Challenges for Migration to Cloud

Contents

1 Challenges for Migration to Cloud

1.1 Overview[1]

The demand for cloud services has increased rapidly in recent years and is expected to continue to increase in the coming years. Over 2015–2018, the cloud services industry is expected to grow at a CAGR of 19.6%, reaching USD43bn by 2018.

The hype surrounding cloud services makes it seem like all of an organization's resources should be migrated to the cloud immediately, however there are parameters that are needed to be considered before cloud adoption which can lead to delays, apart from the challenges that organisations face during and after cloud adoption.
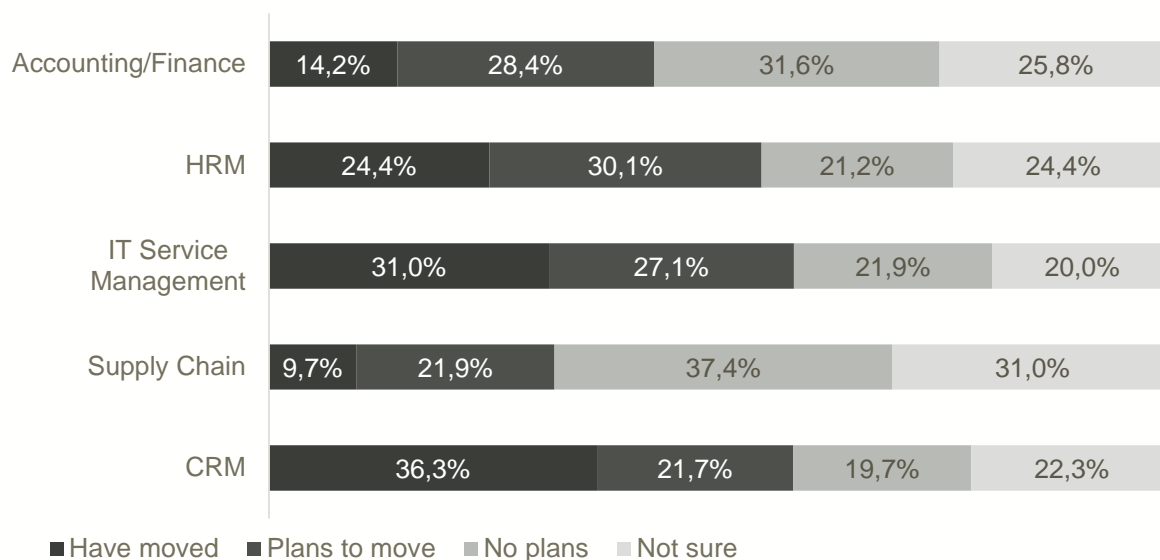
"I think the upfront migration piece is based on good planning, good partners and good project management to make sure it's done well. The integration and interface side of cloud is a challenge, but will more and more become a part of the IT infrastructure going forward."

Bill Oates, Commonwealth Chief Information Officer, Massachusetts Office of Information Technology

1.1.1 Highest cloud migrations in CRM, lowest for Supply chain[2]

According to a survey by RightScale[3] in 2015, majority enterprises are planning to use a portfolio of clouds with 82% reporting a multi-cloud strategy, in which 55% are planning to migrate to hybrid cloud, 13% to multiple public and 14% multiple private.

Organisations are planning to use cloud for a variety of purposes, including management of data in fields of accounting/finance, HRM, IT service management, supply chain and customer relationship management (CRM). The following chart provides a breakdown of cloud migration by types of functions in various organisations as reported by CSA[4] survey in 2016:

	Have moved	Plans to move	No plans	Not sure
Accounting/Finance	14,2%	28,4%	31,6%	25,8%
HRM	24,4%	30,1%	21,2%	24,4%
IT Service Management	31,0%	27,1%	21,9%	20,0%
Supply Chain	9,7%	21,9%	37,4%	31,0%
CRM	36,3%	21,7%	19,7%	22,3%

Cloud-based CRM solutions were used by 36.3% of companies surveyed, followed by IT service management with 31%, a category that includes applications like ServiceNow. In human resources management (HRM) application, 24.4% of companies have moved to the cloud. While, cloud based system were least used for supply chain management. For HRM, IT service management, and CRM majority of the companies have moved or have plans to move to cloud-based systems.

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[1] Roundup Of Cloud Computing Forecasts And Market Estimates Q3 Update, 2015, Forbes, Sep 27 2015

[2] The Cloud Balancing Act for IT: Between Promise and Peril, Skyhigh, 2015 / Cloud Computing Trends: 2015 State of the Cloud Survey, Rightscale, Feb 2015

[3] The RightScale 2015 survey respondents were 930 IT professionals ranging from executive positions to managers and practitioners, across various industries.

[4] The CSA survey respondents were 209 professionals at companies across industries worldwide across geographies of Americas, EMEA and Asia Pacific.

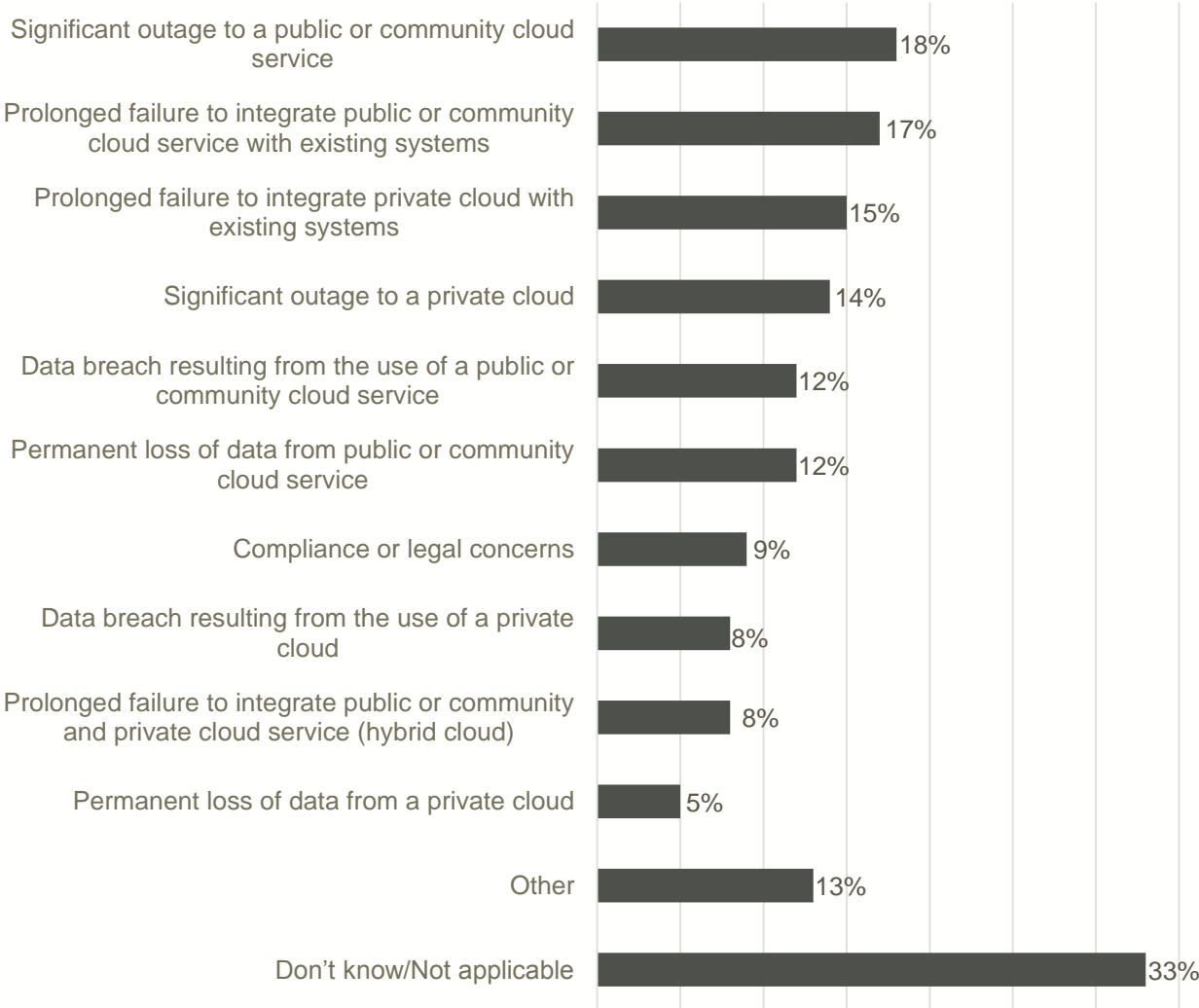## 1.2 Challenges and issues related to cloud adoption[5]

Though cloud provides advantages such as elastic scalability, reduced costs, easy access and business agility, but for efficient operations, migration to cloud often requires identification of correct workload, security and privacy, quality of service, cost savings potential, network performance and integration complexity. This can lead to delays in cloud adoption and hamper organisation's performance.

"Before migrating to the cloud, IT managers must evaluate and test applications to permanently avoid bottlenecks and optimize their network through WAN optimization controllers."

Les Williams, ExterNetworks' CMO

Organisations have built up extensive experience in managing and optimizing their cloud deployments for the safety and security of cloud infrastructure. Though cloud computing does not appear to be risky, companies have experienced some problems, such as outages and integration failures.

According to a survey conducted by *The Economist*[6], the following are the major implementation issues that organizations have reported while migrating to cloud:
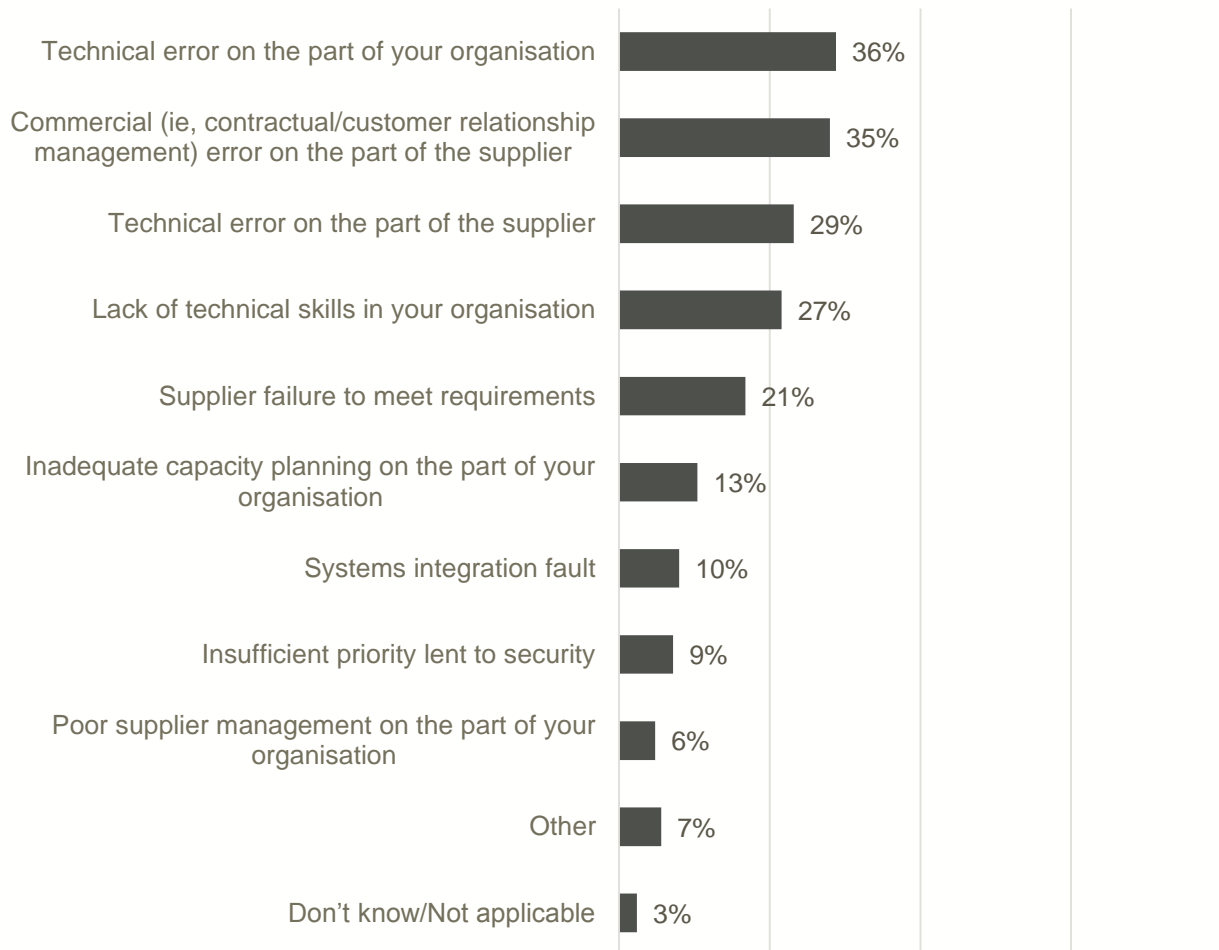
Significant outage to a public or community cloud service	18%
Prolonged failure to integrate public or community cloud service with existing systems	17%
Prolonged failure to integrate private cloud with existing systems	15%
Significant outage to a private cloud	14%
Data breach resulting from the use of a public or community cloud service	12%
Permanent loss of data from public or community cloud service	12%
Compliance or legal concerns	9%
Data breach resulting from the use of a private cloud	8%
Prolonged failure to integrate public or community and private cloud service (hybrid cloud)	8%
Permanent loss of data from a private cloud	5%
Other	13%
Don't know/Not applicable	33%

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[5] Preparing for next-generation cloud, The Economist, 2015 / Migrating Applications to the Cloud: Issues and Challenges, IJARCSSE, June 2015

[6] The Economist survey (Jan-Feb 2015) respondents were 232 global information technology (IT) executives, out of which are 43% are either members of their companies' boards or are C-level executives, and over half are from organisations with global annual revenue exceeding USD500m.

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Of the total companies surveyed, about 72% of the companies reported that they suffered at least one of the above issues. The following were reported to be the major reasons for the issues:

Reason	Percentage
Technical error on the part of your organisation	36%
Commercial (ie, contractual/customer relationship management) error on the part of the supplier	35%
Technical error on the part of the supplier	29%
Lack of technical skills in your organisation	27%
Supplier failure to meet requirements	21%
Inadequate capacity planning on the part of your organisation	13%
Systems integration fault	10%
Insufficient priority lent to security	9%
Poor supplier management on the part of your organisation	6%
Other	7%
Don't know/Not applicable	3%

Apart from the above issues, following are some of the key issues specific to cloud implementation, which lead to cloud migration delays for organisations:

Issues	Description
Cloud Interoperability	In cases where all the components cannot be moved to the cloud, local applications must interact with applications on cloud for the system to work efficiently. If the proprietary cloud APIs are not well integrated with the company's existing legacy systems, this can lead to delays and other issues. Multiple clouds can make these issues even more acute. *"The complexity of the interoperability (not just integration) of devices and data sources gets particularly challenging"* *Don Whittington, VP and Chief Information Officer (CIO), Florida Crystals*
Data security concerns	Though companies can access data stored in the cloud, they cannot secure or control it. This makes them hesitant to use cloud services for applications that involve critical or confidential data. . *"The cloud introduces new security challenges, and legacy security systems based on physical attributes such as port and protocol just aren't adequate to secure these highly dynamic environments"* *Jon Oltsik, Senior Principal Analyst, Enterprise Strategy Group*

Portablity	If the company's infrastructure and applications are not transferable to the cloud, they have to be rewritten in order to integrate them in the new cloud framework. This problem generally arises when the company's infrastructure is obsolete or incompatible with cloud. These portability issues can cause long delays. *"People talk about cloud solutions, and you might think they are easy. They are not easy. That was a lesson we learned. You have to be enterprise-ready. You're taking an enterprise-ready solution and plugging into your environment, and where there are deficiencies, you're going to find out quickly"* *Robert Owens, CIO, Department of Health and Human Services, Office of Inspector General*
Bandwidth and Network latency issues	The management of cloud services can become challenging if there are issues related to network latency and flexibility of WAN bandwidth. If the client's network is not upgraded and have such bottlenecks, the migration to cloud could become slow or impossible. In recent years, bandwidth issues have increased because of the emergence of IoT. The convergence of IoT and cloud tends to generate zetabytes of data from diverse traffic sources. This can make latency and timeout issues even more acute. *"In the wake of IoT adoption and the increased contention for bandwidth right-sizing becomes a critical factor for capacity planning of the Cloud"* *Les Williams, CMO, ExterNetworks*
Conflict of interest	The adoption of cloud could also become complicated if there is a conflict of interest between the vendor and the client. For instance, in some cases, the locations that are favourable for the vendor due to their cost-effectiveness are not suitable for the customer due to security and compliance issues. For instance, IT projects in Canada are prohibited to use US-based hosting environments.
Tax issues	The revenue generated from cloud services may trigger tax issues in the cloud vendor's geography as well as the client's region. For example, cloud services offered to users in one country could be subjected to local withholding tax and value added tax in another country, and profits earned by vendors could be taxable in their country. To prevent such tax exposures and risks, the cloud must be monitored continuously. *"I recommend that you ask your ERP cloud vendor what tax services or APIs are available, and whether they're compatible with your industry-specific tax engine. It's also worthwhile for the chief tax officer to be given the chance to review the reporting and determine whether it's going to be adequate."* *Reid S. Okimoto, National Tax Leader, Emerging Technology, KPMG*

1.3 Cloud adoption case analysis

The following examples show how efficient planning and management can lead to smooth migration to cloud, while inefficient management can lead to unplanned downtime and delays:

Synopsis	Time taken for migration	Delay / Unplanned downtime	Observations / Reasons for delay
In 2014, Veyance IT wanted to replace its multi-local architecture to cloud-based system. The cloud-provider used different types of application migration: virtual-to-virtual, physical-to-physical, physical-to-virtual, and even brute-force heterogeneous data migration.	About seven months	No	-
In 2014, Swiss bank UBS suffered a delay in the adoption of Oracle HR system, a cloud based HR system taking two and a half years after deciding to implement Oracle Fusion Human Capital Management (HCM).	About two and a half years	Yes	Though the reasons were not specified by the company but changing HR systems towards the end of financial year was a challenge for the bank with HR activities at their peak and this over exertion could have been a possible reason for cloud delay
In 2013, JP Morgan announced that it had migrated all its internal Java and .NET applications to a PaaS model. The project involved delivery of over 2,000 applications, and 4 data centers in PaaS environment.	About 2 years	No delay mentioned	-
In 2014, Department of Labor (DOL) moved two legacy systems to different clouds: Email for 17,000 workers at offices around the nation was migrated to Microsoft 365 for Government's federal community cloud	Not specified	Yes	For the migrations, 150 consistencies had to be cleaned in the office infrastructure, while bandwidth was needed to be increased four times, which lead to delay.
In 2013, Fortis Healthcare planned to shut down the company's corporate datacenter and migrate the company's entire IT onto a public cloud	Not specified	No	Company faced minor challenges but as most of the applications used by the company were already built for a virtual environment, it was able to migrate without any major delay.

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