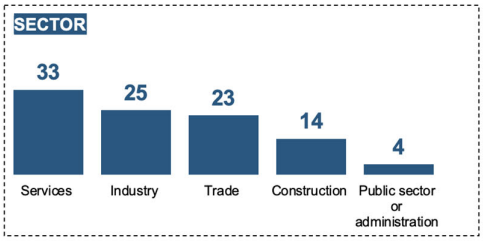

Table 8.1: Distribution of organisations per sector in Europe (in %)

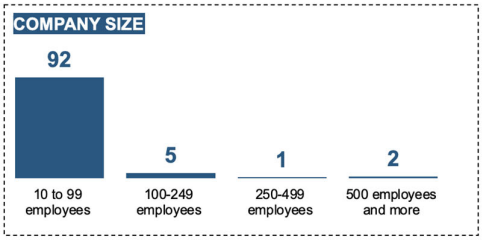

Table 8.2: Distribution of organisations per size in Europe (in %)

[34] https://sales.rocks/

8.4.2 Margins of errors

A sample is by definition smaller than the population it is based on, meaning that there is a degree of error in the results obtained from it. The principle of a survey is based on a mathematical law - the law of large numbers - that states that an average score measured among a sample of interviewees / organizations (i.e., an extract of the full population) has an increasing probability to match with the exact value in the full population (i.e., if we had interviewed all organizations in each country) as the sample grows.

In other words, the % measured in a survey are only “probable mean values”, and the margins of error (which are the lower and upper bounds of the confidence interval) are used to quantify this probability.

The margins of error rely on:

- The sample size (1,000 interviews here)
- The score measured: the closer it is to 50%, the larger the margins of error.
- The confidence level (commonly 95%): it means that 95% of people would give a score within the calculated confidence interval (which is comprised of the lower and upper margins of error). In other words, if we perform the same survey 100 times, 95 times out of 100 we would get a result within the margin of error and the remaining 5 times we would get a result outside the margin of error limits.

The margins of error given in surveys are based on the assumption of random sampling. The margin of error depends on the sample size, as well as the proportion (x axis, Figure 8.1) to which it is applied.

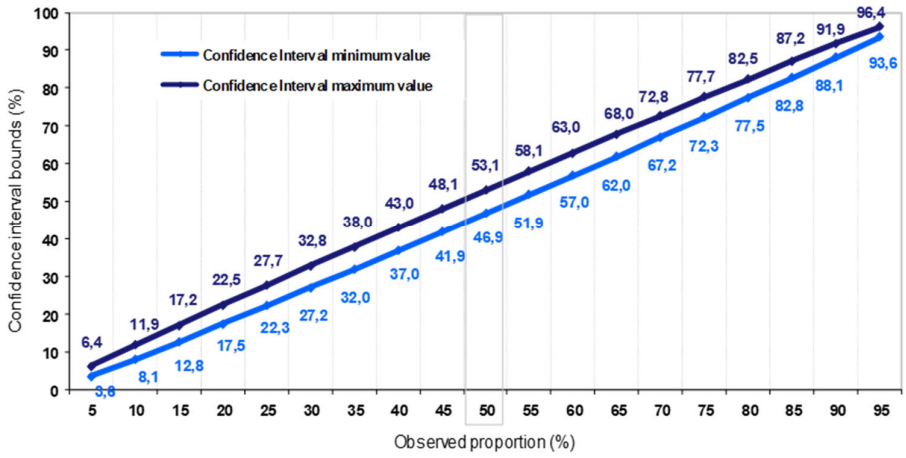

Figure 8.1: Confidence interval and observed proportions for a sample size of 1000

As an example, if a score (or proportion) is measured at 10% in a survey based on a sample of 1,000 respondents, then, the margins of error will be 1.9 points (and the confidence interval 3.8 points). It means that the exact value in the full population (i.e., if every single people in the population was interviewed) is between 8.1% and 11.9%. In the same survey, if another score is measured at 20%, then the margins of error is 2.5 points (and the confidence interval 5.0 points): it means that the exact value in the full population is between 17.5% and 22.5%. The largest margins of error is for scores measured at 50% (margins of error of 3.1 points, and confidence interval of 6.2 points).

The smaller the sample size, the wider the confidence interval (and thus the margins of error), meaning although there might be large differences in data, it is not necessarily significant, for instance, between one sector and another. As such, results are to be interpreted carefully, particularly when the base is small (the base varies between questions as different subgroups are considered). Note that the differences commented in the report are all significant.

As an indication, below are confidence intervals for different sample sizes:

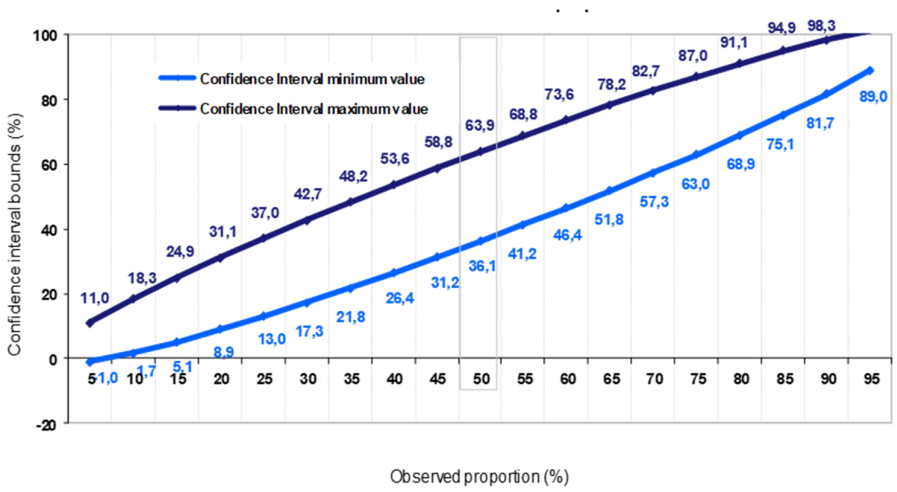

Figure 8.2: Confidence interval and observed proportions for a sample size of 50

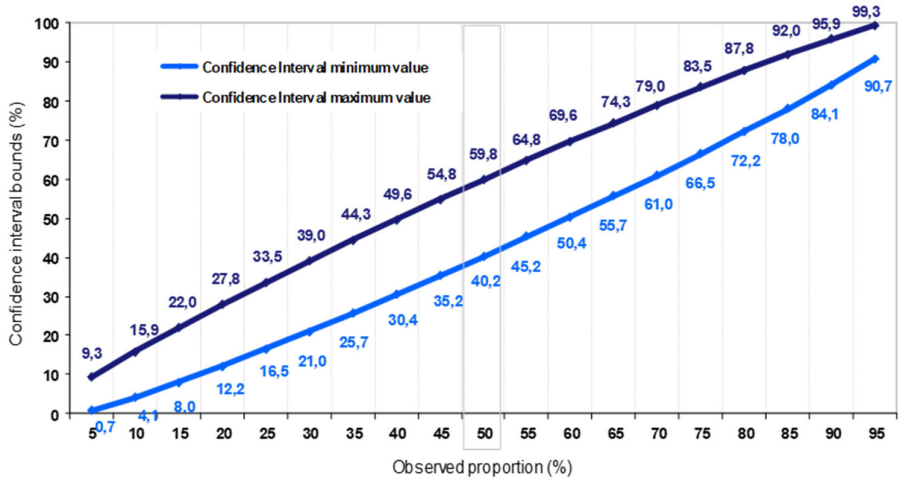

Figure 8.3: Confidence interval and observed proportions for a sample size of 100

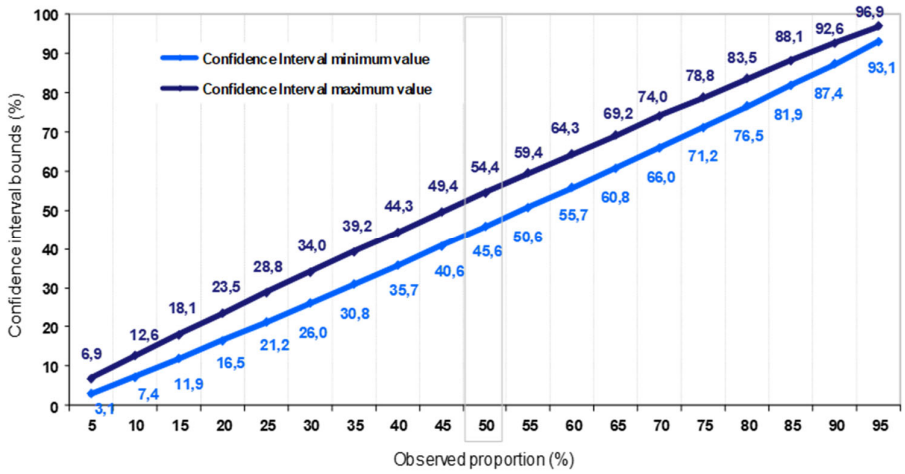

Figure 8.4: Confidence interval and observed proportions for a sample size of 500

When relevant, complementary analysis will be displayed on specific targets (number of sites, activity sector, number of providers). The raw basis per sector is presented below: the figures in red show the bases that are too low (less than 40 respondents) and cannot be used for the analysis. Nevertheless, this did not influence the weighting.

Table 8.3: Raw respondents' basis per sector

	Industry	Construction	Trade	Services	Public
Total	544	62	189	163	42
Less than 250 employees	376	42	133	123	28
250 employees or more	168	20	56	40	14

All results in this study are based on declarative answers. As such, there might be bias in the result to:

- A difference between the perception of the interviewees and their actual situation: for instance, thinking two products are subscribed as a bundle because they are provided by the same supplier.
- Some technical aspects they are not familiar with, particularly among small and medium business users. Indeed, in these organisations, IT and ECS subjects are often managed by the founder, managing director or finance director who have less technical background than dedicated IT managers in large organisations.

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