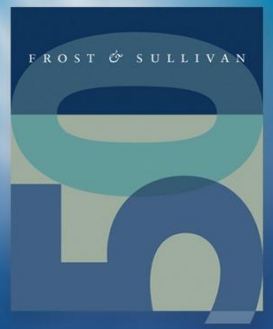
Cloud Computing in the European Banking Sector

Banks' Adoption of Cloud Will be Limited to Private Clouds



9A68-67

February 2013

FROST & SULLIVAN

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Executive Summary

Research Objectives, Scope, and Methodology

Objectives

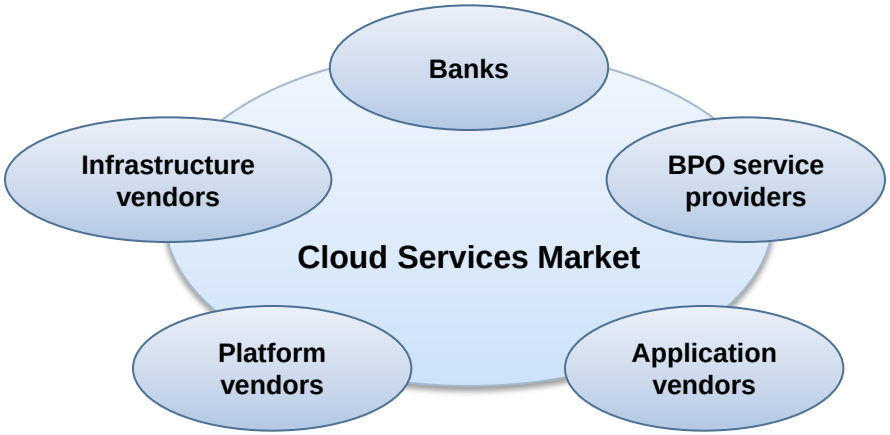
- This presentation seeks to provide a market and technology analysis of the latest trends across the European cloud computing services market (hereinafter referred to as cloud services market).
- It also intends to offer strategic recommendations to key stakeholders within the cloud services market across Europe.

Geographic Scope

Europe

Ecosystem Scope

Europe



Research Methodology

- Primary research: Interviews were conducted with key stakeholders within the European cloud services market.
- Secondary research: Frost & Sullivan research services, online databases, market participants' reports, and industry study groups were also utilized while compiling this study.

Source: Frost & Sullivan analysis.

Key Study Findings

- The adoption of cloud computing in the European banking system is still in its infancy. A majority of cloud services projects for banks have been focused on private clouds.
- Frost & Sullivan believes that in the long term, more and more banks will migrate to a private cloud arrangement, and banks with more experience and expertise in the cloud will adopt a hybrid cloud arrangement.
- From a service delivery model standpoint, infrastructure-as-a-service and software-as-a-service dominate cloud services for banks. Typically, banks are using the cloud for non-core, non-differentiation systems such as enterprise communications, document storage and management, and highly consuming computational power simulations.
- Frost & Sullivan believes that cloud computing will play a fundamental role in the development of banking services through the digital channels (e.g., smartphones, tablets, and PCs).
- European banks have excluded core banking from any cloud services projects until now. Frost & Sullivan believes that there is no intention from banks to change the status quo. Regulatory and security compliance, costs and risks of core banking migration, and the low value added by the cloud to core banking are the main reasons behind banks' decision to maintain core banking outside the cloud.
- Frost & Sullivan's research indicates that the willingness of banks' IT managers, IT department directors, CIOs, CTOs, or COOs to engage in a cloud initiative is a decisive factor in the "go/no-go decision" to move banks' systems to the cloud.

Source: Frost & Sullivan analysis.

Market Definitions

Market Definitions

- **Cloud Computing**: This is the delivery of IT capabilities over the Internet. An in-depth definition is provided in the Introduction to Cloud Computing section.
- **Virtualization**: This is the development of a virtual version of infrastructure or part of the infrastructure. As a result, multiple running execution environments can be run in a single resource from the infrastructure.
- Cloud computing and virtualization are thus two different concepts. Both cloud and virtualization deliver a more efficient usage of computing resources, but they are fundamentally different.
- Cloud computing can be enhanced through virtualization, but cloud computing can be achieved without virtualization.
- **Core, Differentiation Banking Systems**: This includes all systems that, due to regulatory or business reasons, are fully owned and managed by the banks. These systems typically include core banking, functional systems (for consumer banking, corporate banking, treasury, and payments), risk management systems, and customer information management systems. The scope of core, differentiation banking systems may vary from one bank to another.
- **Non-core, Non-differentiation Banking Systems**: This includes all systems that deliver common services across the bank, such as HR systems, enterprise communications (collaboration) systems, and IT development systems. The scope of non-core, non-differentiation banking systems may vary from one bank to another.

Source: Frost & Sullivan analysis.

Introduction to Cloud Computing

Definition of Cloud

- Frost & Sullivan defines cloud computing as the delivery of IT capabilities (in the form of storage, computing power, software development environments, applications, or entire business processes) over the Internet.
- Below, Frost & Sullivan lists key features that characterize cloud computing-based (cloud-based) services:
  - **Shared**: A number of either end users within the same company or different companies share the same service.
  - **Flexible**: A company can scale up and scale down its consumption of IT capabilities rapidly (much faster than deploying the same IT capabilities in-house).
  - **"Pay-per-use"-based**: A company pays only for those services that it consumes.
  - **Self-service:** Users serve themselves.
- **Accessible through Standard User Interfaces (UIs) Technologies and Common Application Programming Interfaces (APIs)**: By leveraging standard UI technologies or common APIs, cloud service vendors aim to provide a satisfactory end-user experience as well as facilitate the interoperability of their services with other information systems.

Source: HP, Frost & Sullivan analysis.

Cloud Types

There are three different type of clouds:

Private Cloud

- **Single Tenancy:** The cloud-computing resources are dedicated solely to a single enterprise.
- **On Premises:** The cloud computing resources are located on the enterprise's premises.
- Either the enterprise or the vendor can manage the cloud services.

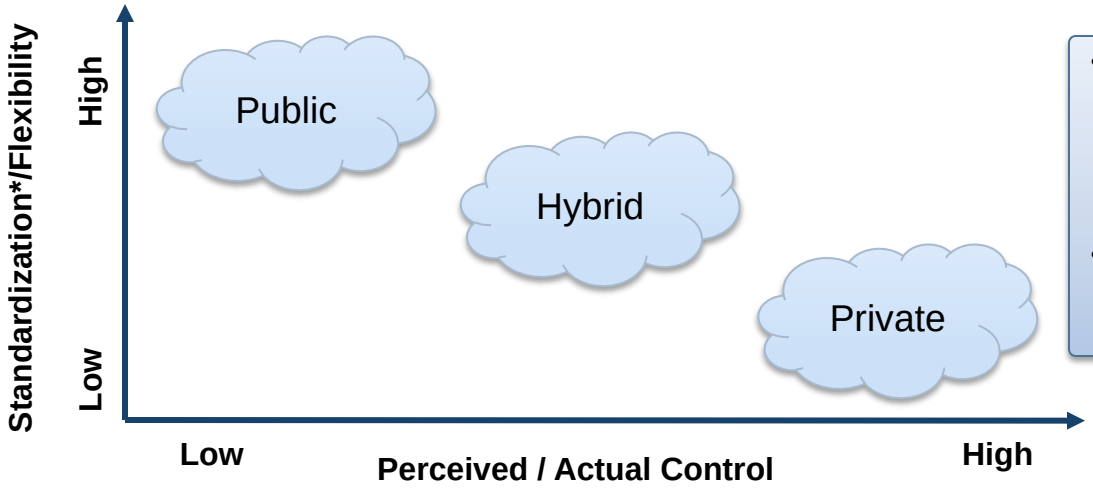
Public Cloud

- **Multi-tenancy:** The cloud-computing resources are delivered to multiple clients.
- **Off Premises**: The cloud computing resources are located on the vendor's premises.
- The vendor manages the cloud service.

Hybrid Cloud

- This is a combination of public and private clouds.
- Some cloud-computing resources are in the private cloud, and some others are in the public one.

Cloud Services Market: Cloud Types' Comparative Flexibility and Standardization, Global, 2011

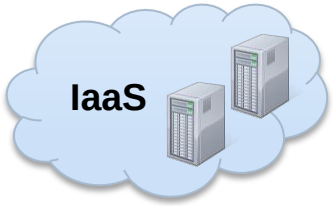


- Enterprises face a trade-off between the degree of standardization and flexibility of their cloud services and the perceived/actual degree of control of the service.
- Typically, a public cloud service is highly standardized and flexible, but the degree of control of the service is low.

*Standardization is at a cloud service level, not at an enterprise level. Source: Frost & Sullivan analysis.

Cloud Service Delivery Models

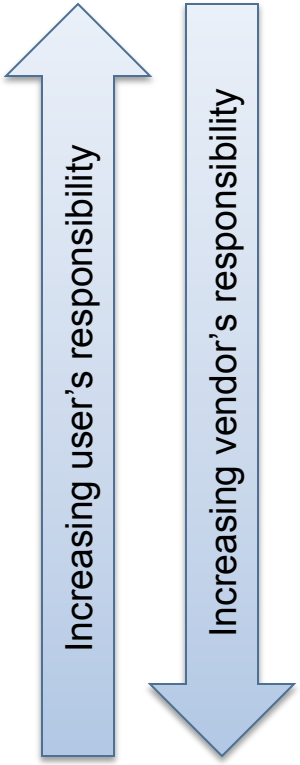
- Frost & Sullivan's research indicates that a majority of cloud services vendors agree about the existence of three main service delivery models: infrastructure as a service (IaaS), platform as a service (PaaS), and software as a service (SaaS)*.
- As their names imply, each service delivery model provides different IT capabilities. Frost & Sullivan provides the definitions of IaaS, PaaS, and SaaS for this research service below:



- Servers, datacenter space, and operating system software are delivered as a service.
- Typically, IaaS allows enterprises to use computing power or storage space on demand.

- Platforms for development, testing and storage of applications, interfaces, and databases are delivered as a service.
- PaaS enables enterprises to use a fully functional computing platform with utilities to maintain and develop applications.

- Applications and their related data are delivered as a service.
- SaaS provides enterprises access to specific software over the network.



*Various cloud service providers include business process as a service (BPaaS) as a fourth service delivery model. Source: Frost & Sullivan analysis.

Adoption of Cloud Computing in the European Banking Sector

Banking Systems by Cloud Type

- Frost & Sullivan has found that the nature of a bank's system and the bank's need for perceived and actual control or security of the system's data determine the type of cloud it will use.
- As of now, challenges related to security, regulatory compliance, technical feasibility, and IT departments' engagement make it difficult to migrate banks' systems to a public cloud.
- From a technology vendor's standpoint, the split of banks' systems by cloud types is as follows:

Cloud Services Market: Private, Public, and Hybrid Clouds in Banking from Technology Vendors' Perspective, Europe, 2011

Private

- This increases the efficiency and standardization of systems at a bank level.
- It allows customization of the bank's systems vis-à-vis other banks' systems.
- It is typically used for core, differentiation systems that can benefit from the cloud but must comply with specific regulatory, privacy, or security requirements.

Public

- This reduces costs and increases flexibility. In particular, it allows banks to avoid large capital expenses.
- It standardizes the bank's systems vis-à-vis other banks' systems.
- It is typically used for non-core, non-differentiation systems.

Hybrid

- Technology vendors envision that banks will opt for hybrid clouds only in the long term.
- Banks will keep unique, core, or differentiation systems in-house or in a private cloud, and common or non-differentiation systems in a public cloud.
- Hybrid clouds will combine the advantages of both private and public clouds.

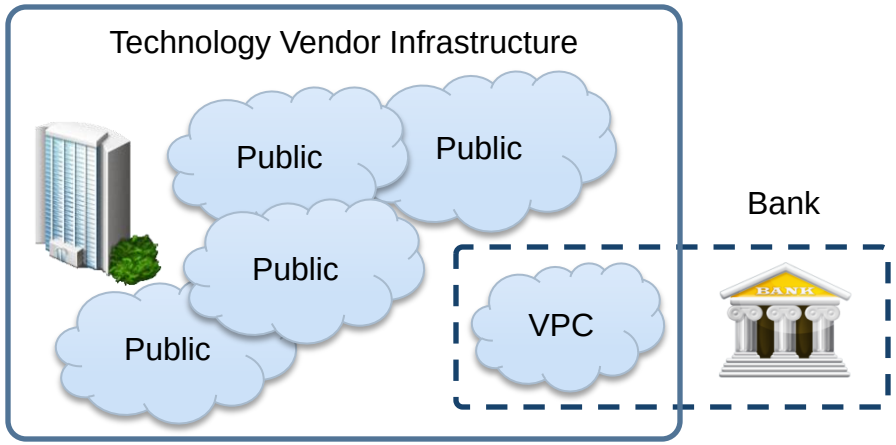
Until now, European banks have mainly shown interest in moving some of their systems to private clouds

Source: Frost & Sullivan analysis.

Emergence of Virtual Private Clouds

- Private clouds have some positive effects, because banks still need to invest in the setup and maintenance of the infrastructure. Moreover, private clouds offer limited flexibility.
- Considering the limitations of private clouds and the fears of moving to a public cloud, technology vendors have increasingly focused on fostering their virtual private cloud solutions.

- Virtual private clouds (VPC) are a section of a public cloud fully dedicated to a bank, providing it full control over the networking environment.
- The bank can also manage certain aspects of the cloud, such as capacity of the storage or number of users.
- The bank, however, cannot change the core service features delivered by the technology vendor.



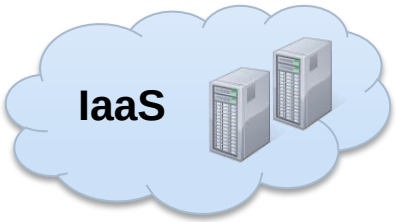
- Based on primary research, Frost & Sullivan believes that virtual private clouds will play an important role for non-core, non-differentiation banks' systems in the short and medium term.
- Moreover, the use of private clouds can potentially pave the way for banks to move certain systems to public clouds.

Source: Frost & Sullivan analysis.

Banking Systems by Cloud Service Delivery Model

From a cloud service delivery model perspective, Frost & Sullivan's research indicates that IaaS cloud services for computing power and document storage and SaaS cloud services for specific non-core applications represent the immediate opportunities for technology vendors and European banks.

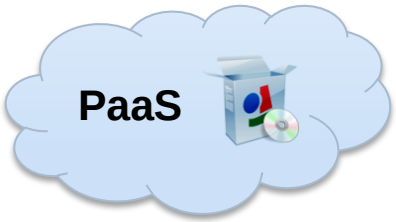
Cloud Services Market: IaaS, PaaS, and SaaS in Banking, Europe, 2011



Document management and storage

Computing power for simulations

Development and testing environments



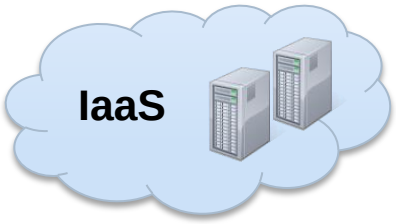
Banks tend to latch on to the concept of only using platforms in-house.

Collaboration tools

Digital channel services

Source: Frost & Sullivan analysis.

IaaS Cloud Services—Immediate Opportunities



Document management and storage

The hassle of sharing, managing, and storing various documents can be eliminated through (virtual) private clouds. The cloud service can be enhanced by including a system of access rights. The implementation can be at a bank level or at an inter-bank level, the latter being more challenging.

Computing power for simulations

A low-priority but high-consuming computing power application can be moved to the cloud to improve the performance of the application itself and reduce the load of the bank's own infrastructure.

Development and testing environments

A particular type of high-consuming computing power applications is development and testing environments. IaaS can enable banks' IT departments to test new products/services under extreme conditions. To obtain genuine results, it is key that the rented infrastructure replicates the features of the banks' own infrastructure.

Source: Frost & Sullivan analysis.

Case Study: Bankinter and Amazon Web Services

- Bankinter, a Spanish bank, runs multiple credit-risk simulations, about 5 million, to obtain truthful results.
- The average time to run these simulations in their own infrastructure was about 23 hours (including several pauses while other critical applications were running).
- Bankinter could reduce the average time to run the credit-risk application to 20 minutes by using Amazon Elastic Cloud Compute.
- The company not only could significantly reduce the average time, but also could increase the number of simulations, making the results much more reliable.

bankinter.

amazon web services

After following strict encryption procedures, more and more banks can move high-consuming computing power applications to the cloud to increase operating efficiency or release their own infrastructure from overloads.

Source: Amazon Web Services, Frost & Sullivan analysis.

SaaS Cloud Services—Immediate Opportunities

Collaboration tools

Video conferencing, instant messaging, and other enterprise communication services are perfect candidates to move to the cloud. The cloud provides a bank-wide standardization of communication services, and it enables an increasing mobile workforce to communicate.
About 71 percent of enterprises (including banks) in the European, Middle Eastern, and African regions say that 25 percent or more of their workforce have mobile devices.

Digital channel services

With the proliferation of mobile devices, the delivery of banking services (mobile banking, mobile payments) through tablets and smartphones has become a priority for banks.
Given that all new modern devices are Internet-enabled, cloud computing becomes the cornerstone of the service. Cloud computing provides the needed flexibility, enabling the service uptake to increase rapidly.

Source: The 2011 (ISC)² Global Information Security Workforce Study, Frost & Sullivan analysis.

Case Study—PKO Bank Polski and HP

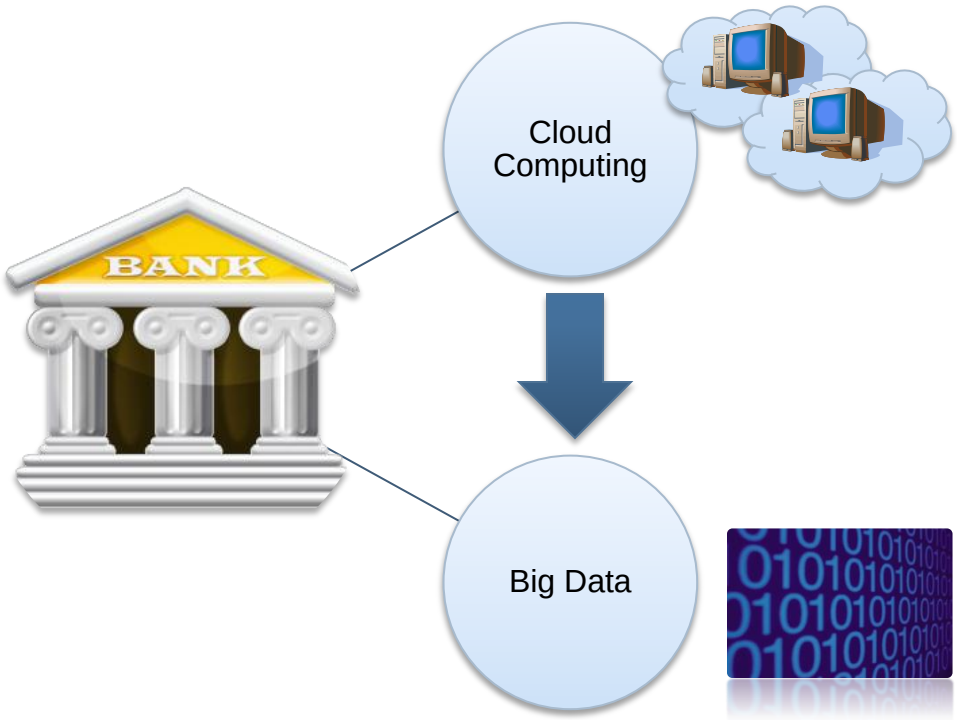
- After commanding the rollout of contactless cards in Poland, PKO BP was said to be considering launching a near field communication (NFC)-based mobile payment (m-payment).
- Instead, PKO BP decided to launch an Internet-based payment in the fourth quarter of 2012.
- HP was the service integrator of the project, which included a Swedish company responsible for developing the m-payment application.
- The authentication of end users and authorization of transactions are carried out over the cloud. Assuming the adoption of m-payment service abruptly increases, PKO BP and HP will have the infrastructure in place to respond to the rising demand.

The cloud is ideal for new products and services, not only at the development and test phase, but also at the launch and growth phases, as it provides the necessary flexibility.

Source: Frost & Sullivan analysis.

Big Data and the Cloud

- Once a bank migrates one or various systems to the cloud, the “next” logical step is the usage of big data tools to improve decision making.
- The most attractive applications of big data are at the front end, namely CRM systems and social media, to improve the bank’s cross-selling and up-selling opportunities.
- However, Frost & Sullivan has found that the adoption of big data at the front end remains low. This is mainly because of:
  - The adoption of the cloud in the European banking sector is still limited.
  - The information of the different customer interaction channels is often still in silo.
- Based on the result of Frost & Sullivan’s analysis, big data applications at the back end (for detecting and/or preventing fraud, and improving risk management) have been the focus of efforts of European banks to date.



Source: Frost & Sullivan analysis.

Core Banking and the Cloud

- Frost & Sullivan's research indicates that there is no cloud-based core-banking implementation in Europe. Banks have demonstrated little to no interest in cloud computing.
- The furthest a bank gets with cloud computing is to ask its core banking platform vendor whether it could possibly migrate to the cloud in 10 years' time.
- From a technology vendor perspective, few vendors have worked on "cloudifying" their core banking solution. Those vendors that have cloudified their solution target it mainly to emerging countries.
- Why European banks are not—and will be not be—interested in cloud-based core banking:

Regulatory and Security Compliance: Banks' core banking platform must comply with strict regulations from both European and local bodies. Ensuring compliance with regulations through the current SLAs with technology vendors would make such a migration impossible.

Migrating Costs and Risks: The process of migrating to a **new core-banking platform** is usually prohibitively expensive and risky. The migration to a **cloud-based core banking platform** can only be more complex and costly.

Low Added Value of the Cloud: The usage of a core banking platform, for a well-established bank, is rather predictable. Banks can foresee how many resources a core banking platform will consume, and thus plan accordingly.

Source: Amazon Web Services, Frost & Sullivan analysis.

Market Overview of Cloud Services in the European Banking Sector

Customer Segmentation

- The results of the primary research indicate that neither a bank's size (measured in terms of the value of its assets) nor its geographical footprint play a role in defining the readiness of the bank to adopt cloud services.
- The determining variable that shows a bank's readiness is the willingness of its IT managers, IT department directors, CIOs, CTOs, or COOs to engage in a cloud initiative.
- Frost & Sullivan has identified some European banks that are already involved in cloud initiatives:

BARCLAYS	Barlcays has launched a private cloud-based person-to-person (P2P) m-payment service. Three months after initiating the service in February 2012, Barclays stated that the application had been downloaded more than 800,000 times and the value of transactions almost reached EUR 12.3 million (GBP 10 million). Frost & Sullivan believes that the cloud approach was fundamental to supporting the rapid expansion of the m-payment service.
BBVA	BBVA has migrated from its previous email system to the Google Apps Business suite, which includes cloud-based productivity and collaboration apps such as Gmail, Google Calendar, Google Chat, and Google Video. The migration involves 112,000 employees in 26 countries and is expected to be completed by the end of 2012.
ING	ING envisions building a large hybrid cloud. The company has already built a private cloud, on which about 5 percent of its applications are run, mainly utility applications. The bank has firstly focused on the virtualization of its infrastructure and it has a clear strategy to expand the footprint of cloud services.

To drive adoption of cloud services, technology vendors should target their marketing strategies at banks' IT decision makers to understand their needs, address their concerns, and demonstrate the added value of the cloud.

Source: Frost & Sullivan analysis.

Regulatory Framework for Cloud Computing in the European Union

- From a regulatory standpoint, the European Commission (EC) has developed a strategy that fosters the development of cloud services in the European Union (EU).
- The EC believes that a proactive role from regulators will positively affect the development of cloud computing. The EC aims to tackle the challenges faced by cloud computing in three areas:

Division of the Digital Market	• The EC has established the European Cloud Partnership (ECP). • The ECP will be responsible for recognizing public sector cloud requirements, and accordingly developing terms for IT procurement. The ECP will also assist European public bodies in joint procurement initiatives. • It is believed that the private sector, including banking, will benefit from the ECP initiatives, which will ensure an interoperable, transparent, and highly competitive market among cloud service providers.
Contracts and Agreements	• Enforcing a cloud services contract has been regarded by market participants as difficult, and this perception has deterred the adoption of the cloud. • To correct this, the EC expects to formulate, in conjunction with key stakeholders, model terms and conditions for SLAs of cloud-based services. • The EC will also review various clauses on data protection to ensure the participation of Europe in the global growth of cloud computing.
Standards	• The EC will support the research and work of various European and international standards bodies to identify, develop, and promote specifications and certifications in the field of cloud computing. • The ultimate aim of the EC is to foster an interoperable cloud-services market and to avoid issues of cloud-services related to vendor lock-ins, data portability, and reversibility.

Source: European Commission, Frost & Sullivan analysis.

Regulatory Framework for Cloud Computing in the European Banking Sector

- Frost & Sullivan believes that the measures adopted by the EC will support the overall development of cloud services in Europe.
- At the banking sector level, Frost & Sullivan argues that the EC's initiative could bring the following benefits:

Feasibility of a Multi-vendor Strategy: One of the key priority of banks is to avoid vendor lock-ins. As the market matures and the relevant regulations enter into force, banks will be incentivized to migrate certain systems to the cloud.

Enforcement of SLAs: Another pain point signaled by banks is the complexity of developing a contract with specific SLAs. The EC's work will assist banks and service providers in better formulating SLAs. However, further work will be required to adapt the general model of terms and conditions to the banking sector.

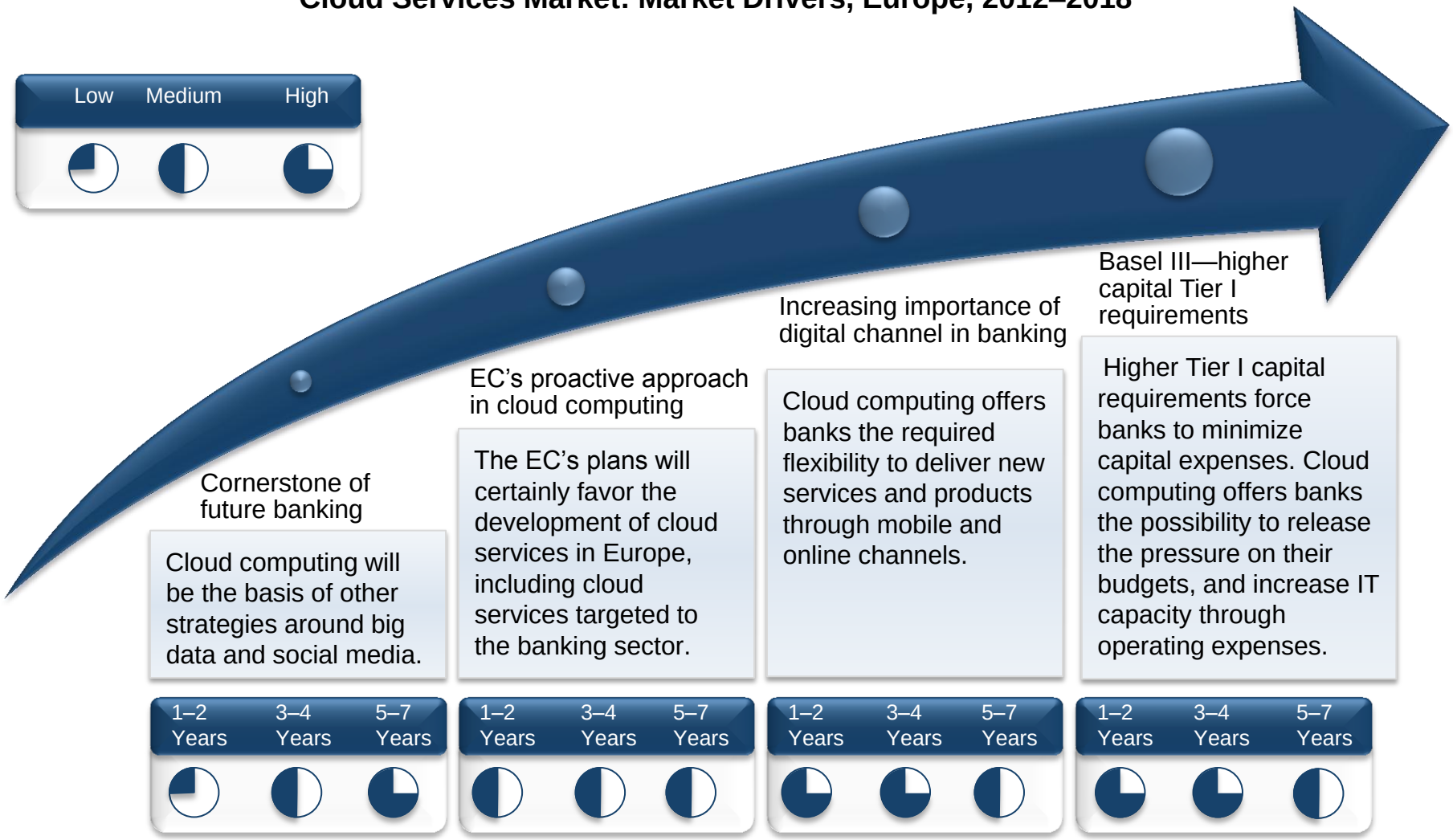
- Frost & Sullivan believes, however, that the abovementioned benefits will be limited to increasing the uptake of cloud-based non-core, non-differentiation banking systems. In regard to core, differentiation banking systems, banks will have little to no incentive to move to the cloud.
- Although a majority of national financial services authorities have not explicitly regulated cloud computing in financial services, cloud services (and their corresponding data processing) would fall into the category of "outsourcing."
- Technology vendors interested in serving the banking sector will have to comply with the current regulations for outsourcers, as well as data processors from local financial services authorities and national data protection laws, respectively.

Source: Frost & Sullivan analysis.

Market Outlook

Market Drivers

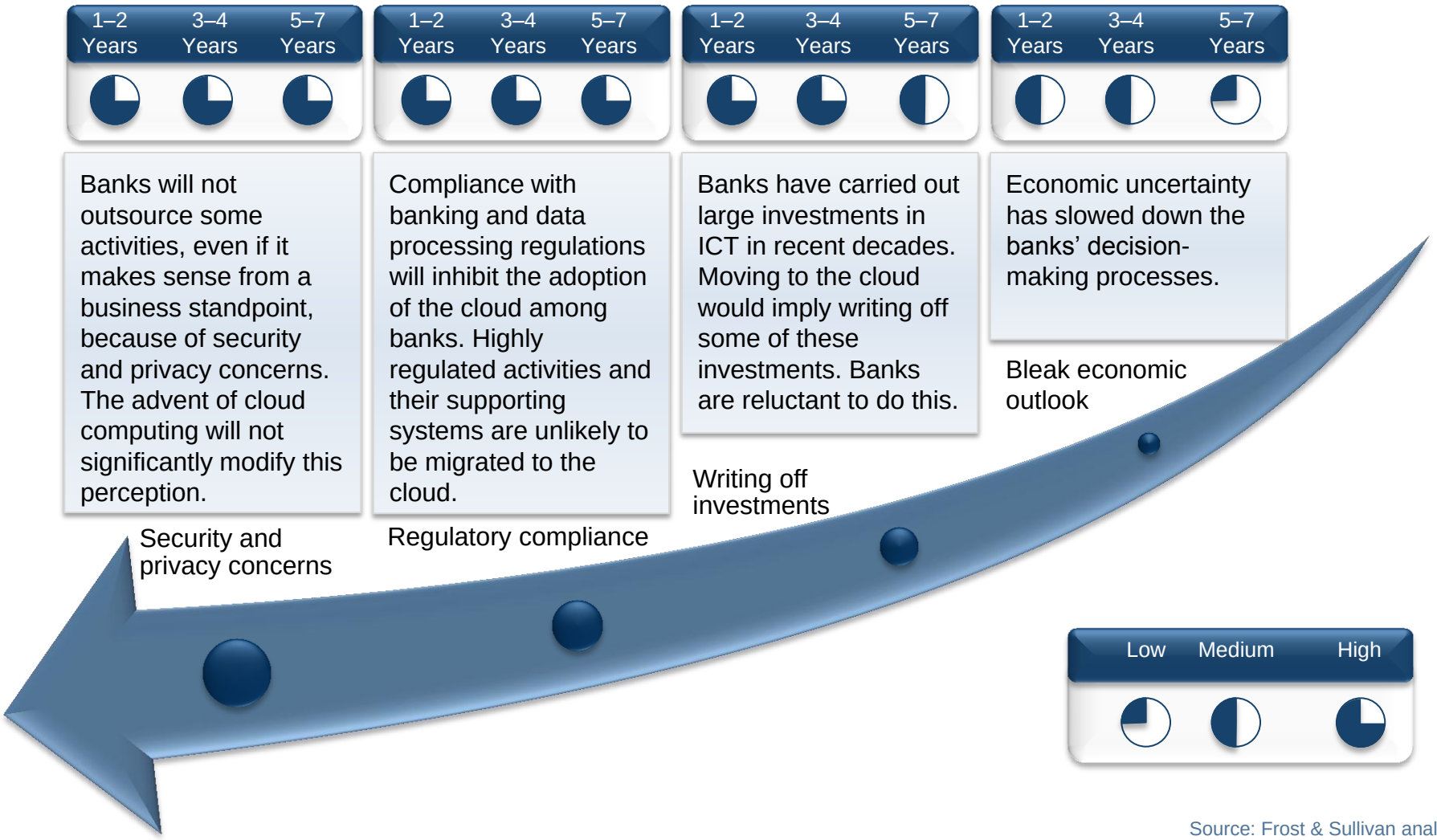
Cloud Services Market: Market Drivers, Europe, 2012–2018



Source: Frost & Sullivan analysis.

Market Restraints

Cloud Services Market: Market Restraints, Europe, 2012–2018



Source: Frost & Sullivan analysis.

Future of Cloud Services in European Banking

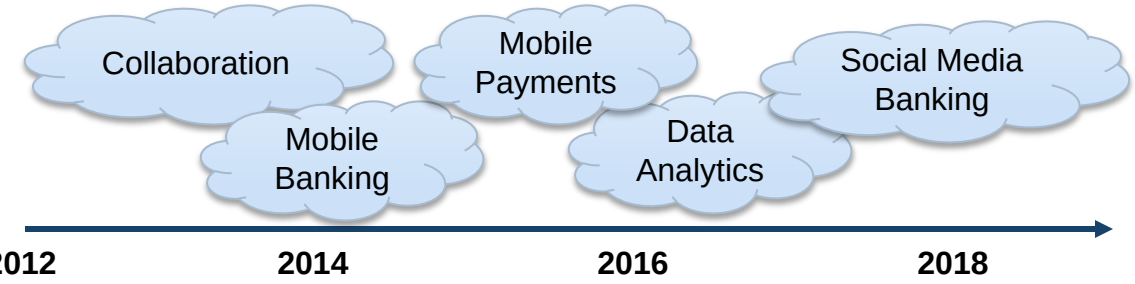
- Cloud service vendors agree on the steps an industry must take to adopt the cloud:

1. Consolidation of the datacenter(s)
2. Virtualization of the datacenter
3. Transformation of information systems for the cloud

The consolidation of datacenters in the European banking industry is today a reality.

- Even though European banks have consolidated their datacenters, Frost & Sullivan believes that the adoption of cloud services will be mainly limited to private clouds delivering non-core, non-differentiation systems.
- In the long term, the most interesting applications are around big data and social media. However, banks still need to integrate their siloed channel information management systems before moving to the cloud.

Cloud Services Market: Adoption of Selected Cloud Services in Time, Europe, 2012–2018



Banks are unlikely to move core banking applications to the cloud over the next five years.

Source: Frost & Sullivan analysis.

Competitive Landscape

Competitive Landscape

- The competitive landscape of common cloud services and banking sector-specific cloud services is to a great extend the same.
- The competitive landscape is characterized by the presence of well-established telecom and IT service providers. Below, Frost & Sullivan provides a high-level analysis of these two types of service providers.

Cloud Services Market: Competitive Landscape for Cloud Services Vendor, Europe, 2012–2018

Telecom Service Providers

- Key market participants from the region: BT, Deutsche Telekom, France Telecom.
- Value proposition: end-to-end solution, meaning that they provide IT services plus the network (connectivity).
- Comparative advantage: the efficiency of the network plays a fundamental role in delivering cloud services. Telecom service providers own the network, and thus have an advantage.

IT Service Providers

- Key market participants from the region: Accenture, Atos Origin, HP, IBM.
- Value proposition: in-depth IT knowledge. Depending on the type of IT service provider, they can further offer cloud-based business process outsourcing.
- Comparative advantage: Various IT service providers develop the infrastructure on which their services are run. Furthermore, they have expertise in system integration services, which is a key component in most of cloud services projects.

Further convergence will force technology vendors from the telecom and IT industries to compete for the delivery of cloud services in the banking sector.

Source: Frost & Sullivan analysis.

Competitive Landscape (continued)

- The adoption of cloud services will move many of the integration, development, and installation processes from the bank side to the service provider side.
- When it comes to defining their partners in a cloud service project, Frost & Sullivan believes that banks will continue being decision makers. But as the market matures, Frost & Sullivan believes that decision making will shift from the banks to the service providers.
- Hence, Frost & Sullivan believes that having in place the right partnerships will be a key success factor for service providers. Below, Frost & Sullivan provides high-level recommendations:

Telecom service providers:

- Partner with hardware vendors to build the underlying infrastructure of their services. The infrastructure should be made up of cutting-edge technology and offer some degree of differentiation from IaaS vendors that develop their own hardware.
- Partner with software vendors to offer bundled services (network + infrastructure + business applications). In the short and medium term, adoption of non-core, non-differentiation business applications will be stronger than that of specific banking applications.

IT service providers—Hardware/Service vendors:
Partner with software vendors to provide SaaS and PaaS service on the top of IaaS.

IT service providers—Business Process Outsourcing Services vendors:
Partner with hardware vendors to build the underlying infrastructure of their services.

Cloud computing changes the way IT services are delivered. Having the right partnerships will be a key success factor in the long term.

Source: Frost & Sullivan analysis.

Business Models

- The business models in the cloud are, in simple terms, described as “pay-per-use,” whether the end user is paying to use infrastructure, a platform, a business application, or a process.
- Typically, cloud service providers structure their business model in the following manner:

Initial/setup fee

- Although cloud service providers emphasize a “pay-per-use,” “pay-as-you-go” model, all of them charge a fee for setting up the service (IaaS, PaaS, SaaS).
- The value of the fee is, of course, attached to the complexity of setting up the service.

Pay-per-use fee

- Cloud service vendors use different variables to determine the “pay-per-use” fee. The variable depends on the nature of the service.
  - IaaS: the storage capacity or the computational power used in a certain period of time.
  - PaaS: the number of users that use the platform in a certain period of time.
  - SaaS: the number of users of/the number of transactions that are performed by the business application.

Fixed fee

- Various cloud service providers offer an option, whereby the end user pays a fixed fee for a fixed amount of resources delivered through the cloud. If an end user requires additional resources, it enters into the pay-per-use fee model.

Source: Frost & Sullivan analysis.

Market Consolidation

Mergers and Acquisitions

- Economies of scale are crucial to being profitable in the cloud services market.
  In contrast to other emerging technologies, cloud computing has been rapidly adapted by well-established IT and telecom service providers.
- Frost & Sullivan believes that mergers among large cloud service providers, in particular within the IaaS segment, are rather unlikely, as the market is already dominated by large market participants.
- Frost & Sullivan expects large cloud service providers to perform sporadic acquisitions of smaller yet innovate cloud service providers.
- Frost & Sullivan, however, does not expect large cloud service providers to acquire banking-specific cloud service providers, as the market for these solutions is still in its infancy.

New Entrants

- As the market matures, and banks increasingly adopt cloud services for non-core, non-differentiation systems, Frost & Sullivan expects that specific-banking software vendors that currently license their software for in-house use will “cloudify” their solutions and enter the cloud services market.
- Frost & Sullivan also projects the entrance of “true” cloud service startups for banking-specific systems in the long term.

The market structure of cloud services in banking is unlikely to significantly change over the next five years.

Source: Frost & Sullivan analysis.

Conclusions

Conclusions and Strategic Recommendations

Capture the immediate opportunities	Although cloud computing in the banking sector is currently a hot topic, Frost & Sullivan believes that massive adoption of cloud services is still three to five years away. The immediate opportunities for market participants are around IaaS (document management and storage, computing power for simulations, and testing and developing environments) and SaaS (collaboration tools and digital channel services).
Target IT decision makers at banks	Frost & Sullivan has identified that a determining variable that shows a bank's readiness for the cloud is the willingness of its IT managers, IT department directors, CIOs, CTOs, or COOs to engage in a cloud initiative. Hence, technology vendors should target their marketing strategies at banks' IT decision makers to understand their needs, address their concerns, and demonstrate the added value of the cloud.
Find the right partner	Frost & Sullivan believes that as the market for cloud services in the banking sector matures, the decision making of those who will be the partners in a given cloud services project will shift from the banks to the service providers. Hence, Frost & Sullivan believes service providers must form the right partnerships today to benefit from them tomorrow.

Source: Frost & Sullivan analysis.

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Appendix

List of Abbreviations Used

CAPEX—Capital Expenditures

CRM—Customer Relationship Management

EU—European Union

EC—European Commission

ECP—European Cloud Partnership

HR—Human Resources

IaaS—Infrastructure as a Service

ICT—Information and Communication Technologies

m-Payment—Mobile Payment

M-Banking—Mobile Banking

NFC—Near Field Communication

OPEX—Operating Expenditures

P2P—Person-to-Person

PaaS—Platform as a Service

PC—Personal Computer

SaaS—Software as a Service

SLA—Service Level Agreement

Source: Frost & Sullivan research.

The Frost & Sullivan Story

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Market	Global and regional market analysis, including drivers and restraints, market trends, regulatory changes, competitive insights, growth forecasts, industry challenges, strategic recommendations, and end-user perspectives.

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