European Commission

Uptake of Cloud in Europe

Follow-up of IDC Study on Quantitative estimates of the demand for Cloud Computing in Europe and the likely barriers to take-up

FINAL REPORT

A study prepared for the European Commission
DG Communications Networks, Content & Technology
by:

IDC
Analyze the Future

Digital Agenda for Europe

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Internal identification

Contract number: 30-CE-0610497/00-87

SMART 2013/0043

DISCLAIMER

ISBN 978-92-79-45436-3

DOI: 10.2759/791317

Table of Contents

Table of Tables

Table of Figures

ABSTRACT

This is the Final Report of the study "SMART 2013/0043 - Uptake of Cloud in Europe. Follow-up of IDC Study on Quantitative estimates of the demand for Cloud Computing in Europe and the likely barriers to take-up "entrusted by the European Commission DG CONNECT to IDC, carried out from January 2014 to November 2014.

The objective of this study is to undertake a comprehensive economic analysis and provide quantitative estimates of the impact of cloud computing on the EU economy. The previous study was carried out for the Commission by IDC in 2011-2012.

The report looks at the potential economic impact of the EU28 resulting from the adoption of Cloud based computing solutions by the Public and Private Sector. It provides updated data of Cloud adoption in the EU28 by industry, company size, and country. It estimates the level of substitution by Cloud spend of IT spend. In undertaking the assessment of the economic impact IDC prepared three scenarios, termed baseline, optimistic and pessimistic, reflecting a range of outcomes that reflect "most likely", "best case" and "worst case" respectively. The study also looks at how competitive the EU owned IT industry is in meeting the demands and opportunities that Cloud Computing presents.

EXECUTIVE SUMMARY

Cloud Computing has become synonymous with the purchase of IT services and solutions in the second decade of the 21st Century. Whether it is purchasing online storage, securing access to computing power or acquiring core applications to help run the business, there is a Cloud based solution available. Unlike many other forms of large scale IT which were targeted solely at business purchasers, and often the larger businesses, there is a cloud solution for everyone from the multi-billion Euro corporation operating in multiple locations around the globe to the one person business operating out of a spare room in their home and even down to the individual consumer.

Indeed one of the attractions for the smaller business is that the availability of IT solutions in the Cloud has given them access to highly sophisticated systems and applications which would previously have been completely out of reach. Perhaps the best known example of this is the market leading CRM application from Salesforce.com. At its most simple level, it does not matter if the customer is a small business or a large multi-national – the exact same CRM product is available to both at an affordable price.

This Final Report is the third deliverable of the study "*Uptake of Cloud in Europe. Follow-up of IDC Study on Quantitative estimates of the demand for Cloud Computing in Europe and the likely barriers to take-up*" entrusted by the European Commission, DG Connect, to IDC. The objective of this study is to undertake an economic analysis and provide quantitative estimates of the impact of cloud computing on the EU economy. This study is a follow up to the study "*Quantitative estimates of the demand for Cloud Computing in Europe and the likely barriers to take-up*" (SMART 2011/0045), carried out for the Commission by IDC in 2011-2012.

This Final Report investigates the structure of the Cloud Industry in Europe, the size and forecast growth of the market and how competitive the European IT Industry is in the supply of Cloud based services and solutions when it comes to addressing that market opportunity and the economic impact that the adoption of Cloud computing will have on the overall European economy and specifically the GDP of the Member States. The previous study undertaken by IDC for the European Commission in 2012 only considered the adoption of Public Cloud (multi-tenanted) computing, whilst this study also includes Hosted Private Cloud solutions (i.e. solutions where the client has a dedicated computing environment but it is located on the suppliers premises and delivered as a Cloud service with the inherent benefits of scalability and usage based charging). In addition this study includes Croatia and provides estimates for the EU28.

Adoption of Cloud Services

Throughout this report it is necessary to differentiate between Public Cloud (multi-tenanted, shared environments located away from the customer's premises, with customers paying for usage at the point and time of consumption) and Private Cloud (single-tenant, located either on the supplier's or client's premises) when looking at adoption levels. Public Cloud is the most commonly understood version of Cloud, if only because it is one that consumers themselves can buy (or in some cases access for free). It is also the implementation that was first offered under the Cloud banner and thus been around the longest.

Across the EU economy, IDC estimates that in 2013 some 61.5% of all businesses have at least one Cloud based solution in their IT mix. For some that might simply be their e-mail system or the use of a unified communications solution, for others it may be something

more sophisticated such as a CRM solution, their accounting software or access to external computing power and storage upon which to run their own applications or store their data. According to our study however the difference in cloud diffusion excluding or excluding basic office/collaborative application is very low. By the end of 2015 IDC expect this to have reached almost 70% of all business.

What is interesting to note here is that it is the Telecommunication/Media and Financial Services sectors that are leading the use of Cloud, both at or close to 70% in 2013 and reaching above 75% by the end of 2015. By contrast the Public Sector is lagging slightly behind with only just over half of all Public Sector bodies using Cloud in 2013 and only just getting close to 60% in 2015.

There are a number of possible reasons for this lag by Public Sector including concerns about data security, operational practices and the historical use of traditional outsourcing with long contract duration all making it less easy for this sector of the market to adopt new approaches to technology quickly.

By contrast when looking at Private Cloud adoption there are two critical differences observed. Firstly current levels of adoption across all sectors of the EU economy are much lower (typically mid 20% to low 30%) and the rate of growth from 2013 to 2015 is much higher, in some cases adoption levels more than doubling over that period. Also whilst the Public Sector is found, in 2013, to have one of the lower levels of adoption (27.7%) of Private Cloud solutions by 2015 it will have one of the highest adoption levels at 49.6%.

This report also looks at the levels of adoption by company size and what becomes apparent is that in 2013 the levels of adoption of Public Cloud solutions by businesses employing more than 250 staff (70.4%) was much higher than those employing less than 250 staff (48.3%). However by 2015 that gap will have closed considerably, with the adoption rates by large companies at 76.6% versus 63.7% by SMEs, demonstrating that there is a major opportunity for providing Public Cloud services to the smaller business sector of the economy. When it comes to Private Cloud adoption the two business communities are more closely matched.

When considering how Cloud services are used in the organisations it is very clear that different sectors of the economy are using cloud solutions to address different needs in their business. In the Financial Services sector Security is the top Cloud based service whilst Content Management is bottom. By contrast in the Distribution sector CRM is top but BI/Analytics is almost non-existent. This emphasises the need for those selling Cloud solutions to the market to be able to fully recognise the needs of the customer base and target their offerings accordingly. It is not a "one size fits all" marketplace.

The other key observation regarding Cloud Adoption is that whilst a large number of businesses across all sectors of the economy have adopted Cloud based solutions IDC's research finds that on average, across the total economy, the average number of Cloud based applications per company is less than 2. Clearly the reality will be somewhat different in that some will have many and many will have none, but the important conclusion to this is that there is massive potential for the Cloud industry to sell additional Cloud based solutions to those that already have experience of Cloud and the market growth is not restricted to just selling to those who have yet to try the approach. Looking forward to 2015 the average number of Cloud applications per company is expected to more than double from 1.4 in 2013 to 3.6, again illustrating that Cloud based solutions are becoming commercially attractive to business.

Finally the events of June 2013, when evidence of mass surveillance was revealed suggesting that the US Government was regularly accessing data held on computers around the world: the issue of where data is stored and who has access to it has become a major topic of debate. EU businesses are much more reluctant to engage with a vendor if their data is being stored in the US1. This does of course only really impact the Public Cloud component of the market.

Many of the leading US cloud providers are now busy establishing data centres in Europe to ensure they can address data location issues. At the same time the European Commission is actively redrafting the Directive addressing data protection issues to ensure it is interpreted in the same way across all of the EU rather than the current and confusing country by country interpretation which has impacted the willingness of some to adopt cloud services. This may have a short term impact on the adoption of cloud by businesses and may favour European based providers, but in the longer term it is expected that the industry will address the concerns and customers will return to selecting suppliers primarily on service and price.

Expenditure on Cloud

In preparing its calculations as to how much money is being spent on Cloud based computing in the EU economy today and how that might grow through to 2020, IDC created three scenarios. The first is what IDC is calling the Baseline Scenario and is considered the most likely by IDC, but given the current level of uncertainty about economic and financial growth, a range of potential different outcomes must be considered Therefore, the second scenario is based on the assumption of relatively faster GDP growth in Europe and faster adoption of IT innovation and cloud (optimistic scenario), while the third scenario examines the consequences of lower growth, higher impacts of cloud barriers, lower IT investments resulting in the adoption of cloud services actually failing to meet current expectations (pessimistic scenarios). Therefore the 3 scenarios outline the upper and lower boundaries of the potential cloud market growth and their potential impacts on the economy.

In all three scenarios the forecast for 2015 is the same, as IDC is highly confident at the current time of how the next 18 months will pan out with regard to cloud service adoption. In 2020 IDC's baseline scenario shows the total cloud market to be worth some €44.8bn (€32.7bn for the Public Cloud and €12.06bn for the private). By contrast the Optimistic scenario forecasts the market to be worth €59.6bn (€45 bn for the Public Cloud and €14.6bn for the private) and the pessimistic scenario forecasts a total market value of €28.4bn (€18.1bn for the Public Cloud and €10.3bn for the private). Clearly there is a significant difference between the best and worst scenario and it must be hoped that market conditions are such that the outcome is closer to the Optimistic scenario.

IDC estimates also the total spend on IT by scenario. In the baseline scenario, Cloud spend is expected to represent 10.8% of a total IT spend in the EU of some €414bn in the year 2020. But the incidence of cloud spend could be much lower by 2020 in the case of the pessimistic scenario (6.9%) or as high as 14.4% in the optimistic scenario. In fact, in case of higher growth, we expect higher demand of IT-based innovation and faster substitution by cloud of traditional IT spend.

[1] As part of IDC's regular discussions with both the enterprise end user community and the Cloud vendor community, the issue of data location and access to that data has become a major topic. Whilst ultimately the customer may chose a non-local (often US based) supplier, local alternatives are actively pursued and seen as a preferable alternative all other things being equal.

What must also be recognised is that just because Cloud Computing is a new concept, the spend on Cloud services is not necessarily new money over and above existing IT spend, indeed a switch to Cloud based computing is often seen (initially at least) as a way of reducing overall IT spend. Money spent on IaaS (Infrastructure as a Service) will more often than not simply be money that in the past would have been spent on purchasing servers and other equipment and services upon which to run an organisation's business applications. Likewise spend on SaaS (Software as a Service) is more often than not simply replacing past software licence and support spend.

IDC estimates that every Euro spent on a SaaS solution is replacing €2.30 spent previously across traditional hardware, software and services to deliver the same outcome. Likewise for every Euro spent on PaaS the organisation would previously have spent €1.80 and for IaaS the Euro spent replaces a previous spend of €1.80 (in this last case mostly due to lower hardware spending).

This change in spending is having an impact on the traditional IT industry in a number of ways. Software companies that have previously relied on upfront licence payments and ongoing maintenance revenues have to adapt to the new shape of their revenue streams that comes from a subscription model. Likewise the hardware industry, which has traditionally made extensive use of resellers and distributors to sell their products to end user organisations, is now finding that they have less need for the channel as the number of end user customers directly buying their products declines as they switch to acquiring their infrastructure from Cloud providers. In turn the indirect channel is having to find new ways in which to add value to a vendor's core product (cloud or traditional) or develop their own offerings, often competing with those from the vendors they used to partner with.

Competitiveness of the EU Cloud Industry

As is already evident in this report, the Cloud Industry is not a simple one, it is actually quite complex with different types of suppliers offering different types of Cloud based solutions to accommodate different customer needs.

The assessment of the competitiveness of the industry is very different when considering Public or Private Cloud environment. The Public Cloud environment was born in the United States (in the latter part of the 1990s) when companies like Salesforce.com and Amazon began offering IT solutions to customers utilising a subscription model, at the time often referred to as ASP or Application Service Provision. The US market proved very receptive to this new way of buying computing resources and as the businesses grew the suppliers began to offer the same services in Europe. Because the delivery of Public Cloud based computing essentially knows no geographic boundaries it is probably difficult to determine whether they simply started to receive orders from European based customers or whether they made a conscious effort to start selling to the European market. The presence of EU based subsidiaries of US companies only makes this even harder to determine with any certainty.

Whatever the truth is, by the time the European IT industry was in a position to offer its own Public Cloud services the major US based players (as they are known today) had already established a presence in the market. In addition, their experience and capability developed from their domestic market made them seem the safe choice and as such their business grew faster than the European domestic providers.

One reason as to why the US industry was able to grow so much more easily in its home territory than has been the case for the EU headquartered provides in Europe comes down to the legal framework. In the US there is broadly a common legal framework across all 50 states and US businesses are well used to deal with any variances that exist. That common framework does not exist in Europe and many businesses, especially the smaller ones, have little or no experience of dealing with suppliers outside their own country. Lack of a common language also presents a barrier to European businesses engaging with suppliers in another European country.

In IDC's view, the early mover advantages held by the US-based Public Cloud services vendors in terms of scale and global public awareness still exist today, though they are diminishing. Public Cloud vendors in Europe still have multiple country markets that they need to successfully establish themselves and sell services into, in order to get close to the level of opportunity that exists in the US. Moreover, success in one country market does not guarantee success in other country markets. For example, it does not remove all the challenges of selling into the new market, and in particular sensitivities over data location and access still exist even when data is stored only within the EU. Curiously national issues also arise with EU based companies seemingly happier to consider a US based provider as an alternative to a domestic supplier than a supplier headquartered in another EU state. This may in part be due to the fact that leading US providers of Public Cloud services (including Amazon, Google and Microsoft) are well known.

Revelations about mass surveillance have led to businesses giving consideration to where their data is being held and by whom, but with all the leading US cloud providers actively building datacenters in Europe, any downturn in the willingness to use these vendors for Public Cloud services is expected to be short lived especially as these new European based facilities come on stream. IDC's Cloud Tracker service which tracks the revenues of the Cloud Service Provider industry continues to show revenue growth for providers headquartered in both the US and Europe illustrating that this has had at the most only a dampening effect on growth.

Looking at the leading Public Cloud providers in Western Europe it is not until reaching #8 that one finds the first European based provider (SAP). The first 7 together account for over 23% of the total Western European Public Cloud market. What is also clear is that the market is highly fragmented: the 25th largest supplier has just 0.5% of the market. Of the top 25 suppliers 17 are US based, 7 come from the EU and 1 from Norway.

When considering the providers of Private Cloud services (both on premise and dedicated off-premise), which are deemed to be essentially Infrastructure based services, European providers do much better, especially in their domestic market. Many of the Private Cloud vendors are IT services providers and/or Telcos with IT services practices, including outsourcing. Their Private Cloud services have been established in response to demand from their existing IT services customers to reduce the cost of running their systems while assuaging the customers' uncertainties over issues such as governance, legal jurisdiction and security that can arise in Public Cloud deployments. IT services providers therefore are offering Private Cloud services to prevent their existing clients from defecting to other vendors, and to provide them with a defence against cannibalization of revenue by Public Cloud vendors.

In the same way as the US based providers were able to do well in the US when they first launched Public Cloud services, so the European based Private Cloud providers are able to exploit the relationships they already have with their customers, their local presence in the

market and their ability to address concerns about supplier and data location. It must however be pointed out that not all of the leading European based providers are also European headquartered: many, such as Hewlett-Packard, IBM and CSC, are US headquartered businesses despite their strong presence in the European market.

Economic Impact of Cloud Adoption

In considering the economic impact of Cloud adoption there are a number of key parameters to investigate and consider. At an enterprise level it is widely regarded that on a like for like basis the adoption of technology that is delivered on an "as a service" basis (aka Cloud) is less expensive than the acquisition of the same technology either as a capital purchase or via some other sourcing arrangement. The benefit for the business is that it can then either invest the savings in other technology projects or use it to invest in and develop the broader business. Businesses adopting new technology, no matter how delivered, can expect that new technology to also deliver operational efficiencies and/or enable the expansion of the business, which in turn then delivers economic benefit through increased revenues, and/or cost reductions.

At a macro level there needs to be in place the correct environment to give businesses the confidence to invest and make the commitments to their suppliers. In the specific case of technology, businesses also need access to a reliable and fast Internet connection, especially where the business is looking to utilise Public Cloud or Hosted Private Cloud services which primarily rely on the Internet as their access medium.

As already discussed in assessing the market for Cloud based computing in the European Union we developed three scenarios: baseline, optimistic and pessimistic. We have carried these three scenarios forward into the assessment process for the economic impact. In measuring the economic impact we have considered two metrics. The first one is the GDP resulting from the adoption of Cloud, either through companies being able to generate increased revenues because of the improved and/or new IT systems, or the creation of new companies. The second metric is the number of additional jobs created either as a consequence of companies needing to respond to expanding sales or due to the creation of new companies.

The three scenarios use the following basic assumptions.

- We have adopted the most recent macroeconomic forecasts of the European Commission, published in Spring 2014 and updated for 2015 (European Economic Forecasts, Spring 2014 http://ec.europa.eu/economy_finance/eu/forecasts/2014_spring_forecast_en.htm).
- In the baseline scenario, after an economic crisis lasting longer than expected, with widespread investment shortfall, the indicators and the conditions for a sustained recovery in the medium term are improving.
- In the baseline scenario, we assume that the recovery will be relatively slow and in line with the recent historical data.
- Challenges and vulnerabilities in the EU economy remain, so that in the pessimistic scenario the recovery may be slower than in the baseline mainly because the investment and consumption recoveries are slower than expected, with very slow improvements in the labour market.
- An optimistic scenario is also possible and is mainly based on the idea that the EU Member States achieve the main structural reforms, which will accelerate the employment recovery, and therefore an improvement in the consumption trends.

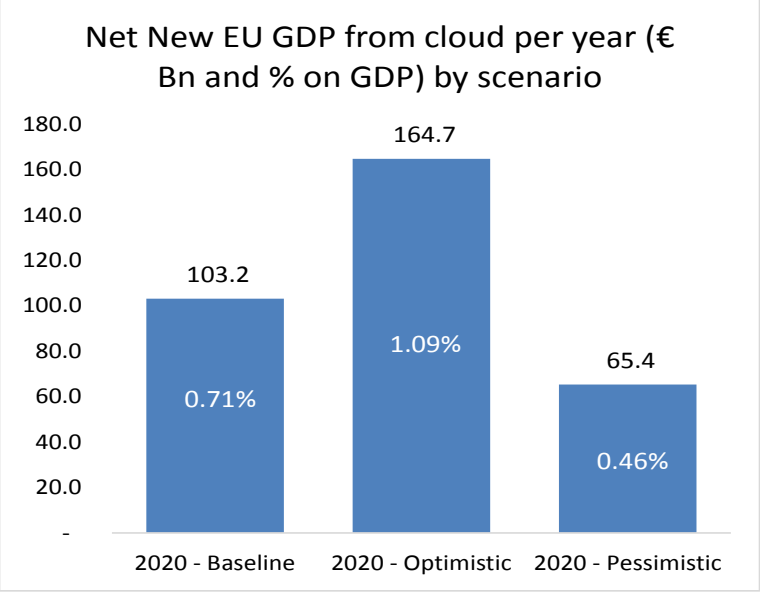
- During the past years, the EU economy and especially the knowledge economy has not created jobs as fast as in the past

Specific Cloud assumptions

- Cloud adoption is a direct function of the IT spending, which is itself linked to the economic performance of the economy as measured by GDP. As IT expenditure grows so does the rate of adoption of Cloud based services.
- Adoption of Cloud also varies by country to reflect local cultures and preferences
- Broadband availability is gradually evolving, although Internet connectivity, both access and speed, continues to be an issue in less business-intensive geographical areas.
- The adoption path and the innovation process for Cloud in the public sector are similar to that seen in the private sector.
- Investment decisions and innovation decisions for cloud adoption are shaped by the current economic crisis and they are often driven by cost-saving reasons.

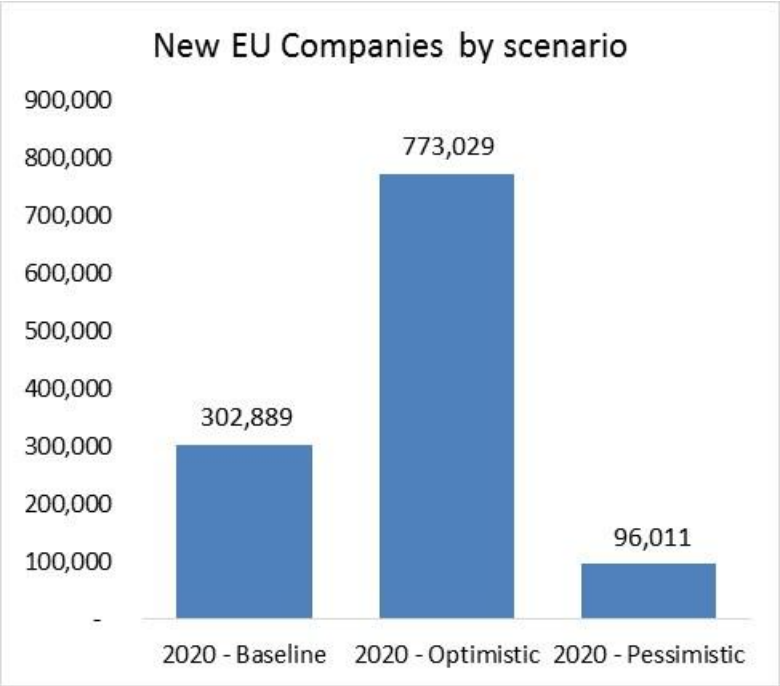
The forecasts presented in the 2012 study cannot be directly compared with those presented in this study, given the different scope (as the 2012 study excluded Private Cloud and Croatia) and the different scenario assumptions (2 scenarios based on policy intervention, versus 3 scenarios based on economic growth assumptions). However, the potential impacts by 2020 have been reduced from the 2012 scenarios to the current ones, because of the worse performance of the EU economy in the last 2 years. IDC has significantly lowered its forecasts for IT spend across the region compared to two years ago. More important, the expectations on the level of impacts on jobs and GDP have been revised downwards, given the greater caution and slower investments by economic actors in the current socio-economic context.

FIGURE 1 POTENTIAL CLOUD IMPACT ON EU GDP BY SCENARIO



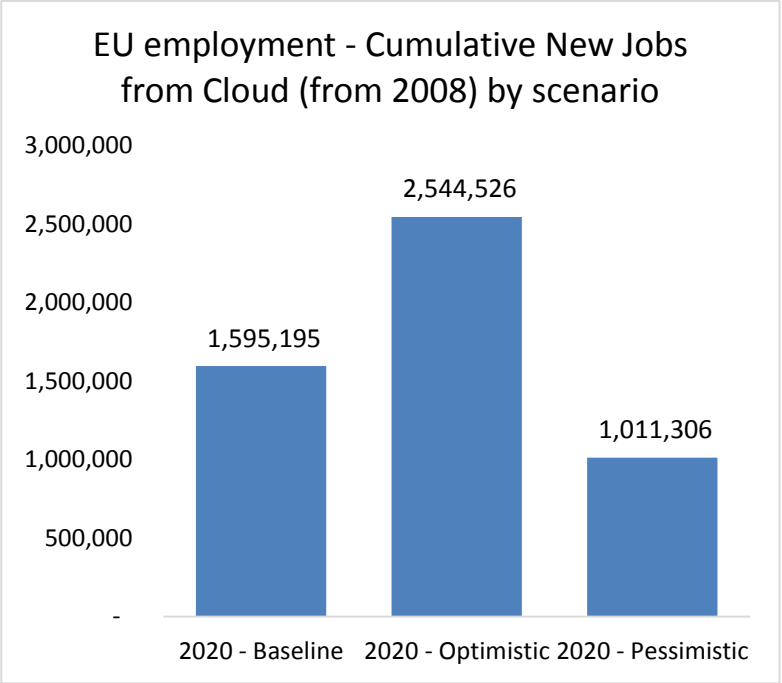
Source: IDC 2014

FIGURE 2 POTENTIAL CLOUD IMPACT ON THE CREATION OF NEW COMPANIES IN THE EU



Source: IDC 2014

FIGURE 3 POTENTIAL CLOUD IMPACT ON EMPLOYMENT BY SCENARIO



Source: IDC 2014

Conclusions on Economic impacts

In conclusion it is clear there is a considerable willingness for European businesses to incorporate Cloud computing into their IT estate and the market is by no means anywhere near approaching saturation.

It is also clear that the adoption of Cloud Computing, even allowing for the outcome to more closely follow the pessimistic scenario, will create incremental wealth and employment in the economy. If the outcome is more aligned with the Optimistic scenario then the results are quite significant

According to the baseline scenario considered most likely by IDC, in the period from 2015 to 2020 cloud computing could add a cumulative total of €449bn to the EU28 GDP, of which €103bn of net new GPD for the year 2020 (Figure 1), and approximately 303,000 new companies. The cumulative impact on employment is expected to reach 1.6 million for the years from 2008 to 2020 (Figure 3).

However, if low growth continues in Europe (pessimistic scenario), this may decrease to a cumulative total of €355bn contribution to GDP in the same period, with only €65.4bn of net new GDP in 2020 (Figure 1). The corresponding impact of employment would be around 1 million new jobs "only".

On the other hand, better economic conditions and faster cloud adoption could push the cumulative contribution to GDP to €585bn, with a peak of €164.7bn added in 2020. The addition of new jobs could grow up to 2.5 million, always for the period 2008 to 2020, with a sharper increase in the period 2016-2020. The considerable variation between these forecasts reflects the high uncertainty about economic perspectives in Europe, but shows

also the potential for policy action to promote the most favourable scenario by removing barriers and stimulating adoption, particularly by European SMEs.

Excluding the impact of the public sector adoption of Cloud Computing, then we estimate that in the period from 2015 to 2020, Cloud Computing will add somewhere between €340bn (pessimistic scenario) and €563bn (optimistic scenario) in terms of GDP growth and a cumulative total of between 373,000 and 1.8 million new jobs across the EU28 economies.

Currently US based companies have a strong presence in the supply of Cloud services, especially Public Cloud, to the European market and it is unlikely that this can be overcome within a normal free market environment. European headquartered IT businesses need to leverage their local knowledge and close proximity to the customer, plus the existing relationships with their customers, in order to differentiate themselves by providing a different value-added proposition.

Whilst from a fiscal perspective it is clearly highly desirable that the businesses delivering goods and services to customers in the EU are themselves headquartered in the EU and pay taxes within the EU, many of the non-EU headquartered (often US) businesses are making significant investments in building out Cloud infrastructure and delivery capability within the EU, partly driven by the market demands for local data residency when dealing with Public and Hosted Private Cloud solutions. This investment is itself adding value to the EU economy and also driving increased levels of employment.

1. INTRODUCTION

1.1. Introduction

This is the Final Report of the study "*Uptake of Cloud in Europe. Follow-up of IDC Study on Quantitative estimates of the demand for Cloud Computing in Europe and the likely barriers to take-up*" entrusted by the European Commission, DG Connect, to IDC. This Final Report takes into account the focus and structure agreed at the kick-off meeting on January 15th 2014 and builds on the Interim Report published in June 2014.

The key change between the Interim Report and this Final Report is the inclusion of the estimates of the impact to the European Union GDP and labour market as a result of businesses adopting Cloud based solutions to fulfil their technology needs. These estimates have been made using IDC's Economic Impact Model, adapted to reflect the specific requirements (Geographic, vertical market and Cloud Services) of the European Commission.

This report revises the initial estimates of the market size and potential demand for Cloud Computing in Europe and the assessment of the competitiveness of the European Cloud Industry.

1.2. Structure of the Document

The report is structured as follows:

- The first chapter presents a summary of the key observations and conclusions from the work done to date.
- The second chapter (this chapter) provides an introduction to the goals and objectives of the Study.
- The third chapter looks at the level of adoption of Cloud Computing by businesses and public sector organizations across Europe.
- The fourth chapter explores the total level of spending on Cloud Computing in Europe and how that spending is expected to change in the period up to 2020. This chapter also explores the economic impact that is expected to result from the predicted adoption of Cloud computing by EU based businesses.
- The fifth chapter assess how competitive the European Cloud Industry is with particular reference to the Cloud Service providers who are headquartered in the region.
- The sixth chapter looks at the changes between this report and the previous report undertaken by IDC for the Commission and published in 2012
- The seventh, and final, chapter discusses the conclusions from the study and identifies areas the EU may wish to address via policies and other forms of intervention to maximise the impact of Cloud adoption on the EU economy.

1.3. Main Goals and Objectives of the Study

The objective of this study is to undertake a comprehensive economic analysis and provide quantitative estimates of the impact of cloud computing on the EU economy. This study is a follow up of the study "*Quantitative estimates of the demand for Cloud Computing in Europe and the likely barriers to take-up*" (SMART 2011/0045), carried out for the Commission by IDC in 2011-2012.

This study will generate economic analysis and data covering the whole range of direct and indirect impacts caused by the diffusion of cloud computing in Europe. This study aims at:

- **Sizing and forecasting the level of adoption of cloud services in the EU**, for the years 2013,2015 and 2020, segmented by industry sector and company size, and by intensity of adoption (numbers of solutions adopted);
- **Sizing and forecasting the total expenditure on cloud computing in the EU,** in absolute terms, relative to overall IT spending, and in substitution of other IT spending, for the period 2013-2020, segmented by industry and company size;
- **Estimating the overall value and growth dynamics of the EU cloud market**, by type of cloud services (IaaS, PaaS, SaaS), for the period 2013-2020;
- **Assessing the macroeconomic impacts of cloud computing** (on GDP, jobs, business creation and productivity). This will be done by updating the model designed by IDC for the previous study, including updating the 2 alternative scenarios for the period 2016-2020 (higher and lower growth of cloud computing) linked with the main cloud policy strategies;
- **Collecting fresh evidence about productivity and cloud benefits in general** through a small CAWI survey with a sample of approximately 60-90 businesses already using clouds in the 5 larger MS of the EU. This will help to assess the productivity benefits;
- **Assessing the competitiveness of EU-headquartered cloud providers in Europe and the world**, estimating their aggregated market share in the EU, providing a description of the competitive scenario, identifying the 15 top cloud providers, comparing their positioning with that of other international competitors.

2. THE LEVEL OF ADOPTION OF CLOUD SERVICES

2.1. Overview

Using the results from a survey conducted by IDC, on behalf of the EC, this section examines the adoption of cloud services amongst enterprises. The survey was undertaken in-house by IDC, with completed interviews from a total of 1651 companies with 10 or more employees, across a wide range of industries in France, German, Italy, Spain and the UK, being interviewed during October 2013.

From IDC's previous work with the EU, and other research it has undertaken, IDC already knows that the adoption of cloud services is widespread in Europe. User organizations large and small, and from all vertical markets, use cloud services to fulfil their business needs on a daily basis. This report therefore brings up to date the insight into the levels of adoption for cloud services and examines it in more detail.

It is important to consider that cloud usage is often under-reported by user organizations. To give a simple example, many respondents fail to realise that web collaboration is a cloud service unless it is pointed out to them. Moreover, cloud solutions are still being adopted departmentally without consultation or involvement of IT departments. An example where usage is growing rapidly at the moment is file sharing, which may or may not be endorsed by corporate IT departments.

As a result, IDC believes that users' statements of cloud adoption rates are very often under-statements of actual usage.

In this report IDC is providing two perspectives on the cloud adoption based on the survey data:

- Enterprise view – the data analysed by number of companies only. A response from a large enterprise carries equally weight to a response from an SMEs;
- Employee count – weightings are added to the responses so that large organizations responses carry more weight than SMEs. As a result, this gives a view of the data that aligns with the extent of usage of cloud amongst the working population.

Selected results from the survey using the two views are presented below.

2.2. Cloud adoption by industry

Table 1 shows the adoption of different cloud services by industry and this is important to consider as different business types have very different IT requirements and thus follows their willingness and ability to adopt cloud based solutions differs.

TABLE 1 % OF COMPANIES ADOPTING AT LEAST ONE CLOUD SOLUTION BY INDUSTRY SECTOR REPORTED IN 2013 AND EXPECTED IN 2015

	At least one Public Cloud including office/ collaborative		At least one Public Cloud excluding office/ collaborative		At least one Private Cloud Service	
	2013	**2015**	**2013**	**2015**	**2013**	**2015**
Finance	69.1%	76.4%	69.1%	76.4%	32.7%	43.8%
Manufacturing	55.0%	65.3%	54.5%	65.3%	20.3%	44.2%
Healthcare/Education	54.4%	65.7%	52.8%	64.2%	32.1%	49.2%
Distribution	68.8%	74.3%	68.8%	74.3%	20.3%	45.4%
Telecom/Media	71.2%	80.3%	70.8%	80.3%	31.1%	45.3%
Other Services	66.3%	75.9%	66.1%	75.9%	25.4%	52.2%
Total Business sector	***63.3%***	***72.4%***	***62.8%***	***72.2%***	***26.0%***	***47.7%***
Government	53.0%	60.0%	52.7%	59.2%	27.7%	49.6%
Total EU	**61.5%**	**70.3%**	**61.0%**	**69.9%**	**26.3%**	**48.0%**

Source: IDC Vertical Markets Survey 2013, n= 1651

At an industry level the above table shows the high level of experience that business in all sectors have with regard to utilising Public Cloud somewhere within their business and thus the limited levels of growth in this area through to 2015. One could interpret this along the lines of "those that will have already done so and those that have not are increasingly less likely to". Clearly there is still some growth to be expected and that growth will continue going forward it is just that that the rate of growth is falling off.

Telecommunications/Media and Financial Services are the discrete segments where the highest penetration of Public Cloud services are expected by 2015 and of course what this data does not consider is whether there is a single Public Cloud instance in the organisation or many. From a future adoption of Public Cloud solutions perspective what is clear from this data is that across all sectors there is a high degree of existing experience and thus, providing the solutions offer are relevant to the business being targeted, it is to be expected there will be a willingness to at least consider adoption of further solutions into the business.

For the purposes of Tables 1-5, Cloud based office/collaborative applications would include usage of on-line productivity tools such as Office 365 and Google Apps as well as web conferencing apps such as WebEx.

When it comes to Private Cloud, current levels of penetration are relatively modest but IDC is expecting significant growth in the adoption of Private Cloud solutions by the end of 2015 such that the overall levels of adoption will jump from slightly over 25% to just under 50% in two years. There is therefore considerable opportunity for suppliers of Private Cloud solutions. The one sector that will show slightly lower levels of growth here is the Finance sector and that can possibly be attributed to the high degree of penetration of

traditional outsourcing in this sector limiting the short term demand for Private Cloud solutions. As discussed later in this report this is important for EU based suppliers of Private Cloud services as there is clear evidence to show that organisations are more likely to purchase Private Cloud solutions from a locally based supplier than one from another country or region.

TABLE 2 % OF COMPANIES ADOPTING AT LEAST ONE CLOUD SOLUTION BY COMPANY SIZE IN 2013 AND EXPECTED IN 2015 BY EMPLOYEE COUNT

Business sector	At least one Public Cloud including office/ collaborative		At least one Public Cloud excluding office/ collaborative		At least one Private Cloud services	
	2013	**2015**	**2013**	**2015**	**2013**	**2015**
<250	48.3%	63.7%	48.0%	63.4%	22.2%	45.4%
250+	70.4%	76.6%	69.9%	76.4%	27.9%	48.7%
Total Business sector	***63.3%***	***72.4%***	***62.8%***	***72.2%***	***26.0%***	***47.7%***
Overall EU including public sector						
<250	48.7%	62.8%	48.5%	62.5%	23.6%	45.8%
250+	67.0%	73.5%	66.5%	73.1%	27.5%	49.0%
Total EU	**61.5%**	**70.3%**	**61.0%**	**69.9%**	**26.3%**	**48.0%**

Source: IDC Vertical Markets Survey 2013, n= 1651

As the table above shows, cloud adoption is much higher in organizations with 250 or more employees, and this is expected to remain the case for the foreseeable future as IDC's overall observations of the market are that large organizations are ahead of smaller organizations in their adoption of cloud services.

This may seem to be a surprising result, but in IDC's view, large organizations in Europe are very open to adopting cloud services. Moreover, they generally have larger, more complex IT demands, and therefore use more of every sort of IT – including cloud services.

There are some exceptions in isolated results, and also for hosted Private Cloud, which is generally lower by employee count, as a result of greater adoption by SMEs than larger companies. The most consistent area where there is greater uptake in SMEs is hosted Private Cloud, where in almost every industry (and in particular in Finance) smaller organisations report much higher levels of adoption than in larger organizations. The probable explanation for this is that larger organizations are more capable of hosting their own Private Cloud themselves, but SMEs are more likely to turn to service providers for this service.

Larger organisations may also have embraced traditional outsourcing solutions and as such have a lower need for hosting at the current time. This may change as these traditional data centre outsourcing contracts come up for renewal and there is already evidence to

suggest that cloud based solutions are being seriously considered (and adopted) as an alternative to traditional outsourcing.

Table 3 shows the type of cloud deployments that companies have already adopted or plan to adopt.

TABLE 3 TYPE OF CLOUD DEPLOYMENT HAVE ADOPTED OR PLANNED

% by company/organization count in each industry	ERP	CRM	Content management	BI/ analytics	UC	Security	Storage	Database as a service	Office/ collaboration	Sync & Share	Other solution as a service	Private Cloud - internal	Private Cloud - hosted
Finance	24.0%	19.0%	5.1%	11.5%	25.2%	34.6%	21.1%	34.4%	29.1%	14.1%	17.0%	33.0%	39.5%
Manufacturing	8.5%	8.1%	3.8%	6.4%	15.0%	6.9%	11.8%	9.3%	14.1%	4.9%	7.4%	5.1%	11.1%
Healthcare/Education	19.6%	21.1%	10.0%	13.5%	13.8%	19.3%	14.5%	18.0%	11.8%	4.7%	11.8%	3.5%	25.9%
Distribution	16.5%	23.8%	9.5%	0.3%	11.6%	19.8%	17.7%	21.0%	20.9%	3.6%	8.8%	2.9%	18.7%
Telecom/Media	12.5%	18.5%	13.2%	6.6%	18.9%	18.5%	16.1%	18.1%	22.6%	4.6%	16.8%	7.4%	21.1%
Other Services	18.9%	18.1%	8.0%	8.9%	19.9%	18.0%	20.7%	17.7%	29.0%	4.1%	9.8%	7.0%	16.9%
Total Business sector	**14.7%**	**16.8%**	**7.3%**	**5.7%**	**15.1%**	**15.2%**	**16.2%**	**16.2%**	**20.0%**	**4.4%**	**9.0%**	**5.1%**	**16.6%**
Government	19.4%	20.6%	9.1%	12.3%	17.9%	19.9%	20.5%	16.2%	23.0%	7.7%	16.0%	11.5%	22.0%
Total EU	**14.8%**	**17.0%**	**7.3%**	**5.9%**	**15.2%**	**15.4%**	**16.4%**	**16.2%**	**20.1%**	**4.5%**	**9.3%**	**5.4%**	**16.8%**
% by number of employees using cloud in each industry	**ERP**	**CRM**	**Content management**	**BI/ analytics**	**UC**	**Security**	**Storage**	**Database as a service**	**Office/ collaboration**	**Sync & Share**	**Other solution as a service**	**Private Cloud - internal**	**Private Cloud - hosted**
Finance	32.5%	36.7%	19.1%	22.0%	17.2%	40.4%	34.5%	34.0%	24.8%	23.0%	19.2%	22.9%	19.6%
Manufacturing	27.2%	22.5%	16.5%	20.4%	17.0%	20.2%	22.0%	10.7%	19.5%	18.0%	13.5%	14.9%	12.8%
Healthcare/Education	25.1%	19.2%	18.9%	16.2%	17.0%	18.7%	20.1%	13.9%	15.9%	12.2%	13.3%	20.0%	20.1%
Distribution	34.6%	39.0%	25.4%	13.3%	16.9%	31.1%	33.6%	26.8%	20.2%	24.1%	22.2%	15.0%	13.8%
Telecom/Media	35.0%	39.0%	25.2%	20.6%	29.5%	39.2%	43.2%	33.3%	26.5%	22.7%	26.4%	21.1%	18.6%
Other Services	30.6%	28.9%	19.6%	15.9%	21.5%	29.4%	32.3%	22.7%	23.9%	18.4%	15.2%	17.5%	17.0%
Total Business sector	**30.3%**	**29.4%**	**20.4%**	**17.4%**	**19.7%**	**28.1%**	**29.9%**	**21.7%**	**21.5%**	**19.0%**	**17.2%**	**17.9%**	**16.6%**
Government	25.2%	25.0%	19.8%	18.2%	16.6%	23.7%	23.9%	13.2%	18.5%	18.1%	19.0%	20.3%	15.3%
Total EU	**29.4%**	**28.6%**	**20.3%**	**17.5%**	**19.2%**	**27.3%**	**28.8%**	**20.2%**	**20.9%**	**18.8%**	**17.6%**	**18.3%**	**16.4%**

Source: IDC Vertical Markets Survey 2013, n = 1651

In reading the numbers in Table 3 consideration should be made to the fact that they are almost certainly under-estimates of the true penetration of different cloud services. Not only do respondents tend to under-estimate their own cloud usage, but also respondents may not be aware of all the cloud services used by others in their organization.

These limitations aside, the table above strongly suggests that organizations in the Finance sector use the most cloud services, followed by Healthcare/Education, while Manufacturing uses the fewest in the commercial sector. Government is, however, lowest of all.

It should also be noted that the usage made of cloud by organisations within their businesses differs due to the nature of the business. A clear example of this is seen when comparing the usage of cloud for Content Management between the Financial and Telecommunications/Media sectors, with the later not surprisingly being much higher than the former.

Table 4 shows the average number of cloud-based solutions that user organizations have adopted by 2013 based on the survey results. Again, due to under-reporting, this is far more likely to be an underestimate than an overestimate.

TABLE 4 AVERAGE NUMBER OF SOLUTIONS ADOPTED IN THE CLOUD BY INDUSTRY SECTOR 2013 - TOTAL MARKET

	Average number of Public Cloud solutions including office/ collaborative	Average number of Public Cloud solutions excluding office/ collaborative	Average number of Private Cloud modes	Average number Public or Private Cloud
Finance	1.88	1.66	0.56	2.44
Manufacturing	0.83	0.73	0.16	0.99
Healthcare/Education	1.40	1.28	0.26	166
Distribution	1.26	1.11	0.25	1.51
Telecom/Media	1.41	1.25	0.32	1.73
Other Services	1.42	1.22	0.28	1.69
Total Business sector (Excluding Government)	***1.17***	***1.03***	***0.23***	***1.41***
Government	1.60	1.43	0.36	1.97
Total EU	**1.19**	**1.04**	**0.24**	**1.43**

Base: total of the market (including companies adopting and not adopting cloud). Averages are weighted by respondent numbers.

This table confirms that, including both public and Private Cloud, Finance is by far the biggest user of cloud, while Manufacturing is the lowest. Government is surprisingly the second highest user of public and Private Cloud services.

Ultimately, the most defensible conclusion on cloud adoption is that usage is widespread through all sectors of the economy led by the financial sector, but that there are very different levels of adoption in the remainder of the EU commercial and government markets.

Looking forward to 2015 (Table 5) we anticipate a somewhat different picture with the number of cloud solutions per organisation rising significantly.

TABLE 5 AVERAGE NUMBER OF SOLUTIONS ADOPTED IN THE CLOUD BY INDUSTRY SECTOR BY YEAR-END 2015 - TOTAL MARKET

	Average number of Public Cloud solutions including office/ collaborative	Average number of Public Cloud solutions excluding office/ collaborative	Average number of Private Cloud modes	Average number Public or Private Cloud
Finance	3.52	3.15	0.84	4.36
Manufacturing	2.34	2.05	0.46	2.80
Healthcare/Education	3.75	3.34	0.79	4.54
Distribution	2.99	2.64	0.68	3.67
Telecom/Media	3.34	3.02	0.71	4.06
Other Services	3.35	2.98	0.69	4.05
Total Business sector (Excluding Government)	***2.93***	***2.59***	***0.62***	***3.55***
Government	3.27	2.90	0.75	4.02
Total EU	**2.94**	**2.60**	**0.62**	**3.57**

Base: total of the market (including companies adopting and not adopting cloud). Averages are weighted by respondent numbers.

3. TOTAL EXPENDITURE ON CLOUD COMPUTING IN THE EU

3.1. Sizing and forecasting cloud spending

The sizing and forecasting of cloud spending in Europe detailed in this report is based on the extrapolation of IDC's existing published market data. This new forecast, extended to 2020 (IDC's published data only forecasts for a 5 year period), has been derived as follows:

- IDC's existing published forecast for Western Europe with the non-EU countries removed
- Added in IDC's forecast for the EU member states in Eastern Europe.
- The model is based on IDC's projections for different country market sizes, both in relation to each other and from local input by in-country IDC analyst teams. IDC will further calibrate the model according to the market sizing above and adjust growth rates according to any new knowledge from the user interviews in the study, any new market knowledge from the study or from other sources.

IDC's cloud forecast takes into account a very large range of factors, including survey work with user organizations, financial reports, briefings, and other information provided by vendors, and general market and economic data, including:

- Reported and observed trends and events in 2012 and 2013 and their predicted impact on each cloud services market for the five-year period
- Analyst predictions of future segment-specific developments, including the anticipated impacts of customer behaviour, supplier actions, market competition, and relevant changes in the regulatory environment (These predictions are based on demand- and supply-side research conducted by IDC analysts on an ongoing basis in the form of interviews, surveys, case studies, and analysis of company and market data.)
- IDC's worldwide forecasting process, which gathers and reconciles input from analysts in IDC's expertise centres in Europe.

3.2. Estimate of the overall value of the EU cloud market

Table 6 shows the estimate of the cloud services markets in the EU for 2013 and 2015, and the baseline forecast of the EU cloud services market. This baseline forecast is effectively the one that concurs with existing published data from IDC extended to 2020 and is regarded as the most probable outcome for the industry based on expectations of how the market will develop over the forecast period.

This report uses the completely revised market model for Public Cloud services, which is based on IDC's cloud tracker and was published by IDC in June 2014. IDC has undertaken a worldwide project to build an unprecedentedly large database of vendor revenue and markets. But as a result of introducing the cloud tracker, the Public Cloud market data has been radically revised. The overall Public Cloud services market is smaller than previously forecast, but it will continue to grow more strongly in Western Europe, from a market size of $8.6 billion in 2013 to $29.6 billion in 2018. Based on the analysis in this forecast, IDC concludes the following:

- The market for software-as-a-service (SaaS) applications was around the same size as our previous forecast in 2013, but it is set to enjoy higher growth, with country markets growing between the high 20s or low 30s percent CAGRs.

- Other Public Cloud markets including SaaS infrastructure, infrastructure-as-a-service (IaaS) servers, and IaaS storage are significantly smaller than we previously believed. Platform as a service (PaaS) is approximately the same size. The main reason behind the smaller market size is that our former estimates of these markets were too high. Except for SaaS infrastructure, these markets are growing at least as strongly as SaaS applications.

TABLE 6 THE OVERALL VALUE OF THE EU CLOUD MARKET - BASELINE FORECAST

Data in € M	2013 Spend	2015 Spend	*cagr 13-15*	2020 Spend	*cagr 15-20*
SaaS	5,061	8,477	*29.4%*	23,416	*22.5%*
PaaS	770	1363	*33.0%*	4,855	*28.9%*
IaaS	868	1476	*30.4%*	4,487	*24.9%*
Total Public	**6,699**	**11,317**	***30.0%***	**32,758**	***23.7%***
Private Cloud - IaaS only	2,847	5,902	*44.0%*	12,067	*15.4%*
Total Cloud	**9,546**	**17,218**	***34.3%***	**44,825**	***21.1%***
Total IT Spend	**363,120**	**381,285**		**414,189**	
Cloud Spend as % of IT Spend	**2.6%**	**4.5%**		**10.8%**	

Source: IDC 2014

In addition, IDC has developed "optimistic" and "pessimistic" forecasts for the period to 2020, as shown in the tables below. The differences between the baseline optimistic and pessimistic scenarios are as follows:

- In the optimistic scenario, there is proportionally more adoption of SaaS applications compared to the baseline, due to more SMEs adopting cloud and potentially more cloud adoption into core processes of all user organizations; the converse (less SME adoption) is used for the pessimistic forecast.
- SaaS system infrastructure (security, storage, etc.) is seen to grow more strongly in the optimistic forecast than is the case in the baseline, but the increase is less than the change for SaaS applications, as SaaS infrastructure services already grow comparatively quickly in the baseline. Though they do grow a little more in the optimistic scenario than the pessimistic, proportionally SaaS applications add more growth than system infrastructure SaaS in the optimistic scenario, as issues like security and storage are not as core to business processes. The same applies to IaaS.
- However, in the optimistic scenario, PaaS grow proportionally more due to more digital entrepreneurs adopting PaaS to launch new products and services. The converse is assumed in the pessimistic scenario.
- Private Clouds also increase proportionally less than public. One could potentially argue that if Public Cloud grows very fast there could even be a negative impact on Private Cloud.

TABLE 7 THE OVERALL VALUE OF THE EU CLOUD MARKET - OPTIMISTIC FORECAST

Data in € M	2013 Spend	2015 Spend	*cagr 13-15*	2020 Spend	*cagr 15-20*
SaaS	5,061	8,477	*29.4%*	32,869	*31.1%*
PaaS	770	1363	*33.0%*	6,434	*36.4%*
IaaS	868	1476	*30.4%*	5,701	*31.0%*
Total Public	**6,699**	**11,317**	***30.0%***	**45,003**	***31.8%***
Private Cloud -- IaaS only	2,847	5,902	*44.0%*	14,581	*19.8%*
Total Cloud	**9,546**	**17,218**	***34.3%***	**59,584**	***28.2%***
Total IT Spend	**363,120**	**381,285**		**414,189**	
Cloud Spend as %ge of IT Spend	**2.6%**	**4.5%**		**14.4%**	

Source IDC 2014

TABLE 8 THE OVERALL VALUE OF THE EU CLOUD MARKET - PESSIMISTIC FORECAST

Data in € M	2013 Spend	2015 Spend	*cagr 13-15*	2020 Spend	*cagr 15-20*
SaaS	5,061	8,477	*29.4%*	12,767	*8.5%*
PaaS	770	1363	*33.0%*	2,775	*15.3%*
IaaS	868	1476	*30.4%*	2,560	*11.6%*
Total Public	**6,699**	**11,317**	***30.0%***	**18,102**	***9.9%***
Private Cloud -- IaaS only	2,847	5,902	*44.0%*	10,315	*11.8%*
Total Cloud	**9,546**	**17,218**	***34.3%***	**28,418**	***10.5%***
Total IT Spend	**363,120**	**381,285**		**414,189**	
Cloud Spend as %ge of IT Spend	**2.6%**	**4.5%**		**6.9%**	

Source IDC 2014

The model calculates differences between the new baseline compared to the old baseline (for the total market) and adjusts the scenario (baseline is less optimistic; so scenario has to be less optimistic).

Note this scenario is an update of the one used in the previous delivery, so it is a policy scenario. The assumption is that in the optimistic scenario the barriers identified and investigated in the previous study lessen, as the EC cloud strategy becomes very successful.

IDC is a bit less optimistic, though, due to the fact that the actual growth was lower than it expected two years ago. Also, governments did not invest heavily in Public Cloud and some barriers on data location, security/privacy and legal jurisdiction will be difficult to overcome for certain applications and/or companies which show a reluctance to fully embrace cloud today.

3.2.1 SaaS spending scenarios by industry and size of organization

Below are the SaaS spending scenarios for baseline, optimistic and pessimistic by industry and size segment.

TABLE 9 BASELINE FOR SAAS BY INDUSTRY AND SIZE SEGMENT

SaaS	**2013**	**2015**	***cagr 13-15***	**2020**	***cagr 15-20***
Manufacturing and primary	1,437	2,520	*32.4%*	7,647	*24.9%*
Distribution	645	1,004	*24.8%*	2,377	*18.8%*
Telecommunications & media	383	645	*29.8%*	1,745	*22.0%*
Finance	1,056	1,835	*31.8%*	5,249	*23.4%*
Healthcare/Education	179	235	*14.7%*	417	*12.1%*
Other services	1,125	1,923	*30.7%*	5,430	*23.1%*
Total Business sector	**4,825**	**8,163**	***30.1%***	**22,865**	***22.9%***
Government	236	314	*15.4%*	552	*11.9%*
Total	**5,061**	**8,477**	***29.4%***	**23,416**	***22.5%***
SaaS	**2013**	**2015**	***cagr 13-15***	**2020**	***cagr 15-20***
<250	1,234	2,072	*29.6%*	6,031	*23.8%*
250+	3,591	6,091	*30.2%*	16,834	*22.5%*
Government	236	314	*15.4%*	552	*11.9%*
Total	**5,061**	**8,477**	***29.4%***	**23,416**	***22.5%***

Source IDC 2014

TABLE 10 OPTIMISTIC FORECAST FOR SAAS BY INDUSTRY AND SIZE SEGMENT

Total cloud (public + private)	**2013**	**2015**	***cagr 13-15***	**2020**	***cagr 15-20***
Manufacturing and primary	2,465	4,611	*36.8%*	26,509	*37.0%*
Distribution	1,043	1,795	*31.2%*	6,108	*27.7%*
Telecommunications & media	666	1,160	*31.9%*	3,683	*26.0%*
Finance	2,115	3,836	*34.7%*	11,706	*25.0%*
Healthcare/Education	457	755	*28.6%*	1,195	*23.8%*
Other services	2,147	4,000	*36.5%*	15,189	*30.6%*
Total Business sector	**8,893**	**16,156**	***34.8%***	**56,720**	***28.6%***
Government	653	1,062	*27.5%*	2,864	*22.0%*
Total	**9,546**	**17,218**	***34.3%***	**59,584**	***28.25***
Total cloud (public + private)	**2013**	**2015**	***cagr 13-15***	**2020**	***cagr 15-20***
<250	1,900	3,176	*29.3%*	13,438	*33.4%*
250+	6,993	12,980	*36.2%*	43,283	*27.2%*
Government	653	1,062	*27.5%*	2,864	*22.0%*
Total	**9,546**	**17,218**	***34.3%***	**59,584**	***28.25***

Source IDC 2014

TABLE 11 PESSIMISTIC FORECAST FOR SAAS BY INDUSTRY AND SIZE SEGMENT

Total cloud (public + private)	**2013**	**2015**	***cagr 13-15***	**2020**	***cagr 15-20***
Manufacturing and primary	2,465	4,611	*36.8%*	7,331	*9.7%*
Distribution	1,043	1,795	*31.2%*	2,876	*9.9%*
Telecommunications & media	666	1,160	*31.9%*	1,977	*11.3%*
Finance	2,115	3,836	*34.7%*	6,707	*11.8%*
Healthcare/Education	457	755	*28.6%*	1,072	*7.3%*
Other services	2,147	4,000	*36.5%*	6,897	*11.5%*
Total Business sector	**8,893**	**16,156**	***34.8%***	**26,860**	***10.7%***
Government	653	1,062	*27.5%*	1,558	*8.0%*
Total	**9,546**	**17,218**	***34.3%***	**28,418**	***10.5%***
Total cloud (public + private)	**2013**	**2015**	***cagr 13-15***	**2020**	***cagr 15-20***
<250	1,900	3,176	*29.3%*	5,051	*9.7%*
250+	6,993	12,980	*36.2%*	21,809	*10.9%*
Government	653	1,062	*27.5%*	1,558	*8.0%*
Total	**9,546**	**17,218**	***34.3%***	**28,418**	***10.5%***

Source IDC 2014

3.3.Measuring cloud spending versus total IT spending

IDC has estimated the proportion of cloud as a fraction of total IT spend for Western European EU countries.

Total IT spend includes:

- Hardware: Disk Systems, Hardcopy peripherals, High-end servers, Midrange servers, Volume servers, Networking, PC monitors, Personal Computers, Smartphones, Tablets & eReaders, Tape;
- IT services: Implementation, Maintenance and support, Operations, Planning, Training and education;
- Packaged Software: Appl. development and deployment, Applications, System infrastructure software.

The overall trend is that cloud is growing from 1.1% of overall IT spend in 2010 to 10.8% of IT spend in 2020 in the EU (Table 6). However, there is considerable variation between member states both at the start and at the end of the period covered in this analysis:

- Ireland is forecast to have the largest proportion of IT delivered as cloud services for the entire span of the forecast. Ireland's economy is a natural home for cloud services, with a large number of SMEs in technology-using industries, easy adoption of cloud due to English being a national language. Another possible factor is that many cloud US companies have established datacenters in Ireland.
- Of the major IT economies of the EU, the UK has seen the most aggressive rates of adoption of Cloud services. This follows a similar pattern seen with IT Outsourcing in the 1990s, with a strong willingness by UK based companies to utilise third parties for provision of core business services, a closer link to the US style of economy and business culture and the high presence of subsidiaries of US owned companies.
- By contrast France and Germany have shown much lower levels of penetration and in Germany in particular issues relating to data sovereignty have had a significant dampening effect on the adoption of Cloud, over and above the more cautious attitude to the use of third party providers in both countries due in part to the strong influence of the workforce at board level.
- At the other end of the scale, Italy has the lowest penetration of cloud services. There are many reasons for this, including business culture and language skills.

3.4. Substitution of other IT spending by cloud

Cloud displaces other spending on IT systems and services. For example, adoption of SaaS services removes the need to buy software (applications and infrastructure) and servers. In addition, possibly the largest spending item affected is the need for end user organizations to construct new datacenters, though some datacenters will be constructed by cloud services vendors, they are effectively shared and have higher utilization rates.

One of the main attractions of cloud services is that they save user organizations considerable amounts of money. However, this is not an area that is well documented. There are contrasting trends affecting this ratio, for example:

- Public Cloud spending has a negative impact on spending for enterprise servers and storage hardware, but not on client systems, smartphones or tablets. In addition, mobility and cloud computing are complementary and mutually reinforcing, so the increase in cloud spending tends to be accompanied by an increase in the diffusion of mobile devices.
- Growth in Public Cloud adoption increases spending by cloud service providers in storage, servers and networks, but reduces spend by their customers.
- Increasing use of SaaS applications reduces demand for small outsourcing projects (such as hosted services), while it has less of an impact on consulting.
- IT departments are notoriously bad at understanding how much they are actually spending on IT (products, services and staff) and as such gathering data on changes in spend proves very difficult.

IDC therefore proposes a simple model linking every € spent on cloud services to the software, hardware and reduces IT services spends that are displaced. Table 12 below presents IDC's simple model with initial "estimates" of the substitution effects.

TABLE 12 IDC MODEL OF CLOUD SPENDING ON IT SPENDING

	Software spend displaced per € in cloud	Hardware spend displaced per € on cloud	IT services spend displaced per € on cloud	Total displaced spend per € on cloud
SaaS	1	0.3	1	2.3
PaaS	1	0.3	0.5	1.8
IaaS	0	1.5	0.3	1.8

Source IDC 2014

The data in the table above shows that every €1 spent on SaaS is replacing €2.30 of expenditure for the organisation to deliver the same functionality via a traditional solution. Likewise for IaaS every €1 spent on this Cloud service is replacing €1.50 of spend on hardware and €0.30 spend on services associated with the hardware to deliver a similar level of computing capacity. We have considered the following when arriving at our estimates for the impact of spend that Cloud services substitute for compared to conventional IT:

- **SaaS** – this cloud service is a direct substitute for software applications and infrastructure software. The revenue model for SaaS is different to conventional software, but total cost of the SaaS service is approximately the same as the cost of the software it replaces, over the lifetime of the software of 5 to 10 years. The main economic effect is that SaaS does not require the customer to acquire servers or a datacenter and all the attendant costs.
- **PaaS** – this cloud service is a direct substitute for middleware software. The revenue model for PaaS is different to the revenue model for middleware software, but the economic costs of the service are software are approximately the same. Like SaaS, the main saving is in the systems required to support the middleware software. But also, the PaaS market will be less than the middleware market, as SaaS services have their middleware included in them.
- **IaaS** – this cloud service is a direct substitute for servers and storage. The economic model for IaaS is different from the conventional, users pay for what they consume, not for buying the hardware systems. They also do not need to buy new datacenters or expand existing datacenters.

3.5.Economic Impact Analysis

In considering the economic impact of any product or service it is necessary to not only consider both the revenues and profit created by the supply of the item but also the impact, in terms of revenue and profit, the use of the item has on the acquiring business.

As part of this study IDC undertook a limited number (100) interviews with enterprises across core EU member states to get their perspective on Cloud adoption and the impact it has had on their business. The primary purpose of this research was to help refine the model that estimates the economic impact on the adoption of Cloud, however the research findings themselves provide an interesting perspective on the impact of Cloud computing on businesses in the EU. It should be recognised when looking at the results that the data is not statistically valid with regard to the total population, it does however provide useful insight into the impact of Cloud computing on the user organisations. With this in mind we highlight some of the key findings from the research below.

3.5.1. Enterprise Cloud Impact Research

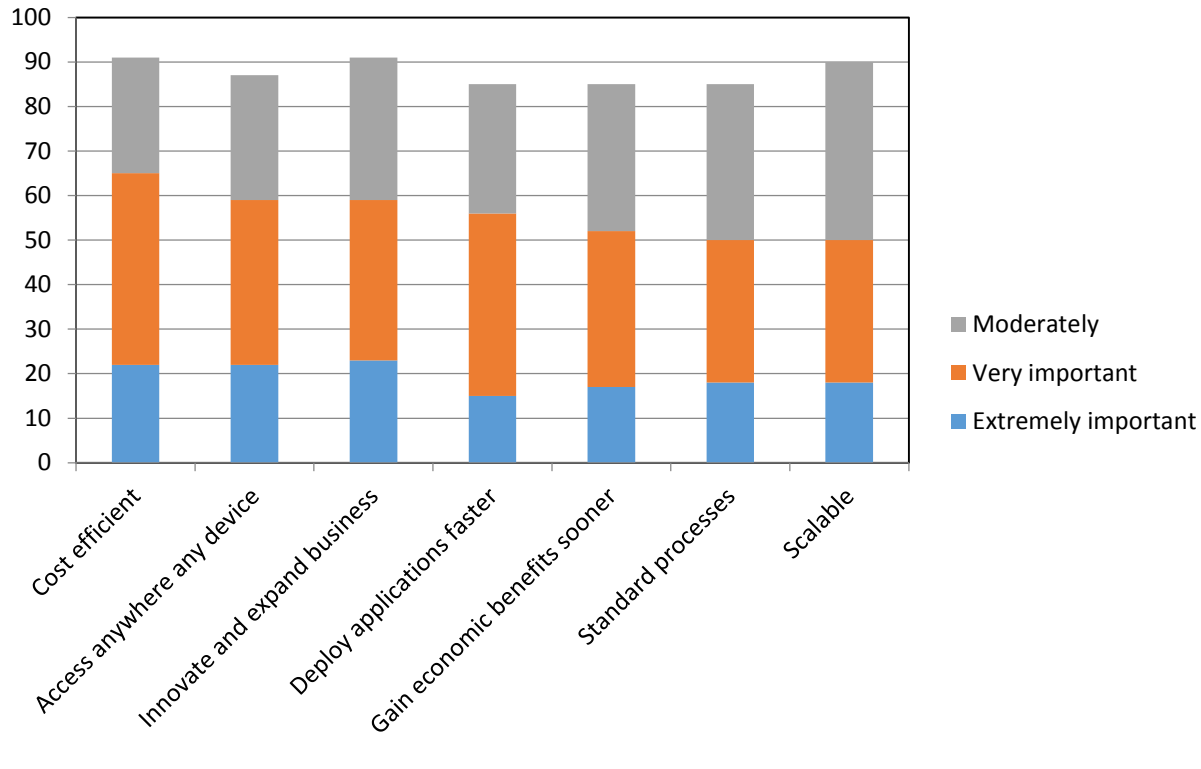
3.5.1.1. Importance of cloud benefits

We asked the respondents to rank a range of different potential cloud benefits according to how important they thought they were. The options we gave them were:

- Cost efficient
- Improves access from various devices and locations (access anywhere)
- Enables us to innovate and expand the business
- Helps to deploy applications faster
- Helps to delivering economic benefits sooner than traditional on-premises basis did
- Helps to establish standard processes
- Makes IT scalable

Figure 4 shows the results from the survey carried out for this report, ranked according to the sum of "extremely important" and "very important".

FIGURE 4 IMPORTANCE OF CLOUD BENEFITS



As the chart shows, cost efficiency is ranked highest by the respondents, but actually there is comparatively little variation in the results. What this shows, therefore, is that the respondents have a very wide range of business benefits that they hope to fulfil using cloud.

3.5.1.2. First usage of cloud

Table 13 shows the time that organizations who said they were cloud user first started using cloud:

TABLE 13 INITIAL USAGE OF CLOUD

	Country					Employee Size			TOTAL
	France	Germany	Italy	Poland	United Kingdom	2 to 99	100 to 249	250 or more	All Cases
Less than 1 year ago	0%	7%	8%	45%	22%	27%	13%	4%	16%
1 to 2 years ago	38%	43%	46%	36%	56%	40%	53%	46%	45%
3 to 5 years ago	46%	50%	31%	9%	22%	30%	20%	42%	32%
Over 5 years ago	15%	0%	15%	9%	0%	3%	13%	8%	7%
Total	N=13	N=14	N=13	N=11	N=18	N=30	N=15	N=24	N=69

While some organizations say they adopted cloud more than five years ago, they are a minority. In most cases, most organizations say they started using cloud either three to five years ago or one to two years ago.

However, we suspect that this may be an underestimate of how long they have used cloud, at least in some cases. In particular, a widely used type of cloud service is email filtering. Services of this type have been widely adopted, yet often users don't include them in cloud services. Similarly, users often use web conferencing without thinking of these services as cloud services, which they are.

3.5.1.3. Factors influencing cloud adoption

We asked respondents about a wide range of factors that might have influenced them in adopting cloud. The factors were:

- More visibility into location of the data
- Simpler access to their data centers for audits.
- More visibility into the data center technical and physical security policies (SIG)
- Proven total cost of ownership reduction within two years.
- Simplicity of deployments and upgrades.
- Guaranteed portability of data to and from competing, [SIG]
- Better pricing options (e.g. discounts for pre-booked capacity, discounts for bundles, no upfront fees, free trials, etc.) [SIG]
- Availability of services from a datacenter located in your country
- Availability of services from a datacenter in any country within the European Union.
- Cost that was 10% below (or lower) that of comparable providers

- A range of cloud services from a marketplace and our organization could switch between them freely, [SIG]
- Continuity of the service above the level offered by comparable providers
- Granular identity and access management that allowed to differentiate provisioning of the service by organizational unit/role, etc
- A dashboard to monitor performance and security of the service 24/7

The most striking outcome from this question was that all the factors received a very similar level of support. Specifically, adding up the "very influential" and "extremely influential" scores for each category led to total responses in the range of 53% to 47% with only one factor (granular identity management) outside this range at 41%.

There are some variations in the responses from countries, for example French and German respondents rated proven total cost of ownership reduction higher than other sets of respondents. Also German and Italian respondents rated having a datacenter in country higher than other respondents. However, the sample sizes are too small to draw any firm conclusions from these variations, thought the requirements for local datacenters is certainly a frequent requirement we hear in discussions with users from these two countries.

We also have a general observation that the largest organizations (with 250+ employees) seem to have more factors that they see as important. This is what we would expect in larger organizations with professional IT managers.

3.5.1.4. Cost savings seen from cloud adoption

We asked all respondents a specific question about cost savings from using cloud. 27% of the respondents overall said they had identified cost savings from adopting cloud. 59% of these said they had seen savings of between 5% and 19% of total IT costs, and 26% said they had savings of 30% or more. However, 15% said they had seen savings of 4% or less, or could not quantify the savings.

Of those who could quantify the savings, 50% said they had used them to fund other cloud based IT projects, 19% said had invested them in non-cloud IT projects, 19% said they had reduced IT spend and invested the funds elsewhere, while 12% said they have reduced their overall cost base.

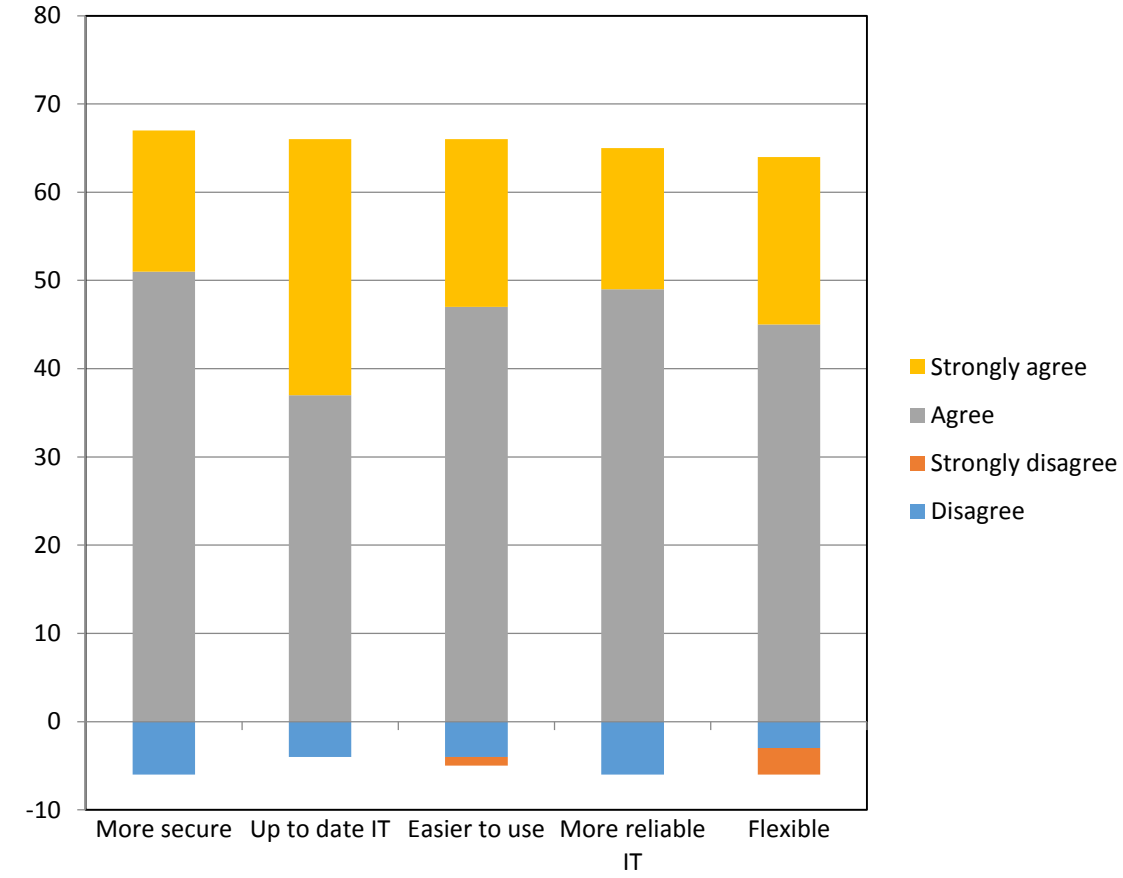
It may seem odd that only around a quarter of respondents have seen cost savings, because a strong theme in the cloud proposition of is that it saves cost. However, in many IT environments, cloud replaces only part of the functionality of on-premises systems, and as a result the main burden of cost from the other systems not replaced by cloud still has to be carried, for the time being at least. If and when companies using cloud downsize their datacenter estates, they will probably see significant cost savings.

3.5.1.5. Other IT benefits from cloud solutions

We also asked those respondents who had adopted cloud services whether they had seen a set of benefits beyond cost savings. Respondents were asked respond on a scale from "strongly agree" to "strongly disagree" that they have seen the specific benefits.

Figure 5 shows the results for the questions that related directly to IT considerations.

FIGURE 5 IT BENEFITS SEEN BY SURVEY RESPONDENTS (NEUTRAL RESPONSES EXCLUDED)



As the chart above shows, most respondents achieved some IT benefits from cloud computing. Perhaps surprisingly, the benefit seen most often is that it made their IT more secure (16% strongly agreeing and 57% agreeing), as cloud is often denigrated as being less secure than on-premises systems. However, our experience suggests this is not the case for many mid-sized and smaller businesses, as they lack the capacity to employ security specialists.

Cloud also is seen as more up to date than in-house IT (29% strongly agreeing, 37% agreeing), which is not surprising given that keeping standard IT up to date is a constant problem for internal IT departments with limited resources, whereas cloud vendors themselves keep their IT systems up to date.

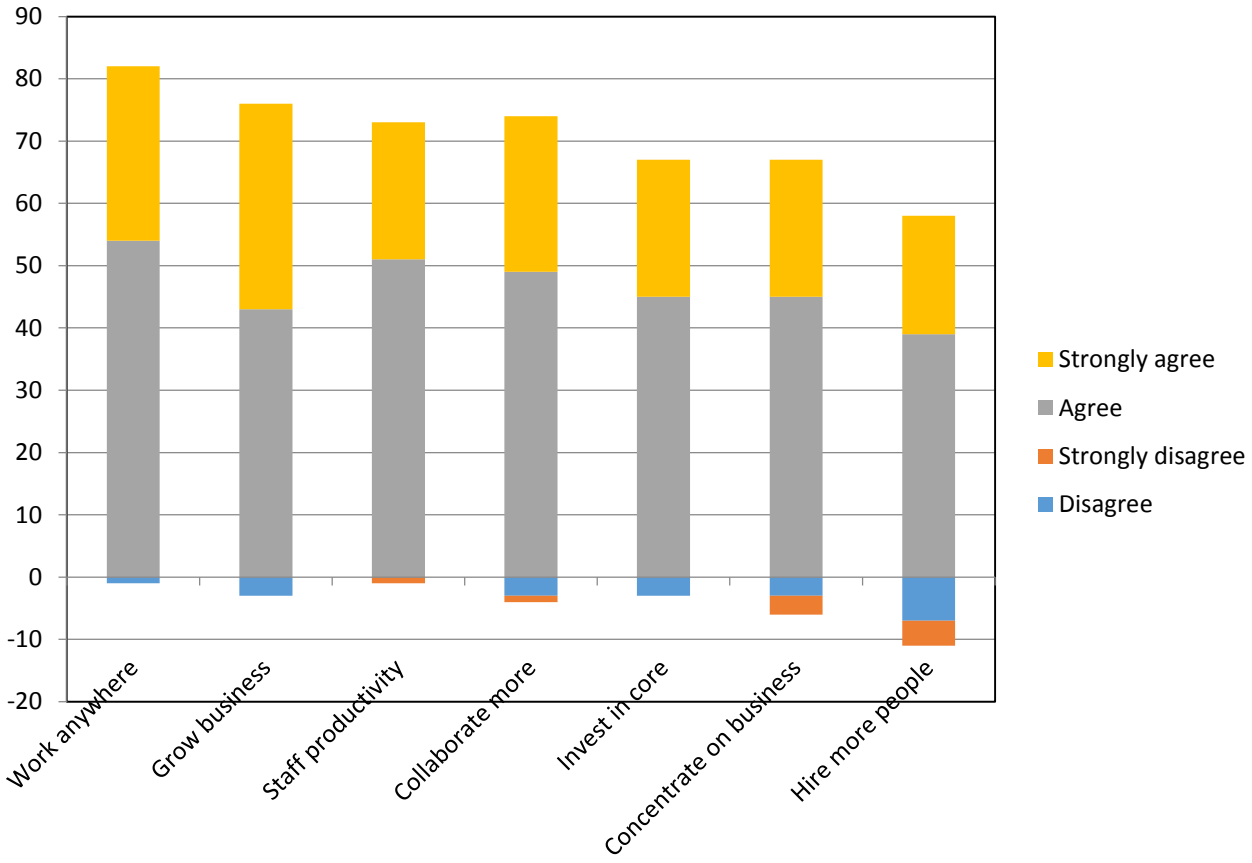
Cloud is also widely seen as easier to use (19% strongly agreeing, 47% agreeing), and is also seen as more reliable than standard IT (16% strongly agreeing, 49% agreeing). Most respondents also saw cloud as more flexible than standard IT (19% strongly agreeing, 45% agreeing) though there was a minority of respondents (3%) who strongly disagreed with this statement.

The key take-away from this is that IT departments that have historically seen cloud as more "flaky" than standard IT now seem to have become the minority in the EU.

3.5.1.6. Business benefits from cloud computing

We also asked respondents with cloud services in production about a range of potential business benefits, and the results are seen below in Figure 6. As above, we asked respondents to respond on a scale from "strongly agree" to "strongly disagree" whether they had seen the specific benefits.

FIGURE 6 BUSINESS BENEFITS SEEN BY CLOUD COMPUTING USERS.



Work anywhere (better mobile working):	38% of respondents overall said they had seen this benefit, including 50% in Germany and Italy, and 25% in Poland. 48% of respondents said they expected to see this benefit in the future. This is not an unexpected finding. In particular, the vast majority of cloud applications offer mobile access to their customers. For smaller organizations, building mobility capabilities internally can be challenging for enterprises to do themselves.
Increased productivity:	31% of respondents overall said they had seen this benefit, with country scores ranging from 40% in Italy and the UK to 15% in Poland. 53% of respondents said they expect to see this benefit in the future. Many organizations have adopted cloud as a way to replace out-of-date "legacy" systems, especially business applications that had poor and sometimes user-hostile user interfaces. It is not surprising that they are able to be more productive with the new service.

Increase in business volume:	26% of respondents overall said they had seen this benefit, with country scores ranging from 35% in the UK to 25% in Poland. 54% said they expected to see this benefit in future. Increasing business volume means that cloud customers are seeing better utilization of a range of resources, in particular but not exclusively in sales and production departments. This is potentially a very important business benefit, because European organizations are often hurt commercially by their relatively small size compared to US organizations. This suggests that greater usage of cloud can help to bridge the efficiency gap.
Decrease in overtime hours for the same production level:	24% of respondents overall said they had seen this benefit, including 35% in Germany, and a further 50% said they expected to see this benefit in the future. This is also a consequence of increasing employee efficiency, if they are more productive during the day, then less overtime will be required.
Increased adoption of standard front-office processes:	23% of respondents overall said they had seen this benefit, including 40% in Germany but only 10% in Poland. A future 51% said they anticipated this benefit. While providing a better UI is not an exclusive feature of cloud services, cloud services are often used to replace older systems with poorly designed user interfaces. Moreover "try before you buy" selection process will favour cloud services that that are highly usable.
Ability to enter new business areas or offer new services:	22% of respondents (including 35% in Germany) have seen this benefit, and 45% expect to see this benefit in the future. This benefit relates to the relative flexibility and the ability to bring online when needed, or conversely drop cloud services when not needed, compared to traditional IT. Not having to spend large amounts of capital, and having relatively flexible costs and services (within reason – in SaaS services, many customers commit to annual contracts in exchange for discounts).
Increase capital spending outside IT:	22% of respondents overall (including 35% in France) have seen this benefit, and a further 46% expect to see this benefit in future. One of the key financial appeals (for many, at least) of cloud services is that it switches capital spend away from the IT area and makes it available to other areas of the business. The corollary is that cloud becomes an operating expense, though there is a case for saying that adoption of cloud can reduce IT operating expenses.
Decrease fixed-term contracts for the same productivity level:	22% of respondents said they had seen this benefit, including 30% in Germany, and an additional 40% said they expected to see this benefit in the future. As with decreasing overtime hours and increased productivity, cloud is expected to save costs and make costs more predictable.

Able to enter new Geographic markets:	18% of respondents overall (including 25% in both France and Germany) have seen this benefit, and additional 50% of respondents expect to see this benefit. This is a corollary of the previous benefit, staff in a new location just need an internet connection to become productive.
Able to open offices in new locations:	17% of respondents overall have seen this benefit, including 20% in France, Italy, Poland and the UK. An additional 50% of respondents said they expect to see this benefit. Making it easier to open offices in new locations is potentially a strong benefit to entrepreneurial companies expanding rapidly. SaaS applications in particular are designed to work on public internet connection, and to adapt to the connection speed available.

3.5.1.7. Revenue, profit and productivity benefits

We asked respondents specifically about the effects on revenue, profit and productivity. Looking first at revenue, 79% of respondents agreed that adopting cloud had helped them grow their revenue. Table 14 shows how much these respondents said their revenue grew by.

TABLE 14 REVENUE GROWTH ATTRIBUTED TO CLOUD ADOPTION

Revenue growth attributed to cloud adoption	% of respondents
1 to 4%	15%
5% to 9%	36%
10% to 19%	23%
20% to 29%	15%
30% to 49%	8%
Don't know	4%

Source: IDC 2014

The data suggests that revenue growth was quite evenly spread between small, medium and large companies. It also appears that revenue growth was evenly spread between the countries. However, the sample size is too small to support any conclusions on the variations between countries.

Also all respondents, save a small minority, said that that cloud had helped them to become more profitable over the last 12 months, as shown in Table 15.

This result seems to be highly consistent between the different countries in the survey and between the company size classes.

TABLE 15 PROFIT GROWTH ATTRIBUTED TO CLOUD ADOPTION

Profit increase	% of respondents
1 to 4%	32%
5% to 9%	32%
10% to 19%	13%
20% to 29%	13%
30% to 49%	4%
50% or more	2%
Don't know	4%

Source: IDC 2014

3.5.1.8. Source of the benefits

While the respondents above were clear that they had seen economic benefits, the source of these benefits was much less clear. Table 16 shows the result when we asked each respondent to identify the one type of cloud service that had delivery the greatest economic benefit to them.

TABLE 16 RESPONDENTS VIEW ON WHICH CLOUD SERVICES GAVE THE BEST ECONOMIC RETURN

Cloud service type delivering greatest economic benefit	**% of respondents**
E-mail/calendar/diary	7
Content management	3
Customer Relationship Management (CRM)	14
Accounting/back-office	3
Personnel/HCM or Talent Management	6
Application platform as-a-service	4
Database management	9
Business intelligence/analytics	6
Application development and/or online testing	1
Security	9
System & network management	6
Storage on-line including back-up and/or disaster recovery	9
Infrastructure/compute power	7
Document sharing and management	13
Not applicable	3

Source: IDC 2014

What this shows is that respondents derive benefits from a wide range of services. Clearly CRM and document sharing are very widely used services, and CRM in particular directly influences revenue when used effectively. The conclusion from this analysis is that economic benefits are delivered by a very wide range of services.

3.5.1.9. Preferred source of cloud services

We asked the respondents who their preferred source of cloud services would be, all other factors being equal. Table 17 shows the results:

TABLE 17 PREFERRED CHOICE OF CLOUD SERVICES PROVIDER

Type of provider	% of respondents
Pure cloud providers headquartered outside of the European Union	16
Pure cloud providers headquartered in the European Union	15
IT service providers headquartered outside of the European Union	7
IT service providers headquartered in the European Union	11
Software providers headquartered outside of the European Union	10
Software providers headquartered in the European Union	16
Telecom services providers headquartered outside of the European Union	9
European telecom providers	9
Not applicable	7

Source: IDC 2014

This shows that there is no single preferred source. Rather respondents select the service and the preferred provider is whoever provides that service. Customers are buying cloud services for what they offer, not for the supplier. However, that is not to say that customers will buy cloud services from suppliers with a poor reputation, they will follow their normal commercial due diligence process. This conclusion is reinforced by Table 18 below:

TABLE 18 MAIN CHOICE FACTOR FOR CLOUD SERVICE PROVIDER

Factor	% of respondents
Geographic location of the equipment providing the services I will use	26%
The location of the supplier's headquarters	29%
Availability of local implementation partners	31%
Price	50%
Ratio quality/price of the services provided	60%
The supplier's reputation	47%
The service level agreement (SLA, or the uptime guarantee)	38%
Other/not applicable	3%

Source: IDC 2014

Clearly respondents consider multiple sources of information when selecting suppliers: the ratio between the quality of the service and the price, followed by price itself and the SLA are the three leading factors.

That said that the key factor is implicit – how well the service fulfils the user's business needs at a given price.

3.5.1.10. Summary

European organizations already use a wide range of cloud services and the consumption of cloud services is clearly going to increase in the future. While there are factors that customers would like to see in their cloud services providers, such as geographic location, in most cases the main criterion is how well the service meets the customers' business needs. In summary. European organizations most definitely see the business advantages of cloud, and they are highly pragmatic in their approach to adopting cloud.

3.5.2. Economic Impact of Cloud

Cloud computing is one of the most relevant innovations introduced in recent years by the IT industry and its adoption by the market has proven to be extremely pervasive. Pervasiveness of innovation usually drives important impacts on the economic system and its fundamentals. Identifying such impacts is relevant not only for the stakeholders of the industry but also for the users and the policy makers.

In this section of the report, we are going to explore the main impacts that cloud computing may have on the overall economy and to estimate the values of the impact in the forthcoming years.

The estimates of such impacts will be presented for the years 2016 and 2020. This is a medium term forecast; we should also consider that the long and uncertain recovery from the economic crisis makes forecasting more uncertain and difficult.

In order to determine such impacts, we will use the "scenarios methodology" approach. Following the approach adopted in the estimate of the cloud market, based on alternative adoption scenarios, we will estimate the impact of the cloud adoption on the economy within those three alternative scenarios.

With regard to the scenarios methodology: when the economic environment is very uncertain, and implementing forecasts remains an activity with very uncertain outcomes, the scenarios approach may be very helpful. A scenario is basically a story internally consistent and describes a plausible future. The adoption of cloud is linked with the general economic trends which is in turn extremely uncertain in the coming years. Because of this we decided to determine the estimates of the economic impact of cloud adoption with a scenario approach. There are different plausible trends which are all possible so that different impacts are in turn plausible. For this study we proposed three plausible scenarios: a baseline, a pessimistic and an optimistic one. These three scenarios are based on three different trends of the economy. The three scenarios are all built in order to be reasonable, credible and possible and they should be interpreted as providing a range of estimates, from the worst to the best one.

What are the possible direct impacts of cloud on macro-economy

With Cloud computing being a general purpose technology, its impacts on companies and on the economy are complex and include a wide range of effects (Etro 2008, 2009). The most important benefits of the cloud computing adoption can be grouped into different categories:

- **Direct costs savings:** Cloud computing directly reduces the costs per unit of outputs thanks to changes within the organization for example in the IT maintenance costs as well as external economies of scale based on large data centres housing the IT infrastructure;

- **Productivity improvements:** Productivity may increase because both Private and Public Cloud deployments may share pooled resources improving better workload balance for different applications. The transition to Cloud is also often accompanied by a refresh of the technology and, especially in the case of software, the use of the latest technology and applications can have a significant effect on the operational efficiency of the company;
- **Innovation:** Introducing the Cloud is an innovation which has multiple economic impacts. First of all, cost savings allow the reinvestment of the savings in other types of innovation and eventually in other IT investments. Besides, the cloud computing involves a number of organizational innovations within the companies, which may improve productivity, improve the work organization (including remote working) and its flexibility and also enable companies to open up new markets (and routes to market) for its products and services.

The above shows how companies and other organisations adopting such a technology can take advantage of the opportunities that arise from utilising IT services that are delivered on an on demand basis without incurring heavy up-front costs or the need to scale the operation to address peak load levels which only exist for a limited time.

Cost analysis shows that avoiding the need for capital investment is the main positive impact on the overall IT cost structure for a business. This, as we know, has a direct and immediate impact on savings and therefore on competitiveness, especially where SMEs are involved. Widespread adoption of this technology may therefore transfer significant advantages to the whole economic system through savings and reinvestments. Additionally, this may have a positive effect on the firm's ability to innovate by reducing the fixed costs of entry and production turning them into variable costs. Such an impact will be even more relevant in creating competitive advantage in industries where fixed ICT spending is significant. The savings will enable businesses to then adopt other ICT related innovations to support further productivity gains and make them more competitive. The adoption of ICT technologies such as cloud computing may considerably impact the competitive scenario and growth of some industries and therefore of the economy.

Key assumptions for the impact model

The impact model adopted for the impact assessment is based on the idea that cloud innovation decreases the fixed costs of production and delivery, as explained in the previous paragraph and this has a positive impact on productivity and competition. The savings can then be allocated to other areas of the business including new investments (IT or general business) and enabling business innovation. This means, besides making the business more competitive, it also increases the companies and industries productive activities and turnover and that in turn increases employment and the creation of new business.

The main key assumptions adopted for the assessment of the cloud impacts are the following.

General economic assumptions

The general economic assumptions take into account three possible scenarios, based on three different recovery paths from the economic crisis.

- We adopted the most recent macroeconomic forecasts of the European Commission, delivered in spring 2014 with forecasts for 2015 (European Economic Forecasts, Spring 2014).

- For the economic forecasts from 2016 to 2020 we have adopted three different scenarios: a baseline one, an optimistic one and pessimistic one.
- In the baseline scenario, after an economic crisis lasting longer than expected, with widespread investment shortfall, the indicators and the conditions for a sustained recovery in the medium term are improving.
- In the baseline scenario, we assume that the recovery will be relatively slow and in line with the recent historical data.
- Challenges and vulnerabilities in the European economy remain, so that in the pessimistic scenario, the recovery may be slower than in the baseline mainly because the investment and consumption recoveries are slower than expected, with very slow improvements in the labour market.
- An optimistic scenario is also possible and is mainly based on the idea that the EU Member States achieve the main structural reforms, which will accelerate the employment recovery, and therefore an improvement in the consumption trends.

Specific cloud assumptions

- Cloud adoption is a direct positive function of the IT spending which in turn is a direct positive function of GDP. . This means that the higher the IT spending, the higher the level of cloud adoption. The proportion of cloud as a fraction of IT spending varies between different countries, and also may vary depending on the general economic climate. With a positive growing economy the proportion of cloud may be higher than is seen in a slowing economy.
- Broadband availability is gradually evolving, although Internet connectivity is remaining an issue in less business-intensive geographical areas.
- The adoption path and the innovation process for Cloud in the public sector are similar to those seen in the private sector.
- Investment decisions and innovation decisions for cloud adoption are shaped by the current economic crisis and they are often driven by cost-saving reasons.
- During the past years, the European economy and especially the knowledge economy is not creating jobs as fast as in the past (The OECD Jobs Strategy, Technology, Productivity and Job Creation).

To analyse the impact of the cloud adoption, IDC assessed the impacts of such a technology on employment, on business creation and increased revenues, on employment and on GDP.

Productivity Impact

It had been hoped through the survey and other data to arrive at an estimate of the impact on productivity through the adoption of Cloud based computing in the enterprise. Unfortunately the data obtained via the research does not provide us with sufficient insight to state that the staff using a cloud based IT systems are x% more productive than those not. There are a number of reasons for this. Companies do not tend to measure staff productivity in this way and therefore cannot report accurate data when asked. For many the initial adoption of Cloud based applications is either too recent and/or it is a new application that is not replacing an existing one so measuring productivity gains is not practical. Finally for many staff they are largely unaware when the infrastructure has switched from traditional to being Cloud based, as should be the case. Such a switch in how the infrastructure is delivered is unlikely to have any significant impact on productivity – assuming it is a like for like swap - of individuals in the business, it does however change the cost base and that is where the bulk of improvements will arise. It may also in time allow new solutions to be deployed that mean fewer additional staff is required as the business grows.

Because of the lack of reliable and meaningful data from the research, it has not been possible to assess the impact on productivity and incorporate it into the model or report on it here.

Main impacts in the baseline scenario

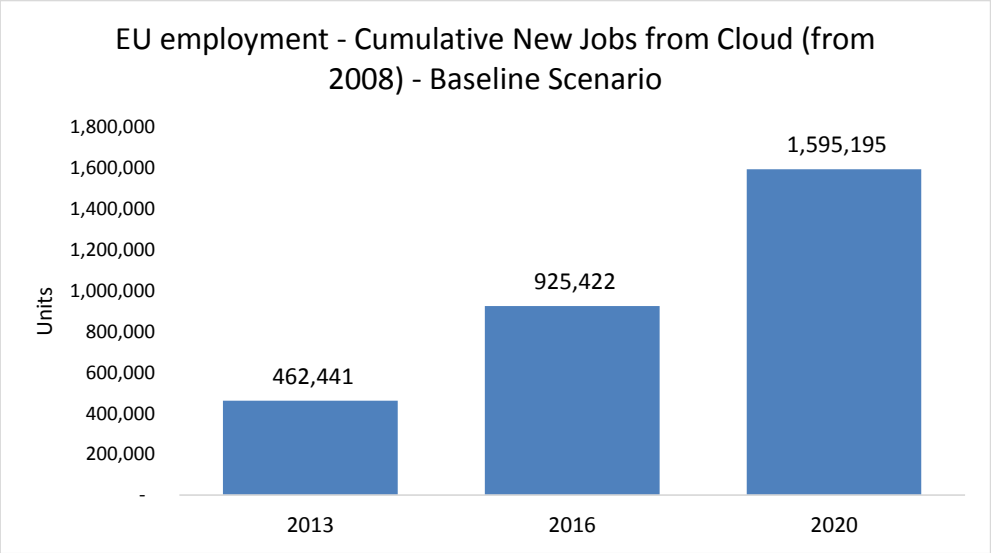
In the baseline scenario, the European economy started recovering in early 2014 and will achieve a growth of 2% in 2015 which will last throughout 2016. Because of short economic cycles, in 2017 GDP growth will very gradually start to slowdown. The trend until 2020 is based on the average trends of the years before the economic crisis. Based on such a trend, all industries will start investing again but with moderate growth rates. Investments in IT and especially in the cloud technology will be supported by saving reasons. As soon as GDP starts to grow, enterprises in all industries will start investments in order to obtain processing power at low cost and to decrease fixed costs. Investments will be moderate with conservative effects because the recovery of the European economy is only moderate. The reduction of costs and the consequent impact on innovation, as well as an improved competitiveness, will positively impact the creation of new businesses and employment.

The model used by IDC calculates the creation of jobs based on economic growth and innovation and the number of new jobs required to deliver that growth. The model does not take into account the jobs that would be lost or the workers displaced by cloud-related reorganization of business processes and/or associated productivity gain.

Based on IDC research and the model estimates, the adoption of Public Cloud and hosted Private Cloud generated in the period 2008 to 2013 an estimated total of 462,441 new jobs; this cumulative impact is forecast to grow to nearly 1.6 million new jobs by 2020, of which almost 1 million jobs will be created in the period 2015-2020 (Figure 7).

Although this is a conservative scenario, cloud represents a good opportunity within the EU, where job creation remains a major concern – considering that unemployment continues to have negative repercussions on the on the overall economic recovery. This is particularly true for the younger generations, the group most affected during the crisis in terms of employment. Young people are also those in which it will be more likely to find the skillsets needed to take full advantage of the cloud-enabled revolution that is taking place. This is already the case, as we hear of successful youngsters entering the digital marketplace with innovative products that are making breakthroughs in the market, while also witnessing growing demand among ICT players for young professionals to be employed in cloud-related jobs, and this will become even more evident in the medium term.

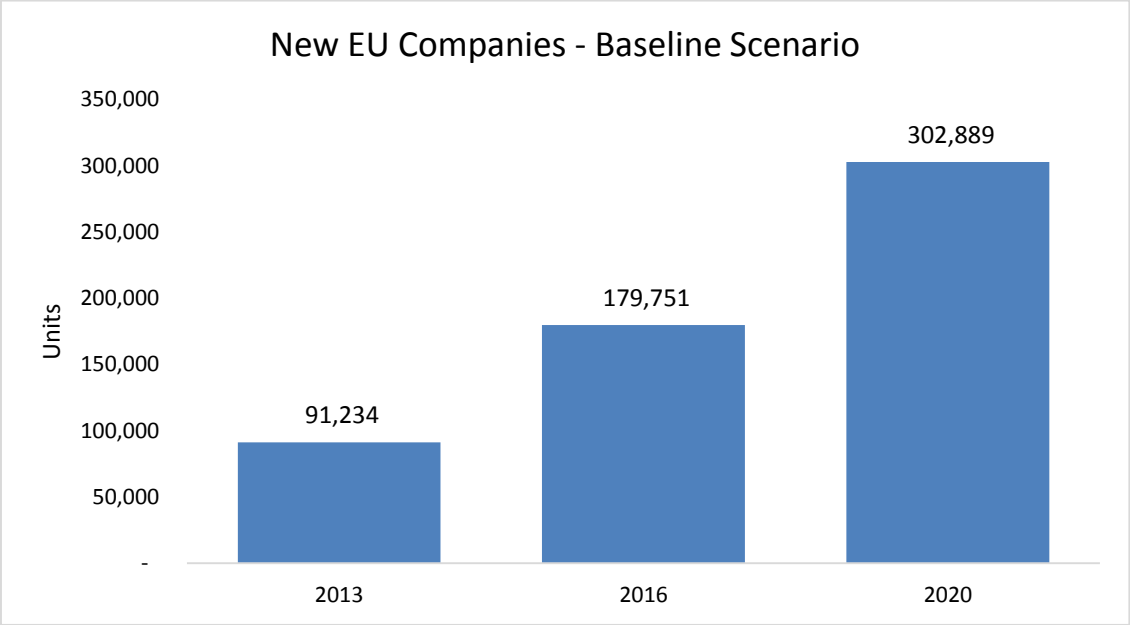
FIGURE 7 BASELINE SCENARIO – CUMULATIVE CLOUD IMPACTS ON JOBS CREATION



Source: IDC 2014

Beyond the positive effects on jobs and employment, the cloud is determining a wave of new business creation - particularly relevant in the SME market. Current estimates, under the baseline scenario, indicate that by 2016 the availability and adoption of cloud based computing will have resulted in the creation of approximately 180,000 new businesses and that this figure will grow to close to 303,000 by 2020 (Figure 8). These new businesses include both those created in order to deliver Cloud based services to the wider economy and also businesses whose creation has been possible because the use of Cloud based computing services has provided an affordable option for the business. It also accounts for business failures that will inevitably occur.

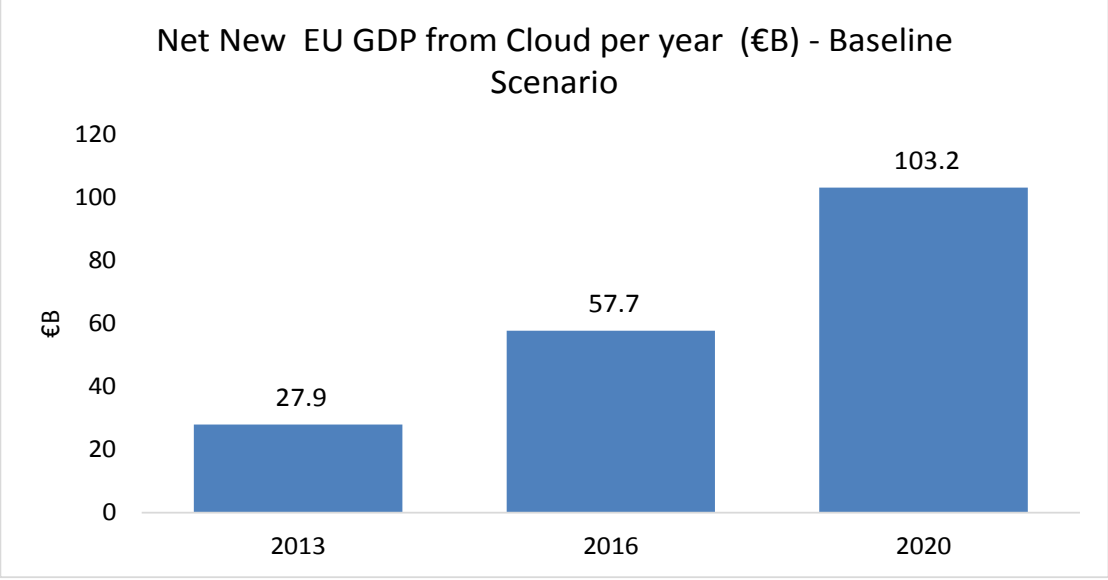
FIGURE 8 BASELINE SCENARIO – CLOUD IMPACT ON THE CREATION OF NEW COMPANIES



Source: IDC 2014

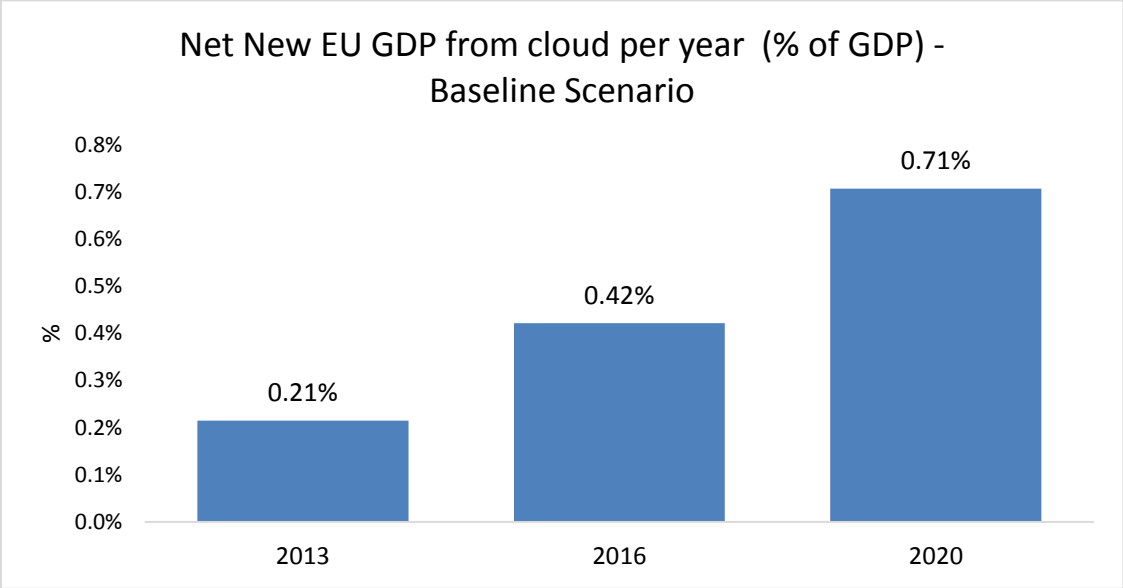
According to IDC estimates, the adoption of cloud contributed to the EU28 GDP approximately €27.9 Billion in 2013 (Figure 9), corresponding to 0.2% of the total (Figure 7). By the year 2016 the net new GDP generated by cloud adoption in the EU is expected to grow to €57.7 Billion, representing 0.4% of GDP. By the year 2020, according to the baseline scenario, the net new impact of cloud on the EU GDP is expected to grow to €103.2 Billion representing a share of 0.71% of the total, more than 3 times of the share represented in 2013. This includes both the private and public sectors.

FIGURE 9 BASELINE SCENARIO – CLOUD IMPACT ON EU GDP (€B)



Source: IDC 2014

FIGURE 10 BASELINE SCENARIO – CLOUD IMPACT ON EU GDP (%)



Source: IDC 2014

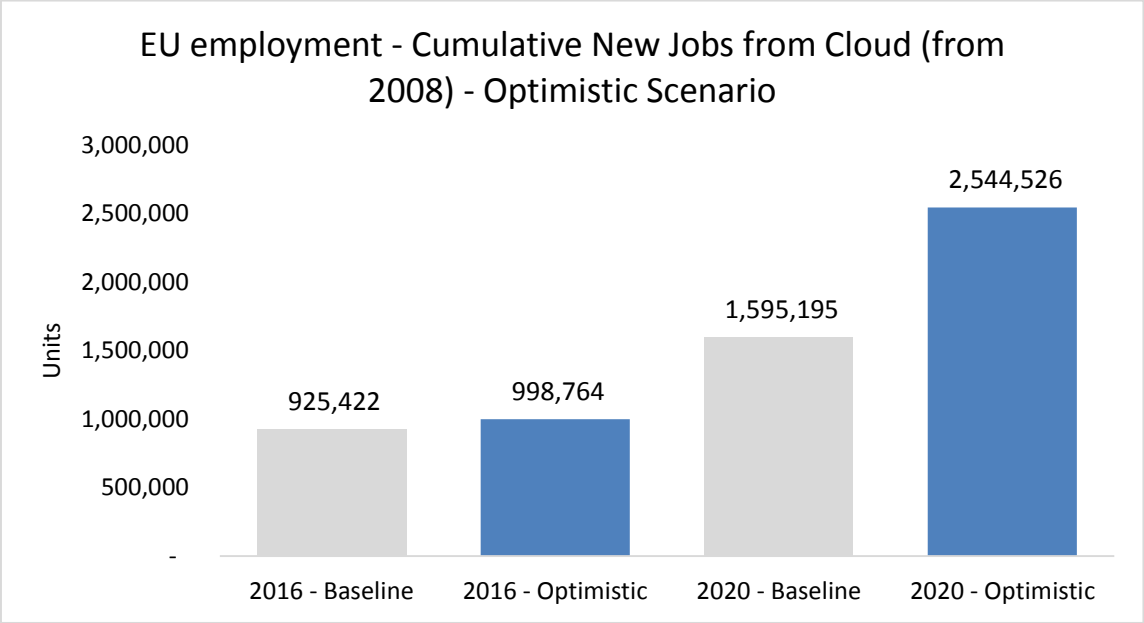
Main impacts in the optimistic scenario

In the optimistic scenario, the recovery from the economic crisis is seen to be faster than assumed in the baseline scenario. This scenario may occur if the Member States fully implement the expected and recommended structural reforms especially in those countries with severe funding constraints.

In this case, the recovery started in 2014 and 2015 will accelerate and the GDP trend for the upcoming years will show growth rates higher than they were in average before the economic crisis. Such a trend will improve confidence of enterprises which will initiate a positive trend for IT investments, with a relevant share of those investments addressed to the cloud adoption and to the innovations required to operationalise it. At the same time, the EC Cloud strategy and the related policies will result in the lowering of barriers to cloud uptake; particularly Public Cloud will be driven by higher adoption among SMEs and to greater dynamism of the digital entrepreneurship market resulting into proportionally higher uptake of PaaS.

From an employment perspective, Figure 11 shows that under this optimistic scenario, Public Cloud and hosted Private Cloud adoption will generate some 998,764 direct and indirect jobs in the business sector by 2016 (from 2008), already showing a positive difference with the baseline scenario. By the year 2020 the increase of new jobs creation could be remarkable, reaching a total of 2,544,526 new jobs, almost a million jobs more than the baseline scenario. This shows the high potential impact of faster cloud adoption in Europe. This positive effect will be driven by the entity of the cloud investments but also by the improved confidence of the firms in their business performance which will help to create employment.

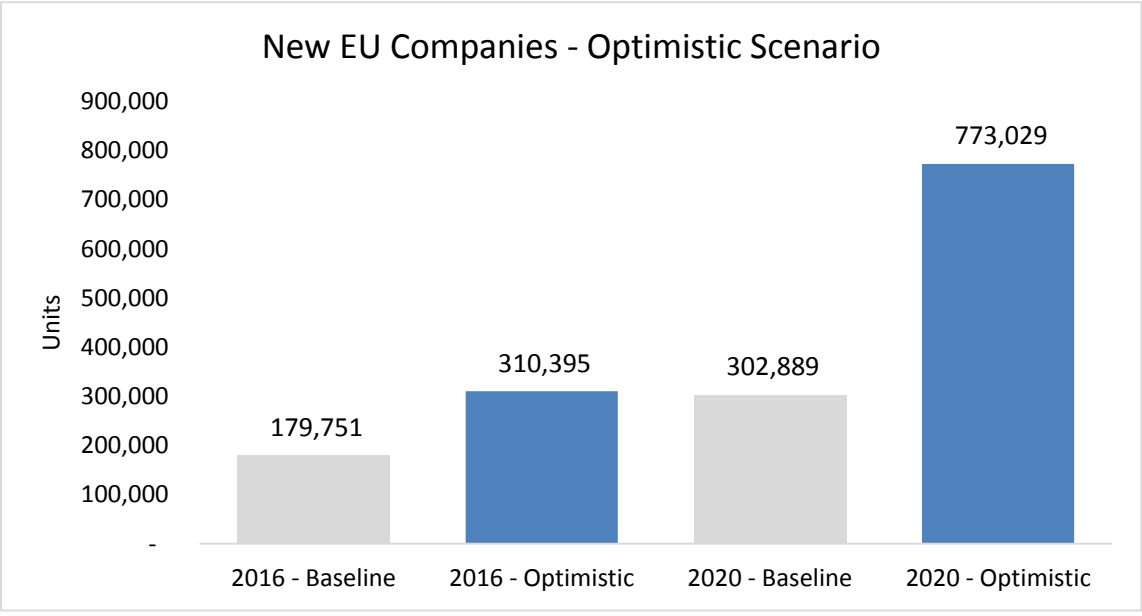
FIGURE 11 OPTIMISTIC SCENARIO – CUMULATIVE IMPACTS OF CLOUD ON JOBS CREATION



Source: IDC 2014

In terms of new businesses creation, under this optimistic scenario, IDC estimates that by 2016 the cloud may generate up to 310,000 new companies, growing to 773,000 by 2020, twice as much as in the baseline scenario. (Figure 12)

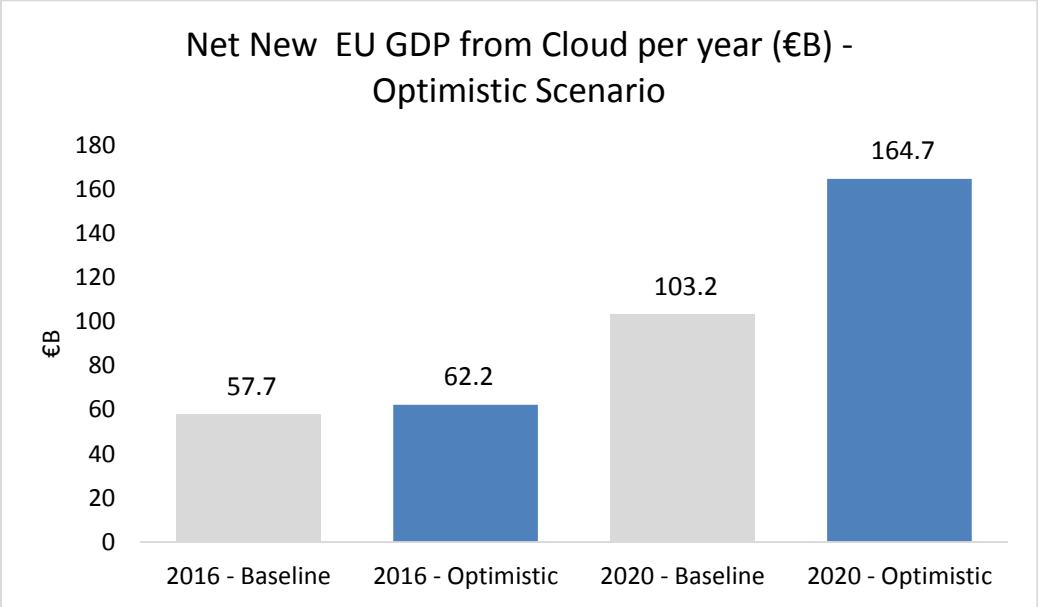
FIGURE 12 OPTIMISTIC SCENARIO – CLOUD IMPACT ON THE CREATION OF NEW COMPANIES



Source: IDC 2014

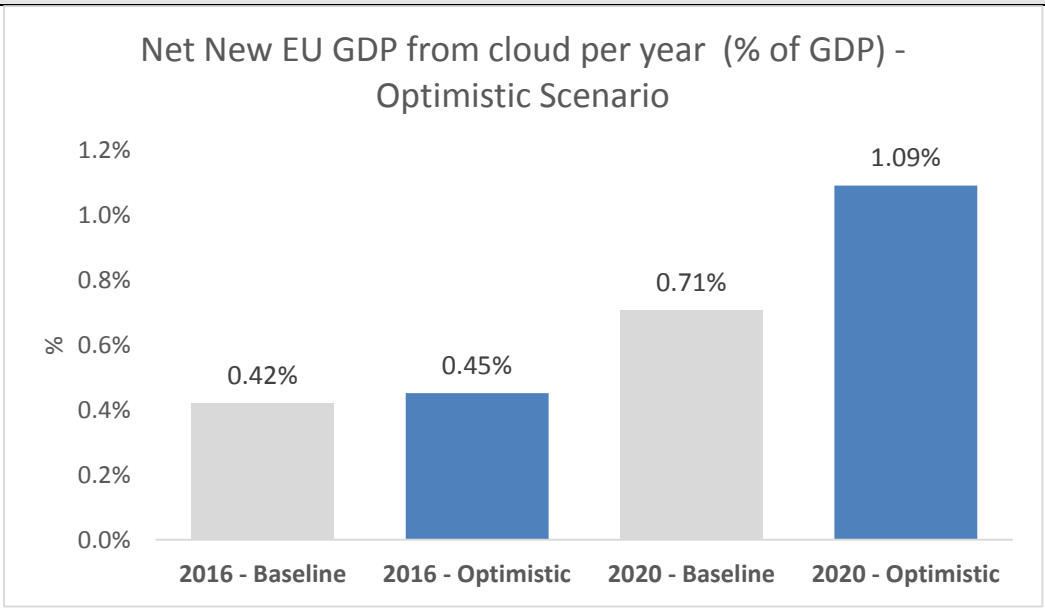
Looking at the contribution to EU GDP growth, under the optimistic scenario the adoption of cloud could generate €62.2 Billion in the year 2016, with only a marginal improvement on the baseline scenario. However, over the next few years the cloud impact on GDP under the optimistic scenario is expected to magnify reaching €164.7 Billion of contribution in 2020, representing a share of 1.09% of GDP, substantially higher than in the baseline scenario.

FIGURE 13 OPTIMISTIC SCENARIO – CLOUD IMPACT ON EU GDP (€B)



Source: IDC 2014

FIGURE 14 OPTIMISTIC SCENARIO – CLOUD IMPACT ON EU GDP (%)



Source: IDC 2014

Main impacts in the pessimistic scenario

In the pessimistic scenario, the economic agents will have to face an uncertain and especially slow recovery from the economic crisis. In quantitative terms, this means that the GDP trend will be, after 2015, lower than they were before the economic crisis.

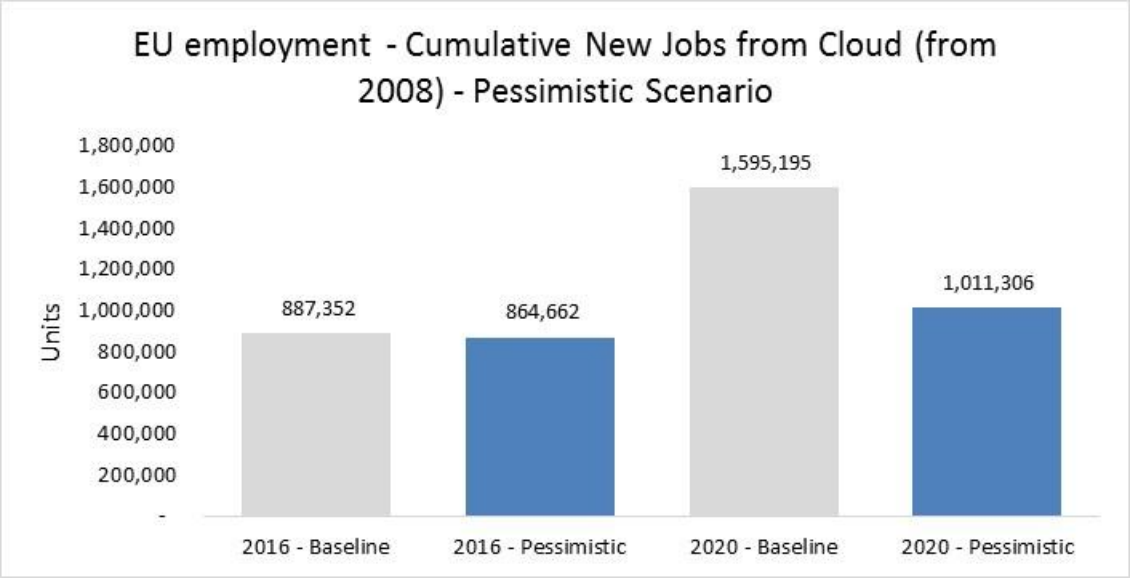
Economic agents will hesitate starting new investments and these, on one hand, will only be addressed to cost saving strategies. On the other hand, these investments will create, for cost reasons, only the new jobs strictly necessary to operationalise the cloud computing. In such an uncertain environment, the creation of new business will stay at low level.

Under these assumptions cloud adoption of at least one solution will increase across all industries, but cloud intensity will overall remain limited, with most companies adopting cloud in selected areas instead of adoption across the board as it was in the optimistic scenario.

Moreover, under the pessimistic scenario, the barriers to cloud uptake may remain high hindering the full potential of cloud benefits in the economy. SMEs will continue to rely on free cloud solutions and consequently their spending will remain limited.

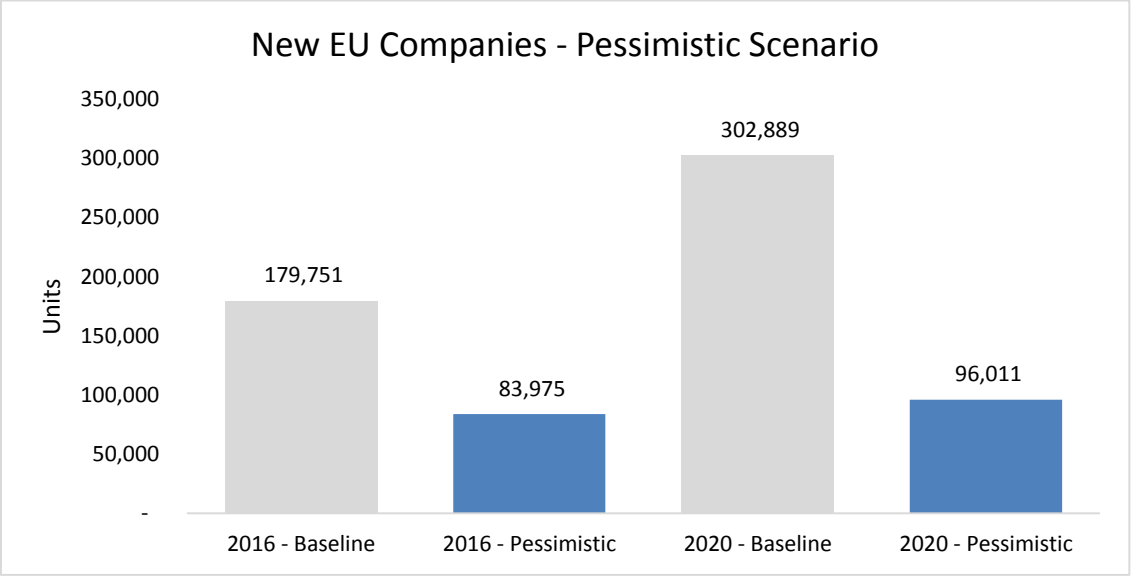
As a consequence, under the pessimistic scenario Public Cloud and hosted Private Cloud adoption would generate only 1,011,396 cumulative new jobs in the period 2008-2020, about half a million lower than the baseline scenario (Figure 15). The creation of new enterprises would be only about a third of the baseline scenario, at about 96,011 new companies only by 2020 (Figure 13).

FIGURE 15 PESSIMISTIC SCENARIO – CUMULATIVE IMPACTS OF CLOUD ON JOBS CREATION



Source: IDC 2014

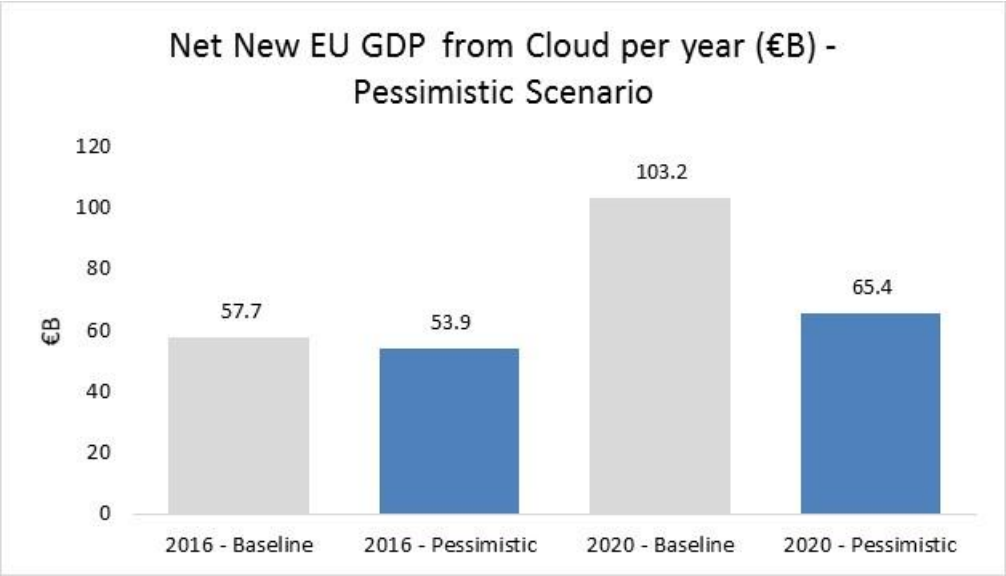
FIGURE 16 PESSIMISTIC SCENARIO – CLOUD IMPACT ON THE CREATION OF NEW COMPANIES



Source: IDC 2014

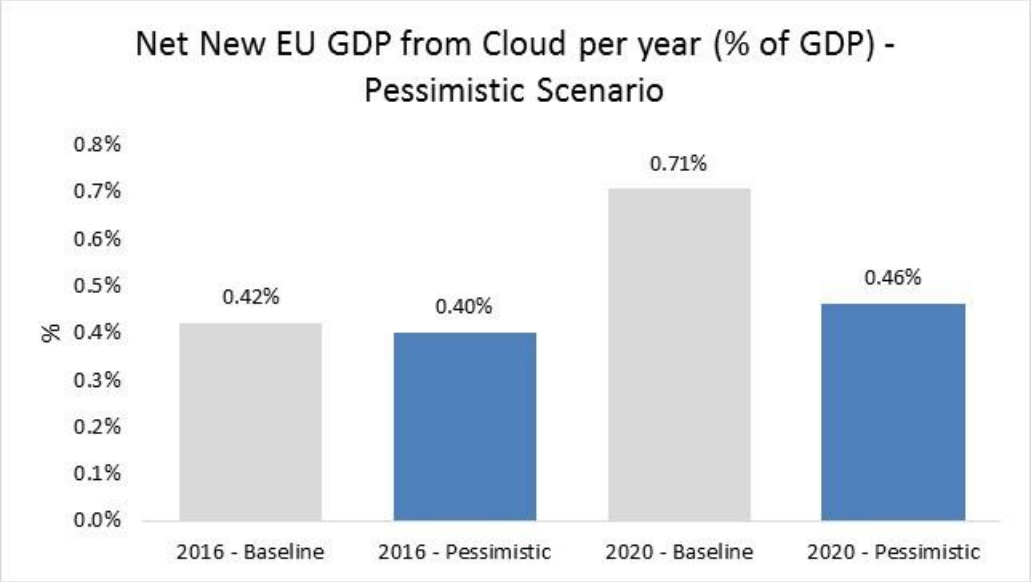
IDC estimates show that, under the pessimistic scenario, in 2016 public and hosted Private Cloud would generate just under €53.9 Billion of contribution to the EU GDP, quite lower than the baseline (Figure 17). Even in this pessimistic scenario, the cloud contribution to GDP is expected to grow, reaching €65.4 billion in the year 2020, representing 0.46% of the EU GDP, slightly more than half the 0.71% expected in the baseline scenario (Figure 18).

FIGURE 17 PESSIMISTIC SCENARIO – CLOUD IMPACT ON EU GDP (€B)



Source: IDC 2014

FIGURE 18 PESSIMISTIC SCENARIO – CLOUD IMPACT ON EU GDP (%)



Source: IDC 2014

3.5.1. Economic impact data tables, total and excluding government

The model estimated also the specific impacts of cloud computing in the government sector. The following tables present separately the data on impacts for the total economy, the government sector and the economy without the government sector, under the 3 scenarios.

In summary, according to IDC the adoption of cloud computing is likely to add to the EU economy between €584.9bn of cumulative new GDP growth (optimistic scenario) and €355.2 bn (pessimistic scenario) in the period 2015-2020.

The cumulative impact on employment in the same period 2015-2020 could range between 1.9 million new jobs (optimistic scenario) and only 384,569 (pessimistic scenario). This huge variation is due to the assumption that much of the new jobs growth and new companies creation should materialise when the diffusion of cloud is widespread in the economy in the last years of the forecast period. If we consider also the cumulative impacts of cloud on jobs in the period 2008-2014 the total jobs gain are remarkable.

3.5.2. Economic Impact Data Tables

TABLE 19 ECONOMIC IMPACT DATA – TOTAL AND GOVERNMENT SECTOR - BASELINE SCENARIO

Economic Impact Data – Baseline Scenario						
		2013	**2015**	**2016**	**2020**	**2015-2020**
Total EU28 Market, including the government	Net New GDP from Cloud (€B).	27.9	47.9	57.7	103.2	
	Cumulative GDP from Cloud					449.3
	Cumulative Total New Jobs from Cloud (from 2008)	462,441	777,152	925,422	1,595,195	968,458
	New Jobs in Year	206,320	150,415	148,270	157,524	
Government	Net New GDP from Cloud (€B).	1.1	2.0	2.4	3.8	
	Cumulative GDP from Cloud					17.5
	Cumulative Total New Jobs (Government) from Cloud (from 2008)	18,447	32,427	38,071	50,827	25,229
	New Jobs in Year	1,714	6,830	5,643	1,295	
EU28, excluding the government	Net New GDP from Cloud (€B).	26.8	46.0	55.3	99.4	
	Cumulative GDP from Cloud					431.8
	Cumulative Total New Jobs (non-Government) from Cloud (from 2008)	443,994	744,725	887,351	1,544,368	943,229
	New Jobs in Year	204,606	143,585	142,627	156,229	

Source: IDC 2014

TABLE 20 ECONOMIC IMPACT DATA – TOTAL AND GOVERNMENT SECTOR - OPTIMISTIC SCENARIO

		2013	2015	2016	2020	2015-2020
Total EU28 Market, including the government	Net New GDP from Cloud (€B).	27.9	49.3	62.2	164.7	
	Cumulative GDP from Cloud					584.9
	Cumulative Total New Jobs from Cloud (from 2008)	462,441	798,591	998,764	2,544,526	1,917,789
	New Jobs in Year	206,320	171,854	200,174	527,289	
Government	Net New GDP from IT (€B).	1.1	2.0	2.5	5.9	
	Cumulative GDP from Cloud					22.2
	Cumulative Total New Jobs (Government) from Cloud (from 2008)	18,447	33,322	40,964	77,831	52,233
	New Jobs in Year	1,714	7,724	7,642	10,119	
EU28, excluding the government	Net New GDP from IT (€B)	26.8	47.2	59.7	158.8	
	Cumulative GDP from Cloud					562.7
	Cumulative Total New Jobs (non-Government) from Cloud (from 2008)	443,994	765,269	957,800	2,466,695	1,865,556
	New Jobs in Year	204,606	164,130	192,532	517,170	

Source: IDC 2014

TABLE 21 ECONOMIC IMPACT DATA – TOTAL AND GOVERNMENT SECTOR - PESSIMISTIC SCENARIO

Economic Impact Data – Pessimistic Scenario						
		2013	**2015**	**2016**	**2020**	**2015-2020**
Total EU28 Market, including the government	Net New GDP from Cloud (€B).	27.9	47.9	53.9	65.4	
	Cumulative GDP from Cloud					355.2
	Cumulative Total New Jobs from Cloud (from 2008)	462,441	777,152	864,662	1,011,306	384,569
	New Jobs in Year	206,320	150,415	87,510	-15,101	
Government	Net New GDP from IT (€B).	1.1	2.0	2.3	2.8	
	Cumulative GDP from Cloud					14.9
	Cumulative Total New Jobs (Government) from Cloud (from 2008)	18,447	32,427	36,303	37,226	11,628
	New Jobs in Year	1,714	6,830	3,875	-2,004	
EU28, excluding the government	Net New GDP from IT (€B)	26.8	46.0	51.6	62.6	
	Cumulative GDP from Cloud					340.3
	Cumulative Total New Jobs (non-Government) from Cloud (from 2008)	443,994	744,725	828,359	974,080	372,941
	New Jobs in Year	204,606	143,585	83,635	-13,097	

Source: IDC 2014

4. COMPETITIVENESS OF THE EU CLOUD INDUSTRY

4.1. Overview

This section examines the competitive state of the EU cloud industry. This inevitably involves comparison with the cloud industry in the United States, as many of the main cloud players are domiciled there, and where adoption of cloud services (and in particular, Public Cloud services) is significantly more advanced than other regions.

4.2.Cloud Market Landscape

Before exploring the specifics of how competitive the cloud market is in Europe and specifically how successful the European headquartered firms are in addressing that market, it is worth considering exactly what constitutes the Cloud market, who provides those services and how they are sold.

4.2.1 Types of Cloud Service

Cloud computing serviced tend to be defined as one of the following three core offerings

- Infrastructure as a Service (IaaS)
- Platform as a Service (PaaS)
- Software as a Service (SaaS)

Infrastructure as a Service

Cloud infrastructure services (IaaS) are a subset of cloud services and comprise servers, basic storage, network and clients delivered as a service using the cloud model.

Platform as a Service

Platform as a service (PaaS) includes all application development and deployment services that are delivered via a cloud.

Software as a Service

Software as a Service (SaaS) is a software distribution model in which applications are hosted by a vendor or service provider and made available to customers over a network.

4.2.2 Types of Cloud Service Delivery

- Public Cloud
- Private Cloud
- Community Cloud
- Hybrid Cloud

Public Cloud

Public Cloud services are built for a market, and are delivered from a shared infrastructure that serves all customers with the means to pay. By definition the equipment supporting a Public Cloud service is located on the supplier's site not the customers.

Private Cloud

Private Cloud services are built specifically for individual customers (or a closed group of customers) who share the services internally. The equipment supporting a Private Cloud service may be located at either the supplier's site (off-premises) or at the customer's site

(on-premises) and it is not unusual for Private Cloud solutions to see a combination of both off-premises and on-premises equipment.

Community Cloud

A Community Cloud is specific Cloud Solution portfolio established to serve a closed community of user organizations and can be regarded as a subset of the Private Cloud segment. Examples of this could include members of a specific trade association who have a common set of needs and/or the need to share data between each other, businesses all located in a specific geographic location or, as in the case of the UK Government's G-Cloud initiative, a large business entity wishing to create a portfolio of approved (and pre-negotiated) solutions which can be deployed in the individual businesses quickly and at price points lower than would have been the case if each buying point negotiated with the supplier individually. These Community Cloud solutions will often comprise a combination of Public and Private Cloud offerings, dictated by the supplier and the nature of the individual solutions being deployed.

Hybrid Cloud

The concept of a Hybrid Cloud has emerged in recent years as cloud adoption rises. In essence a Hybrid Cloud solution is one that utilises both Public and Private Cloud as part of the solution. Whilst there are many different examples of this type of solution, the common one is where an organisation utilising a Private Cloud has the need on occasions to have access to additional computing power (often due to seasonal peaks in their business) and this can be best (most economically) provided by adding and removing Public Could infrastructure as required.

Primarily user requirements determine the type of Cloud delivery model that is most suitable and appropriate for their needs, however that is not always the case and for some situations, particularly in the case of certain applications (e.g. salesforce.com) the vendor makes a decision on the type of delivery model available and customers have to "take it or leave it".

4.2.1. Cloud Service providers

The suppliers of Cloud services can be split into a number of discrete categories

- General IT Services Companies
- Network Operators
- Industry Specialists
- Generalist Cloud Providers
- Software Specialists

General IT Services Companies

These companies are the traditional bedrock of the IT services industry and range from the very biggest such as IBM and HP to small niche players and everything in between. From a Cloud perspective some will have their own infrastructure that they utilize to create and deliver their services whilst others will utilize a third party infrastructure.

Network Operators

These are the telecom operators of old and include both the former national monopoly operators (BT, KPN and Orange/France Telecom) as well as newer players such as COLT and Vodafone. Core to their value proposition in the Cloud space is their network and the global reach they are able offer their customers. Many of these operators are offering

Cloud services based around a combination of their own infrastructure and capabilities and reselling third party cloud solutions. The reality to date has been that the Network Operators have not managed to achieve the market penetration they had hoped or was initially predicted when Cloud computing first started to gain momentum in the market.

Industry Specialists

This is a relatively new segment in the market and reflects the need for and attraction of businesses who all operate in a niche sector, and may have the need to share data between each other, to have access to a dedicated cloud model. An example of this is the Air Transport Industry Cloud solutions created by industry specialists such as SITA (in partnership with Orange Business Services) and Sabre, to address the specific needs of the industry including very high levels of both availability and data security as well as the needs of various industry partners to easily and securely share data between each other.

Generalist Cloud Providers

These are perhaps the most high profile players in the market and include Amazon, Google and Microsoft and for many people define the industry. However this group is not exclusively based around the Public Cloud offerings from these and other players, there are many other providers of infrastructure cloud solutions that are focused on providing Private Cloud offerings, including EMC, Rackspace, to corporate clients.

Software Specialists

Cloud computing has transformed the way in which software is purchased by organizations. Software as a Service is often the first way in which an organization experiences the concept of Cloud Computing and it is this activity that is driving the growth in non-IT users becoming an increasing force in the spend on IT. Salesforce.com is probably the best know provider of a cloud based application, but there are many other software providers including to name but a few SAP, Microsoft and Sage who have embraced the cloud service model for sale and distribution of applications. In the future the idea of buying and hosting software on a traditional licence model will be almost alien to the majority of businesses as the flexibility and lower costs associated with a cloud based model become increasingly attractive.

4.3.Impact of Cloud on the IT Supply Industry

For many of the traditional IT supplier community operating in the Cloud world, the impact of the move to a Cloud based business model has been either revenue and profit incremental (it is taking them into new more profitable business areas) or at worst it is flat. However for software vendors the impact (at least in the short term) is negative as the historic model of large up front licence revenues and ongoing profitable maintenance charges are replaced by lower, but more predictable, subscription payments. Many software vendors have issued short term revenue and profit warnings to their shareholders as they transition their business to the new world order.

Since the launch of the mini-computer in the 1970s the IT industry has created and relied upon an indirect sales model for the distribution of its products to its customers and today globally there are many thousands of businesses who perform the role of the sales channel for the IT industry. Some of these channel partners have been primarily focused simply selling vanilla products from the vendors with little or no value add whilst others have added significant value to the ultimate solution either through the assembly of components from multiple suppliers into a solution for the customer or in the development of their own

applications to run on the generic hardware and software they were reselling. As end user organizations increasingly adopt cloud based solutions there is a real risk that this indirect channel will become at best highly marginalized and potentially largely extinct.

It is not all negative, however, providing this channel adapts to the new order. Cloud solutions are not simple "sign up and run" offerings, they require implementing in the organization and as such the suppliers of Cloud services need third parties to provide these implementation skills to the customer base. The Cloud providers also need an indirect channel as was the case for the hardware and software vendors in the past, but this requires a degree of specialization by the channel so they can both differentiate themselves from other providers of similar skills and services and also demonstrate intimate knowledge of the target customer's business and how the chosen Cloud services can enhance the business and deliver a strong positive Return on Investment. It must also be remembered that not everyone is going to adopt Cloud based IT for their business and there will continue to be a role for the traditional channel, however it is to be expected that only a fraction of the current channel will survive in the long term totally reliant upon the traditional model.

4.4. Assessing the Competitiveness of the EU Cloud Market

For this analysis, it is important that the differences between public and Private Cloud services are clearly understood. The distinction between these two services is that Public Cloud services are built for a market, and are delivered from a shared infrastructure that serves all customers with the means to pay, while Private Cloud services are built specifically for individual customers (or a closed group of customers) who share the services internally. The origins of the two markets are related but different.

The analysis of the competitiveness of the EU-based players therefore needs to look at these two market segments separately and these differences also mean that a different approach must be used when looking at each market. Specifically:

- For the Public Cloud, the very large number of players and different market segments means that IDC have to use a data-driven approach to analyse this market. IDC has recently incorporated Public Cloud services into its tracker process, meaning that it now collects data worldwide on the vendors of Public Cloud services and this will form the basis of IDC's investigation of this segment.
- The Private Cloud market is not currently included in the IDC tracker process. However the comparatively lower number of significant Private Cloud providers makes a more individualised analysis of the Private Cloud market possible.

This report therefore examines the competitiveness of Public Cloud and Private Cloud markets separately below.

4.4.1 Public Cloud Vendor Competitiveness in the EU

The Public Cloud services industry has its origins in the United States, where cloud pioneers like Salesforce.com, Webex and Amazon Web Services (AWS) started offering their services to US based customers in the closing years of the previous century. These vendors started to attract, and then formally marketed to, customers organisations based in Europe.

Soon after these US vendors entered the European market, a number of European Public Cloud vendors launched their own Cloud operations. These companies were a mixture of

cloud specific start-ups and existing IT vendors who recognised the potential for cloud and also the possible negative impact it might have on their traditional business.

In particular, a number of established European software vendors (most of whom were in the business applications market) tried to bring SaaS versions of their products to market, with varying levels of success. Also in the same timescale, a number of European organizations with a range of different backgrounds began offering Private Cloud services - Private Cloud is discussed further in the sections that follow.

In offering Public Cloud services, the US based vendors have the significant advantage of a very large, homogenous "home" market with a single business and legislative environment, as well as a large number of potential "home" customers eager to use new technologies to benefit their business. This generates a great deal of both cash and experience, both of which made it possible for successful US-based Public Cloud vendors to grow rapidly, and to introduce their services into the EU. The EU based subsidiaries of US headquartered businesses that had themselves begun utilising Public Cloud for their IT requirements also provided a receptive source of potential customers and helped the US based providers to establish a presence in Europe.

Having started earlier, the US Public Cloud vendors also gathered a great deal of practical experience in what works in the Public Cloud market, both on a business level and a technology level. The US has, as a result, also produced a large pool of experienced people who know how to build, run, manage, sell and support cloud services.

Consequently the US vendors have been able to aggressively push into the European country markets, using their experience and resources to grow. Often the UK has been their starting point, due to its common language and similar business culture, but most vendors quickly seek to grow their business in other EU countries. This follows a similar pattern that was seen in the 1980s and 1990s with data centre outsourcing.

It is also worth pointing out that the supply and consumption of Cloud services in effect knows no geographic boundary. Providing the customer is legally able to buy the service and the supplier is willing to deliver it, there is no reason for the two parties not to enter into a commercial relationship. Much has been made in the press of individuals racking up considerable sums on their personal or company credit card bills to gain access to cloud based IT on behalf of their companies in part to illustrate how easy it is to get access to cloud based computation resources.

In recent times much has also been made about the legal issues regarding the location of the storage of data however in the early stages of the market development this was probably not considered by many of those buying cloud services either because they were frustrated by the internal processes needed to get the IT they required and circumnavigated the normal purchasing and legal processes to get it, or they simply didn't even consider it an issue. For many the US based vendors were perceived to be the only option available (at least in the early days) and this further helped these providers to establish their presence.

In IDC's view, the advantages of US-based Public Cloud services vendors still exist today, though they are diminishing. Public Cloud vendors in Europe still have multiple country markets that they need to successfully sell into to get close to the level of opportunity that exists in the US. Moreover, success in one country market does not guarantee success in other country markets. For example, it does not remove all the challenges of selling into the new market, and in particular sensitivities over data location and access still exist even

when data is stored only within the EU. Curiously national issues also arise with EU based companies seemingly happier to consider a US based provider as an alternative to a domestic supplier than a supplier headquartered in another EU state.

Issues around data sovereignty with regard to the US based Public Cloud vendors are also being addressed with many of them now establishing data centres in their key European countries.

The result is that US cloud services vendors still dominate the European market, as Table 22 shows. This table draws on data from IDC's cloud tracker, and it shows data from the top 25 Public Cloud services vendors in Western Europe ranked by share of the overall Western European Public Cloud services market. Although the base data includes Western European countries that are not part of the EU, and excludes Eastern European countries that are part of the EU, it is IDC's view that these two essentially net each other out and as a result the share and growth rates apply equally to the EU.

TABLE 22 ESTIMATED EU MARKET SHARES OF THE TOP 25 PUBLIC CLOUD SERVICES PROVIDERS

Rank in WE	Vendor name	Headquarters location	EU market share in 2013	Growth 2012-2013 in EU
1	Salesforce.com	US	6.9%	183%
2	Amazon.com Inc.	US	6.0%	212%
3	Microsoft	US	2.8%	383%
4	Google	US	2.4%	178%
5	Oracle	US	2.0%	153%
6	IBM	US	2.0%	254%
7	Adobe	US	1.8%	164%
8	SAP	Germany	1.7%	576%
9	Symantec	US	1.6%	96%
10	Opentext (GXS)	US (formerly UK)	1.4%	105%
11	Cisco	US	1.3%	18%
12	Visma	Norway	1.2%	172%
13	HP	US	1.2%	96%
14	ServiceNow	US	1.0%	238%
15	Citrix	US	0.8%	122%
16	T-Systems	Germany	0.8%	328%
17	SmartFocus	France/UK	0.8%	119%
18	Concur Technologies	US	0.8%	137%
19	Unit4	Netherlands	0.7%	203%

20	Cegid	France	0.6%	193%
21	IntraLinks	US	0.6%	131%
22	ADP	US	0.6%	220%
23	Zoho	US	0.6%	204%
24	Zucchetti	Italy	0.5%	147%
25	Wolters Kluwer	Netherlands	0.5%	156%

Source IDC 2014

As the table shows, 17 of the top 25 Public Cloud service vendors in this market are US-based companies, though one (GXS, bought by Opentext) has only recently relocated its headquarters to the US.

This highlights another ongoing issue that faces EU based IT companies. They are often the target for acquisition by US based companies or investors, resulting in an inevitable "westwards shift" in ownership. The NASDAQ stock market is also seen by many European IT business owners as being a more attractive option when looking to take their company public, again leading to EU businesses becoming foreign owned. Regrettably there is very little acquisition activity in reverse by EU based businesses taking over US owned companies.

The table also shows that there is a big disparity between vendors' European Public Cloud services growth rates. The simple average growth rate of all 25 cloud service providers is 192%, but the range is from 576% growth at SAP to a mere 18% at Cisco. This disparity is driven by a wide range of factors, but mostly by the success or otherwise of the vendor's cloud strategy.

For example, it is IDC's view that SAP's rapid growth is associated with a change in strategy from trying to get its customers to adopt a radical vision of cloud, centred on new and untried cloud offerings, to a far more pragmatic approach centred on maximising growth from its existing cloud offerings.

4.4.2 Origins of Public Cloud Vendors in the EU

The top aggregated revenue share by domicile of the cloud service providers' parent company is shown below for the top 25 Public Cloud services vendors in Europe by cloud services revenue.

TABLE 23 MARKET COMPARISON OF TOP 25 PUBLIC CLOUD VENDORS BY ORIGIN

Origin	Number of Providers	Total Share of Top 25 Revenue	Average Share per Provider
EU	7	14.0%	2.0%
US	17	83.0%	4.9%
Other	1	3.0%	3.0%

Source IDC 2014

As the analysis shows, just over a quarter of the top 25 Public Cloud vendors are EU based companies, one is European but outside the EU, and the remaining 17 are all US

companies. Moreover, the 17 US companies have on average twice the revenue of the European Public Cloud services providers.

What are the similarities and differences between the US and EU vendors? What is striking is that there are a very large number of business applications vendors overall. However, the EU vendors are all applications vendors (as is also the solitary non-US and non-EU vendor, Visma), while some of the US vendors have large non-applications (ie infrastructure) revenue like Amazon, Microsoft and Symantec.

Looking at the next 75 cloud services vendors, the pattern is different, as Table 24 shows:

TABLE 24 MARKET COMPARISON OF TOP VENDORS 26-100 BY ORIGIN

Origin	Number of providers	Total Share of 25-100 revenue	Share per player
EU	23	34.1%	1.48%
US	49	60.7%	1.24%
Other	3	4.1%	1.38%

Source IDC 2014

This pattern suggests that there are plenty of up-and-coming EU Public Cloud vendors, though they are still outnumbered in their home market by their US counterparts.

The full listing of the Top 100 EU Public Cloud providers can be found in Annex A to this report.

4.4.3 European Public Cloud Vendors

The top five European-based Public Cloud vendors by European market share are:

- SAP
- T-Systems
- SmartFocus
- Unit 4
- Cegid

These players also provide examples of cloud service providers with different origins:

- SAP is well known as the world's largest vendor of business management software, including enterprise resource management, customer relationship management, and supply chain management. However it also offers cloud services, in particular software-as-a-service applications for CRM and ERM. SAP made a comparatively early start in the SaaS market, but initially had disappointing results. However, the company has made acquisitions and improved its Public Cloud offerings, and is now seeing strong growth.
- T-Systems is a subsidiary of Deutsche Telecom which has a long standing involvement in the European IT market. T-Systems main cloud focus is in providing Private Cloud services, however it also offers a virtual Private Cloud (services based on a shared environment but with enhanced security and control compared to "standard" Public Cloud offerings), which IDC counts as Public Cloud services.
- Smartfocus is vendor of SaaS services for email, social and mobile marketing. Founded in Paris in 1999 as Emailvision, the company acquired UK-based

Smartfocus in 2013 and subsequently took the SmartFocus name for the combined company and moved its group headquarters to London.

- Unit 4 is a business applications vendor based in the Netherlands. It offers its applications as multi-tenant applications but with isolated tenant databases. Coda, its leading financial management software suite, has a range of different solutions that can be hosted on its cloud infrastructure, and it has a number of datacenters for cloud hosting in different European locations.
- Cegid is a long-standing French vendor of business applications that also offers SaaS applications. It says it has 24,000 small companies using its SaaS accounting services, and over 650 mid-sized and large customers for its SaaS services.

4.4.4 Private Cloud Competiveness of EU Vendors

The Private Cloud services industry has effectively had simultaneous origins in multiple regions, where existing service providers (in particular IT services providers and telcos) saw the opportunity to offer services similar to Public Cloud services, but dedicated to single large organizations or closed groups of related organizations.

The aim of these services is to bring the economies of industrialization available in the Public Cloud to more individualized services, especially for organizations that had concerns over the security, reliability and governance that cannot be accommodated by Public Cloud services.

At the most basic level, Private Cloud can mean using a dedicated set of resources (from an isolated group of servers to an entire datacenter) to serve the customer with higher guaranteed SLAs or other performance characteristics that Public Cloud providers find it an operational challenge to commit to, as it essentially breaks their business model of treating all customers the same.

The main differences between the Public and Private Cloud market are:

- In Private Cloud, there are many strong European-based players with large market shares, especially in their home markets. In contrast, the largest players in the European Public Cloud market are predominantly US-based vendors.
- The Private Cloud services are dominated by IaaS offerings. Though there are private SaaS and PaaS services, the market for these services is much smaller than the private IaaS services and the licensing economies of scale for softwasre do not exist in the same way. In contrast, in Public Cloud there is a balance between SaaS and IaaS sub-markets, and a smaller but growing PaaS sub-market.

4.4.5 Analysis of the EU Private Cloud Providers

Table 25 shows the leading European headquartered Private Cloud services vendors in Europe. Private Cloud services are not yet in IDC's tracker program and the vendors are reluctant to separate results for their traditional hosting business and Private Cloud, so robust estimates of vendor European revenues for these services are not available. However, what is clear is that European vendors are the largest group amongst the vendors, and account for slightly under 50% of the overall revenue. However there is a very long tail to the market with even the 10th largest vendor only accounting for only some 0.5% of the total Private Cloud revenue.

As these are very much estimates of the revenues and hence market shares we do not see it appropriate to calculate the share to less than a full percentage point, or half percentage point in the case of those with less than 1% share.

It is worth nothing that even if we were to include non-EU headquartered suppliers, T-Systems would still be the largest single provider of Private Cloud services in the EU.

TABLE 25 PROVISIONAL EUROPEAN PRIVATE CLOUD MARKET SHARE - 2013

Europe	Provisional EU Market Share 2013
T-Systems	5.0%
Atos	3.0%
Capgemini	2.0%
BT GS	2.0%
Orange BS	1.0%
COLT	1.0%
Steria	1.0%
Indra	1.0%
Telecom Italia	0.5%
Telefónica	0.5%
Computacenter	0.5%
KPN	0.5%
Tieto	0.5%

Source: IDC, 2014

Why do European suppliers have such a strong presence in the Private Cloud market? Many of the Private Cloud vendors are IT services providers and/or telcos with IT services practices, including outsourcing. Their Private Cloud services have been established in response to demand from their existing IT services customers to reduce the cost of running their systems while assuaging the customers' uncertainties over issues such as governance, legal jurisdiction and security that can arise in Public Cloud deployments. IT services vendors therefore are offering Private Cloud services to prevent their existing clients defecting to other vendors, and to provide them with a defence against cannibalization of revenue by Public Cloud vendors.

In terms of expertise, since Private Cloud services share many characteristics with existing IT services, the technology, sales and marketing skills are transferable. In contrast to Public Cloud, European Private Cloud vendors therefore have a large pool of well-qualified staff to draw on when building their businesses.

As a result of these factors, and the closeness that IaaS Private Cloud services have to existing services offered by European vendors, the Private Cloud market is far easier for European suppliers to succeed in. In particular, and unlike Public Cloud, the relationship with the supplier of the cloud services is a key component and this favours suppliers with a

local market presence though that does not of course dictate that they are European owned businesses.

5. COMPARISON WITH 2012 REPORT

In 2012 IDC was engaged by the Commission to prepare a report (*Quantitative Estimates of the Demand for Cloud Computing in Europe and the Likely Barriers to Up-take - SMART 2011/0045*) to look at the economic impact that the adoption of Cloud Computing might have on the member states economy, what barriers there were that would limit that impact and what could the Commission do to overcome those barriers through policy intervention.

TABLE 26 ECONOMIC IMPACTS OF CLOUD (2012 REPORT)

Estimates from 2012 model	No Intervention scenario	Policy-driven scenario
Cloud contribution to EU GDP, year 2020	€88 bn	€250 bn
Cloud contribution to EU GDP, cumulative 2015-2020	€357 bn	€940 bn
Cloud impact on creation of new jobs, cumulative 2008-2020	1.3 million	3.8 million

Source IDC 2014

The model developed in 2012 was clearly based on actual data up to the year 2011. At a headline level, in 2011 we forecast that based on a successful outcome of a full EU Policy Intervention approach the adoption of Cloud Computing across the EU27 (as they were then) would result in a total cumulative increase of GDP for the period 2015-2020 of €940Bn. The same scenario would result in the cumulative creation of 3.8M new jobs in the period 2008-2020. Substantially lower impacts were expected in case of no policy intervention, because of higher barriers and slower development of the cloud market in Europe.

In this report, under the optimistic scenario we estimate a potential cumulative cloud contribution to EU28 GDP of €585 Bn in the period 2015-2020, while the cumulative impact on new jobs creation is estimated at 2,5 million jobs for the period from 2008 to 2020.

These data are not directly comparable with the estimates presented in this report, as will be clearly explained here, because of differences in the scope of measurement and the methodology approach to scenario development. The no intervention scenario cannot be compared with either the baseline or pessimistic scenarios presented in this study, as they descend from different assumptions. The policy driven scenario might be considered as partially similar to the optimistic scenario of this study, insofar they both assume a fast growth of the market. However, macroeconomic perspectives of growth and development in Europe are today much more pessimistic than a few years ago, and this has resulted in more cautious predictions of growth to 2020.

In the 2012 report, the scope did not include the Hosted Private Cloud component of the market, but did include the impact of use of Public Cloud by Government. The 2014 report includes Hosted Private Cloud but primarily excludes the impact of Government Cloud usage (Public or Hosted Private Cloud), although the impact of that exclusion is specifically addressed in a specific section of the report. Since the 2012 report the EU has also expanded to include Croatia (joining on 1st July 2013).

Logic would suggest that since the 2014 report includes more components of the Cloud market the impact would be greater and thus the values presented would be higher, yet the reverse is actually the case.

In the 2014 report, the model and the assumptions for estimating the impact of cloud computing on the economy has required a number of changes which have led, in part, to us arriving at a different view about the impact of cloud adoption. This is explored in more detail in the paragraphs below where we present our perspective on the comparison of the 2014 data with the estimates presented in 2012.

In the period between the two reports IDC has completely revised the way in which it calculates the size and forecast growth of the Cloud marketplace. The assumptions made in the model used in the 2012 report were based on the early emerging phase of the cloud market and on actual data only up to 2011. Those assumptions were shown to be too optimistic. The new cloud forecast model, published in June 2014 and used in this report, is more cautious and has been shown to deliver estimates much closer to the levels being seen in the market today.

If we look at the employment and GDP impacts estimated for the period to 2020 in this report and at the impacts estimated in the report presented in 2012, we notice an important gap. It is therefore legitimate to ask whether this contractor has changed its mind about the relevance the cloud may have in terms of impacts on the overall economy. To respond to such a question, we need to explain the reasons why the new estimates for the impact of cloud adoption are lower than they were a previously. This is due to a number of reasons.

- First of all, the previous estimates were provided in an earlier stage of the cloud diffusion curve; the estimates provided both in the 2012 report and the 2014 one, cover a period ending in 2020, which in the first case means a forecast period of 9 years and in the 2014 report, 6 years later. Our understanding of current and future cloud adoption is therefore, in the 2014 report, based on a greater proportion of actual data rather than estimates and the forecast period is shorter.
- During the period between the two reports the economic crisis across Europe has continued and with it an environment with a high degree of uncertainty. Against such a backdrop 9 years is a really long time to estimate the potential economic impact of anything and especially a new and emerging technology such as Cloud. The uncertainty affects both the adoption rates and the general economic environment and mood. On both these issues, in 2014, we are in a position to make much more realistic and, we believe, correct assumptions around both the market and the resulting impact. The levels and rate of adoption of cloud technology to date have been slower than we anticipated three years ago when preparing the previous report, and, above all, the impact on jobs and production as a consequence of adopting cloud based solutions through to 2020, is lower than expected.
- It should be noted that this downgrade of the forecasts for Cloud adoption across Europe affects not only the model used in this report but is also reflected in the market forecasts IDC publishes as part of its subscription research programs.
- The economic crisis that has affected Europe from 2007 is still not fully resolved. In 2012, nevertheless, we dared to be more optimistic than we are today about when it would end and the speed of the post-recession recovery. This does not mean that we do not believe that Europe is not going to recover from the crisis, but we definitely believe, in line with consensus forecasts, that the recovery will

not be as fast as we could imagine three years ago. Therefore the optimistic macroeconomic scenarios are based on a more modestly optimistic growth.

- Based on the macroeconomic scenarios, we can assume that going back to the pre-crisis (2007) technology adoption trends and impacts may be even more than optimistic. This is primarily due to the fact that, nowadays, most of the investments in technology are driven by cost saving and efficiency. In the optimistic scenario the investments may be driven in part by the innovation, but in the time of crisis or the difficult recovery from the crisis, the investor usually wishes to achieve some level of savings, maybe by reducing labor costs. This is the reason why we have felt it necessary to be less optimistic than we were in 2012. This decision is supported by the all of the studies undertaken by the contractor during the last three years.
- More optimistic impacts on GDP and employment would depend on a greater and more widespread adoption of technology, across all industries and all enterprises, accompanied by the necessary organizational innovation and changes. As we know such innovations require significant investments and enterprises with a moderate level of confidence will tend to behave cautiously when it comes to making significant investment decisions.
- The 2012 report was commissioned to look at the impact of policies on the market. As a result it offered two scenarios, the first assumed no polices proposed by the Commission were adopted and the second scenario assumed all of the policies proposed by the commission were adopted. This report follows a different approach in that it offers 3 scenarios (Baseline which follows the market as it is currently expected to develop, Optimistic assumes more rapid adoption of Cloud and a more aggressive growth in GDP by the member states and Pessimistic assumes a less aggressive adoption of Cloud and a slower level of GDP growth amongst the member states).
- The Pessimistic scenario is still more optimistic than the "No Policy" scenario of 2012 as it reflects the fact that some policies have already been adopted by member states so a "No Policy" approach is no longer valid.

6. CONCLUSIONS

As is often the case when looking at a market and the opportunities it presents, there are two aspects to be considered, demand and supply. On the demand side there is no doubt that businesses in the EU are adopting Cloud based computing solutions within their businesses, either to bring new technology solutions into the business, support new business initiatives or replace existing IT solutions with ones that are more appropriate to their needs. So on the demand side there is clearly a need for Cloud services in the market and that need is expected to grow significantly over the rest of this decade.

On the supply side, things are not quite so positive for EU headquartered suppliers of cloud based services. Currently the supply of cloud based computing services to the EU based customers is dominated by US headquartered suppliers, even if they have a local presence in some EU countries. Cloud computing was first deployed in the US and grew there, aided by both a cultural fit: and outsourcing, which has become commonplace in the US and Cloud Computing is seen as a logical extension of it. Additionally the common legal system that exists across the US means that many of the legal obstacals (real or perceived) that exist in the EU were not present in the US. This is particulary relevant when it comes to the topic of data location where different EU countries have different interpreations of the EU Data Protection Directive and this has had a significant impact on the adoption of cloud based computing solutions.

First mover advantage by these large US suppliers meant they were able to exploit the opportunities in the EU, whilst EU based firms were still determining their strategy and putting in place the means by which to deliver the services. The scale of these US based operations is now such that it would be a challenge for other suppliers to simply attack them head on, so they will need to consider other strategies to win customers.

Below are highlighted the key conclusions from the three main sections of this report.

6.1. Adoption

- Adoption of Cloud services to support the IT requirements of businesses across the EU is already widespread and is continuing to grow. Indeed it is felt that actual adoption is probably higher than reported adoption because individuals do not recognise that a particular IT system they use is actually cloud based.
- Across industry types, the Financial Services and Telecommunications/Media sectors are leading the usage of Cloud services, whilst the Government sector is currently the lowest user of Cloud services.
- The growth in businesses adopting a Public Cloud service for the first time (i.e. having at least one Public Cloud service) is still growing however that growth is starting to show signs of slowing.
- Private Cloud growth is far more aggressive with some industry segments expected to more than double the level of penetration in the period between 2013 and 2015. In the use of Private Cloud the Government sector is expected, by 2015, to have the greatest penetration in the usage of Private Cloud across the sector.
- Larger businesses are utilising Cloud more than is the case for smaller businesses and this is not expected to change by 2015, however the gap between the two sectors seen in 2013 will have closed significantly by 2015.
- Different industries use Cloud based computing services in different ways as dictated by their business needs and thus a "one size fits all" approach to the market is not suitable or possible.

- When comparing instances of Cloud adoption across the economy with the number of Cloud solutions actually being used by organisations who have adopted Cloud it becomes clear that scope for selling additional services within those companies who have already embarked upon the Cloud journey is huge.
- In the wake of the revelations about mass surveillance (June 2013) that suggested that the US Government was regularly accessing and analysing data held on computers around the world, businesses have become far more aware of the need to understand where their data is located, implications of the location and indeed the nationality of the owner. This has had a particular impact on some companies' willingness to engage with US providers, especially where the data storage is resident in the US. However it should be noted that this does not seem to have had a negative impact on the growth of salesforce.com
- Many of the leading US cloud providers have responded to the issues related to data residency by building datacenters in Europe. These however take time to build and commission and it will be some time yet before this issue is fully resolved.

6.2. Expenditure on Cloud

- The total value of the Cloud market for the EU in 2013 (using IDC's baseline forecast) was estimated to be €9.5bn and this is forecasted to grow to €17.2bn (+34.3% CAGR 13-15) by 2015 and to €44.8bn (+21.1% CAGR 15-20) by 2020. Putting this another way, the market in 2020 is expected to be almost five times the size of the market in 2013, which is a significant degree of growth however it is looked at.
- Our Optimistic forecast scenario would see the total market reaching €59.6bn in 2020, whilst the Pessimistic forecast scenario would see it reaching €28.4bn in 2020.
- In all of the forecast scenarios, it is the Private Cloud sector that shows the greatest growth potential in the period from 2013 to 2015: however, in the following period of 2015-2020, the greatest level of growth (in the Baseline and Optimistic scenarios) is expected to be seen in the Public Cloud sector as both the comfort with and availability of Public Cloud are expected to grow.
- Current spending on Cloud services as an overall proportion of the IT budget is at less than 3% across the EU countries, but this figure is expected to rise to over 10% by 2020 (Baseline scenario).
- Ireland is leading the market here, with the structure and focus of its economy making it well placed to utilise Cloud based computing. By contrast Denmark, Finland and Italy are spending the least amount of their IT budget on Cloud and that is expected to remain the case until 2018.
- It must also be remembered that spend on Cloud computing is not all new spend, but is very often a replacement spend as organisations replace existing traditional IT systems and solutions with ones that are Cloud based. Also, as it is the case with most areas of a business, a large part of the overall IT budget is spent on staff costs for those tasked with keeping it all working and it will take time for the adoption of cloud based services to have a meaningful impact on these costs.

6.3. Impact of Cloud Adoption on the EU Economy

- Regardless of which scenario one considers, the adoption of Cloud by the Private Sector in the EU is expected to have a positive impact on the economy and the level of employment in the EU countries.
- Estimates for net additional GDP growth in the year 2016 resulting from the use of Cloud based computing services range from €53.9bn (Pessimistic) to €62.2bn

(Optimistic scenario) with a cumulative figure of somewhere between 864,600 (pessimistic) and 998,700 (optimistic) new jobs being created (cumulative for the period 2008-2016).

- Extending the year of focus to 2020 sees the GDP growth increase lying in the region of €65.4bn to €164.7bn in the year 2020. The cumulative number of new jobs created by 2020 is expected to be in the region of 1 million (pessimistic scenario) to 2.5 million (optimistic scenario).
- Clearly it is in the interest of all parties to create an environment that ensures as far as possible that the outcome is closer to the Optimistic end of the spectrum.
- The Optimistic forecast assumes that the current economic crises ends as soon as possible across all member states and the general underlying economic growth in the economy returns. It assumes that the structural reforms already proposed are executed by the member states, which in turn creates growth of consumption and investments in the economy.
- A fundamental part of the Cloud computing model is the ability for users to be able to gain access to a reliable and fast Internet connection. Without it, the Cloud model starts to break down or even become untenable. Actions by the European Commission to ensure this is achieved are already in place, but pressure must continue to deliver on the requirements. Some Member States are setting levels of acceptable broadband performance at less than 10Mb/sec whilst in some parts of Asia the target speed being set by the Government is 1Gb/sec. Whilst there are many reasons why 1Gb/sec is not an achievable level in Europe in the medium term, it does show that without a higher target being delivered, European businesses will be at a disadvantage on the global stage and not reap the full potential of technology investments, including the adoption of Cloud based solutions.

6.4.Competitiveness of EU Cloud Industry

- The Public Cloud market is dominated by US vendors and though there are strong and innovative Public Cloud providers in Europe, this dominance will continue, though it may lessen to some degree over time as the market matures.
- The main factor helping US Public Cloud vendors is the strength of their home market which enabled the successful US vendors to gain a large revenue base and considerable practical experience before they exploit overseas markets.
- However, there are other factors, including the availability of skilled staff, that give US vendors an advantage over European vendors, and though these advantages are reducing over time, they will not disappear.
- The scale of the market leading Public Cloud providers has made them household names and with some of those providers also targetting the consumer market and adopting very aggressive pricing strategies, the ability for a EU based provider to turn the tide and achieve anything like the same level of dominance is unlikely.
- By contrast, US vendors have fewer if any factors that distinguish them from their European competitors in the hosted Private Cloud market. Indeed, as has been the case with the traditional IT services market, their lack of a strong local presence close to their customers may actually prove to be a disadvantage. So vendors that have existing customer relationships, in particular through (but not only) the provision of outsourcing and hosted services, are achieving success as customers look to migrate from traditional to cloud based solutions.

7. ANNEX A - TOP 100 EUROPEAN CLOUD SERVICE PROVIDERS – 2013 REVENUES

#	Name	2013 EU Revenues €m	Share
1	Salesforce.com	885.92	6.9%
2	Amazon.com	771.89	6.0%
3	Microsoft	354.21	2.8%
4	Google	302.52	2.4%
5	Oracle	259.58	2.0%
6	IBM	256.60	2.0%
7	Adobe	224.98	1.8%
8	SAP	214.34	1.7%
9	Symantec	204.71	1.6%
10	GXS	179.07	1.4%
11	Cisco	160.84	1.3%
12	Visma	154.55	1.2%
13	HP	152.51	1.2%
14	ServiceNow	124.06	1.0%
15	Citrix	108.45	0.8%
16	T-Systems	107.24	0.8%
17	SmartFocus	105.27	0.8%
18	Concur Technologies	97.72	0.8%
19	Unit4	86.58	0.7%
20	Cegid	75.20	0.6%
21	IntraLinks	73.78	0.6%
22	ADP	72.32	0.6%
23	Zoho	71.91	0.6%
24	Zucchetti	69.79	0.5%
25	Wolters Kluwer	66.15	0.5%
26	Lumesse	63.30	0.5%
27	SDL International	58.73	0.5%
28	EG	57.86	0.5%
29	RackSpace	56.29	0.4%
30	iTradeNetwork	55.01	0.4%
31	Cornerstone OnDemand	54.88	0.4%
32	Dropbox	53.91	0.4%
33	Fujitsu	53.87	0.4%
34	EMC	52.49	0.4%
35	Thunderhead	52.29	0.4%
36	Workday	51.68	0.4%
37	Mimecast	50.99	0.4%
38	Veeva Systems	50.81	0.4%
39	DemandWare	48.21	0.4%
40	AFAS ERP Software	47.12	0.4%
41	Bazaarvoice	43.61	0.3%
42	Exact	40.79	0.3%
43	LivePerson	38.21	0.3%
44	Qualys	36.03	0.3%
45	Hubwoo	35.95	0.3%
46	Vocus	33.45	0.3%
47	NetSuite	33.17	0.3%
48	e-conomic	32.05	0.2%

49	Blackboard	31.38	0.2%
50	SupplyOn	31.21	0.2%
51	Esker Software	30.98	0.2%
52	Sopra Group	30.77	0.2%
53	ExactTarget	30.43	0.2%
54	Medidata Solutions	30.23	0.2%
55	Neolane	29.97	0.2%
56	Responsys	28.44	0.2%
57	Compuware	26.65	0.2%
58	CA Technologies	25.92	0.2%
59	CenturyLink	24.70	0.2%
60	Cegedim	24.52	0.2%
61	Apple	24.28	0.2%
62	BT Global Services	23.78	0.2%
63	Peoplefluent	22.24	0.2%
64	SAS	22.00	0.2%
65	Jive Software	21.93	0.2%
66	CompuGroup Medical	21.18	0.2%
67	Talentsoft	21.17	0.2%
68	BigMachines	20.97	0.2%
69	Mendix	20.74	0.2%
70	Fiberlink Communications	20.16	0.2%
71	Box	19.23	0.1%
72	Colt	18.68	0.1%
73	Evault	18.35	0.1%
74	Dimension Data	17.69	0.1%
75	Telefonica	17.41	0.1%
76	SumTotal	17.19	0.1%
77	Engine Yard	16.87	0.1%
78	Blackbaud	16.17	0.1%
79	BMC	16.08	0.1%
80	Verizon	15.91	0.1%
81	Saba Software	15.76	0.1%
82	Keynote Systems	14.99	0.1%
83	Generix Group	14.96	0.1%
84	Liaison	14.05	0.1%
85	New Relic	13.59	0.1%
86	Xero	13.23	0.1%
87	Meta4	13.12	0.1%
88	Constant Contact	12.77	0.1%
89	CSC	12.63	0.1%
90	Sage	11.99	0.1%
91	Aditro	10.65	0.1%
92	Callidus Software	10.59	0.1%
93	Flexera Software	10.40	0.1%
94	Logicalis	10.35	0.1%
95	Rightscale	10.07	0.1%
96	Navisite/TimeWarner	10.02	0.1%
97	Informatica	9.60	0.1%
98	TIBCO	9.50	0.1%
99	Jaspersoft	9.46	0.1%
100	GT Nexus	9.24	0.1%

8. ANNEX B - METHODOLOGICAL ANNEX

IDC's European vertical markets survey methodology

Conceptual Framework

IDC's European Vertical Markets Survey 2013 is a landmark study of IT solutions, investment priorities, and emerging technologies in over 70% of the European economy. In conjunction with other IDC research, it is fully projectable across countries, industries, and size classes, and offers an unprecedented view of solutions and emerging technologies adoption and issues around Europe. Themes include horizontal solutions (including ERP, CRM, unified communications, document life-cycle, business intelligence and analytics, and storage technologies), security, industry-specific solutions, mobile solutions, cloud, social media, big data, and M2M communications or IoT solutions.

Sample Design

Sampling Unit: IDC's Definition of "Company"

IDC selected the company (or organization) as the sampling unit. For the purposes of IDC's European Vertical Markets and SMB research, a company refers to a legal or social entity, or a group of entities, that engage(s) in activities and transactions (such as the purchase of IT goods and services) in its/their own right. The requirements of a company are that it has one ownership or control. It can be heterogeneous with regard to its economic activity and its location. It has legal, administrative, or fiduciary arrangements, organizational structures, or other parties having the capacity to efficiently allocate resources to achieve objectives. Examples include corporations, non-profit institutions, and government agencies. When the enterprise is a single-location organization, the concepts of company and local unit/establishment coincide.

Sample Quotas

The sample quota consisted of 361 interviews for the U.K., France, and Germany (major sample quotas) and 253 for Italy and Spain (minor sample quota).

Major and minor sample quotas were established by vertical market and company size. Vertical markets were defined according to the NACE coding system. Company sizes were based on the number of personnel employed and are aggregated into the following segments: 10–99, 100–249, 250–499, 500–999, and 1,000+.

Sample Frame and Sampling Method

The sample frame was obtained from a list source representative of the entire local market, regardless of computerization. List sources grouped vertical markets according to the standardized industries (based on NACE codes). A stratified sampling method (representative of the population sectors' distribution in each country) without replacement was used, with organizations with more than 10 employees selected randomly within each vertical/size cell.

A predetermined number of interviews were completed in each company size and industry category to ensure an adequate confidence interval (95% confidence interval) to report on for each size and industry group by country.

IDC attempted to meet sample quotas +/-5% of interviews. Actual completes were above targets for most of verticals, company sizes and countries.

TABLE 27 QUOTAS AND NUMBER OF COMPLETES BY VERTICAL MARKET

Vertical Markets	Quotas	Completes
Banking	45	55
Insurance	32	32
Other finance	29	24
Manufacturing	211	215
Healthcare	170	179
Telecommunications	57	57
Media/Broadcasting	91	99
Transport	43	45
Utilities	119	119
Oil and gas	35	38
Retail	200	209
Wholesale	12	12
Business services	218	228
Local government	170	177
Central government	100	103
Education	56	59
Total	1588	1651

Source: IDC European Vertical Markets Survey, October 2013

TABLE 28 QUOTAS AND NUMBER OF COMPLETES BY SIZE

Size	Quotas	Completes

Size	Quotas	Completes
10–99	209	227
100–249	257	262
250–499	285	293
500–999	367	383
1000+	470	486
Total	1588	1651

Source: IDC European Vertical Markets Survey, October 2013

TABLE 29 QUOTAS AND NUMBER OF COMPLETES BY COUNTRY

Country	Quotas	Completes
U.K.	361	377
Germany	361	375
France	361	378
Italy	253	261
Spain	252	260
Total	1588	1651

Source: IDC European Vertical Markets Survey, October 2013

Respondents and Eligibility

Eligible respondents were, at each organization, the individuals best qualified to answer questions about the overall IT strategy and activities of the organization in the country. For medium/large organizations, the respondent was most likely the CIO, an IT director, or IT manager. For small organizations, it was more likely an IT manager or owner. A screening question determined eligibility. The interview was terminated if there were no PCs installed at the organization.

Interviews

The survey was conducted in the native language of each country. Interviews were conducted via a telephone format, which allowed trained interviewers to clarify some of the more complex questions to ensure accurate, meaningful responses. A computer-aided telephone interviewing (CATI) system, which permitted simultaneous interviewing and data entry, was used wherever possible. This system provided various automatic data checks and skip patterns, which occurred while the respondent remained on the line.

The field survey was carried out from August to the end of September 2013.

Confidence Intervals

The confidence interval of a distribution is a function of the sample number of respondents and the distribution's variation. Considering a categorical variable where the variation is highest (50% yes and 50% no), it is possible to establish a priori that a random sample generating proportional results from 100 cases will yield results within +/-9.8% of the estimated proportion at the 95% confidence interval. So, if 50% of all respondents are investing in a new technology, then a 95% confidence interval will be within 40.2% and 59.8%. That is, if the same question was asked again and again to different samples, 95% of the time the confidence interval from 40.2% to 59.8% will hold the true population proportion. As the sample size increases, the interval shrinks. As the proportion becomes closer to either 0% or 100%, thereby indicating less variation, the interval shrinks. Actual intervals for specific questions may vary due to variations in sample size. With a sample of 1,000 cases, the 95% confidence interval will be between 46.9% and 53.1%.

Analysis of the Data

SPSS was used to analyze the data collected.

The survey comprised both categorical and interval measurement variables. The categorical variables, such as the vertical market one, were re-coded by SPSS as numeric (for example, the values "yes" and "no" were re-coded as 1 and 0). For the categorical variables the analysis was made using a cross-tabulation between the vertical markets and the variable. The cross-tabulation analysis gives the distribution of the vertical market among the categories of the observed variable (for each market the sum of the distribution of the categories is 100%) and the overall distribution. For the interval measurement variables, such as the percentage breakdown of ICT budgets across external IT spending, internal IT spending, and telecom services spending, IDC's data indicates both the mean values of the variable among the vertical markets and the overall mean.

KK-04-15-068-EN-N

European Commission

Uptake of Cloud in Europe.
Follow-up of IDC Study on Quantitative estimates of the demand for Cloud Computing in Europe and the likely barriers to take-up

Luxembourg, Publications Office of the European Union

2014 – 84 pages

ISBN 978-92-79-45436-3
DOI: 10.2759/791317

DOI: 10.2759/791317 ISBN 978-92-79-45436-3