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Superfast Broadband Business Exploitation Project

Digital Maturity Survey for Wales 2018

5th March 2019

Llywodraeth Cymru
Welsh Government
Cronfa Datblygu Rhanbarthol Ewrop
European Regional Development Fund

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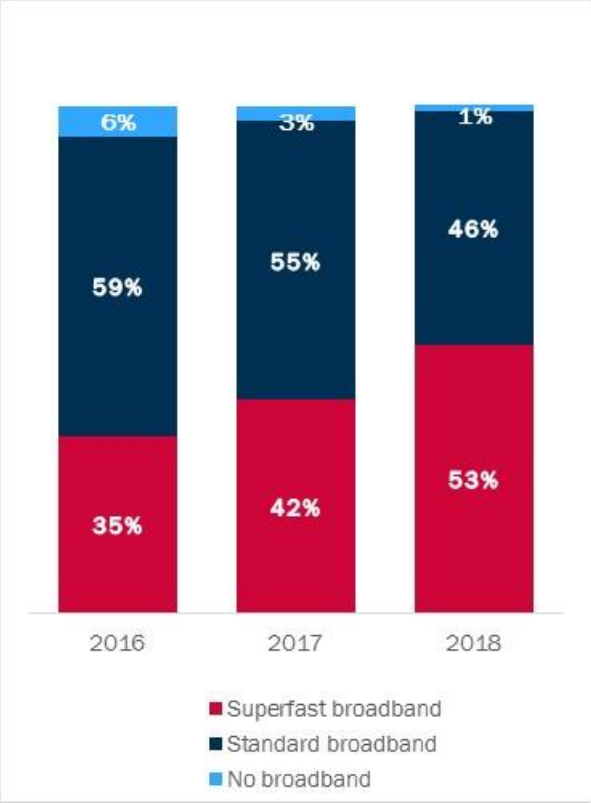
Summary

Maximising the use of digital technologies by SMEs in Wales will be important in leveraging productivity benefits and strengthening regional economic performance. The *Digital Maturity Survey for Wales 2018* casts light on this challenge, providing findings from Cardiff Business School's third annual survey of small and medium-sized enterprises (SMEs) in Wales, and their adoption and use of digital technologies enabled by broadband.

The *Digital Maturity Survey* provides data from a representative sample of SMEs in Wales, based on 479 responses. Its findings provide an insight into the processes by which SMEs' business performance is shaped by adoption of broadband, the level of resources, and the use of broadband-enabled applications.

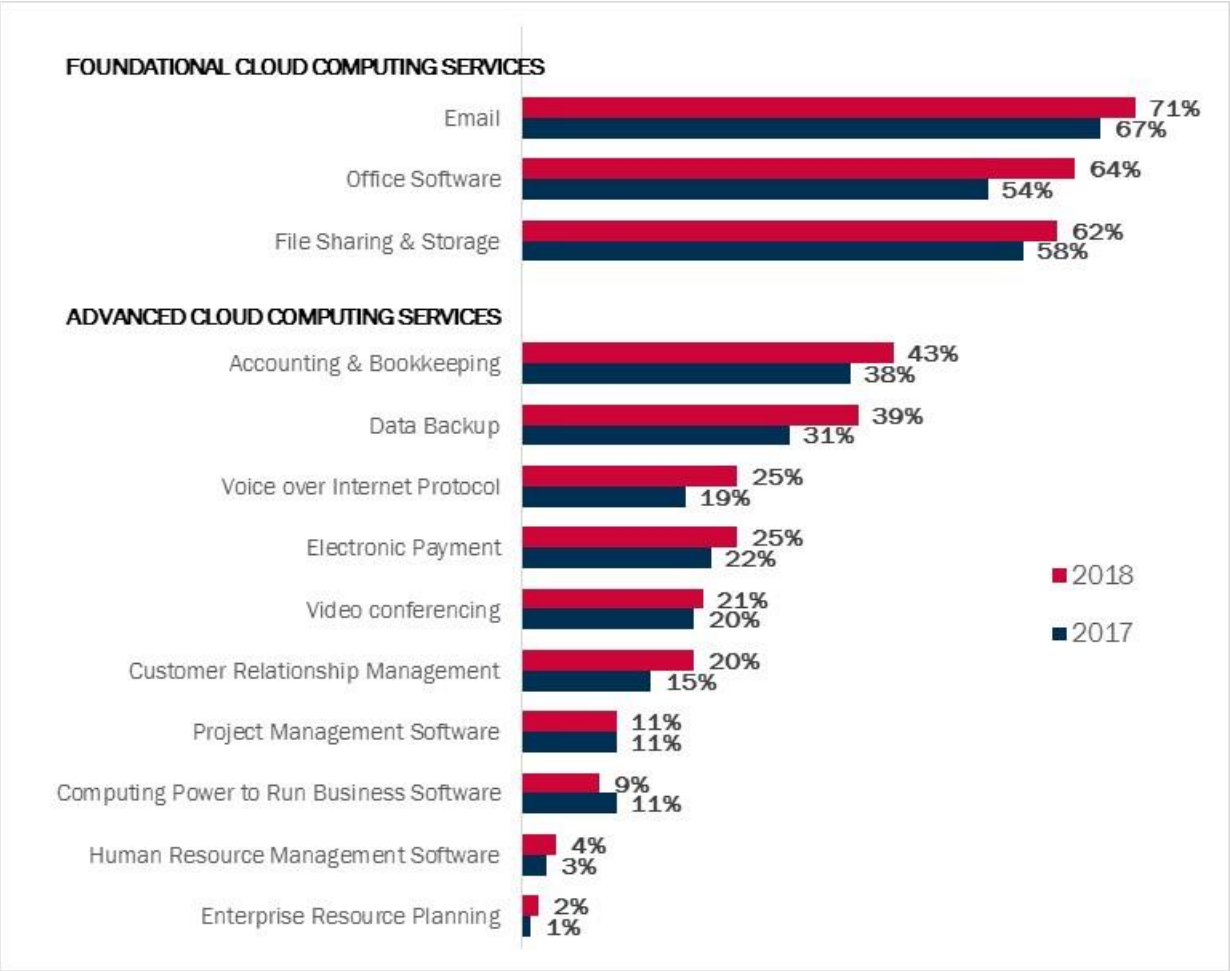
The survey results provide cause for optimism over Welsh SME engagement in superfast broadband and enabled technologies. They show that the majority of SMEs are engaging with superfast broadband through fixed line connections, and adopting in ever greater numbers (53% - up 11 percentage points on the 2017 figure). This, and the fact that only 1% of SMEs report having no broadband in 2018 (See Figure 0-1), suggests that fixed broadband connectivity is now mainstream amongst SMEs in Wales – with superfast broadband accounting for the majority of these connections.

Figure 0-1 Adoption of broadband, by type (% of SMEs)



Analysis reveals that an increasing number of SMEs are reporting sustained use of cloud services, with 72% of SMEs now using at least one form of 'advanced' cloud computing service (up from 60% in 2017). While Figure 0-2 shows comparatively fewer businesses are using advanced cloud computing services (in relation to foundational services), the findings highlight that the majority of service types experienced an increase in use between 2017 and 2018.

Figure 0-2 Proportion of businesses using cloud computing services, by category (% of SMEs)

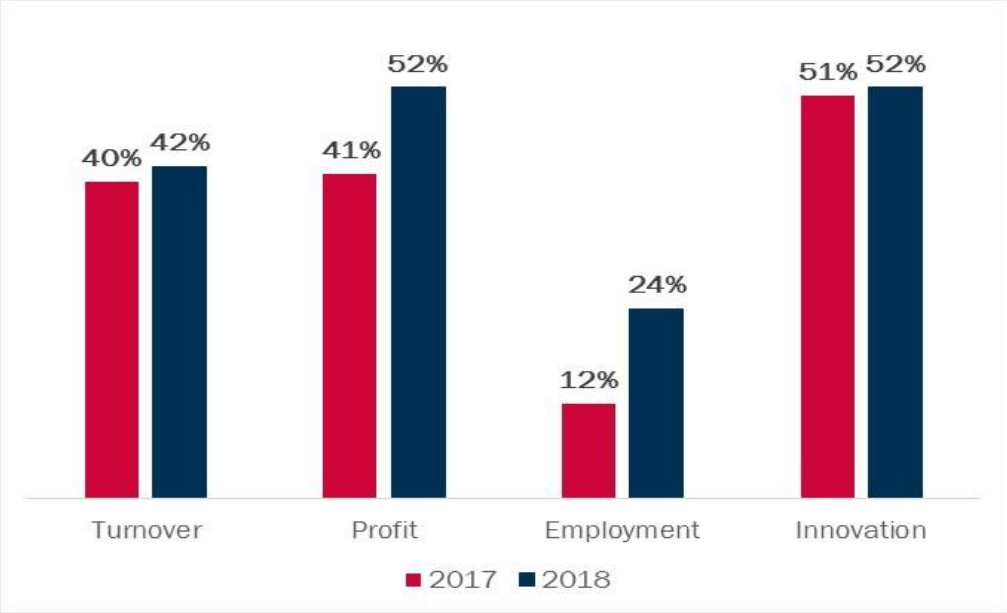


Development of employee skills is another way in which SMEs are able to exploit digital technologies. Here, the results show a small decline in the number of SMEs with 50% or more of their workforce with intermediate or above ICT skills, from 70% to 67% over the period 2017-2018.

The findings further demonstrate the extent that SMEs are making use of digital technologies to transact business. This includes a growing number of e-commerce sales, with 74% of SMEs reporting sales serviced online (up from 67% in 2017), but a decline in the proportion of SMEs making purchases online (from 91% in 2017 to 87% in 2018).

Analysis of the findings provides a clear link between engagement with these digital technologies, and increases in turnover, profitability, employment and innovation between 2017 and 2018. This highlights the potential for productivity benefits to be leveraged through support for growing use of broadband.

Figure 0-3 Performance of SMEs with superfast broadband (% indicating positive outcomes)



Four groups of businesses can be discerned from our analysis of the survey findings (see Figure 0-4). Comparing the latest 2018 data with that from 2017 indicates larger numbers of businesses embraced within the categories of 'digitally embedded' or 'active exploiter' –pointing to growing digital maturity in the SME community.

Figure 0-4 Digital maturity clusters in Wales

Level of Digital Maturity

Digitally Disengaged	Passive Exploiters	Active Exploiters	Digitally Embedded
Businesses tending to be standard broadband users, with a high proportion of employees with below average ICT skills. The majority do not use digital technologies and report no sales from online transactions.	Businesses tending to have standard broadband, but are more likely to have staff with above average ICT skills. Make use of basic cloud-based applications, but the use of online platforms to generate e-sales is low.	Businesses likely to have access to superfast broadband and a high proportion of staff with above average ICT skills. Use a wider range of digital platforms and technologies. Nearly half report online channel as the main source of sales.	Adopters of superfast broadband with a very high proportion of employees with above average ICT skills. Use a high number of digital applications, and secure the majority of their sales from online transactions.

The report goes on to show positive trends in adoption across both rural and urban locations. An underlying attribute of the new technology and its adoption in Wales was that this might aid in closing intra-regional productivity gaps.

While the overall picture presented by the findings is one of increasing digitalisation of SMEs in Wales, they also highlight that this transition is not linear when viewed on a yearly basis, with some indicators declining between 2017 and 2018. This is likely to reflect the evolving nature of digital technologies, and the continual need for SMEs to adapt. The 2019 *Survey* will help us to better understand the direction of adoption trends over time.

Finally, the key context for the DMS 2018 has been uncertainty around the EU transition process. While there is interest in how far adoption of the resources made possible by superfast broadband enhances SME resilience, and removes selected barriers to growth, we are mindful that digitally engaged SMEs might be better positioned to grow exports, better placed to avoid overseas transactions costs, and better informed of overseas opportunities.

This annual Report is an integral part of the Superfast Broadband Business Exploitation (SFBE) programme, part-funded by the European Regional Development Fund (ERDF) through the Welsh Government.

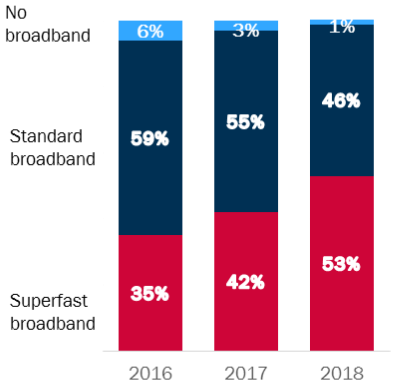
Superfast Business Wales is a free business support service that helps eligible small and medium sized Welsh businesses make the most of online technology. Offering free master-classes, one-to-one advice and website review, their support could help your business save money, boost sales and profits and improve productivity.

Figure 0-5 Digital dashboard for Wales 2018

ICT INFRASTRUCTURE

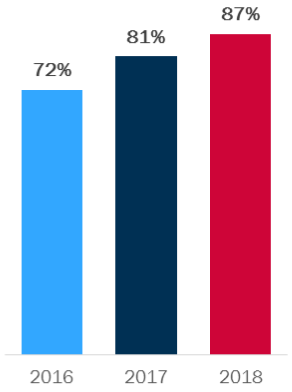
Adoption of broadband

Digital maturity survey, % of SMEs



SMEs able to receive superfast broadband in Wales

Ofcom, % of premises



ICT RESOURCES

Use of advanced cloud computing services

Digital maturity survey, % of SMEs

Share of SMEs with over half of workforce with intermediate or above IT skills

Digital maturity survey, % of SMEs

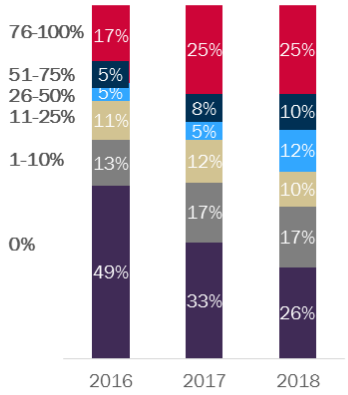
Annual IT spend

Digital maturity survey, £ per employee

Spending category	2016	2017	2018
Hardware	£684	£624	£473
Software	£662	£711	£494
Network	£180	£92	£119
Broadband subscription	£113	£132	£199

Share of e-sales in total sales

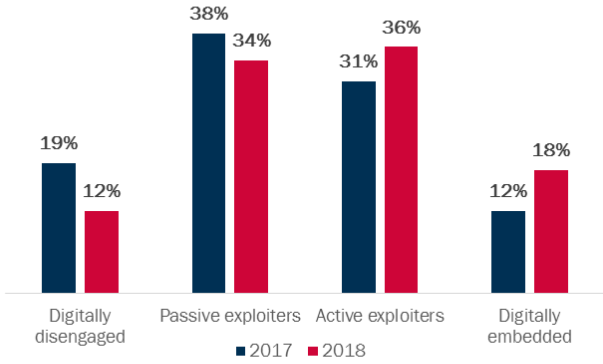
Digital maturity survey, % of SMEs



ICT USE

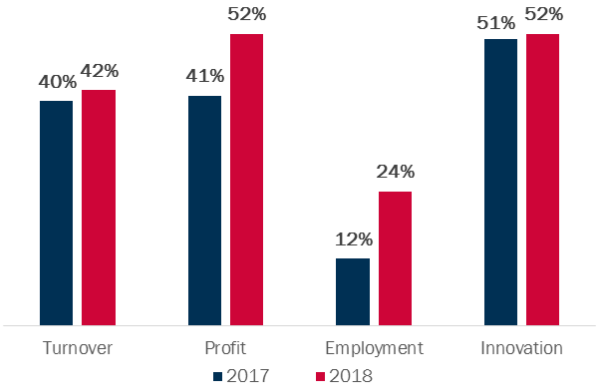
Digital maturity index

Digital maturity survey, breakdown of businesses by category



Performance of SMEs by type of broadband

Digital maturity survey, % of SMEs reporting positive outcomes from adopting superfast broadband services



1. Introduction

The *Digital Maturity Survey for Wales 2018* provides findings from Cardiff Business School's third annual survey of small and medium-sized enterprises (SMEs) in Wales, and their adoption and use of digital technologies enabled by broadband. The *Survey* contributes to the Welsh Government's Superfast Broadband Business Exploitation (SFBE) programme, which is part-funded by the European Regional Development Fund (ERDF), and provides assistance to SMEs to understand, adopt and use online digital technologies.

1.1. The research

This research addresses the need for improved data on how businesses in Wales are using and exploiting superfast broadband and associated technologies. While some data on this issue is available from UK national surveys of the Office for National Statistics (ONS) 'E-Commerce and ICT' survey, no comprehensive source exists on SME use in Wales. The purpose of the research is, therefore, to provide a robust, longitudinal dataset on high speed broadband use and its impact on the Welsh economy.

The *Survey* forms part of a wider programme of superfast broadband research, undertaken by Cardiff Business School, including economic impact modelling and horizon scanning. Results of activities, including the results of the previous surveys, can be found at http://www.cardiff.ac.uk/superfast-broadband-project.

1.2. The context for the research

Broadband adoption and use have become a high priority for policy in Wales. This is reflected in Welsh Government strategies such as 'Taking Wales Forward'[1] and the 'Prosperity for All: Economic Action Plan'[2]. While access to broadband infrastructure is an important element in the development of business and economy-wide impacts, take-up and exploitation of digital technologies by businesses are equally important. Ensuring that businesses are able to profitably use this infrastructure and related technologies lies at the heart of the SFBE programme. This support is provided by Superfast Business Wales and includes workshops and one-to one advice to SMEs[3].

[1] http://gov.wales/docs/strategies/160920-taking-wales-forward-en.pdf

[2] http://gov.wales/docs/det/publications/171213-economic-action-plan-en.pdf

[3] https://businesswales.gov.wales/superfastbusinesswales/

The use of broadband by SMEs is set in a context where sub-regions of Wales face persistent socio-economic disadvantages. This is reflected in relatively low levels of gross value-added per capita, of which poor productivity among SMEs is a contributory factor. The innovative take-up of superfast broadband could work to lever productivity gains, and act as a component of economic convergence processes in Wales. Indeed, such gains are hinted at in our related research on economic impacts[4].

The geographical and demographic characteristics of rural areas in Wales present specific challenges to the deployment and use of broadband. A desire for better coverage, particularly in the remaining harder to reach areas, is the focus of programmes such as Superfast Cymru and its successor (both part funded by ERDF through the Welsh Government), and strategies such as the 'Mobile Action Plan for Wales'[5].

1.3. Survey methodology

The 2018 *Survey* has, again, collected a representative sample of SMEs in Wales. It was disseminated with the support of our research partners (Business Wales, Superfast Business Wales, the 22 local authorities, Federation of Small Businesses Wales [FSB Wales] and Institute of Directors Wales [IoD Wales]). In addition, the WERU team conducted its own dissemination, making use of Bureau van Dijk's FAME database, and a number of telephone and face-to-face surveys. All results were managed using the Qualtrics survey platform. A total of 479 responses were achieved. A detailed breakdown of the survey responses can be found in Table 1-1 below.

Table 1-1 Breakdown of survey responses

	Number of SMEs	Share of SMEs[1]
Location: EU region		
West Wales and the Valleys	286	*59.7*
East Wales	193	*40.3*
Location: Sub-region[2]		
Mid Wales	64	*13.4*
North Wales	107	*22.3*
South East Wales	212	*44.3*
South West Wales	96	*20.0*

[4] http://www.cardiff.ac.uk/superfast-broadband-project/economic-impact-research

[5] http://gov.wales/topics/science-and-technology/digital/infrastructure/mobile-action-plan/?lang=en.

	Number of SMEs	Share of SMEs[1]
Location: Urban/Rural[3]		
Urban	265	*55.3*
Rural	214	*44.7*
Firm Size[4]		
Micro	318	*66.4*
Small	119	*24.8*
Medium	41	*8.6*
Unknown	1	*0.2*
Industry Sector[5]		
Construction	45	*9.4*
Manufacturing	76	*15.9*
Wholesale/retail, transport and storage	58	*12.1*
Accommodation and food services	31	*6.5*
Information and communication	53	*11.1*
Business and other services	214	*44.6*
Unknown	2	*0.4*

Notes:

1. Percentages may not sum due to rounding.
2. Mid Wales sub-region includes the local authorities of Powys and Ceredigion; North Wales sub-region includes the local authorities of Isle of Anglesey, Conwy, Denbighshire, Flintshire, Gwynedd and Wrexham; South East Wales sub-region includes the local authorities of Blaenau Gwent, Bridgend, Caerphilly, Cardiff, Merthyr Tydfil, Monmouthshire, Newport, Rhondda Cynon Taf, Torfaen, and Vale of Glamorgan; South West Wales sub-region includes the local authorities of Carmarthenshire, Neath Port Talbot, Pembrokeshire and Swansea.
3. Postcodes were utilised to classify respondents by the 2011 Census rural-urban classification (A1-F2), available at https://onsdigital.github.io/postcode-lookup/ (last accessed 22/01/19).
4. Micro businesses have 0 to 9 employees, small - 10 to 49 employees, medium - 50 to 249 employees.
5. Industry sectors refer to SIC 2007 categories and are listed in the table as F, C, G-H, I, J, and K-S, respectively.

1.4. New question additions to the 2018 *Survey*

The 2018 *Survey* largely follows the question structure established in previous years. A new question was added, however, to capture the technology choice by which SMEs connected to broadband –fixed line, mobile or other (Figure 2-1). This was included to allow a better understanding of the different ways that SMEs are connecting to broadband. In addition, the option for business respondents to select improved communication as a benefit from broadband use was introduced (**Figure 2-20 Benefits of broadband-enabled services (% of SMEs)**Figure 2-20), as was the option to indicate where invoices issued/sent invoices could be sent in electronic format suitable for automated processing (Figure 2-19). Finally, a number of questions were simplified, resulting in no overall increase in the size of the *Survey*.

1.5. Digital maturity conceptual framework

The framework for the annual *Digital Maturity Survey* is set out in Figure 1-1. This framework was developed from a review of existing studies on digital maturity. It is intended to reflect the processes by which SMEs' business performance is shaped by adoption of broadband, the level of resources, and the use of broadband-enabled applications. The framework comprises three primary elements and also underpins the Digital Maturity Index, described in Section 3 of this report.

ICT Resources includes infrastructure (broadband adoption), investment in physical assets, software and services, skills training; and staff capabilities. These resources have been identified as an important source of competitive advantage for SMEs and underpin a business' ability to make productive use of digital technologies.

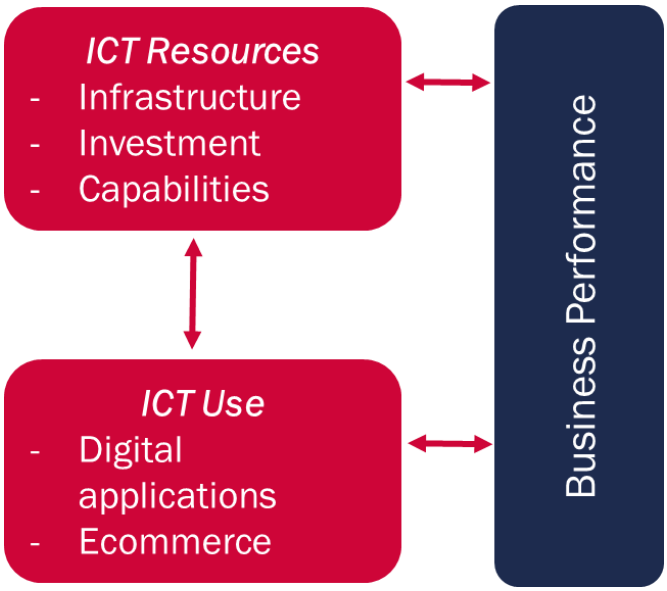
ICT Use refers to the ways in which SMEs make use of digital technologies in their business processes. The scope of digital technologies in use has been a significant growth area in recent years, with the digital maturity of SMEs explained by the growing adoption of superfast broadband, and enabled technologies such as cloud computing.

Business Performance captures the effects of having access to ICT resources and their use by the SMEs. Impact is measured in terms of changes in turnover, profitability, employment, and innovation activity in the business. The Economic Impact Report makes further use of this data to calculate impacts on the Welsh economy[6].

[6] See http://www.cardiff.ac.uk/superfast-broadband-project/economic-impact-research

The framework highlights interactions between the three primary elements of digital maturity – ICT Resources, ICT Use and Business Performance. By reflecting the dynamic nature of these elements it acknowledges the potential for feedback to occur. For example, Business Performance might be both an antecedent and consequence of businesses adopting ICT Resources and ICT Use

Figure 1-1 Digital maturity framework



1.6. Structure of report

The report begins with the Key survey findings from the Digital Maturity Survey for Wales 2018. This is followed by the Digital Maturity Index, which describes the construction and results. The report then sets out the Comparative analysis, presenting longitudinal findings. The report concludes with the Digital Dashboard for Wales and implications for subsequent research in the Conclusions.

2. Key survey results

2.1. Introduction

This section summarises the main descriptive findings from the 2018 *Survey*. Where possible comparative data from the surveys in 2016 and/or 2017 are included.

A sample representative of major industry sectors and size of SMEs (micro: 0 to 9 employees, small: 10 to 49 employees, and medium: 50 to 249 employees) for Wales was produced using a stratification method. The post-stratification weights were then applied to the results to reflect the breakdown of firm size and industrial structure of the Welsh economy.

As businesses who displayed interest in completing the primarily online survey were more likely to be those with greater engagement with all things digital, the results could have an upward bias in terms of digital maturity. To aid in counteracting this a number of survey interviews were completed face-to-face at business events, conferences and over the phone.

The section is structured in five parts (in the same way as the 2017 report) with analysis presented by: 1. Adoption of broadband; 2. Use of broadband-enabled services; 3. ICT expenditure; 4. ICT skills; and 5. E-commerce.

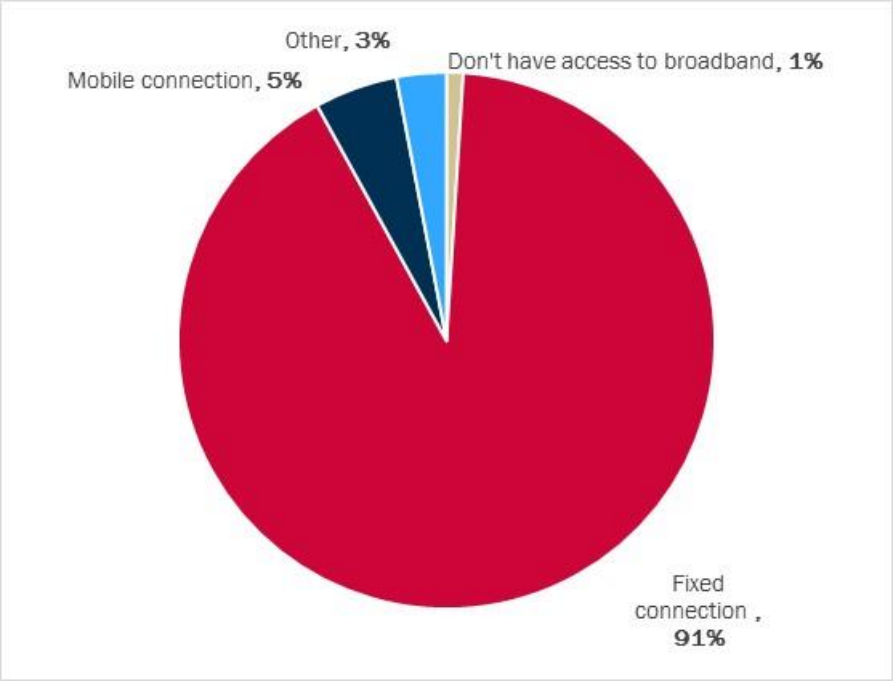
2.2. Adoption of broadband

Connection technology to broadband. The majority of businesses primarily connected to broadband using a fixed connection (91%). Additionally, Figure 2-1 shows that one-in-twenty SMEs (5%) mainly used a mobile connection (3G or 4G), and 3% utilised other connection method, such as satellite or microwave, to access broadband. Having no access to broadband was reported by 1% of SMEs.

The sub-regions of Mid Wales (9%), and North Wales (7%) had the highest proportion of SMEs reporting a mobile connection as their primary technology to access broadband. A mobile broadband connection was most likely to be used by businesses in the Accommodation and food services, and Manufacturing sectors.

Accessing broadband via a satellite or microwave link was most prevalent in Mid Wales and South West Wales (5% of SMEs for both sub-regions), in rural areas.

Figure 2-1 Primary connection to broadband (% of SMEs)



Adoption of broadband. In 2018, over a half of SMEs (53%) reported using superfast broadband, defined as being able to download data at speeds of at least 30 megabits per second (Mbps). Figure 2-2 shows this was an increase of 11 percentage points from 2017 where 42% of businesses reported using superfast broadband. Just under a half of SMEs (46%) had standard broadband only in 2018.

Figure 2-2 Adoption of broadband, by type (% of SMEs)

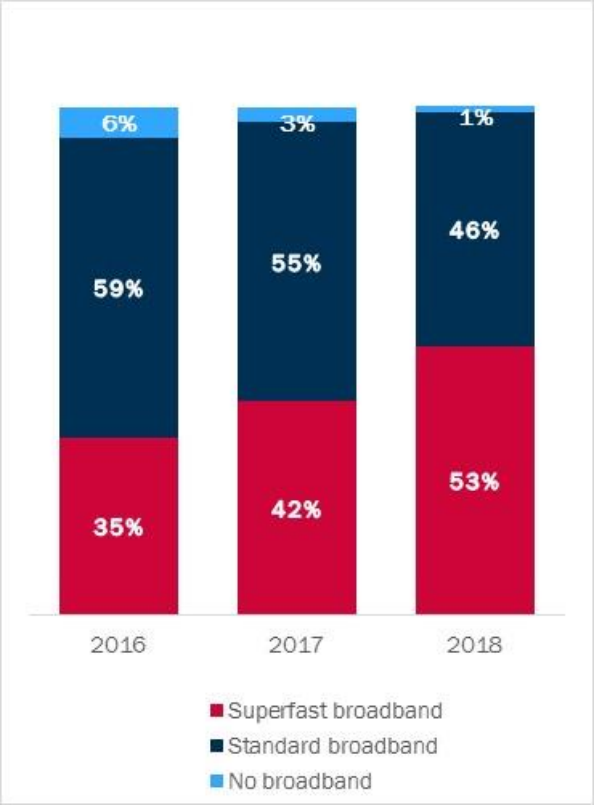
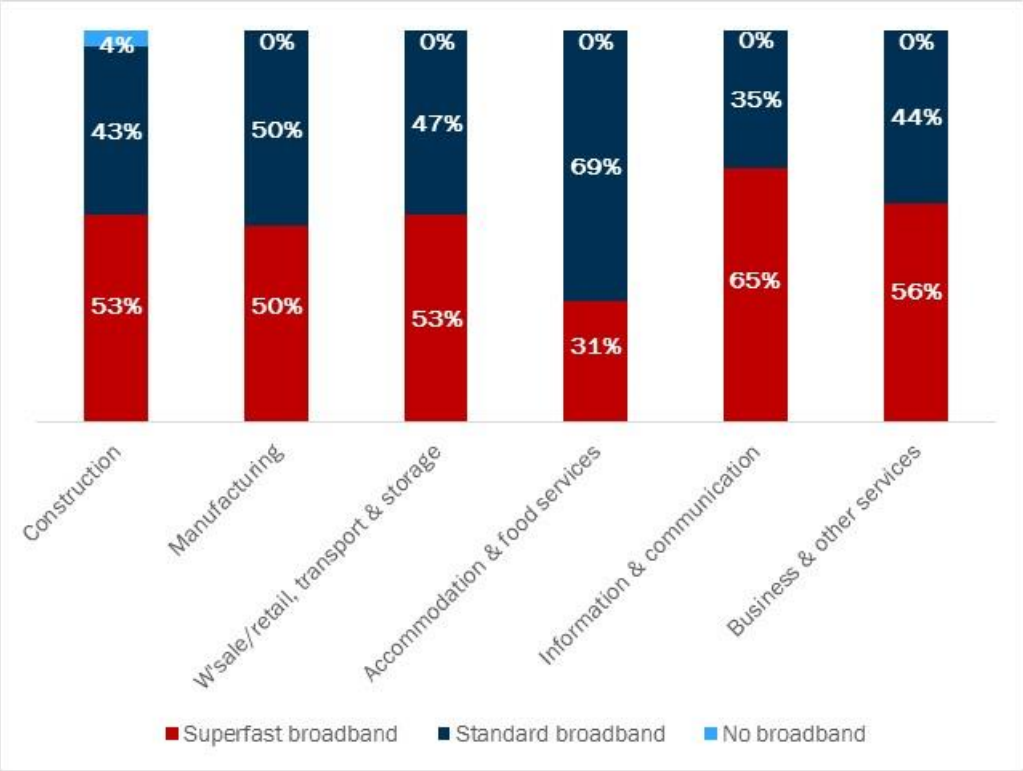


Figure 2-3 shows the adoption of superfast broadband by industrial sector was highest in Information and communication (65%), and Business and other services (56%) sectors (increasing 15 and 9 percentage points respectively in the year from 2017). The Accommodation and food services sector had the lowest share of SMEs with superfast broadband in 2018 (31%).

Figure 2-3 Adoption of broadband, by type, by industry sector (% of SMEs)

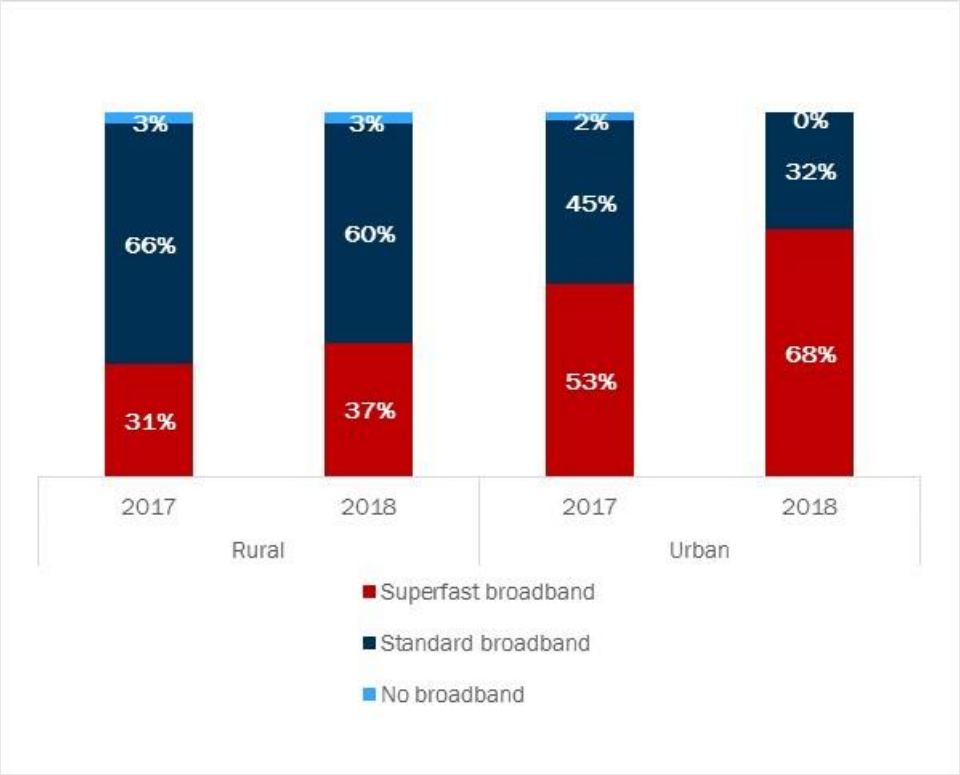


By sub-region, South East Wales SMEs were most likely to have adopted superfast broadband (64%), with Mid Wales SMEs the least likely (32%).

Superfast broadband adoption was highest among medium-sized businesses (up 4 percentage points from 2017 to 75%). In comparison, around half of small (47%) and micro (53%) businesses had superfast broadband in 2018.

Adoption of broadband by SMEs in rural and urban locations is shown in Figure 2-4. The proportion of rural businesses adopting superfast broadband increased by 6 percentage points, from 31% in 2017, to 37% in 2018. However, during the same time period, there was an increase of 15 percentage points in the proportion of urban SMEs adopting superfast broadband, to 68%. The divide between rural and urban areas adoption of superfast broadband consequently increased.

Figure 2-4 Adoption of broadband, by type, by location (% of SMEs)



Average achieved download speeds. Nearly a third of SMEs in Mid Wales (32%) reported achieving an average download speed of 30 Mbps or more in 2018. However, Figure 2-5 shows that over one in five businesses in the same sub-region (22%) achieved less than 2 Mbps.

Two-fifths of North Wales businesses (41%) and nearly a half of South West Wales SMEs reported average download speeds of 30 Mbps or greater. Businesses in South East Wales were most likely to report achieving similar speeds (58%).

Figure 2-5 Average achieved download speeds, by sub-region (% of SMEs)

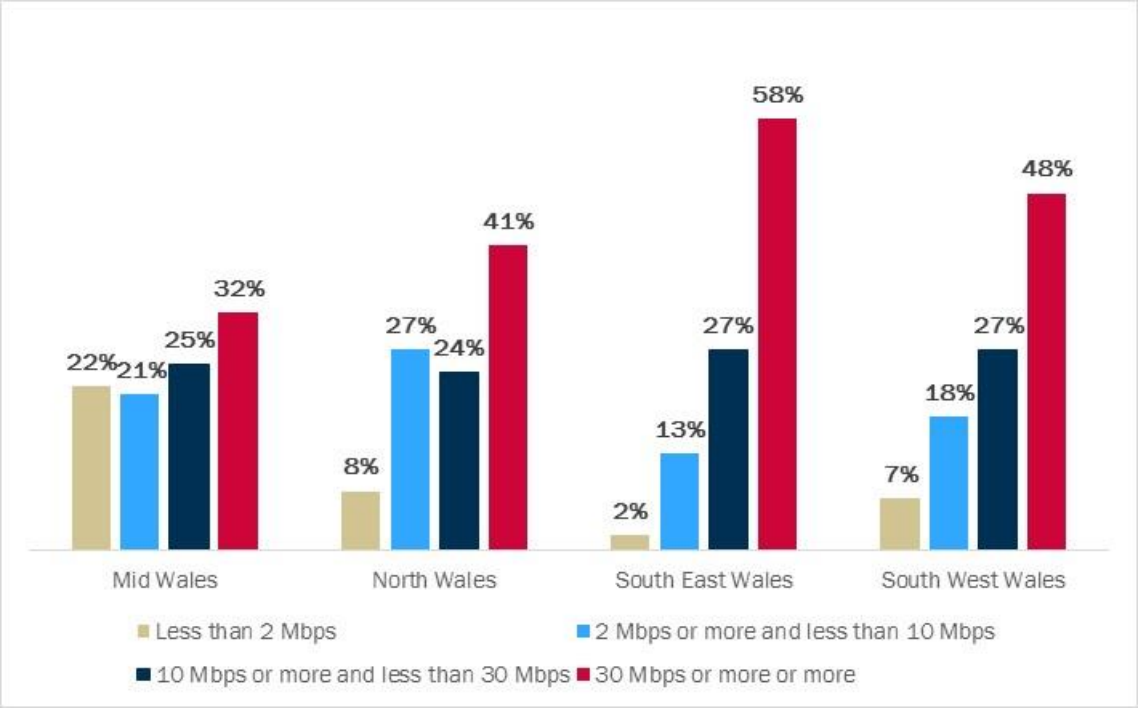
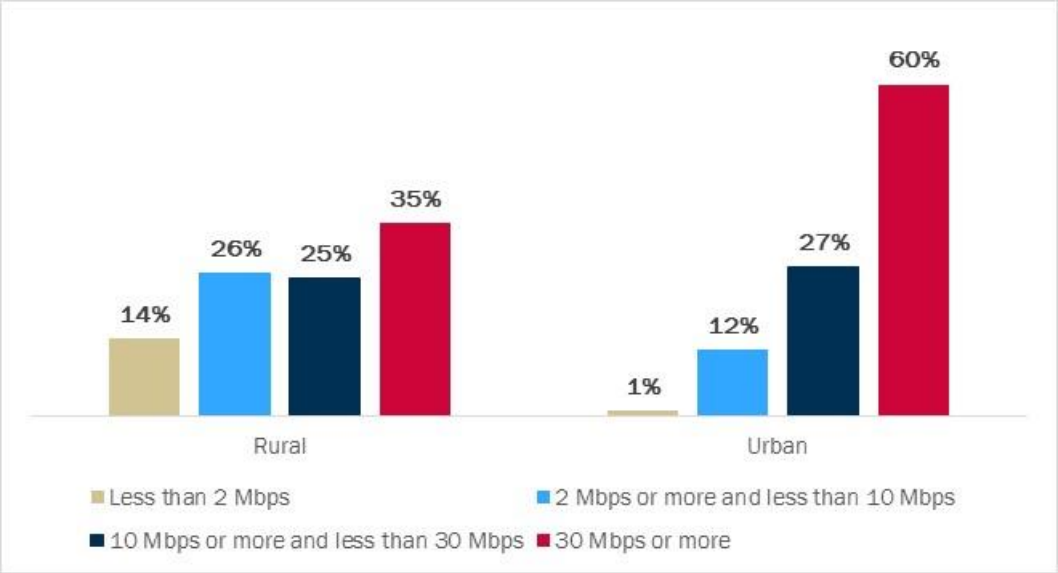


Figure 2-6[7] shows that just over a third of rural businesses (35%) reported being able to achieve average download speeds of 30 Mbps or more. This was an increase of 8 percentage points from 2017. Over the same time period there was a 3 percentage point increase in the proportion of urban businesses able to achieve those speeds on average (60%).

[7] The median (i.e. 'middle' value of observations) download speed in rural locations is 15 Mbps, in urban locations – 38 Mbps.

Figure 2-6 Average achieved download speeds, by location (% of SMEs)

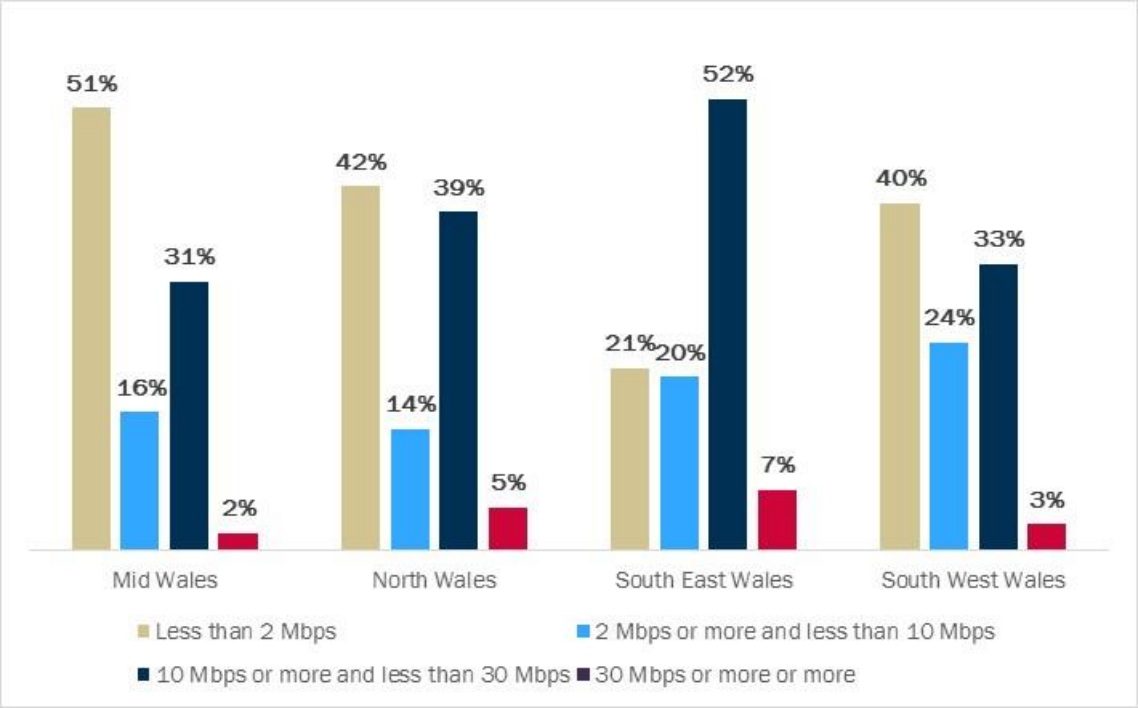


The proportion of rural SMES reporting an average download speed of less than 2 Mbps fell from one in five (20%) in 2017 to one in seven (14%) in 2018.

Average achieved upload speeds. Figure 2-7[8] shows that SMEs in Mid Wales were most likely to achieve an upload speed of less than 2 Mbps, with 51% of businesses in this category, as compared to 42% in North Wales, 40% in South West Wales, and 21% in South East Wales.

[8] The median (i.e. 'middle' value of observations) upload speed in Mid Wales is 1.99 Mbps; in North Wales 6 Mbps; in South East Wales 15 Mbps; and South West Wales, 8 Mbps.

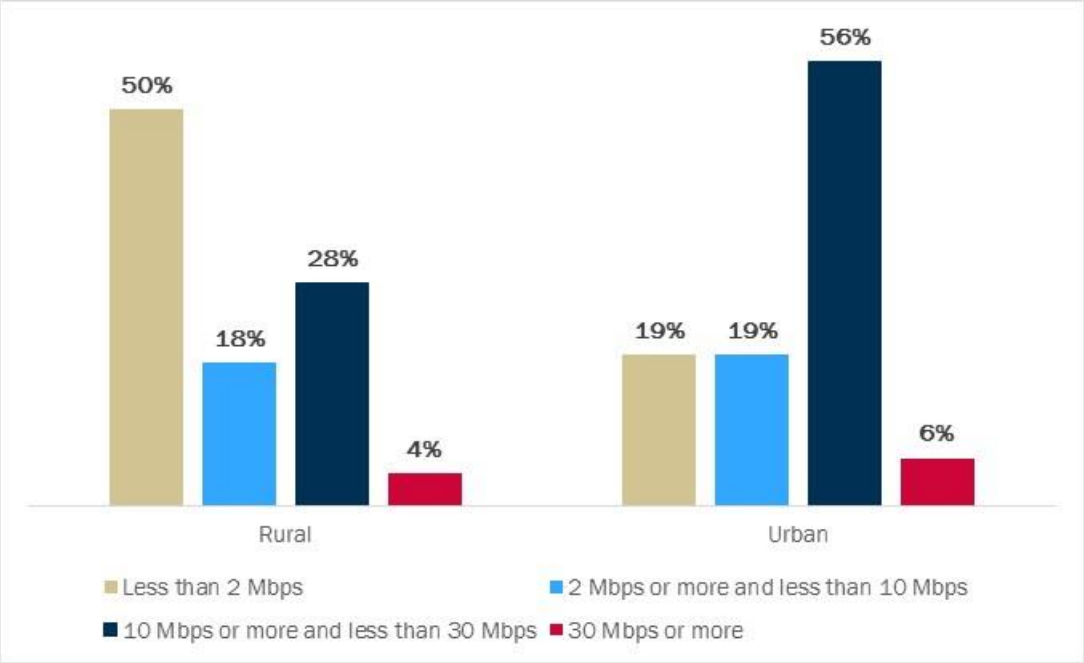
Figure 2-7 Average achieved upload speeds, by sub-region (% of SMEs)



The percentage of SMEs in rural areas achieving upload speeds of less than 2 Mbps fell by 10 percentage points from 2017 to 2018 to 50%. The comparative figure for urban SMEs fell 11 percentage points to 19% over the same time period. Figure 2-8[9] shows that urban based businesses were more likely to achieve faster upload speeds with over three in five (62%) achieving 10 Mbps or more in 2018, as compared to one in three (32%) rural SMEs.

[9] The median (i.e. 'middle' value of observations) upload speed in rural locations is 2 Mbps, in urban locations – 14.7 Mbps.

Figure 2-8 Average achieved upload speeds, by location (% of SMEs)



2.3. Use of broadband-enabled services

Use of cloud computing services. The *Survey* asked SMEs whether they used basic, foundational cloud computing services (digital tools such as email, office software and file sharing/ storage) as well as more advanced cloud computing services. The latter included: accounting and bookkeeping; data back-up; Voice over Internet Protocol; electronic payment; video conferencing; customer relationship management; project management software; computing power to run business software; human resource management software ; and enterprise resource planning.

Figure 2-9 indicates that the proportion of SMEs using at least one advanced cloud computing service increased by 12 percentage points to 72% between 2017 and 2018.

Figure 2-9 Use of advanced cloud computing services (% of SMEs)

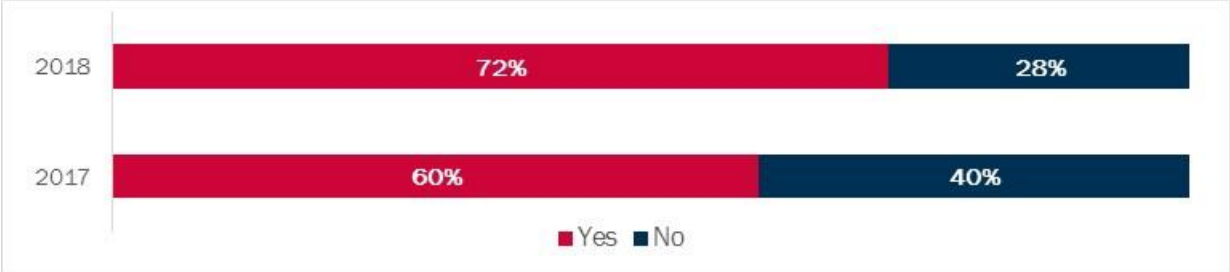
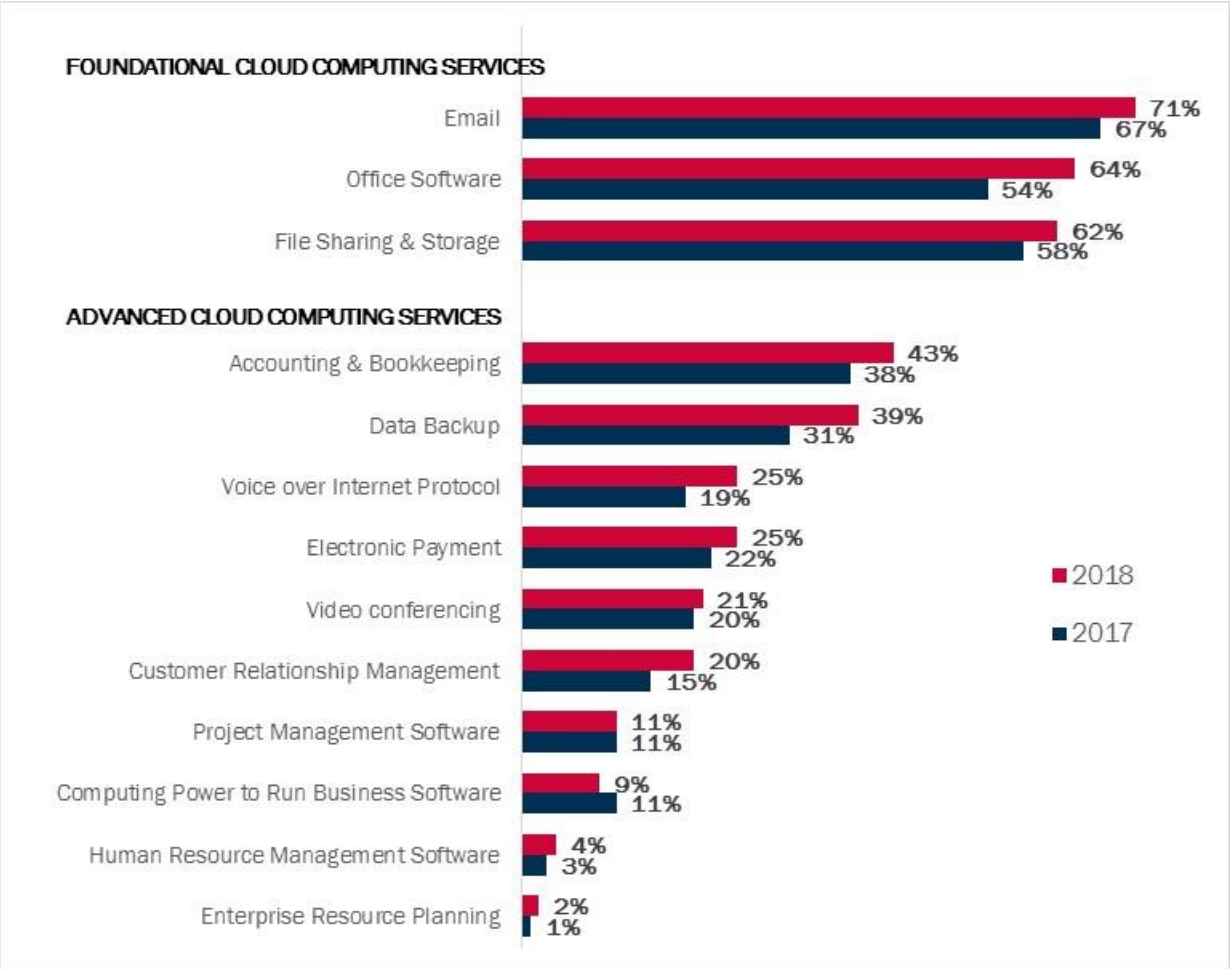


Figure 2-10 shows that more SMEs were using a number of advanced cloud computing services in 2018 as compared to 2017. Usage of cloud computing data backup increased by 8 percentage points to 39% in 2018, Voice over Internet Protocol increased by 6 percentage points to 25% and accounting/bookkeeping and customer relationship management by 5 percentage points each.

Figure 2-10 Proportion of businesses using cloud computing services, by category (% of SMEs)



By sector, Figure 2-11 illustrates that SMEs in the Construction (66%) and Accommodation & Food services (68%) sectors were least likely to use cloud services. However, between 2017 and 2018, Construction sector usage of cloud services had increased 25 percentage points, and Accommodation services and Food services 23 percentage points. Information and Communication (82%) and Business and other services (79%) SMEs were the most likely to use advanced cloud computing services.

Figure 2-11 Proportion of businesses using advanced cloud computing services, by industry sector (% of SMEs)

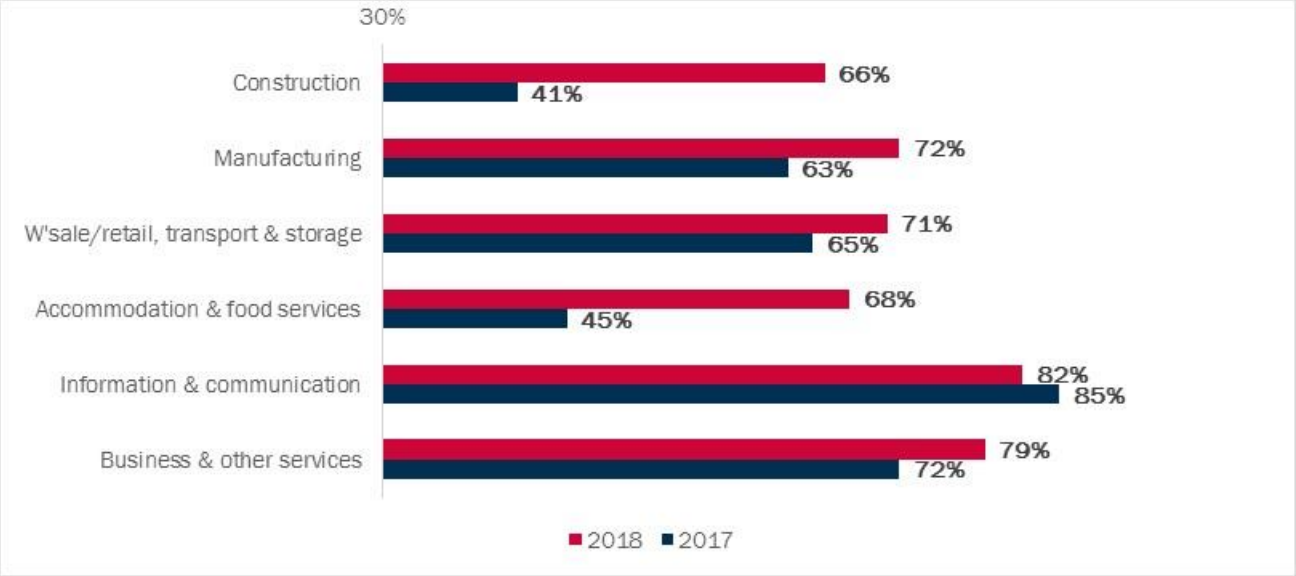
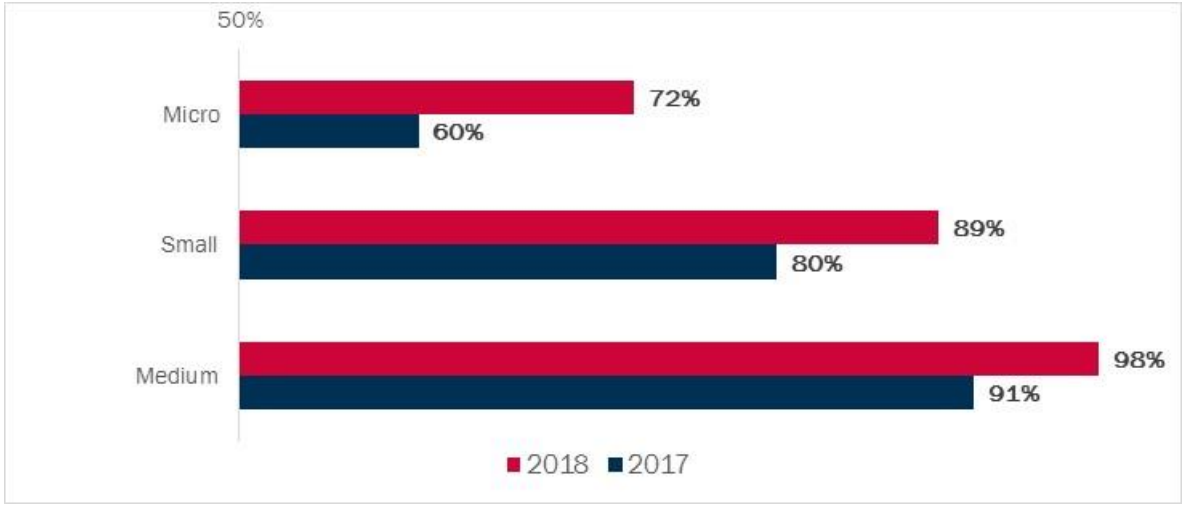


Figure 2-12 shows that there was an increase of 12 percentage points in the proportion of micro sized SMEs using advanced cloud services between 2017 and 2018 to 72%. Medium sized SMEs (98%) were the most likely to use advanced cloud computing services.

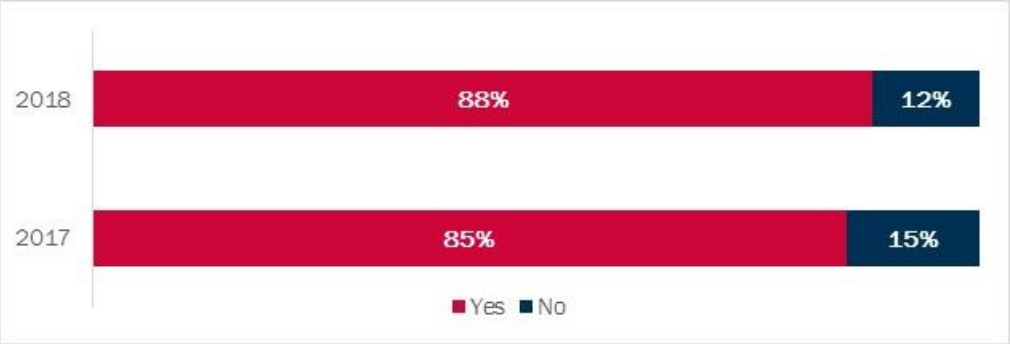
Figure 2-12 Proportion of businesses using advanced cloud computing services, by size of business (% of SMEs)



Urban based SMEs were more likely than their rural counterparts to use at least one advanced cloud computing service (77% and 68% respectively). By economic sub-region, use of advanced cloud services ranged from a high of four-out-of-five SMEs in South East Wales (80%), to a low of three-in-five in South West Wales (61%).

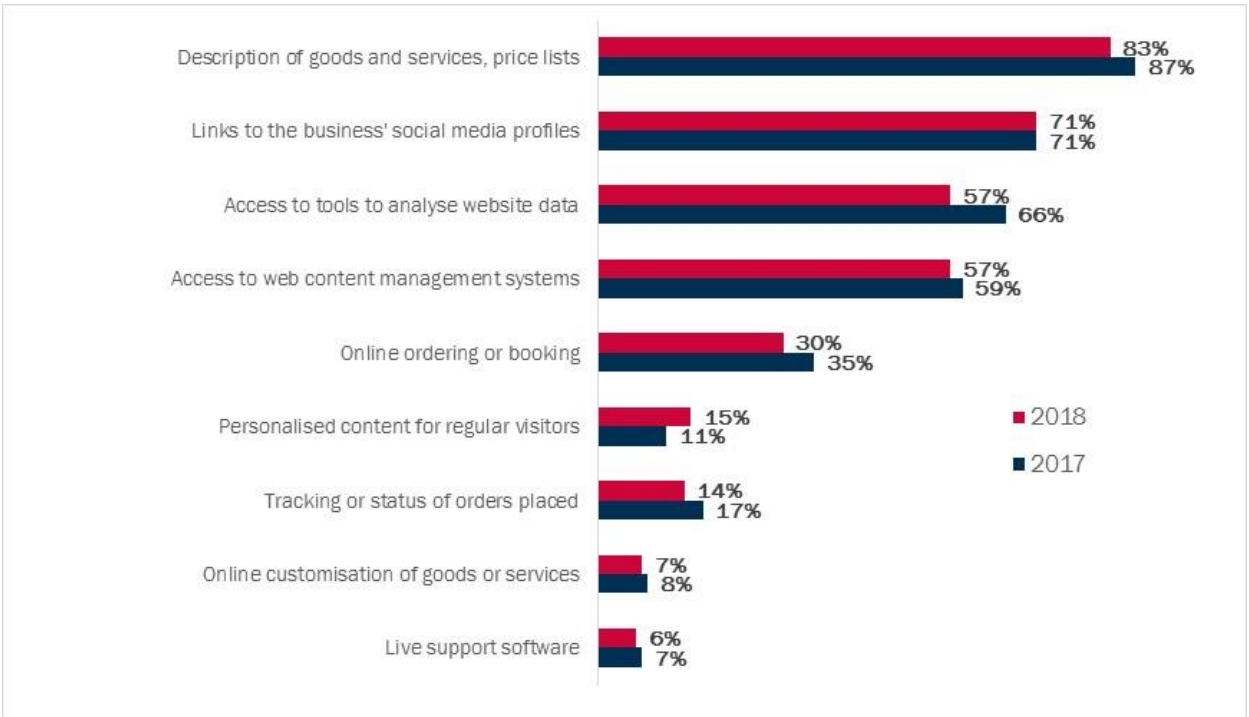
Use of website. Some 88% of the businesses taking part in the survey in 2018 reported having a website.

Figure 2-13 Use of website (% of SMEs)



Despite the increasing percentage of SMEs reporting having a website Figure 2-14 shows a slight fall in usage for most website functions when comparing 2017 and 2018. In particular, and of some concern given their potential to increase SME understanding of their customers, there was an 9 percentage point decrease in businesses having access to tools to analyse website data. The exception to the falling trend in website function usage was an increase of 4 percentage points in personalised content for regular visitors (to 15% in 2018).

Figure 2-14 Proportion of businesses with website, by website function (% of SMEs)



A relatively small proportion of Construction sector SMEs stated they had a website (78%) but encouragingly this was a 17 percentage point increase from 2017. SMEs in the sectors of Information and Communication (98%), Accommodation and Food services (94%), and Business and Other services (also 94%) were most likely to have a website.

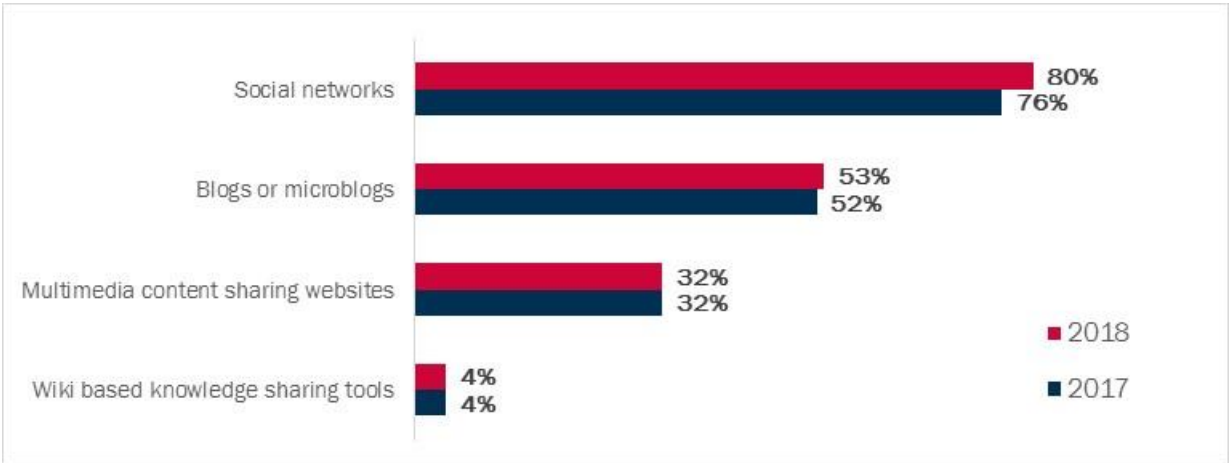
By location, 90% of rural and 87% of urban based businesses noted they had a website, while Mid Wales SMEs were most likely (95%), and North Wales least likely (86%) to have a website. There was an increase of 3 percentage points to 88% in the proportion of micro-sized businesses having a website when comparing 2017 and 2018 data. This compares to 99% of small and 100% of medium-sized businesses.

Use of social media. Figure 2-15 shows just over three-quarters of SMEs (76%) reported using social media in 2018 (76%).

Figure 2-15 Use of social media (% of SMEs)

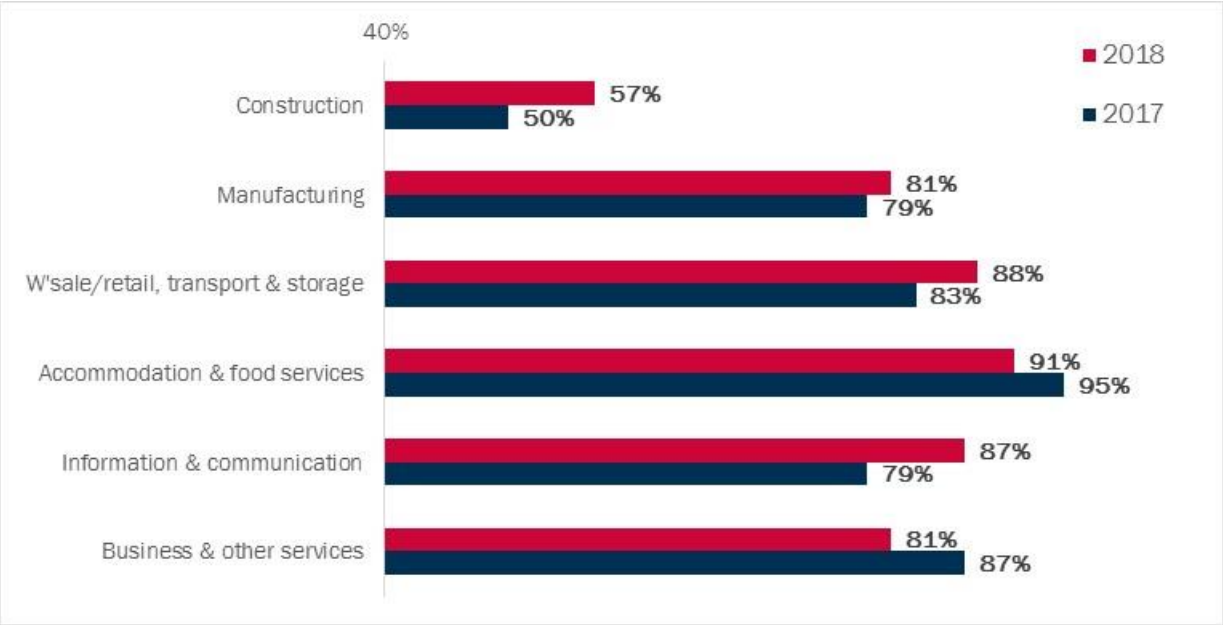
Four-fifths of SMEs (80%) reported using social network platforms in 2018, an increase of 4 percentage points from the 2017. Figure 2-16 shows that use of blogs or microblogs (53%), multimedia content sharing websites (32%), and wiki-based knowledge sharing tools (4%) remained static over the same time period.

Figure 2-16 Proportion of businesses using social media, by platform (% of SMEs)



By industry, Figure 2-17 illustrates that SMEs in Accommodation and Food services (91%) and Wholesale/Retail, Transport and Storage (88%) were the most active users of social media, while Construction sector businesses were the least active (57%) - albeit with a 7 percentage point increase in this industrial sector when comparing data from 2018 to 2017.

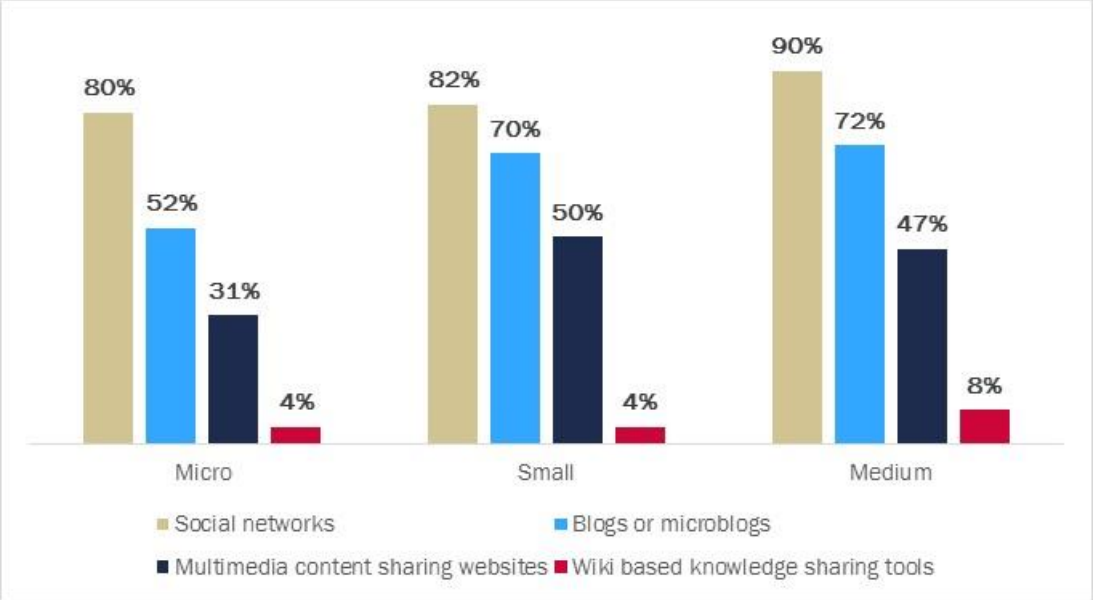
Figure 2-17 Proportion of businesses using social media, by industry sector (% of SMEs)



Urban based SMEs were more likely than rural SMEs to use social media across all the platforms except multi-media content sharing. By sub-region, North Wales businesses reported the highest use of social media (81%), and South West Wales the lowest (71%).

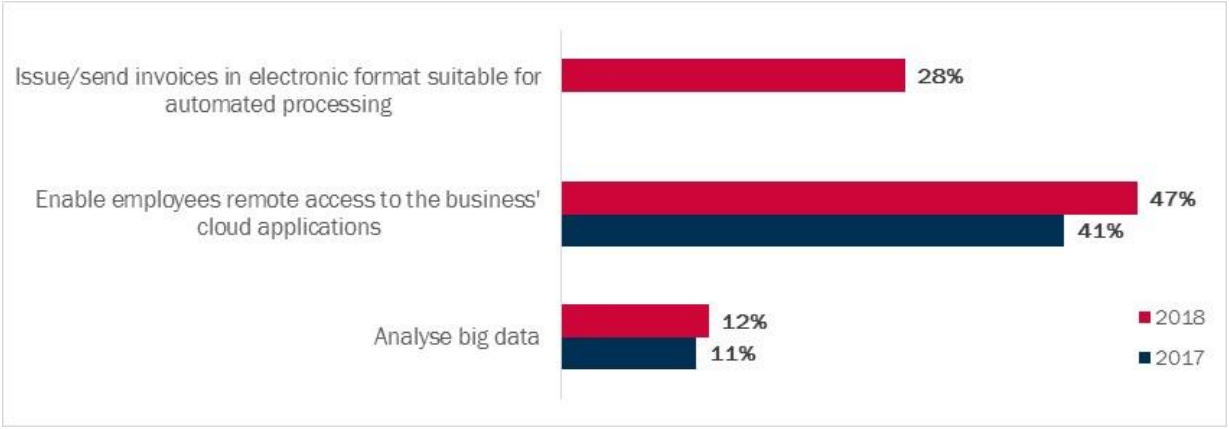
Figure 2-18 shows medium-sized businesses were the most active users of social media, with nine-tenths (90%) of this category using social networks and nearly three-quarters (72%) utilising blogs or microblogs.

Figure 2-18 Proportion of businesses using social media, by size of business and platform (% of SMEs)



Other use of broadband. New to the *Survey* in 2018, businesses were asked whether they issued/sent invoices in electronic format suitable for automated processing. Nearly three in ten (28%) answered positively. Figure 2-19 also shows that half of SMEs provided their employees with remote access to the business' cloud applications (47%), a 6 percentage point increase from 2017, and the proportion of businesses analysing big data increased to one in eight (12%).

Figure 2-19 Use of broadband-enabled functions (% of SMEs)



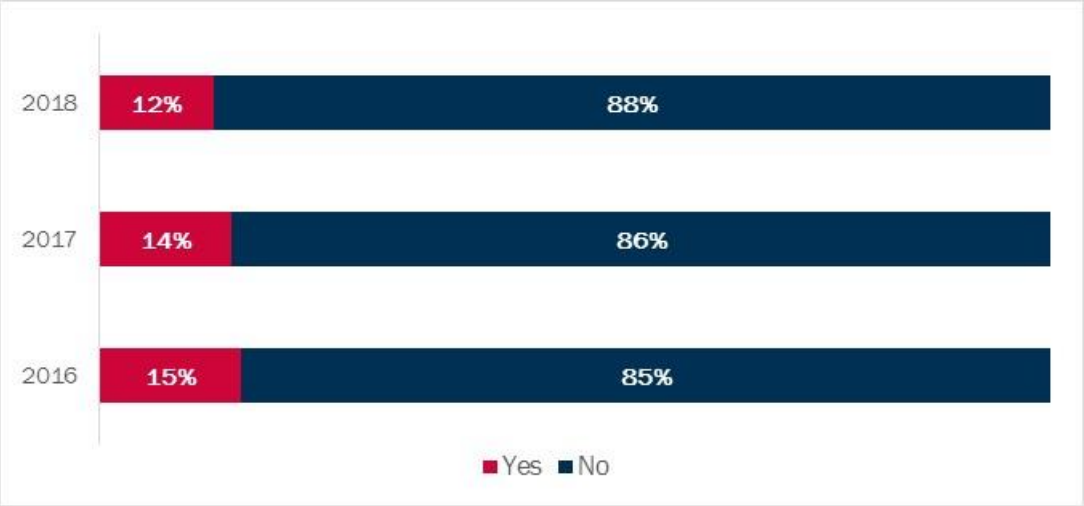
Benefits of using broadband-enabled services. In Figure 2-20 the percentage of SMEs agreeing with statements about the perceived benefits of broadband-enabled services are illustrated. Nine in ten businesses (90%) indicated that adoption of broadband enabled services enhanced their communication – an option new to the 2018 *Survey*. Four-fifths of SMEs (80%) noted improved knowledge management/ information sharing as a benefit of broadband-enabled services, while a similar figure (77%) reported being better able to respond to customer or supplier requirements.

Figure 2-20 Benefits of broadband-enabled services (% of SMEs)

2.4. ICT expenditure

ICT infrastructure investment. Figure 2-21 shows that one in eight (12%) SMEs reported that they had a dedicated ICT budget in 2018, a decrease from one in seven (14%) in 2017. Urban-based businesses were more likely than rural to have a dedicated IT budget (15% and 9% respectively). Micro-sized businesses were least likely to report having a dedicated ICT budget (11%, as compared to 42% of medium-sized businesses). By sector, SMEs in Manufacturing and Information and Communication sectors were most likely to have an ICT budget (23% and 16% respectively).

Figure 2-21 Proportion of businesses with dedicated ICT budget (% of SMEs)



Investment in ICT infrastructure related items was collected in the *Survey* with SMEs asked to specify their annual spend, averaged over the last three years, on hardware, software, network, broadband subscription, and training. Figure 2-22 shows that hardware spend per SME remained static when compared to 2017 at around £3,500, while software spending decreased 9.5% to £3,700. Contrastingly, spending on network, broadband subscription and ICT related staff training increased from 2017 to 2018. This may reflect businesses buying faster speed broadband connections and training staff to better utilise its capabilities.

Figure 2-22 Average spend on ICT infrastructure and training per SME (£ per year)

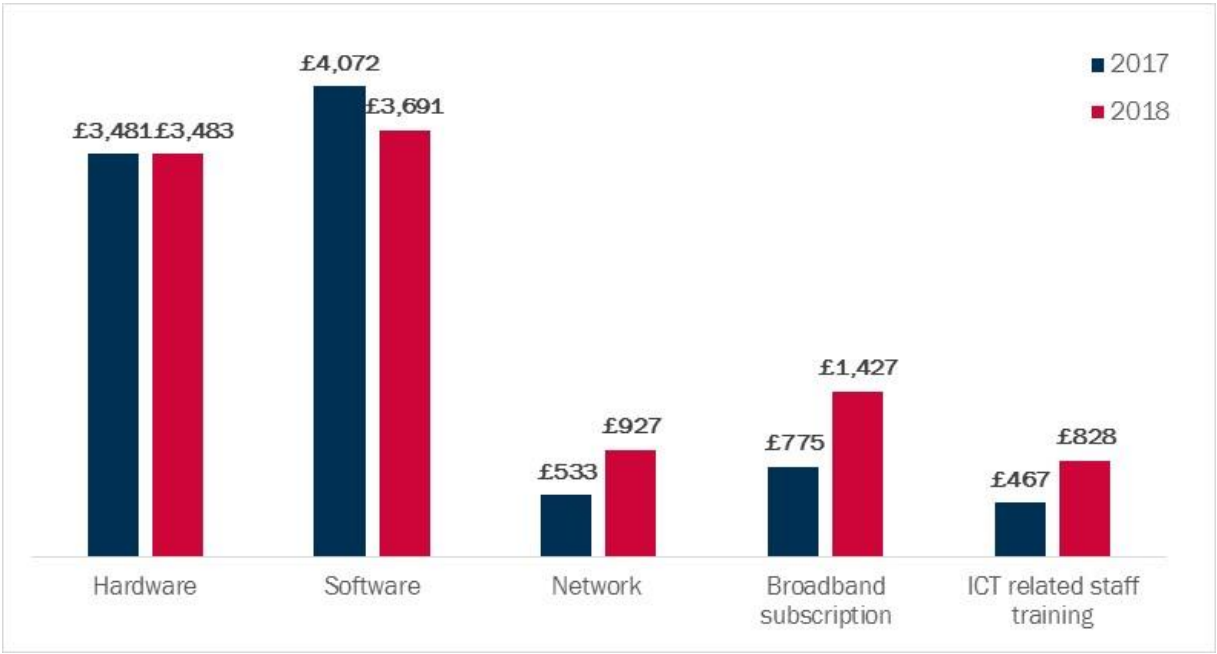
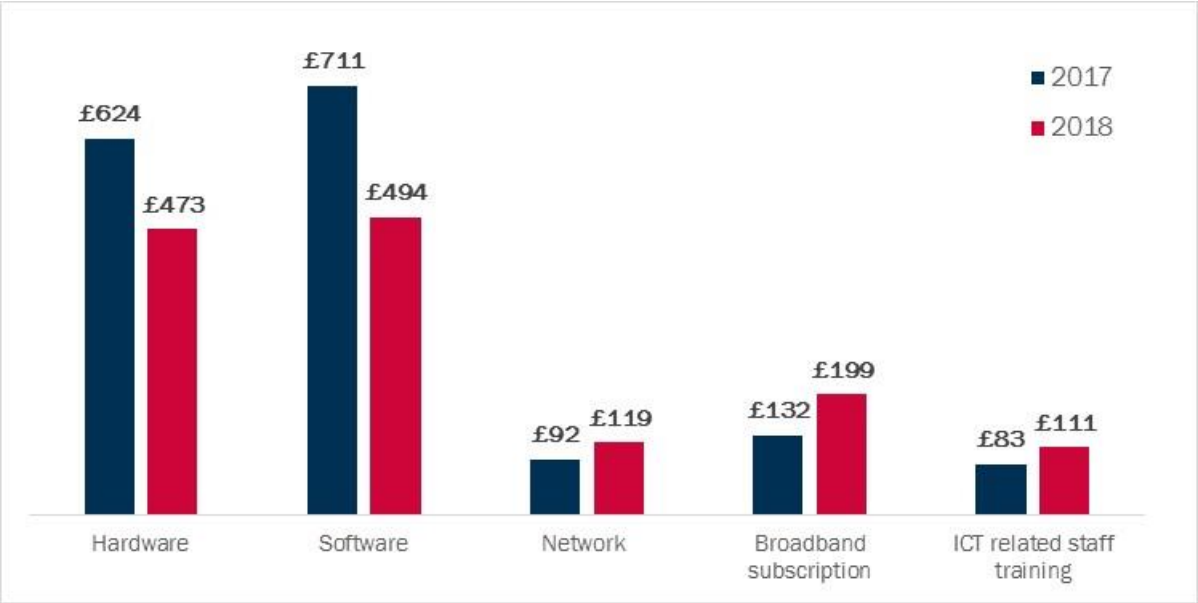


Figure 2-23 shows annual ICT infrastructure and training investment per full-time worker. An average of £473 per full time equivalent employee was spent annually on hardware related items, a decrease of 24% from 2017. Similarly, spend on software fell by 30% to £494 from 2017 to 2018. However, there were increases in spending on networks, broadband subscription and ICT related staff training between 2017 and 2018, in part reflecting the move to more cloud-based application use, where faster connection speeds are required to fully utilise the benefits available.

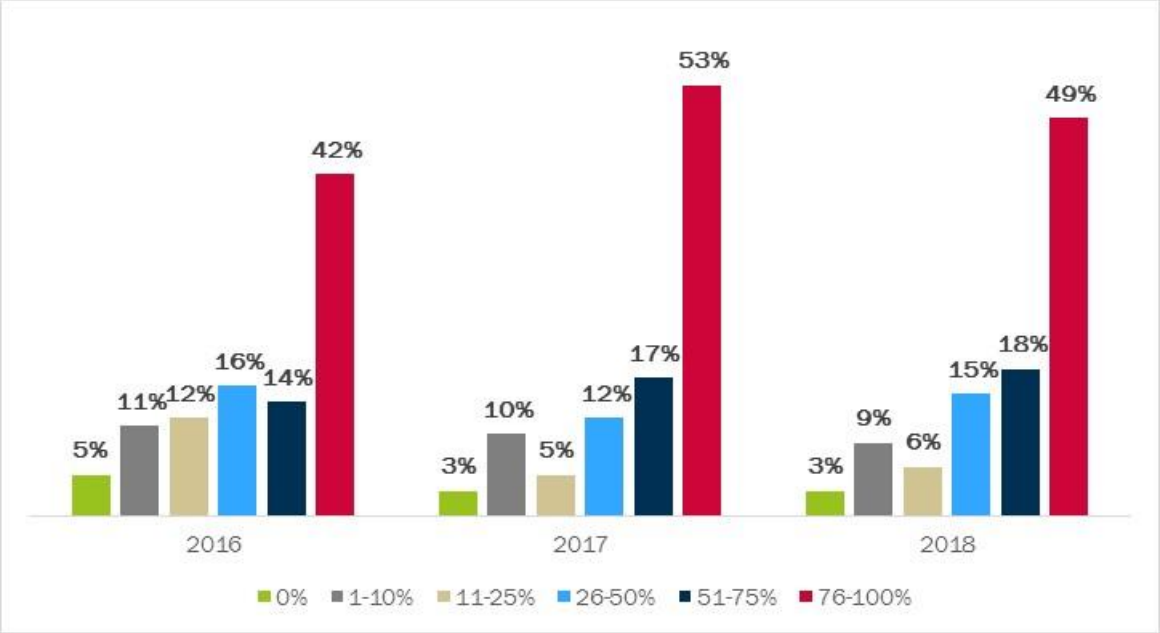
Figure 2-23 Average spend on ICT infrastructure and training (£ per employee)



2.5. ICT skills

Internal ICT capabilities. In 2018, 67% of SMEs had at least half of their employees with intermediate or above ICT skills[10]. Figure 2-24 shows this was a decline of 3 percentage points from 2017 and may relfect the ongoing transformation in how businesses operate, brought about by digital technologies, and their reappraisal of skills in the business. It also points to the constant need to "upskill" in the digital age.

Figure 2-24 Proportion of employees with intermediate or above ICT skills (% of SMEs)

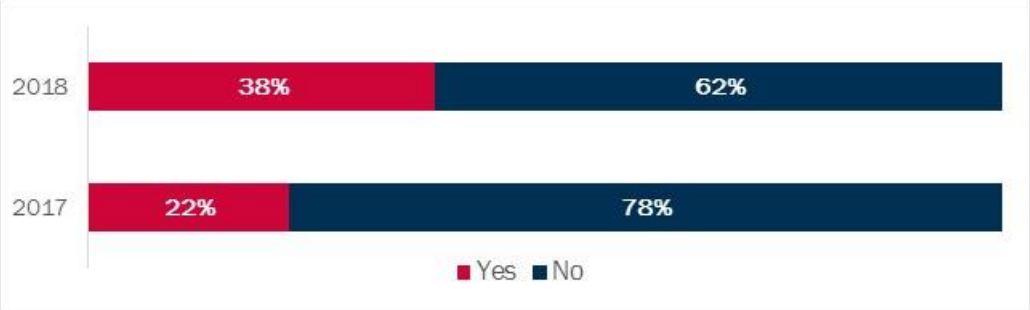


By sector, SMEs in Information and communication, and Business and other services had the highest concentration of employees with above average ICT skills - 91% and 84% respectively, while the compartive figure in Accommodation and Food services was just 46%. Three-fifths of rural businesses (59%) and three-quarters of urban based SMEs (75%) reported having at least half of their employees with intermediate or above IT skills.

[10] Intermediate computer skills include the working knowledge of the operations of the internet and email, computers, word processing, graphics and multimedia, and spreadsheets and databases.

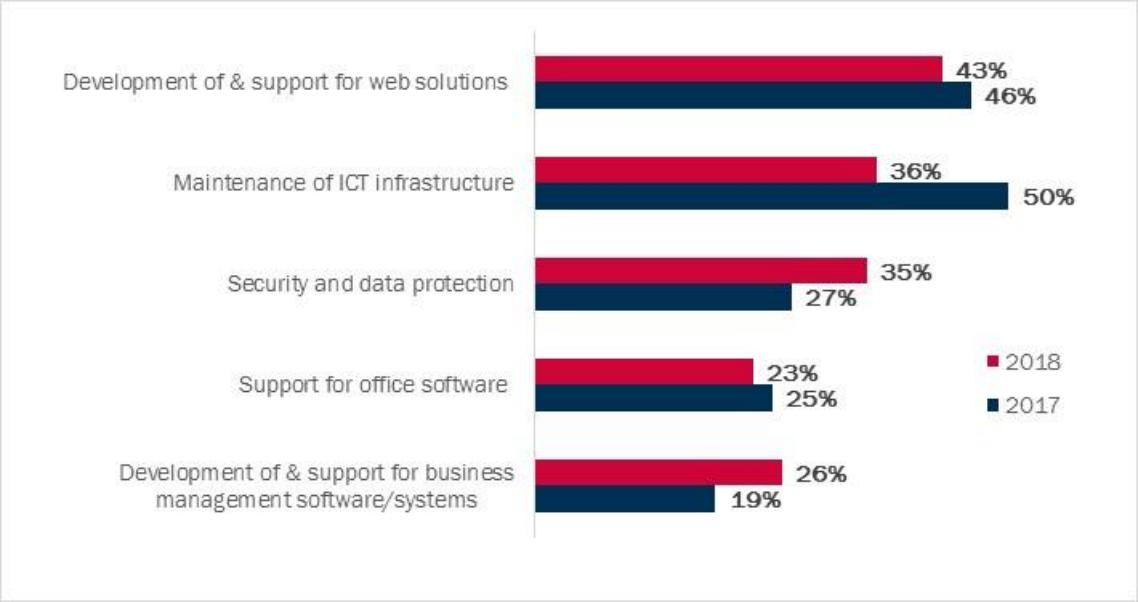
Nearly two-fifths of SMEs noted that they employ internal ICT specialists (38%). Figure 2-25 shows that this represented an increase of 16 percentage points from 2017 to 2018. Larger businesses were more likely to employ internal ICT specialists (63% of medium-sized businesses; small sized 56%; and micro-sized 36%). By sector, Information and Communication SMEs were most likely to employ internal ICT specialists (83%) and Construction sector the least (18%). Businesses in Mid Wales (49%), South West Wales (48%) and North Wales (44%) were all more likely than their counterparts in South East Wales (27%) to internally employ ICT specialists.

Figure 2-25 Proportion of businesses that employ ICT specialists (% of SMEs)



ICT support capabilities. External ICT support was most likely to be utilised by businesses for development of, and support for, web solutions (43%), and for maintenance of ICT infrastructure (36%). However, the proportion of SMEs reporting employing external ICT support in these categories had fallen between 2017 and 2018 (by 3 and 14 percentage points respectively). By contrast, Figure 2-26 shows that utilising external help for security and data protection increased between 2017 and 2018 by 8 percentage points, to over one-third of businesses (35%).

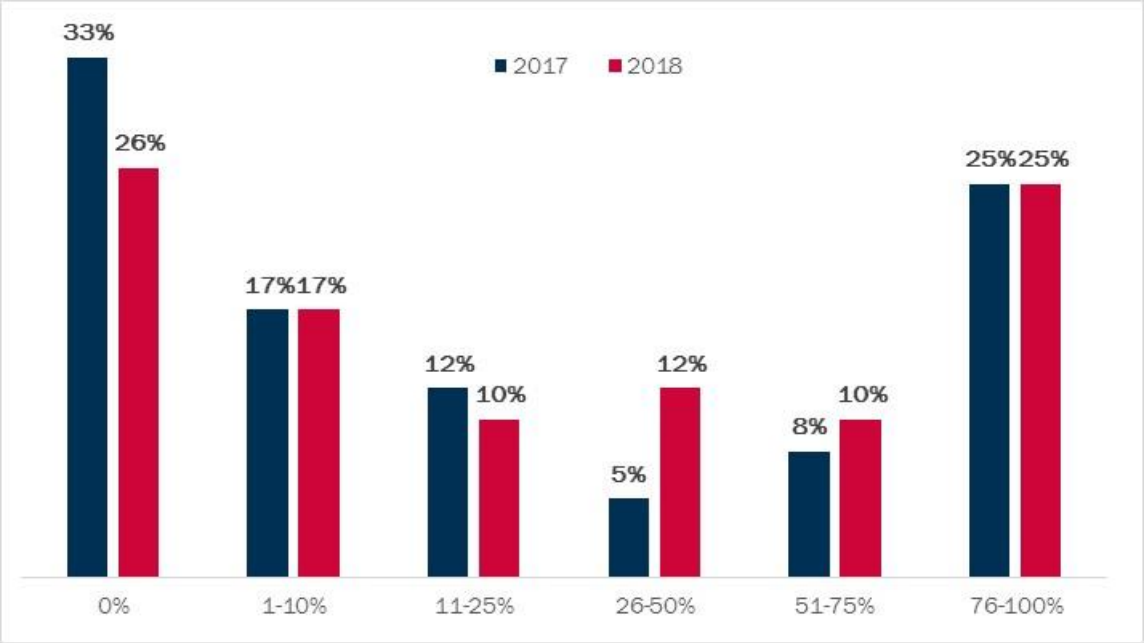
Figure 2-26 Proportion of businesses that use external ICT support, by task (% of SMEs)



2.6. E-commerce

Sales serviced online. Figure 2-27 shows the proportion of SMEs reporting 76% to 100% of their sales being serviced online remained static at one-in-four (25%) when comparing 2017 and 2018 results. The proportion of businesses that did not sell online reduced from one-third (33%) in 2017, to just over a quarter (26%) in 2018.

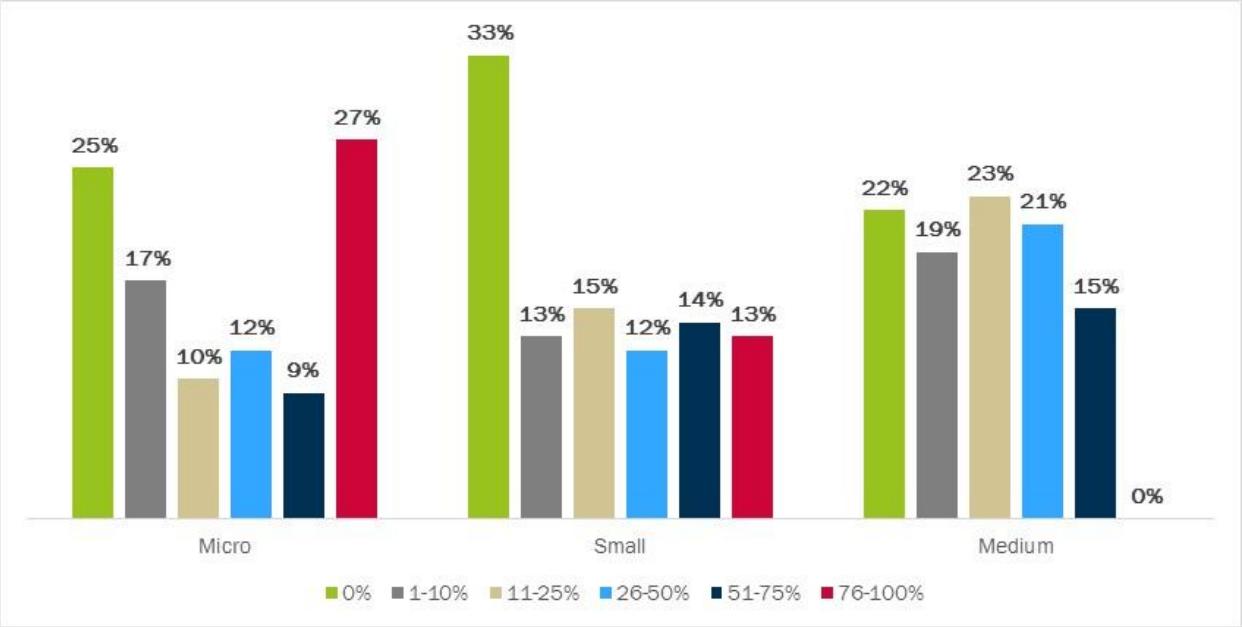
Figure 2-27 Proportion of total sales conducted online (% of SMEs)



Whereas two-thirds of Construction businesses did not sell online in 2017 (67%), this proportion had reduced to under one-half (46%) in 2018. Around a quarter of SMEs in Business and other services (28%), Manufacturing (25%) and Wholesale/Retail, Transport and Storage (24%) did not sell online in 2018. Partly this is explained by the customised nature of services offered, rather than an unwillingness to trade online. SMEs in the sectors of Accommodation and Food services, and Information and Communication, were most likely to report deriving a higher proportion of their sales online.

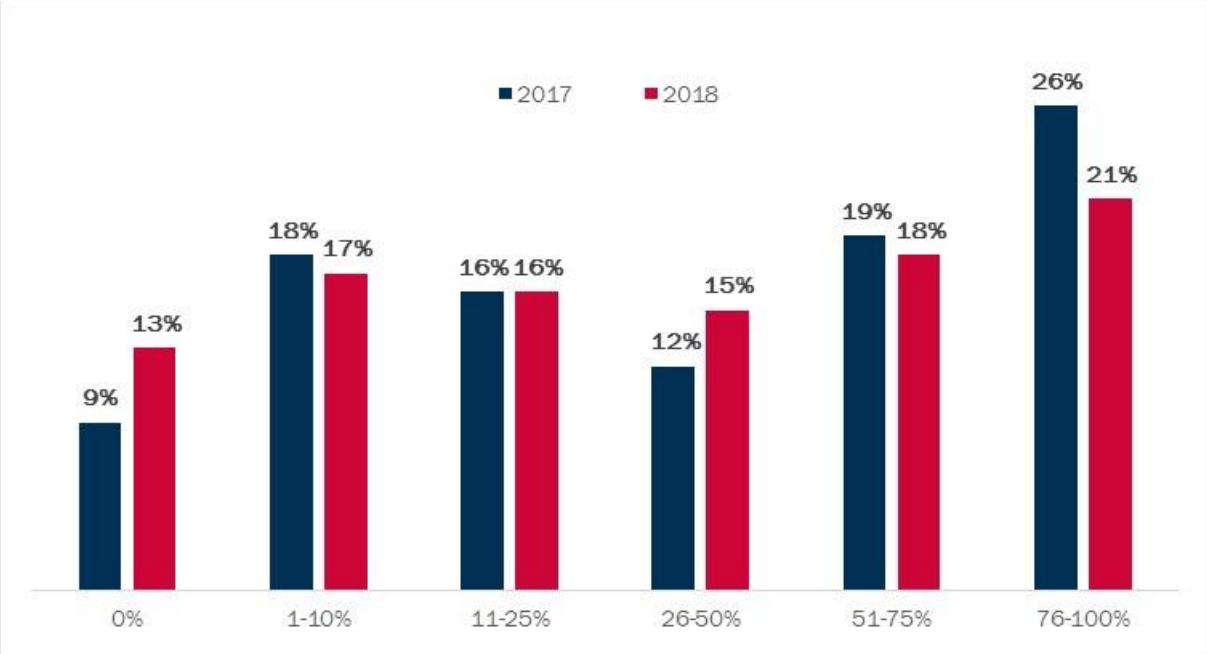
In 2018, micro businesses continued to be the most likely to conduct a higher percentage of their sales online. Figure 2-28 shows that over a quarter of micro businesses (27%) serviced between 76% and 100% of their total sales online- with just 13% of small businesses and no medium sized businesses reporting similar.

Figure 2-28 Proportion of total sales conducted online, by size of business (% of SMEs)



Purchases transacted online. There was a slight increase in the proportion of SMEs reporting that they did not make any purchases online when comparing 2017 (9%) and 2018 (13%). Figure 2-29 also shows that the proportion of businesses for whom online purchases accounted for 76% or more of their total purchases decreased 5 percentage points from 26% in 2017 to 21% in 2018.

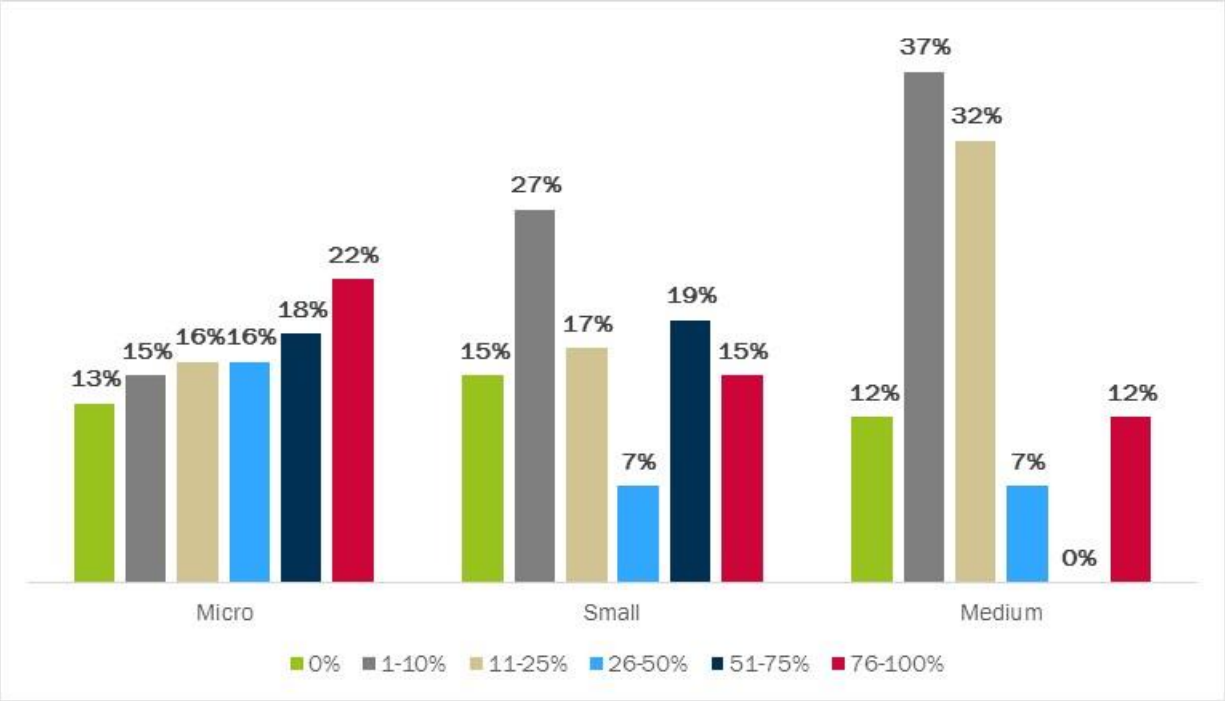
Figure 2-29 Proportion of total purchases transacted online (% of SMEs)



By sector, businesses in the Information and Communication, Manufacturing, and Business and other services sectors were most likely to purchase online. By location, two-fifths of urban based SMEs (41%) and just over a third of rural SMEs (36%) transacted at least a half of their total purchases online.

Figure 2-30 shows that two-fifths of micro businesses (40%) transacted more than half of their total purchases online, in comparison to a third of small businesses (34%) and one-in-eight medium businesses (12%).

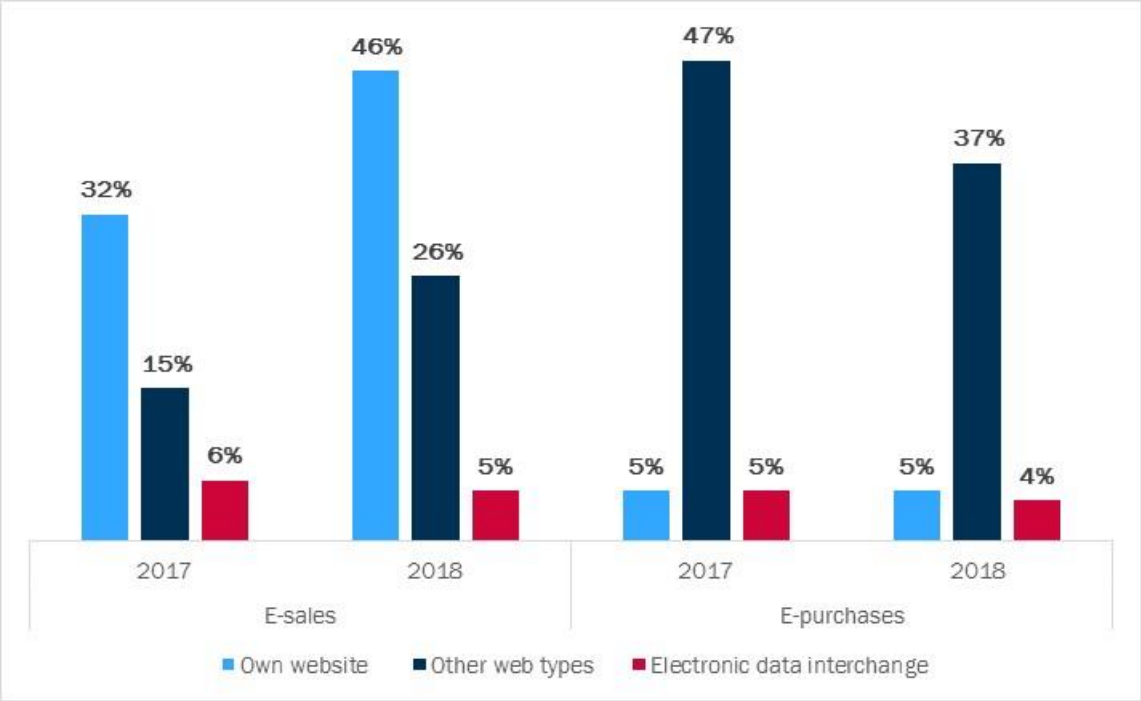
Figure 2-30 Proportion of total purchases transacted online, by size of business (% of SMEs)



Channels of e-commerce activities. The left hand side of Figure 2-31 shows the proportion of businesses reporting E-sales activities through their own website increased from 2017 to 2018, by 14 percentage points, to 46%. A quarter of businesses noted using other web types (such as online stores, apps or other websites).

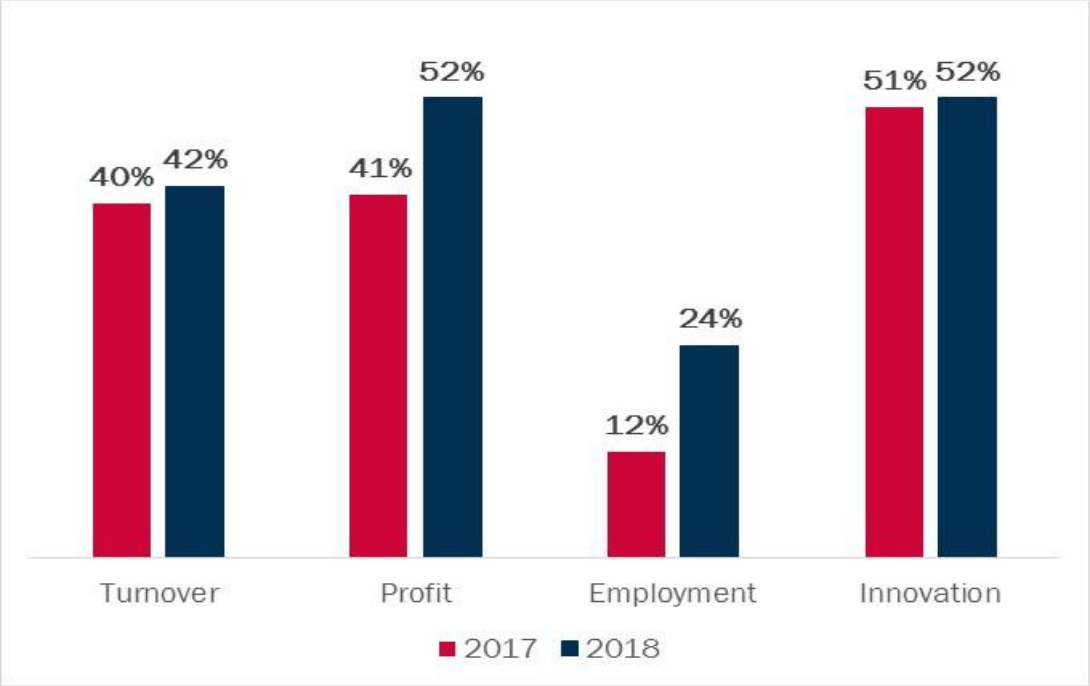
E-purchases, shown on the right hand side of Figure 2-31 were most likely to have been transacted through other web types (37%) in 2018. Reporting of the usage of Electronic Data Interchange (EDI) for e-sales and/ or e-purchases was fairly static between 2017 and 2018.

Figure 2-31 E-commerce activities, by channel (% of SMEs)



Performance of SMEs with superfast broadband. Figure 2-32 shows the proportion of SMEs indicating that they had positive outcomes in terms of turnover, profit, employment and innovation, from adopting superfast broadband.

Figure 2-32 Performance of SMEs with superfast broadband (% of businesses reporting positive outcomes)



Over half of businesses with superfast broadband in 2018 (52%) reported that adopting the service had increased their profits. Nearly a quarter of businesses with superfast broadband (24%) noted they were able to increase employment due to access to superfast speeds. The lowering of non-employment costs may, to some extent, be driving this increase in profits and employment. SMEs with standard broadband reported positive outcomes at a lower percentage for each measure than SMEs with superfast broadband

More detailed analysis on these aspects of the *Survey* will be published in the *Economic Impact Report*.

3. Digital Maturity Index

3.1. Introduction

The Digital Maturity Index reflects the digital maturity level of SMEs by scoring the items from survey questions with a maximum score of 100[11]. The index captures five dimensions of digital maturity as depicted in the conceptual framework in Figure 1-1. Those digital maturity dimensions are defined and measured in Table 3-1.

[11] All the Yes/No items were coded as 1/0, with items that refer to ranges coded from 1 upwards in ascending order. Binary items were multiplied by a constant of 2 to calibrate the scale to a maximum of 2.

Table 3-1 Definiton and measurement of digital maturity dimensions

Digital maturity dimension	Definition	Measurement items
ICT infrastructure	Broadband adoption	• Access to broadband • Download speed • Upload speed
ICT investment	Business budget for ICT-related expenses	• Annual spending on hardware, software, network, broadband subscription • ICT-related staff training
ICT capabilities	Access to human ICT-related resources	• ICT human skills, both internal and external to the business. • ICT skills of internal staff are measured as the proportion of workforce with intermediate and above ICT skills • Access to additional ICT skills is measured according to whether SMEs employ ICT specialists and/or use external ICT support
Digital applications	Use of digital technologies	• Cloud applications for a variety of business functions • Website and its functionality • Social media and other broadband-enabled applications
E-commerce	Engage in online transactions	• Proportion of total sales serviced online • Proportion of purchases transacted online • Breadth of online channels for making e-sales and e-purchases

3.2. Digital maturity scores and groups

The Digital Maturity Index was derived from SMEs that answered 80% and above of the questions in the 2018 *Survey*. The histogram in Figure 3-1 shows the frequency of occurrence of digital maturity scores by interval. Some 70% of SMEs scored between 30 and 60. The maximum achieved score was 85, which suggests that none of the SMEs in the sample were fully digitally mature. Based on these insights, four groups of firms in terms of broad digital maturity characteristics were identified (Table 3-2 and defined Table 3-3).

Of the initial sample of 479 SMEs, 447 are 80%, or above 80%, completed. Only those SMEs were included in the digital maturity analysis. The resulting 4 groups were labelled by the level of their digital maturity as Digitally Embedded, Active Exploiters, Passive Exploiters, and Digitally Disengaged, respectively. The four groups could be described as follows: Active Exploiters and Passive Exploiters covered 36% and 34% of SMEs in the sample, while Digitally Disengaged included the least digitally mature 12% and Digitally Embedded included the most digitally mature SMEs (18%).

Figure 3-1 Histogram of digital maturity scores

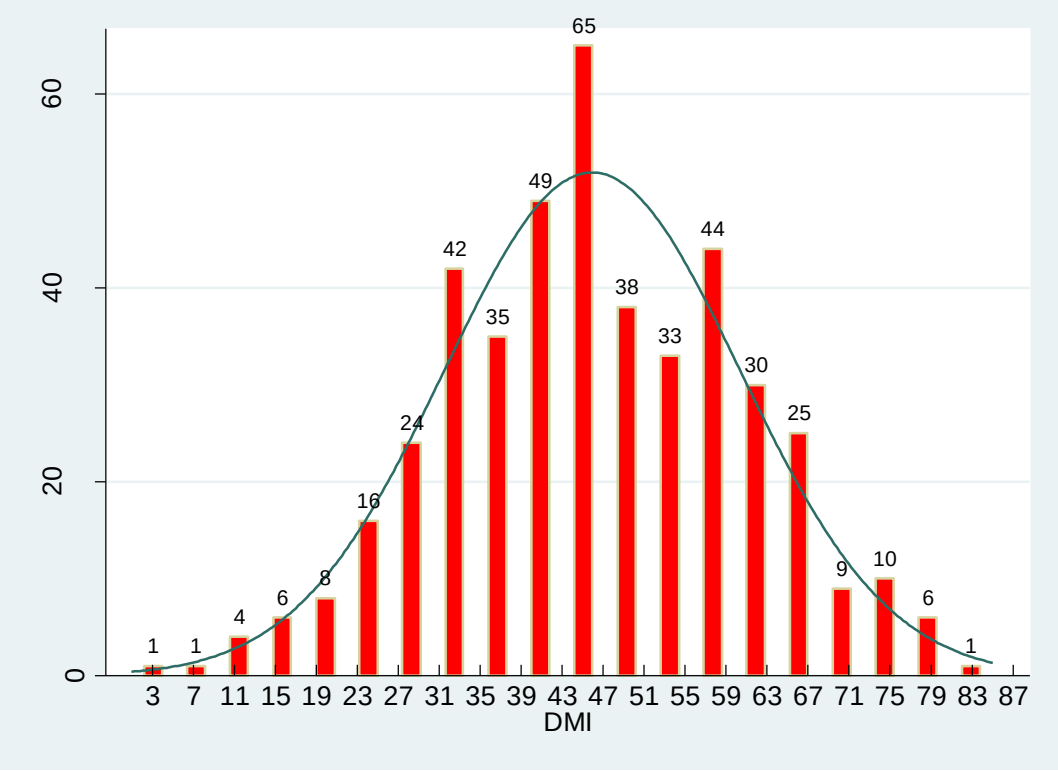


Table 3-2 Profiling of SMEs by their digital maturity score

Digital maturity group	Score range	Group size	Percent
Digitally Embedded	60-85	81	18
Active Exploiters	45-59	159	36
Passive Exploiters	30-44	154	34
Digitally Disengaged	1-29	53	12

Table 3-3 Main characteristics of four digital maturity groups

Digital maturity group	Main characteristics
Digitally Embedded	• adopters of superfast broadband • a very high proportion of employees with above average ICT skills • a high number of digital applications • secure the majority of their sales from online transactions
Active Exploiters	• likely to have adopted superfast broadband • a high proportion of staff with above average ICT skills • a wide range of digital platforms and technologies • nearly half of businesses report online channel as the main source of sales.
Passive Exploiters	• adopted standard broadband • likely to have staff with above average ICT skills • make use of basic cloud-based applications • use of online platforms to generate e-sales is low
Digitally Disengaged	• tend to have adopted standard broadband • a high proportion of employees with below average ICT skills • majority do not use digital technologies • report no sales from online transactions

Figure 3-4 shows the average digital maturity scores among groups and their individual five component scores that make up the Digital Maturity Index. Digital applications represent the Index component that accounts for the largest proportion of digital maturity score in each group. The extent of using digital applications and e-commerce makes the major differences among less and more digitally mature businesses, while the differences in using ICT infrastructure, investment and capability are not as significant in explaining the digital mature differences among groups.

Table 3-4 Average scores per group per digital maturity dimension

	ICT infrastructure	ICT investment	ICT capability	Digital applications	E-commerce	Average digital maturity score
Digitally Embedded	8	4	8	38	10	67
Active Exploiters	7	3	7	27	7	51
Passive Exploiters	6	2	6	18	5	37
Digitally Disengaged	5	1	5	8	3	22
Total	7	2	7	24	6	46

3.3. Digital maturity and business performance

The Survey asked businesses whether adoption of broadband services affected their performance in terms of turnover, profitability, employment, and innovation activity (introduction of new products, processes or services), and further specified what percentage it had been affected by (if it had increased). Overall, higher levels of digital maturity were associated with increases in business performance.

Figure 3-2 depicts how businesses' adoption of broadband affects its turnover, profitability, employment and innovation by digital maturity group. Digitally Embedded significantly outperformed other digital maturity groups, and more than 50% of the businesses in this group reported increases in turnover, profitability, employment, and innovation activity as a result of having adopted broadband. Among all digital maturity groups, increases in innovation are reported as the largest ones compared to the rest of performance indicators of SMEs. Among all the SME's performance indicators (turnover, profitability, employment and innovation), increases in those indicators are all positively associated with the extent digital technologies are used.

Businesses that reported growth in their business performance were further asked to indicate the extent of increase. Figure 3-3 shows the increase range in business performance by digital maturity group. The three 100% bars that appear for the Digitally Disengaged group in Figure 3-3 are because only one business in this group responded with the particular increase range specifically. Businesses in the more digitally mature groups (Active Exploiters and Digitally Embedded), in general, reported higher increases in business performance as a result of superfast broadband adoption.

Figure 3-2 Effect of broadband adoption on turnover, profitability, employment, innovation

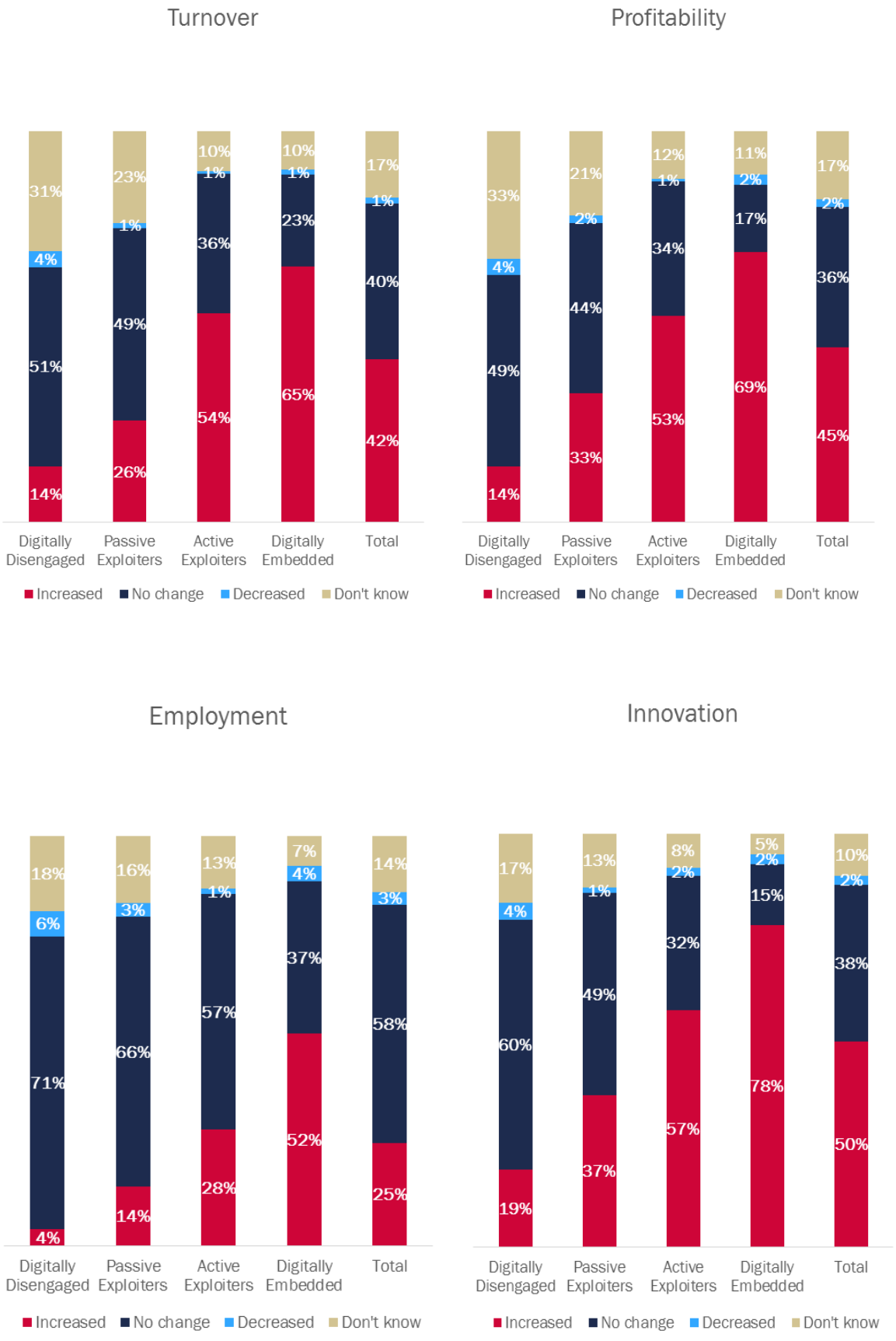
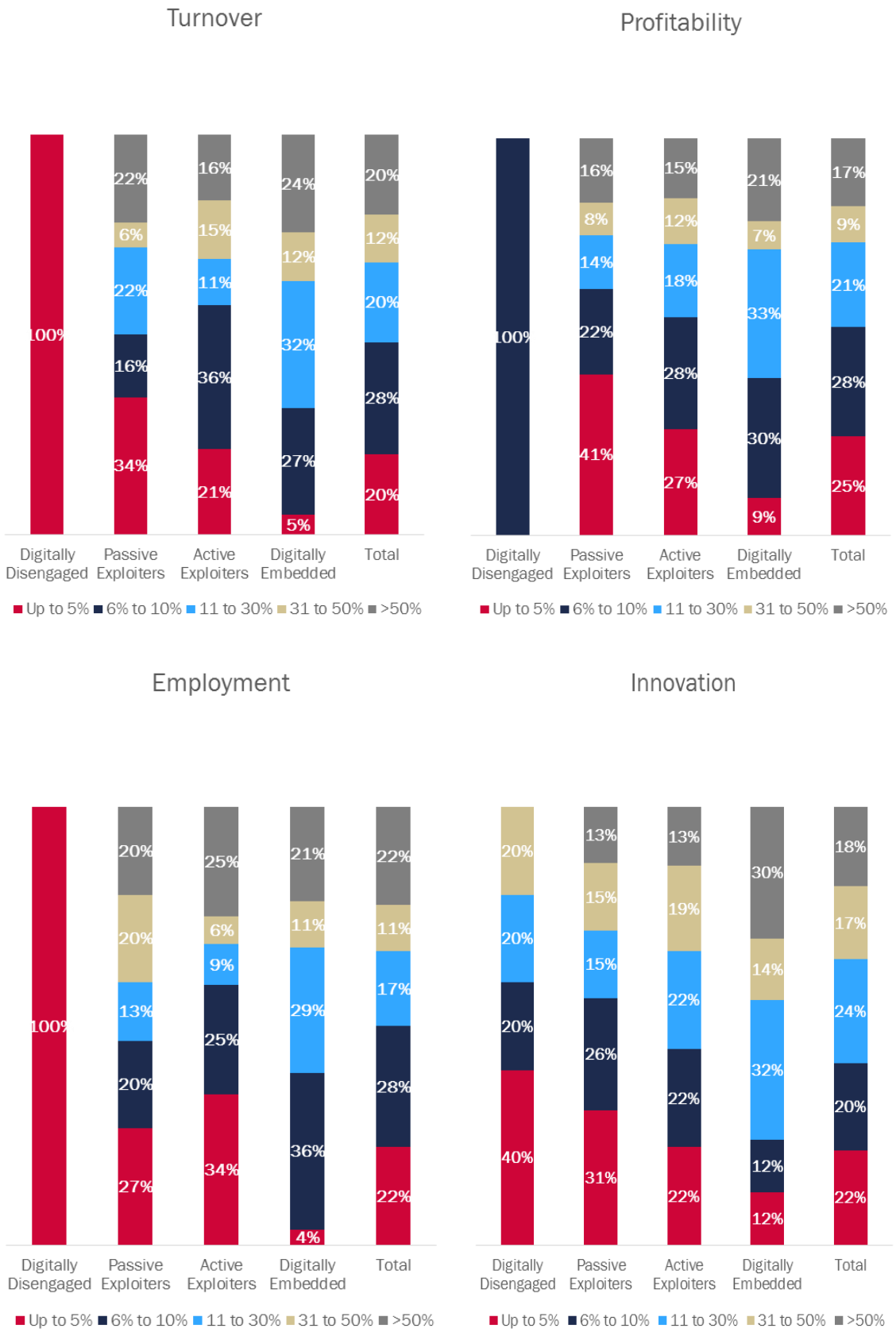


Figure 3-3 Effect of broadband adoption on increase in turnover, profitability, employment, innovation as a result of access to broadband



The majority of SMEs in all digital maturity groups agreed that broadband enabled services improved their knowledge management, productivity and enhance communication (Table 3-5). Less than half (48%) of the SMEs in the Digital Disengaged group believed broadband enabled services enabled them to better respond to customer or supplier requirements. Similarly, only 46% of businesses in this group agreed that such services increase their competence. Some 19% of the Digitally Disengaged businesses consider adoption of broadband enabled services as a tool to improve risk management, whereas the vast majority of SMEs in the Digitally Embedded group reported agreement with all the strategic benefits from adoption of broadband listed in Table 3-5. On average, 41% of SMEs recognised broadband enabled services to be beneficial to their risk management. Close to half (49%) of the businesses agreed that broadband adoption helped to gain access to new geographical markets and increase IT security and data protection for the businesses. A large proportion of businesses in the sample reported that broadband adoption benefited the businesses in terms of all the other strategic benefits named in Table 3-5.

Table 3-5 Effect of broadband-enabled services on perceived business benefits (% that agree)

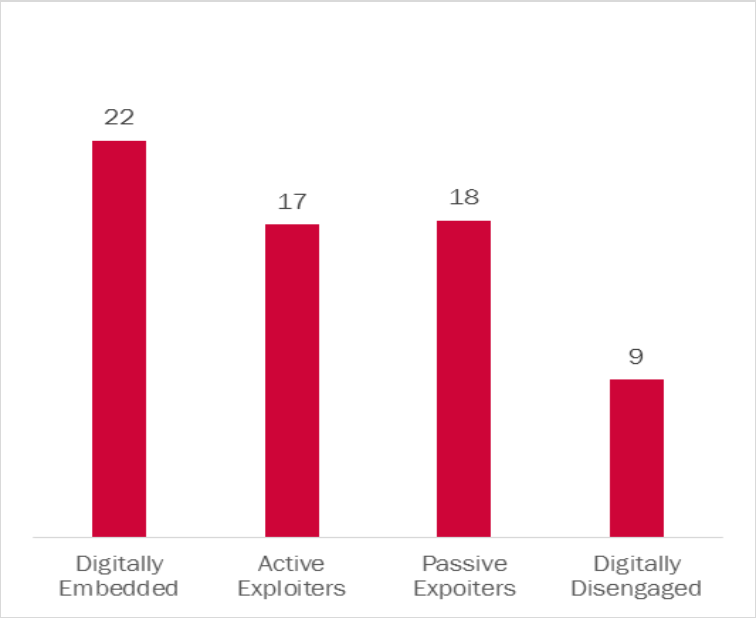
	Digitally Disengaged	Passive Exploiters	Active Exploiters	Digitally Embedded	Average
Better respond to customer or supplier requirements	48%	76%	84%	98%	79%
Keep pace with competition	46%	68%	79%	94%	74%
Improve knowledge management/information sharing	63%	74%	86%	90%	80%
Enhance communication	72%	87%	92%	95%	89%
Improve productivity/efficiency	56%	64%	80%	89%	74%
Gain access to new geographical markets	29%	41%	50%	73%	49%
Increase IT security and data protection	31%	40%	52%	70%	49%
Better risk management (continuity planning)	19%	29%	42%	73%	41%
Achieve overall strategic objectives	35%	52%	72%	86%	64%

3.4. Business characteristics and digital maturity

Business characteristics of the SMEs in the sample are analysed to see how the size, location and industry of the business are associated with its digital maturity level. This suggests that more digitally mature groups tend to be larger in size, located in South East Wales or North Wales, and concentrated more in sectors such as Transport & Storage, ICT, Real Estate, Accommodation & Food industries et al., than the others.

Figure 3-4 shows the average number of people employed by business in the digital maturity groups. Digital Embedded businesses have the highest average number of employees per business (22 employees). The average number of people employed by Digitally Disengaged business is 9. Overall, larger businesses (by number of people employed) are likely to be more digitally mature.

Figure 3-4 Average number of people employed by digital maturity group



In terms of the sub-region distribution of the digital maturity groups, South East Wales accounts for the largest proportion of digitally mature. SMEs in South East Wales and North Wales in the sample have both a greater proportion of Digitally Embedded businesses and Active Exploiters, compared to SMEs in Mid Wales and South West Wales, which corresponds with the fact that South East Wales and North Wales have higher GVA per head than the other 2 sub-regions. This may suggest that productive businesses, on average, tend to be more digitally mature (Table 3-5).

Figure 3-5 Distribution of the digital maturity groups by Subregion

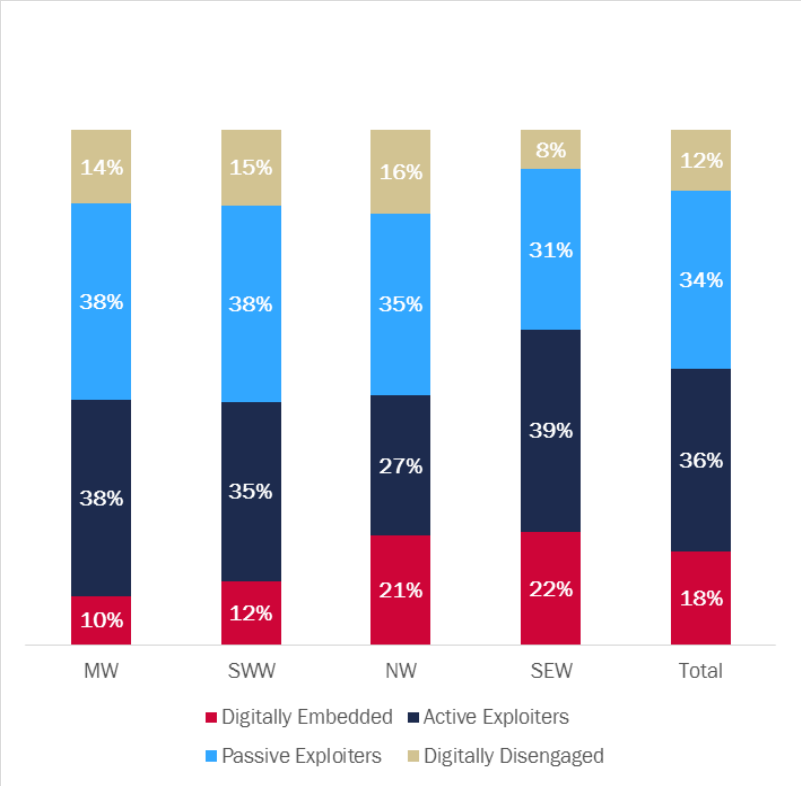
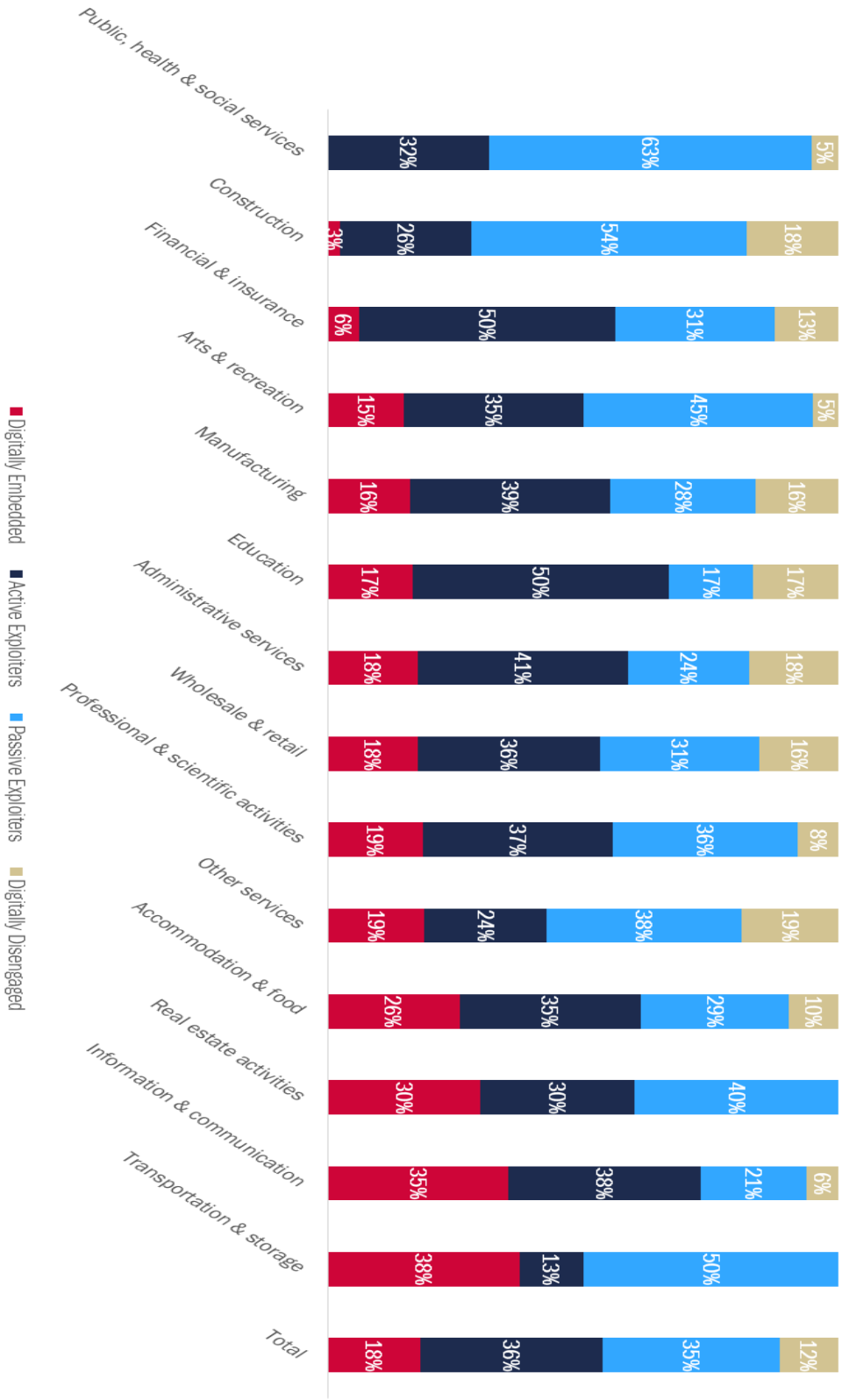


Figure 3-6 depicts the distribution of the digital maturity groups across sectors, sorted by the percentage of Digitally Embedded businesses of the specific industry in ascending order. Public, health & social services, and Construction have the least percentage of Digitally Embedded businesses or Digitally Embedded businesses and Active Exploiters businesses combined. Real Estate and Transportation & Storage have no Digital Disengaged businesses reported in the sample. Overall, the distribution of digitally mature groups by industry may reflect the nature of the services/products the specific industry provides, and the industry profitability (GVA/head), as more profitable businesses are likely to be more digitally mature (Figure 5-1), it may also be related to the sample SMEs' distribution across industries.

Figure 3-6 Distribution of the digital maturity groups by sector



4. Comparative analysis

4.1. Introduction

The *Digital Maturity Survey for Wales* 2018 report represents the third of our series of annual *Surveys*, allowing for comparative analysis on the sub-sample of businesses that have completed questionnaires in each of the two earlier years. This section highlights the aggregate-level analysis, comparing the year-on-year results of the 2016 to 2018 surveys for the sub-sample.

4.2. Firm-level comparative results

Longitudinal sub-sample analysis. A total of 31 businesses have taken part in each of the three years the Survey has so far run. This presents the opportunity to compare aggregated results between the years for this sub-sample.

With a relatively small sample such as this, a degree of caution has to be applied to the results. The findings can, however, provide some general feedback on the adoption and usage of superfast and standard broadband enabled technologies.

The sub-sample analysis is shown for categories where questions were asked in the same or very similar manner over all three years of the survey, and include: broadband adoption; average download and upload speeds; e-commerce; website; and existence of ICT budget.

Adoption of superfast broadband. Table 4-1 shows that just over a third of the longitudinal sample (35%) had adopted superfast broadband at the time of the 2016 Survey. This proportion increased to nearly a half (47%) in 2017, and then to seven-tenths (72%) in 2018. It should be noted that this is likely to be an underestimate of the increase in superfast adoption for the sub-sample, as the definition of what constitutes "superfast broadband" changed from 2016 (minimum download of 24 Mbps) to 2017 (minimum download of 30 Mbps).

Table 4-1 Broadband adoption for sub-sample, 2016 to 2018 (% of SMEs)

Broadband adoption status	2016	2017	2018
No broadband	6%	3%	0%
Standard broadband	59%	50%	28%
Superfast broadband	35%	47%	72%

Average download speeds. The proportion of businesses in the longitudinal sample reporting average achieved download speeds of 10 Mbps or greater increased between 2016 and 2018 by 25 percentage points (to 79%). Table 4-2 highlights that the majority of this increase (14 percentage points) occurred between 2017 and 2018, reflecting the accelerating move to faster broadband speeds.

The percentage of SMEs averaging download speeds of less than 2 Mbps was the same in 2018 as it had been in 2016 (7%).

Table 4-2 Average download speeds for sub-sample, 2016 to 2018 (% of SMEs)

Average download speeds	2016	2017	2018
Less than 2 Mbps	7%	10%	7%
2 Mbps or more and less than 10 Mbps	39%	24%	14%
10 Mbps or more and less than 30 Mbps	18%	24%	38%
30 Mbps or more	36%	41%	41%

Average upload speeds. The proportion of sub-sample businesses reporting average achieved upload speeds of less than 2 Mbps has fallen from over a half (56%) in 2016 to a quarter (24%) in 2018. Table 4-3 also shows that SMEs who had achieved average upload speeds of at least 10 Mbps increased from one in five (19%) in 2016 to three in five (62%) by 2018.

Table 4-3 Average upload speeds for sub-sample, 2016 to 2018 (% of SMEs)

Average upload speeds	2016	2017	2018
Less than 2 Mbps	56%	48%	24%
2 Mbps or more and less than 10 Mbps	26%	10%	14%
10 Mbps or more and less than 30 Mbps	15%	28%	55%
30 Mbps or more	4%	14%	7%

E-commerce. Table 4-4 shows that in 2016 two in five (39%) of the longitudinal sample of SMEs reported that none of their sales were serviced online. In 2018 this proportion had dropped to one in five (19%). Between 2016 and 2018 there was an increase of 19 percentage points in the proportion of sub-sample businesses conducting three-quarters or more of their sales online (25% to 44%).

Table 4-4 Proportion of total sales serviced online for sub-sample, 2016 to 2018 (% of SMEs)

Proportion of sales online	2016	2017	2018
0%	39%	27%	19%
1-10%	14%	10%	15%
11-25%	14%	7%	4%
26-50%	4%	10%	11%
51-75%	4%	7%	7%
76-100%	25%	40%	44%

In 2016, one in seven businesses in the sub-sample (14%) did not make any purchases online. Table 4-5 illustrates that by 2018 all of the businesses transacted at least some purchases online. There was also an increase of 22 percentage points in the proportion of businesses carrying out at least half of their purchases online, from 2016 (43%) to 2018 (65%).

Table 4-5 Proportion of total purchases transacted online for sub-sample, 2016 to 2018 (% of SMEs)

Proportion of purchases online	2016	2017	2018
0%	14%	3%	0%
1-10%	18%	7%	10%
11-25%	21%	14%	17%
26-50%	4%	10%	7%
51-75%	25%	21%	10%
76-100%	18%	45%	55%

Website. There was no change in the proportion of the sub-sample businesses having a website (93%) when comparing the three years from 2016 to 2018.

Table 4-6 Proportion of sub-sample having a website, 2016 to 2018 (% of SMEs)

	2016	2017	2018
Have a website	93%	93%	93%
Do not have a website	7%	7%	7%

Table 4-7 shows that the proportion of the longitudinal sample reporting having a dedicated ICT budget changed positively, by 5 percentage points, to 19% from 2016 to 2018.

Table 4-7 Proportion of sub-sample having a dedicated ICT budget, 2016 to 2018 (% of SMEs)

	2016	2017	2018
Have a dedicated ICT budget	14%	40%	19%
Do not have a dedicated ICT budget	86%	60%	81%

Summary. The main results from the above analysis on the longitudinal sub-sample are presented in Table 4-8. These generally indicate that adoption of broadband technologies has advanced from 2016 onwards, as has the usage to which they have been put. With appropriate caveats in place due to the relatively small sample size, the findings do provide some extra and interesting findings on business progress to higher levels of broadband maturity in Wales.

Table 4-8 Summary of firm-level comparative results, 2016 to 2018 (n = 31)

	Percentage point increase 2016 to 2018
Superfast broadband adoption	+37
Download speed average > 10 Mbps	+25
Upload speed average > 10 Mbps	+43
Business has a website	+/- 0
Business has an ICT budget	+5
E-commerce: Sales online >50%	+22
E-commerce: Purchases online >50%	+22

5. Conclusions

5.1. Introduction

The aim of the Digital Dashboard for Wales is to draw out a snapshot of the results of the Digital Maturity Survey results over the period of the project. The current Digital Dashboard show results covering a three-year period (2016-2018 inclusive), and highlights the dynamic nature of digital maturity. These results are primarily drawn from DMS, but also include other (secondary) sources, which provide supplementary contextual indicators.

5.2. The Digital Dashboard for Wales

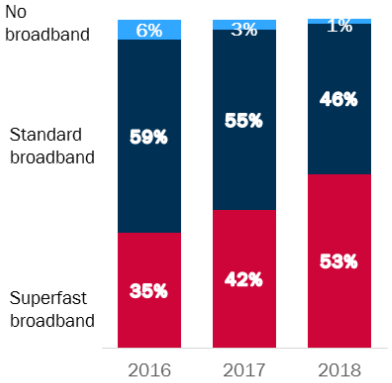
The Digital Dashboard for Wales provides an overview of digital maturity in three main areas: ICT Infrastructure, ICT Resources and ICT Use. Under each key area comparisons are drawn against results from previous years. Due to the introduction of a new methodology in 2017, it is only possible to provide a two-year snapshot of the Digital Maturity Index component of the Digital Dashboard.

Figure 5-1 Digital dashboard for Wales 2018

ICT INFRASTRUCTURE

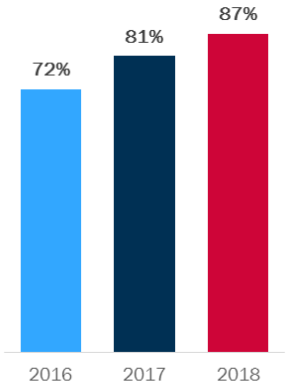
Adoption of broadband

Digital maturity survey, % of SMEs



SMEs able to receive superfast broadband in Wales

Ofcom, % of premises



ICT RESOURCES

Use of advanced cloud computing services

Digital maturity survey, % of SMEs

Share of SMEs with over half of workforce with intermediate or above IT skills

Digital maturity survey, % of SMEs

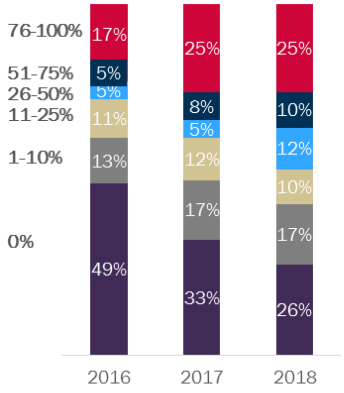
Annual IT spend

Digital maturity survey, £ per employee

Spending category	2016	2017	2018
Hardware	£684	£624	£473
Software	£662	£711	£494
Network	£180	£92	£119
Broadband subscription	£113	£132	£199

Share of e-sales in total sales

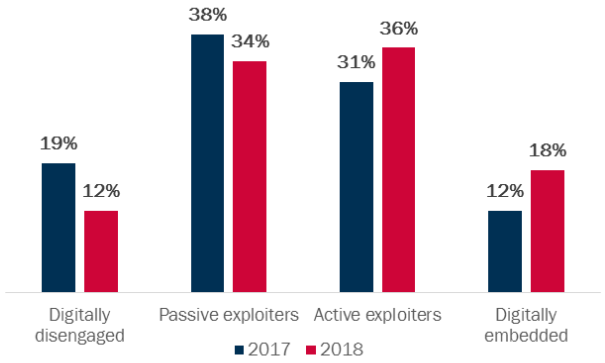
Digital maturity survey, % of SMEs



ICT USE

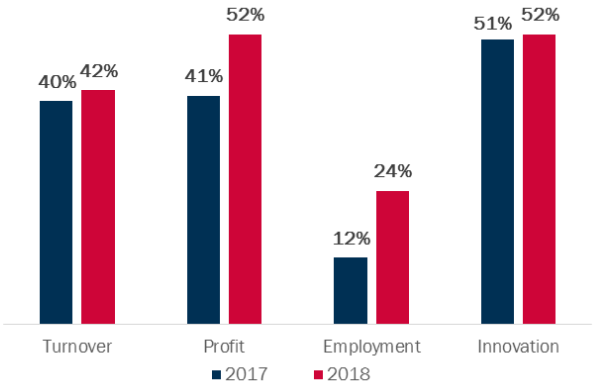
Digital maturity index

Digital maturity survey, breakdown of businesses by category



Performance of SMEs by type of broadband

Digital maturity survey, % of SMEs reporting positive outcomes from adopting superfast broadband services



5.3. Implications

The findings from the Digital Maturity Survey for 2018 give cause for optimism over Welsh SME engagement in superfast broadband and enabled technologies. Particularly significant this year has been a higher degree of confidence in the findings and the underlying trends resulting from two consecutive years with high numbers of completed returns to our survey. The findings reveal more sustained use of advanced cloud computing services, and we find a larger numbers of businesses embraced within the categories of 'digitally embedded' or 'active exploiter'. Perhaps as importantly the DMS 2018 also reveals positive trends in adoption across both rural and urban locations. An underlying attribute of the new technology and its adoption in Wales was that this might aid in closing intra-regional productivity gaps. From this perspective trends in spatial deployment and adoption are very welcome, although with ongoing challenges to connect those properties yet to gain access to superfast broadband, and improving mobile network coverage[12].

The data gathered during 2018, in tandem with our growing body of case study evidence is allowing us to explore in more detail the connections between the resource, its adoption and business productivity. However, while we now provide a compelling case that businesses are making more use of advanced cloud computing services, there are still questions over which specific elements of the adoption identified adds most to productivity, and with these questions having important implications for interventions to assist SMEs. These questions will be further investigated in the series of economic impact reports that follow. Moreover, we remain conscious that the scope of the *Digital Maturity Survey, 2018* is for obvious reasons on the Welsh economy and with real interest in how far identified trends in adoption are replicated in other regions of the UK, and the extent to which our Welsh SMEs are leading or otherwise.

Finally, key context for the DMS 2018 has been uncertainty around the EU transition process. While there is interest in how far adoption of the resources made possible by superfast broadband enhances SME resilience, and removes selected barriers to growth, we are mindful that digitally engaged SMEs might be better positioned to grow exports, better placed to avoid overseas transactions costs, and better informed of overseas opportunities. While there remains some uncertainty on the level of SME exporting from Wales the threats to the export base of Wales' larger firms suggests that there will be an increasing focus on encouraging trade from our SMEs and showcasing how adoption of superfast resources can aid overseas activity in selected sectors of the Welsh economy.

[12] http://gov.wales/topics/science-and-technology/digital/infrastructure/mobile-action-plan/?lang=en. https://gov.wales/newsroom/science-and-technology/2018/180130-Next-steps-to-further-extend-fast-broadband-in-Wales/?lang=en

6. Annex

6.1. Overview of 2018 sample

The following tables show the samples of business population in Wales in comparison to the 2018 survey sample. The data was used to carry out stratification and weighting methods.

Table A-1. Business Population: Wales 2018 by industry and size (% of all SMEs)

	Micro	Small	Medium	All SMEs
Construction	30.5	0.6	0.1	31.2
Manufacturing	7.4	0.8	0.3	8.5
Wholesale/retail, transport & storage	14.1	1.5	0.2	15.8
Accommodation & food services	5.4	1.3	0.1	6.7
Information & communication	5.5	0.1	0.0	5.6
Business & other services	30.8	1.2	0.2	32.2
All industries	93.7	5.4	0.9	100.0

Source: Annual Business Population Estimates, ONS.
https://www.gov.uk/government/statistics/announcements/business-population-estimates-2018

Table A-2. Sample: Digital Maturity Survey 2018, by industry and size (% of all SMEs)

	Micro	Small	Medium	All SMEs
Construction	4.8	2.9	1.5	9.2
Manufacturing	8.0	5.7	2.3	16.0
Wholesale/retail, transport & storage	8.2	2.9	1.1	12.2
Accommodation & food services	5.7	0.6	0.2	6.5
Information & communication	7.8	2.5	0.8	11.1
Business & other services	31.9	10.3	2.7	45.0
All industries	66.4	25.0	8.6	100.0

Source: Digital Maturity Survey 2018, WERU.

The next tables provide details on the sample achieved by the 2018 survey. They include a breakdown of the sample by sector, location, firm size.

Table A-3. Sector

	Number of SMEs	Share of SMEs
C: Manufacturing	76	15.9
F: Construction	45	9.4
G: Wholesale & retail trade; repair of motor vehicles	50	10.4
H: Transport & storage	8	1.7
I: Accommodation & food service activities	31	6.5
J: Information & communication	53	11.1
K: Financial & insurance activities	17	3.5
L: Real estate activities	10	2.1
M: Professional, scientific & technical activities	89	18.6
N: Administrative & support service activities	20	4.2
O: Public administration & defence	1	0.2
P: Education	13	2.7
Q: Human health & social work activities	18	3.8
R: Arts, entertainment & recreation	21	4.4
S: Other service activities	25	5.2
Unknown	2	0.4
Grand Total	479	100.0

Source: Digital Maturity Survey 2018, WERU.

Table A-4. Location, by local authority area

	Number of SMEs	Share of SMEs
Anglesey	5	1.0
Blaenau Gwent	7	1.5
Bridgend	20	4.2
Caerphilly	19	4.0
Cardiff	76	15.8
Carmarthenshire	22	4.6
Ceredigion	23	4.8
Conwy	28	5.8
Denbighshire	10	2.1
Flintshire	6	1.3
Gwynedd	40	8.3
Merthyr Tydfil	2	0.4
Monmouthshire	18	3.8
Neath Port Talbot	30	6.3
Newport	21	4.4
Pembrokeshire	24	5.0
Powys	41	8.5
RCT	22	4.6
Swansea	20	4.2
Torfaen	14	2.9

	Number of SMEs	Share of SMEs
Vale of Glamorgan	13	2.7
Wrexham	18	3.8
Grand Total	479	100.0

Source: Digital Maturity Survey 2018, WERU.

Table A-5. Employee size

	Number of SMEs	Share of SMEs
Micro (0 to 9 employees)	318	66.4
Small (10 to 49 employees)	119	24.8
Medium (50 to 249 employees)	41	8.6
Unknown	1	0.2
Grand Total	479	100.0

Source: Digital Maturity Survey 2018, WERU.

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http://www.cardiff.ac.uk/superfast-broadband-project/digital-maturity-survey

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