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# Introduction:

## Cloud lit from within

Examining the challenges facing the banking industry as it seeks to maximise profitability in the digital age.

Cloud-based technologies are spreading rapidly through the business world: research firm IDC expects the cloud software market to be worth more than \$100 billion by 2018, implying compound annual growth of more than 21 per cent, roughly five times faster than traditional packaged software. So it is clear that cloud computing is on course to become an everyday part of the way that companies operate in the digital economy.

The benefits that this model brings are well known: an enhanced customer experience, higher availability of critical systems, reduced up-front investment in IT systems and resources, and the potential for lower running costs.

In a world where, as my colleague John Schlesinger argues, servers are about to stop getting cheaper, the advantages of cloud computing in terms of cost and customer experience look more compelling than ever. In the banking market, however, the spread of cloud systems has been slower than elsewhere due to factors including concern about data security, uncertainty about the position regulators will take on cloud technologies and the challenge of managing migration from the in-house, legacy IT systems that currently run banks' critical functions. According to a study by NTT Communications<sup>1</sup> in 2013, 71 per cent of chief information officers in financial services companies said they would adopt cloud if their legacy IT were less complex.

Cloud software vendors like Temenos, along with our platform partners and industry organisations, are working closely to address industry concerns. Coordinated efforts such as the Cloud Security Alliance and its Cloud Controls Matrix have set out industry principles for cloud vendors and assist prospective customers in assessing security risk at individual cloud providers. Cloud providers themselves are investing heavily in compliance and security expertise to the extent that many observers argue that a well-implemented migration to the cloud can result in higher levels of security than an in-house system, as well as access to real-time reporting mechanisms that are often superior.

Banks continue to be concerned that regulation remains unclear and in some instances, such as "data sovereignty", the rules may impede their ability to work with cloud providers whose data centres are located in a different jurisdiction. Capturing the benefits of cloud technologies in this environment is a complex challenge. However, cloud-computing platform providers serving the banking market continue to place the requirements of financial regulators at the heart of their strategy. In the case of Temenos's main platform partner, Microsoft Azure, customers are able to specify the geographic areas where their data is to be stored.

"The advantages of cloud computing in terms of cost and customer experience look more compelling than ever."

John Schlesinger, Chief Enterprise Architect at Temenos

While clear challenges remain to more rapid adoption of cloud-based technology in banking, that is not to suggest that no change is happening. Already, analysts at Gartner predict that by 2016, more than 60 per cent of global banks will process the majority of their transactions in the cloud. Many are already moving less sensitive functions there and developing strategies to enable them to capture the benefits of cloud-based systems for their core operations.

Among smaller players and new entrants adoption is advancing well, with many choosing cloud-based solutions which give them access to the latest generation of technology at lower upfront cost than an in-house system would incur. Our recent successes with Soficam<sup>2</sup> in Mexico and Euro Pacific Bank<sup>3</sup> are testament to this.

Research conducted for Temenos by the Economist Intelligence Unit<sup>4</sup> published this year found that the top priority among the banks over the next five years is implementing a digital strategy. Three trends they expect to have the biggest effect on their business are the impact of regulation (46 per cent), changing customer behaviour and demands (46 per cent), and new entrants and competitors (35 per cent). Cloud-based technology is certain to play a key role in the way that all three of these trends unfold, from the need to deliver the digital banking experience that customers are starting to expect to the pressure to ensure the highest standards of risk management, compliance and reporting.

Banks face growing competition and if they are to maximise their profitability in the digital economy they must channel their investment in IT to the most productive and efficient systems. Today these are in the cloud.

Author: David Arnott, CEO Temenos

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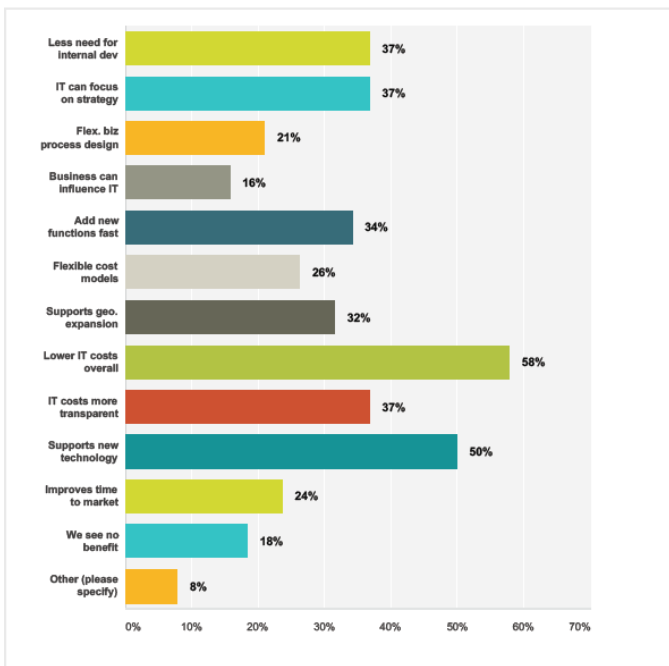
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# Searching questions: Temenos 60-second cloud survey results

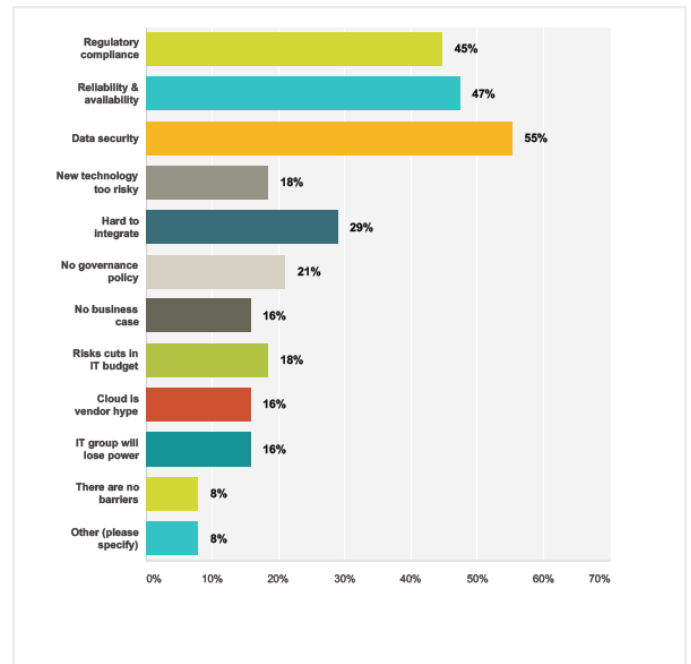
In a recent survey, The Cloud-Banking Heat Map, Temenos asked respondents two key questions:

“What benefits do you seek from cloud services?” and “What barriers to adoption do you face?”. The major benefits cited were lower overall IT costs (58 per cent); ability to shift to new technology (50 per cent) and to add new business functionality more quickly (34 per cent). Chief among the barriers to adoption were concerns over data security (55 per cent), reliability and availability (47 per cent), and regulatory compliance (45 per cent).

## Q1 What are the key benefits you seek by adopting SaaS or other cloud services to deliver banking solutions? Select all that apply to your organisation.



## Q2 Are there any barriers to the adoption of SaaS or other cloud services for banking solutions? Select all that apply to your organisation.





## Safety in numbers

Security and compliance are major concerns when considering a move to cloud-based technology, which is why it is important to choose the right platform provider.

Temenos's cloud banking software runs on the Azure computing platform provided by Microsoft, which has more than 240 million user accounts from companies and organisations in 127 countries. The decision to partner with Microsoft Azure as its cloud platform provider was based on its industry-leading levels of security and data protection and the high levels of compliance and reporting that Azure users are able to achieve. Microsoft is itself subject to regular third-party audits and shares the findings with customers in order to help them meet their own compliance obligations.

Security and risk management are perhaps the biggest single concerns among those considering a move to cloud-based technology and the platform's focus on these areas extends from the Secure Development Lifecycle process that governs how it is developed and designed to the "assume breach" strategy, under which a team of in-house software security experts simulate attacks on the network, platform and individual applications to test their ability to resist, detect and recover from breaches.

Uniquely among major cloud platforms, Microsoft provides cloud-specific privacy statements and makes strong contractual commitments to safeguard customer data and confidentiality. Azure users and customers can specify the geographic areas where their data is stored, addressing a major area of concern for many customers over security and privacy. Access to the system is subject to multi-factor authentication in addition to a user's personal account details,

helping customers to comply with regulatory standards. These efforts have met with strong approval from existing Azure users: according to research carried out for Microsoft by ComScore, 60 per cent of organisations considering a move to the cloud said that concerns about data protection were a barrier to adoption, while 94 per cent of those who made the switch experienced security benefits that they did not previously receive through their in-house system.

Improved ease and effectiveness of compliance processes are central to the Azure offer. The compliance team works with external regulators to ensure its compliance framework meets Azure users' needs. Thanks to its robust and innovative processes, Microsoft has a wide range of third-party certifications including ISO 27001, as well as a series of industry-specific certifications, and is audited annually against the Service Organization Control reporting framework. Microsoft also provides free tools including the Cloud Risk Decision Framework and Cloud Risk Assessment models to help customers achieve the levels of compliance applicable to their business.

Temenos is confident that by partnering with Azure as its cloud platform provider, it can give customers access to security, data protection and compliance processes that in many cases are better than those offered by their existing systems, while at the same time delivering the benefits and flexibility that a move to the cloud can provide.

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# One rule for all: the legal point of view

Legal considerations have led many banks to think twice before migrating to the cloud, but providers are rapidly addressing concerns over security, privacy and financial services regulation.

Banking's biggest lenders know well the advantages that the cloud can confer on their businesses. It offers the chance to cut costs and boost processing power; it allows banks more easily to launch new products and win market share. It allows Experience-Driven Banking to come alive.

The alternative – a constant overhaul of legacy core systems to keep pace with the market – is monumentally complex. But banks have for the most part been hesitant to embrace such a large technological and organisational change that moving to the cloud would mean. This hesitancy is being sustained by concerns in two main areas: security and privacy of data; and compliance with the requirements of financial services regulators.

There is no single body of cloud law. Each country has a different approach, with myriad rules and regulations relating both to privacy and financial services. In addition, there is much "guidance" issued by the regulators, setting out best practice and expected standards. Within the European Union, there will be local regulation from member states as well as regulations from the European Commission to comply with.

On a positive note, there are changes afoot. As Christian Bartsch, Partner and Head of Financial Services Sector Group at law firm Bird & Bird, puts it: "Many chief technology officers have completely bought into the value of cloud. As a result of this mindset, I am seeing a lot more interaction between technology, legal and compliance personnel in the financial services sector on this issue. Proactive collaboration between such personnel will greatly assist financial services organisations to unlock the benefits of cloud-based technology."

In Europe, many see the Netherlands financial services regulator as a trailblazer, with its agreement in 2013 to allow Amazon Web Services to offer credit and risk calculations. Ruth Boardman, a London-based data protection Partner at Bird & Bird, says large banks need the right preparation and systems in place. "Customers must choose a provider who can offer appropriate controls – over security, location of processing and use of sub-contractors. This will really help customers to meet their data protection requirements".

## Data Governance

One of the hurdles to cloud adoption at large banks has been the perceived loss of control of data or perceived lack of governance over data that comes with a move to the cloud. Customer data is no longer stored on servers owned by the bank but on the servers of the cloud service provider. It may often not be transparent to the client exactly where the data is stored.

Some financial services and privacy regulators have imposed requirements that customer data must be kept in the country where the banking services are provided. These data sovereignty laws mean a company is required to store data on servers in the home market, so enabling accessibility and audit by the regulator. That, in turn, has restricted providers of cloud services. A cloud provider might not have a data centre in that country.

In addition, cloud providers prefer for reasons of security to keep the location of their server farms secret, tightly controlling access to them and information concerning the processes protecting the data. A cloud provider considers the overall security of all its clients' data and not the specific audit requirements of a banking client.

The industry is finding ways of working through this complexity. The cloud providers are learning that one size does not fit all. Cloud companies can often provide a service from a defined geography so the data remains within the EU, for example. For regulated clients, service providers can give additional comfort on the security of the data, providing audit reports drawn up by third parties that are sufficiently detailed to put regulators at ease.

**"Customers just need to be informed and understand the processes and the data."**

Ruth Boardman, Partner at Bird & Bird

Further, European financial service regulators in many cases are comfortable with data centres that are located in other parts of the European Economic Area or even elsewhere, as long as robust service contracts are in place. A suitable service contract will include the ability for the bank to monitor the supplier, commitments on the availability of the service and rights to access the data at all times. Importantly, the regulator has the right to examine the service provider or, in extreme cases, order the termination of the contract. In addition Amazon Web Services (AWS) and Microsoft have worked hard to tailor their contractual arrangements to maintain the privacy of data transferred outside the EEA to meet the demands of the EU data protection directive and the privacy regulators.

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### **Security second to none**

A myth appears to have grown up – perhaps driven by the media and fed by the complexity of cybercrime – that public and private clouds are a hacker’s dream, and that security vulnerabilities are an inevitable by-product of cloud migration.

But the cloud, whether for storage or software, does not jeopardise security; the biggest providers offer best-in-class protection, and spend billions on it. Companies such as Microsoft, AWS and IBM are the experts in this field. Indeed, many observers believe that top-tier cloud computing systems can provide better security than banks’ in-house applications.

Much is also being done by cloud providers to ensure that they retain best-in-class security and standardise multiple competing frameworks, especially via the Cloud Security Alliance and its Cloud Controls Matrix (CCM), which provides security principles to guide vendors and assist prospective customers in assessing security risk at cloud providers.

Another body that has helped to demystify the process in Europe is Confidential and Compliant Clouds<sup>5</sup>, an EU-backed industry and academic collaboration that promotes secure cloud use.

### **Flexibility is key**

In the past, cloud providers assumed that “one size fits all” would be a viable model for complex financial service companies. While that may be possible for smaller banks and niche services, it is clearly not viable for core banking and the largest lenders.

Some in the industry see collaboration as the next step. Alan Grogan, Chief Analytics Officer at RBS’s customer services group, has called for industry and government to create a “UK financial services cloud” to ensure that banks can benefit from the cloud’s advantages, while making it easier to mitigate any risks.

There are plenty of signs that providers are showing flexibility and a willingness to restructure terms and conditions to meet the needs of their regulated clients. Regulators are agreeing that cloud solutions can be used by banks provided that controls are in place and the bank retains overall responsibility for the service provider, which is carefully supervised.

It might seem like a complex legal and regulatory landscape, but lenders and IT providers have compelling reasons to make it happen. The cloud may come to pass for the biggest lenders’ core banking efforts far sooner than has recently been assumed.

“The cloud has to happen if banks want to compete. The banks know that but, of course, there are issues to work through before they fully embrace it,” says Emily Walton, Senior Legal Counsel at Temenos.

## Case study: an interview with Soficam CIO, Alejandro Hatchett Cruz

Sociedad Financiera Campesina SA de CV (Soficam) is a specialist Mexican lender established in 2008 and focused on small producers in the agricultural and fishing industries in 19 states.

### How has Temenos's T24 Model Bank helped you to deliver your products to market?

Our role is to act as an intermediary for the Mexican Central Bank, distributing funds to the agricultural and fishery sectors. Having access to a high-quality IT system means that we can deliver a much better experience for our customers and give them faster access to the government funding that they need.

Overall it lets us provide a very stable and reliable service for our customers. T24 allows us to create lending products that are tailored to the particular requirements of our customers such as loans that allow for irregular repayments to reflect the seasonality of the agricultural sector, and to do this while meeting all our obligations in areas such as risk management and compliance.

### What are the operational benefits for Soficam of using this system in the Cloud?

The Cloud model gives us a range of benefits and efficiency gains. Obviously, we don't need to own our IT infrastructure, which means we don't need in-house staff to run our database and provide IT support. That's all taken care of by Temenos and Microsoft, along with all the software upgrades. Also, the Cloud system gives us a very high level of security and higher availability so we run less risk of outages. On the regulatory and compliance side it offers us robust accounting and reporting functions.

### How about cost and financial benefits?

Paying for our key IT infrastructure as a subscription service means we can get the benefits of using a modern and efficient system from day one without having to commit a big up-front investment as we would have to if we were building our own. So initially the Cloud system demands less outlay, but it also allows us to grow our business without having to invest in heavily expanding our IT systems. And on an ongoing basis, it brings us material gains in terms of cost efficiencies.

## Case study: Euro Pacific Bank

Euro Pacific Bank is a fast-growing offshore private bank based in the Caribbean. It currently has 4,000 customers worldwide, who between them run a total of 10,000 accounts. Some 70 per cent of EPB's customers are small businesses with fewer than 20 employees, engaged in cross-border trade.

Having doubled in size in each of the past three years, EPB had inevitably needed to add new technology systems to accommodate its growth. However, these systems were not fully integrated, which meant that staff had to carry out time-consuming manual operations. In time this could potentially pose data security risks and compromise the level of customer service.

After evaluating 15 vendors, EPB chose Temenos's cloud-based core banking software running on the Microsoft Azure cloud platform. The bank's aim is to gain access to a highly scalable platform able to support its rapid growth. For EPB, a cloud solution makes sense for many reasons: it does not regard IT as a core competence and specialist technology professionals are in short supply in the Caribbean, so it is happier working with leading international tech vendors.

EPB's regulator in St Vincent has approved cloud hosting as a secure and logical way to store data, a decision that removes the need for the on-premise deployments required by G7 regulators and allows EPB to take full advantage of the benefits that cloud technologies can provide.

Temenos's T24 model bank system will give it a single, comprehensive view of each customer, enabling it to provide better customer service through a range of channels and to offer the complete range of products that clients would expect from a global bank, but at a price that larger competitors without cloud-based systems struggle to match. In forex, for example, EPB T24 capabilities allow it to offer highly competitive rates to all its customers.

EPB chose Temenos's T24 banking software and anti money-laundering solution in order to gain access to a modern, global compliance system that would also enable high levels of automation. It looks forward to being able to support its rapidly-expanding client base with a much higher standard of customer service, enhanced data security and cheaper, more scalable processes. Effectively a small but ambitious Caribbean bank is equipping itself to compete globally.





## Great expectations

Customer experience is redefining the structure of the banking industry, driven by competition from digital natives.

The spread of cloud computing through banking will transform the industry's future in numerous ways, delivering huge economic advantages to those organisations that make the transition and enabling them to deliver to their customers a banking experience far superior to anything they can offer today.

In moving to a cloud-based model, banks equip themselves to provide what Temenos calls Experience-Driven Banking. This represents a transformation of the standard customer experience and enables banks to operate in an online market where service expectations have been reset by the experience of interacting with "digital native" companies such as Amazon and Apple. Both these internet giants have created services – Amazon gift certificates and Apple Pay – that replicate standard bank services, in this case standard and point-of-sale payments, but do so with greater speed and ease of use, better security and fail safe protections, and much better information for the user on the progress and status of the transaction at every stage.

At the heart of this improved user experience is the split that all large-scale online operators have made in the process of transacting online, between the placing of an order and its execution and settlement. Standard banking systems, by contrast, retain a single integrated process that forces the customer to wait while their transaction is executed and does not provide them with anything like the same level of information on its progress. This might include confirming the payment has reached the intended recipient, for example.

"The typical bank puts less than 7 per cent of the information it gathers into the information it distributes, and it mainly distributes that information to internal management, not to customers," says John Schlesinger of Temenos. "The fundamental principle of Experience-Driven Banking is that every transaction the bank has ever done is used to inform the next transaction and to provide information to the consumer."

An essential element of the future of banking in a cloud-based model, therefore, is a shift to systems that enable the front-end, customer-facing operations to run independently from the core banking operations such as execution and settlement. It was only once they moved to this model, says Schlesinger, that the major internet incumbents found they could scale their operations sufficiently. Cloud systems enable this separation.

However, once banks separate their front-end and core banking processes in this way, the effect is to turn their core banking operations into a utility service that needs to run at the lowest possible cost. It is here that the huge cost benefits of operating in the cloud become central to the argument about the future direction of banking. Cloud systems transform the cost of executing basic banking processes for several reasons.

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**“If you want to run your commodity, core banking at the lowest possible cost it’s hard to see how you can beat the cloud.”**

John Schlesinger, Chief Enterprise Architect at Temenos

First, banks using standard IT systems typically achieve capacity utilisation of just 8 per cent aside from the short period on one day of the month when this rises to about 60 per cent during interest capitalisation on customer accounts. A cloud-based system of shared IT infrastructure operates at much higher levels of capacity utilisation, which effectively makes the system up to 12 times cheaper to run. Second, the hardware used to run cloud-based systems is significantly cheaper to buy and operate than the hardware that banks typically use today, perhaps five times cheaper than Unix and 25 times cheaper than mainframe systems, says Schlesinger.

“Ally 25 times cheaper with 12 times cheaper and you’re getting orders of magnitude of cost reduction,” says Schlesinger. “If you want to run your commodity, core banking at the lowest possible cost it’s hard to see how you can beat the cloud.”

At the front end of a digital bank, customers operate the bank’s technology rather than branch-based tellers. This utterly changes the demands placed upon the bank’s IT infrastructure, producing a vast increase in the number of queries the system must process, particularly where access is via a mobile device. Typically a teller will make five queries for one update, but when a mobile phone carries out the transaction, the number of queries per update is closer to 500. Unless banks use cloud technology, they will struggle to manage a 100-fold increase in query volumes while keeping their costs under control.

It is possible that the cloud’s ability to bring down the cost of utility banking functions could reshape the industry’s current structure of some 50,000 bank front offices “hard wired to the same banks’ 50,000 middle and back offices”, as suggested by BBVA Chief Executive Francisco Gonzalez recently. This could result in a much smaller number of core banking providers servicing a large number of “front end, customer facing operations”. Under this scenario, value in a banking operation would mainly reside in the customer-facing elements that define the banking experience.

This is precisely the threat to traditional banks that Schlesinger sees in Apple Pay. Once Apple links its attractive and user-friendly front-end Apple Pay system to its users’ iTunes accounts, banks will no longer be directly involved as card issuers in the transactions that Apple Pay users carry out because they will have been replaced by iTunes. “So the banks become no part of retail commerce,” he says. “They just become settlement utilities for iTunes.”

Schlesinger argues that internet incumbents have four capabilities that banks need in order to be competitive as digital operations: high levels of customer care; systems that run in real time; the ability to operate at very low margins; and the ability to sustain very high query volumes while still making money.

“The question is how we get those four characteristics into the banks’ business systems before Google, Amazon, Facebook and Apple become banks,” he says.

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# Conclusion

Banks are facing a radically changing competitive landscape; a landscape where if they wish to thrive, they must consider a major technology shift to the cloud. Cloud is hailed THE strategic option for banks looking for long-term success. However with any major change comes fear and uncertainty. We see issues of trust and control emerge, a persistent fear for data security, and confusion over compliance risks derailing cloud hopes. Yet like any form of fear, the only way to address it is to face and discuss it, and we are seeing this happening too. We are seeing software providers, cloud providers, industry groups and financial institutions in a unique collaborative effort to understand and embrace this new generation of technology. Cloud is now just a matter of when, not if.

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