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Use of cloud technologies by Swiss public authorities and administrations

Contents

About the study

This study is based on interviews with experts from Swiss public authorities and administrations, industry and academia on use of cloud technologies within Swiss public administration. Responses from experts who wish to remain anonymous have been included in the study on an unattributed basis.

A representative survey on the broader usage of cloud technologies was also conducted between 12 April and 13 May 2024. 394 public service employees and 934 Swiss citizens took part.
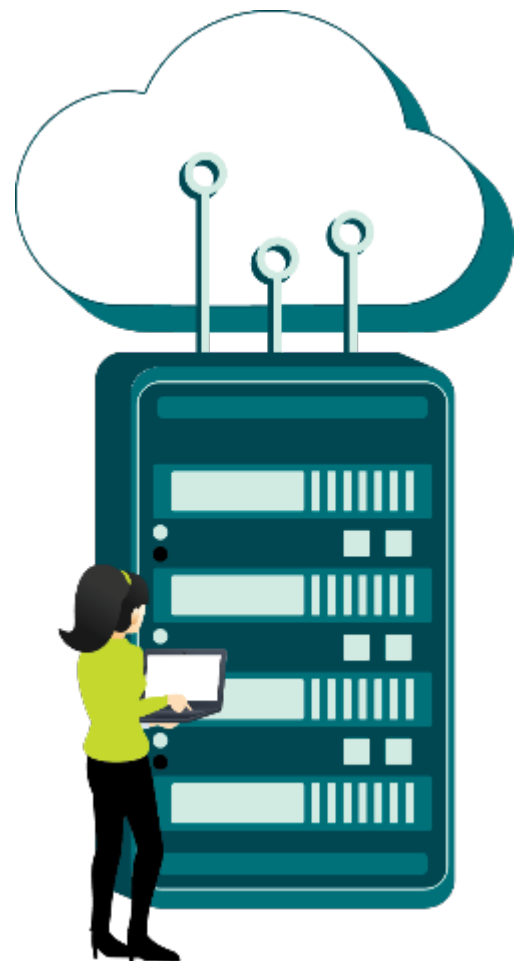
Switzerland joins the global cloud technology trend

Cloud technologies offer a host of opportunities for tackling current challenges posed by the digital transformation and devising innovative solutions. They also open up different ways of working for public service employees and expanded digital services for citizens. In Switzerland, as in other countries, the shift towards cloud technologies has accelerated over recent years.

Many public authorities and administrations face growing challenges as a result of pressure to innovate, the growth in SaaS (software as a service) solutions, and a lack of flexibility on the part of existing data centres and providers. Cloud technologies offer solutions to these challenges: among other advantages, they offer greater flexibility in digitalisation, scope for increased individualisation and more rapid adaptation, greater innovation, potential cost reductions, and diversification and/or independence from individual providers. Like the private sector, the public sector also faces external challenges, such as the phasing out of support from providers (e.g. MS Office), rising demands for information security, the statutory framework for data protection, and the rapid pace of technological change. Against this backdrop, cloud technologies offer new solutions and outsourcing of infrastructure in terms of both operations and services, improving quality of service. As part of the transformation of the technological environment in which the public sector operates, it is particularly important to build new skills among those using technology platforms and to create new collaborative networks. Applications including big data and artificial intelligence (AI) are of growing importance, but most of them require cloud technologies if they are to be used to full advantage.
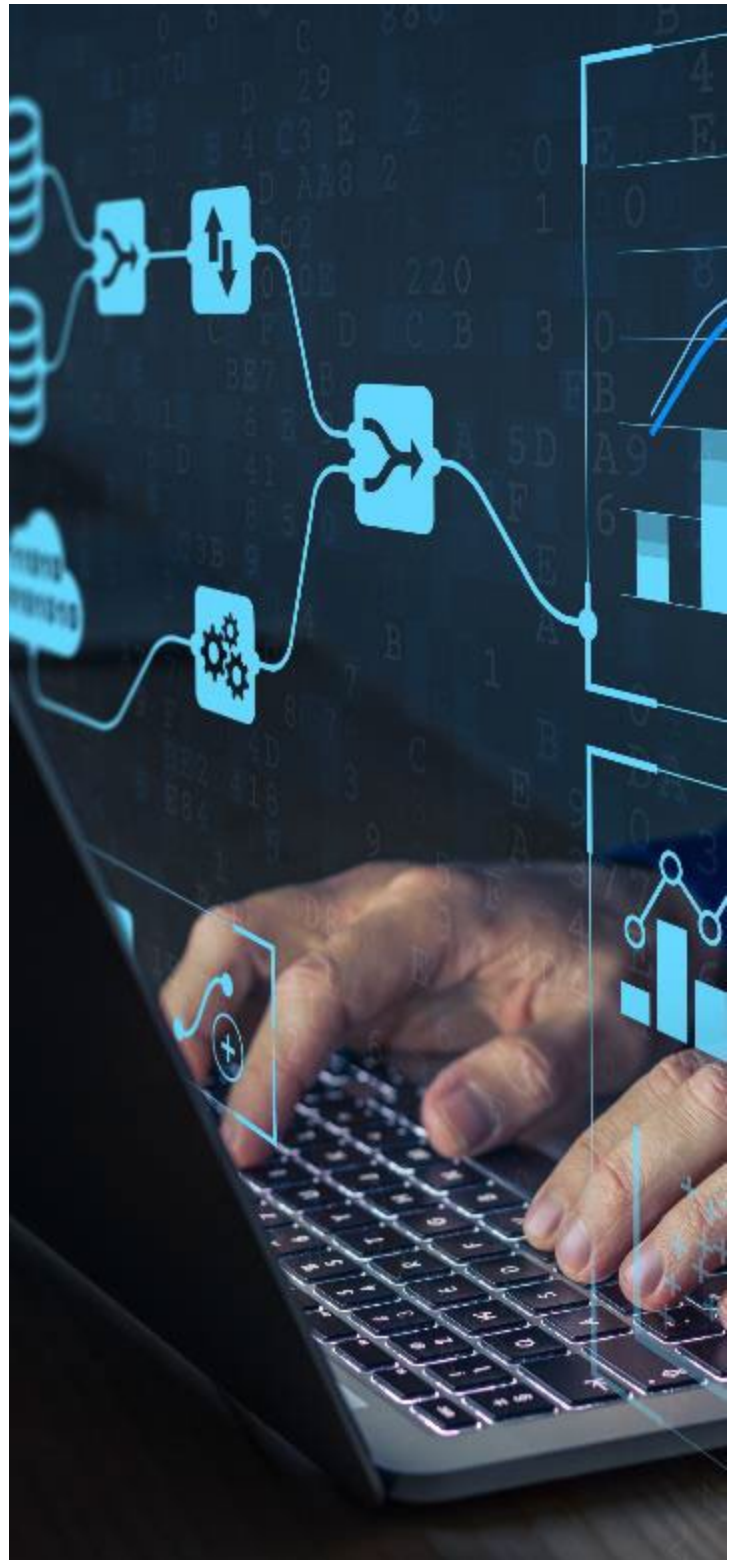
Cloud usage varies in nature and scope

Many Swiss public authorities and administrations have already started to make use of cloud technologies, albeit at a fairly low level. Deloitte's most recent survey indicates that 45% of public service employees in Switzerland always or often make use of cloud solutions as part of their work. The same proportion report that they are positive about the current use of cloud technologies in Swiss public administration.

Many public authorities and administrations have a very good understanding of cloud technologies and are in principle open to using them or already have initial experience of using them. It is clear, however, that there are crucial challenges in relation to data security and data sovereignty. Microsoft 365 is increasingly the entry point to cloud technologies, both because it represents significant added value in terms of scope for collaboration but also because, in some cases, Microsoft is phasing out traditional on-site maintenance and support. Many Swiss public authorities and administrations are already well aware of the issues relating to data security and data sovereignty but face challenges in implementing the country's data protection legislation, ensuring cloud governance, and introducing consistent standards for data classification.

"Myths and misunderstandings abound about the security of cloud technologies. Public clouds are often more effective in guaranteeing the security and sovereignty of data than a private cloud or an on-site solution. And hyperscale computing is also an effective way of ensuring data sovereignty."

Stefan Russian, Senior Director, Head of Federal Government, Deloitte Switzerland

To respond to the need for data sovereignty and greater operational security, a number of international cloud providers have recently opened data centres in Switzerland or have expanded coverage zones for their clients.

«Limiting use of the public cloud to IaaS (infrastructure as a service) applications makes it easier to avoid vendor lock-in and guarantee data sovereignty. And at platform as a service (PaaS) level, users can ensure a high degree of independence from producers by using exclusively interoperable open-source technologies, such as Kubernetes clusters. This simplifies the development and operation of individualised applications. It also makes it easier for organisations to move from one cloud provider to another.»
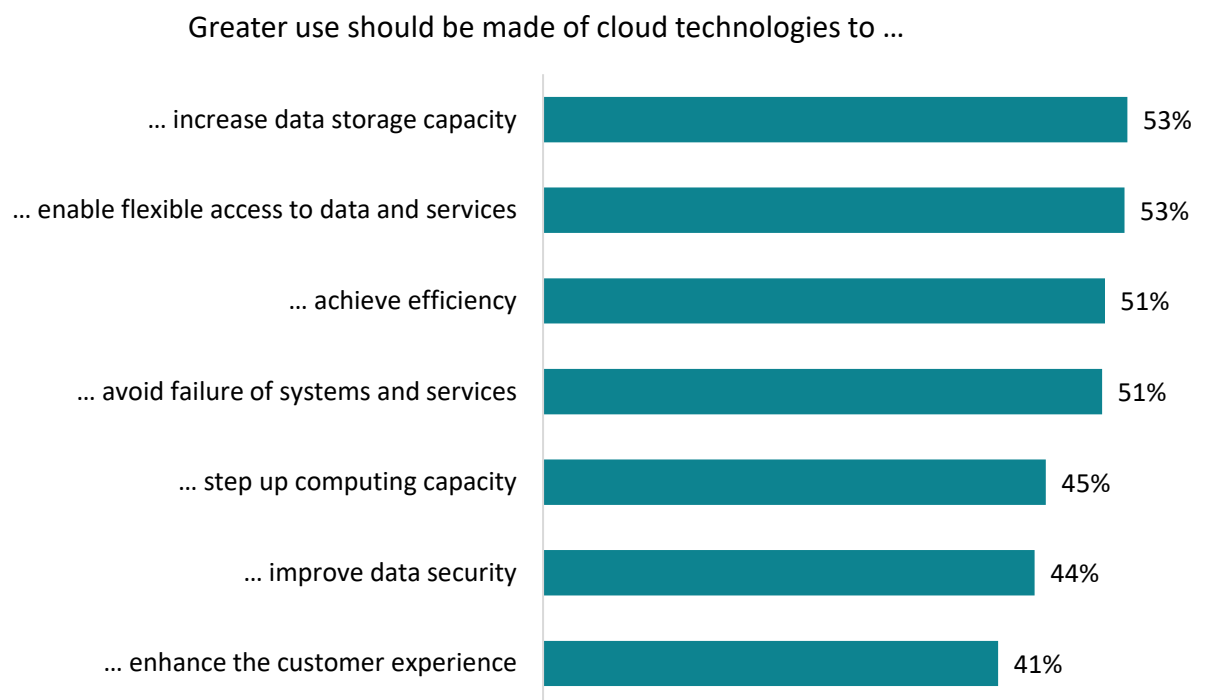
Prof. Dr. Matthias Stürmer, Institute for Public Sector Transformation, Bern University of Applied Sciences

Global market leader AWS[1] has operated in Switzerland since 2017 and has more than 10,000 clients across the country. It plans to invest billions more in its Swiss operations over the next few years.[2] Microsoft Azure, whose link with Microsoft 365 makes it another leading provider, has been operating from two Swiss locations since 2019 to meet local requirements for data residence.[3] Google Cloud has also maintained a data centre in Switzerland since 2019 and now plans a second, to increase security.[4] Alibaba Cloud, meanwhile, is significantly increasing its services in the country. IBM Oracle are two further major international providers operating in the Swiss market .[5] In 2022, the Swiss Federation awarded AWS, Microsoft Azure, Alibaba Cloud, IBM and Oracle a contract for the storage of government data worth CHF 110 million, a move that underlines the willingness of Swiss public authorities and administrations to exploit the many different opportunities cloud solutions offer.[6]

Opportunities offered by cloud technologies outweigh the risks

The major reasons for using cloud technologies can be summarised as efficiency, flexibility, and resilience. A small majority of Swiss public service employees surveyed think that their organisation should be making greater use of cloud technologies to boost data storage capacity (53% of respondents), ensure flexible access to data and services (53%), improve efficiency (51%), and avoid failure of systems and services (51%) (see Chart 1).

Chart 1. Please rate your agreement with the following statements about the potential of cloud technologies in Swiss public administration.

Greater use should be made of cloud technologies to …

… increase data storage capacity	53%
… enable flexible access to data and services	53%
… achieve efficiency	51%
… avoid failure of systems and services	51%
… step up computing capacity	45%
… improve data security	44%
… enhance the customer experience	41%

Source: 2024 Deloitte survey of public service employees

The main benefits of using cloud technologies are greater computing capacity, more dynamic data storage (adaptation of cloud storage to fluctuating data volumes), mobility, and easier and faster access to data. Cloud technologies can also bring down the cost of IT infrastructure and software and of outsourcing middleware or high-level software management. Further advantages arise from an organisation's ability to expand systems and improve security and resilience.
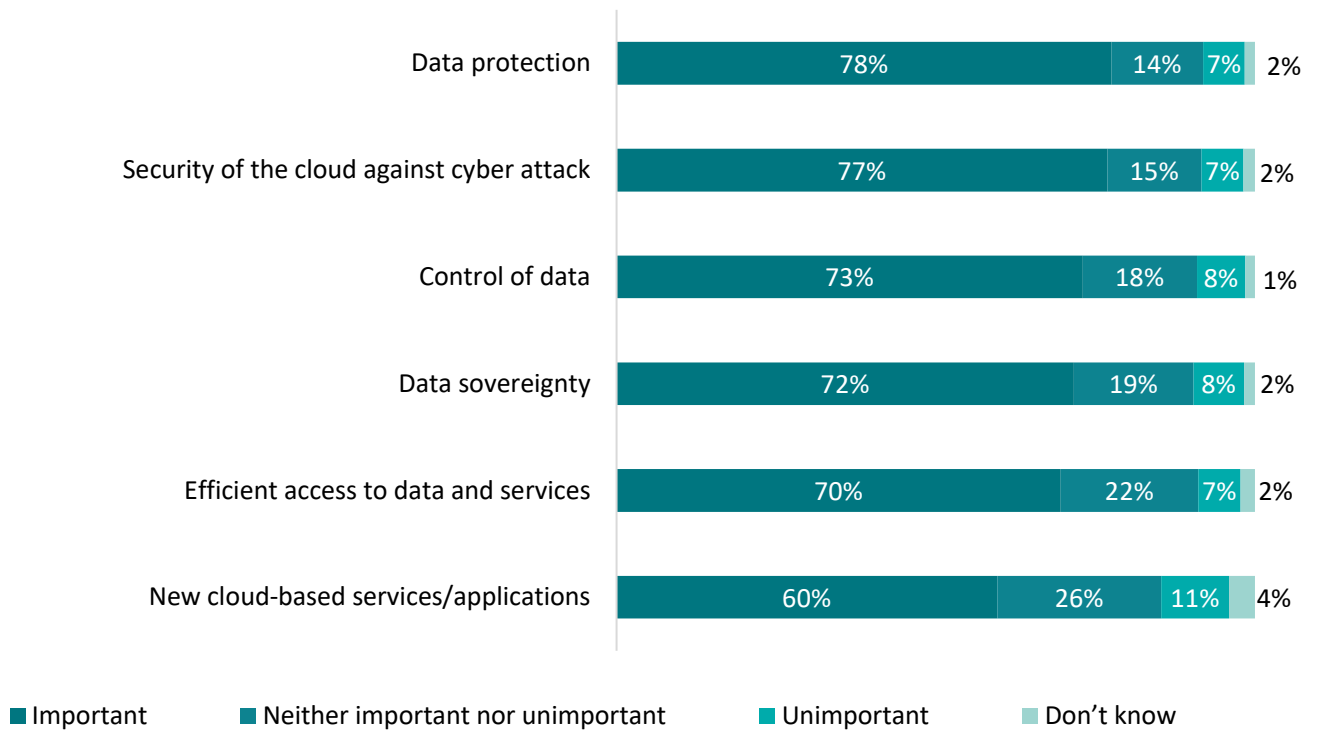
Set against these advantages are the risks of using the cloud, particularly the (supposed) loss of control over data and data protection, along with the risk of that a cloud provider will fail adequately to separate and isolate data from different customers. Cloud usage can also give rise to further problems: dependency on individual cloud providers (vendor lock-in); and data protection – compliance with statutory requirements, varying interpretations of the legislation, and potential access to data by authorities outside Switzerland (e.g. under the US Clarifying Lawful Overseas Use of Data (CLOUD) Act). Our survey of Swiss citizens shows that they

consider protection of personal and confidential data and security against cyber attack to be the two most important issues in relation to the use of cloud technologies in public administration (78% and 77% of respondents respectively). These were closely followed by data control and data sovereignty (protection against access from abroad) (73% and 72% respectively) (see Chart 2).

> "One obstacle to the rollout of cloud solutions is often outdated IT outsourcing mindsets within public bodies. But the public cloud is not the same as IT outsourcing. It involves shared responsibility in which providers are responsible for the cloud itself and authorities and administrations are responsible for what systems run in the public cloud."
>
> **Ronald Muster, Head Government & NPO | Public Sector Switzerland, Amazon Web Services (AWS)**

Chart 2. How important to you are the following issues in relation to the use of cloud technologies in public administration?

Issue	Important	Neither important nor unimportant	Unimportant	Don't know
Data protection	78%	14%	7%	2%
Security of the cloud against cyber attack	77%	15%	7%	2%
Control of data	73%	18%	8%	1%
Data sovereignty	72%	19%	8%	2%
Efficient access to data and services	70%	22%	7%	2%
New cloud-based services/applications	60%	26%	11%	4%

■ Important ■ Neither important nor unimportant ■ Unimportant ▫ Don't know

Source: 2024 Deloitte survey of Swiss citizens

Digitalisation continues to pose risks, regardless of whether or not cloud technologies are used. These risks include, for example, the threat of data loss, access to resources and services (e.g. as a result of system or network failure), and unauthorised use of data. Public service employees and citizens report broadly comparable levels of confidence in Swiss public authorities and administrations to use cloud technologies safely and securely: 34% and 38% of respondents respectively believe these bodies are doing so.

A majority of public service employees surveyed (53%) think cloud technologies pose a range of risks to public authorities and administrations in Switzerland and need to be taken very seriously. Even more (61%) think it is, therefore, particularly important that data is stored exclusively within the country. An even higher proportion of citizens (75%) think the same (see Chart 3). There is a split between the French- and

German-speaking cantons on this issue, with the former more likely to be concerned about having data stored exclusively within Switzerland.

"There is always a trade-off between public cloud solutions and digital sovereignty. Public clouds promise technical simplicity, scalability, and low initial costs. However, they also create dependency on providers, higher costs for intensive use, and a lack of clarity in relation to data protection. Digital sovereignty on the other hand means greater freedom of choice, more transparency, and better control of data protection but requires higher investment and IT know-how within the organisation."

Prof. Dr. Matthias Stürmer, Institute for Public Sector Transformation, Bern University of Applied Sciences

Chart 3. How important is it to you that data is stored exclusively in Switzerland?

Legend: ■ Important   ■ Neither important nor unimportant   ■ Unimportant   ■ Don't know
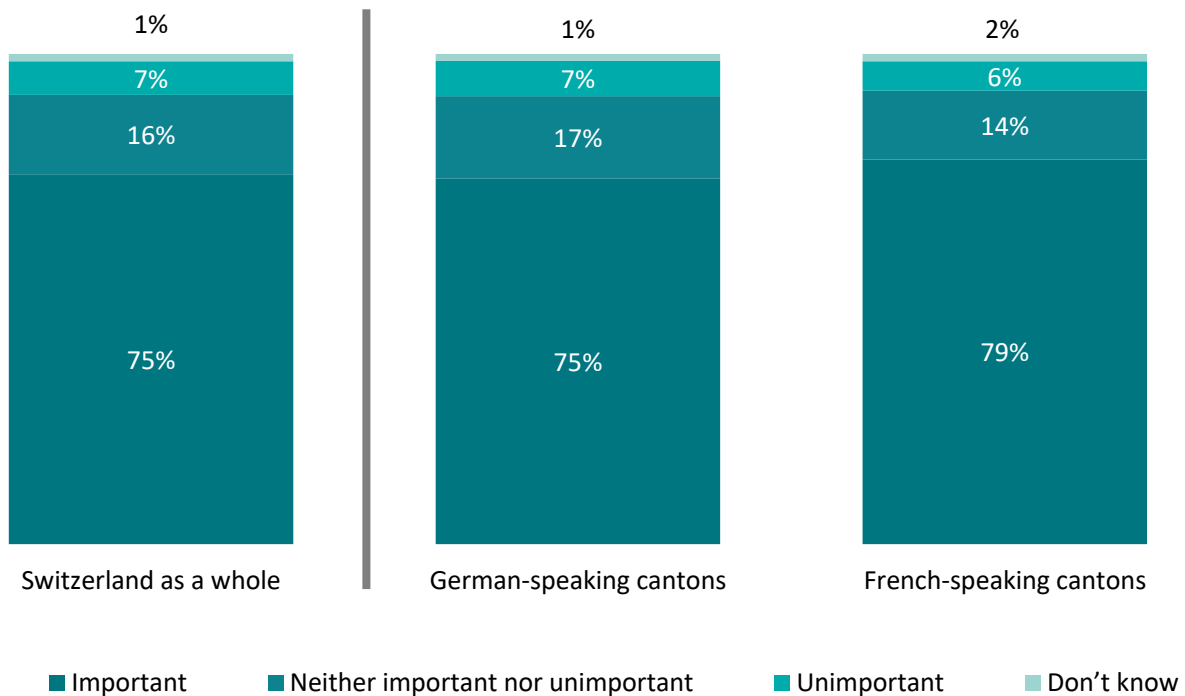
Source: 2024 Deloitte survey of Swiss nationals

Using the cloud: the journey is just as important as arriving

Successfully using the cloud requires public authorities and administrations to follow specific steps as part of their 'cloud journey'.

The first step is to formulate a long-term vision defining the organisation's entire sourcing and cloud strategy. This includes particularly the suitability of cloud technologies for specialist applications, the formulation of business case studies, the organisation's cloud transformation strategy, and its data centre exit strategy.

The second step may then be to set up basic cloud services to achieve a minimal level of cloud operation and governance. Key stages in the successful introduction of such entry-level cloud services are the creation of landing zones, support for compliance and security assessments, a pilot data migration for proof of concept, and the expansion of functionality for mass-scale data migration.

"Cloud platforms underpin digital transformation. Successful implementation of stable, flexible and modern cloud solutions requires a digital end-to-end strategy and a centralised approach to tackle the common issue of individual interests not being coordinated."

Stefan Russian, Senior Director, Head of Federal Government, Deloitte Switzerland

"Public authorities and administrations are not best known for their agility, and the fundamental principle of 'fail fast, fail early' is at odds with the culture and legal status of such bodies. On completion of a new project, they often expect a new permanent status quo, yet the reality is one of continual technological change."

Ronald Muster, Head Government & NPO | Public Sector Switzerland, Amazon Web Services (AWS)

Applications should be migrated to one or more cloud providers only once this pilot phase is complete. The basis for cloud migration is the deployment of a clearly defined approach to implementation, including defining the cloud target operating model, DevOps and cloud CI/CD activation, planning and implementation of different waves of migration, and optimisation of brownfield cloud applications. Once the initial applications have been migrated to the cloud, the focus should also be on managing cloud services, DevOps and automation, cost optimisation, and the ongoing improvement and refinement of cloud functionality for strategic applications.

Key issues, challenges and good practice in the rollout of cloud solutions

A successful implementation of cloud solutions requires authorities and administrations to start by asking and answering the following key questions: What are my strategic goals? What impact do they have on my organisation? And what does my roadmap look like?

1. What are my strategic goals?

Rolling out cloud services raises a host of issues, so defining strategic goals is absolutely essential. These goals define the strategic relevance of cloud issues and the concept of 'the cloud' in context of the authority or administration in question. They also highlight the opportunities the cloud represents with regard to efficiency, collaboration, flexibility, innovation, automation, resilience, compliance, and (data) security and create a framework for using cloud resources, including SaaS. It is also important to create the organisational prerequisites for handling the cloud efficiently and safely and tackling its impact on the job roles and skills of the future. And strategic goals should be the driving force behind any authority's or administration's modernisation, helping it provide better digital services both for both its employees and for the population at large. Finally, strategic goals define the general requirements for the process of approving cloud resources within a particular framework.

Within public administration, the statutory framework, data protection regulations, security, and compliance are of crucial importance. They need to be understood as part of strategic goal setting and adapted as necessary. Depending on the data classification schema used, organisations often store differing classes of data in different locations. This makes a hybrid cloud – a combination of a private and a public cloud – the preferred solution. Specifically, organisations need to clarify whether a multi-cloud approach involving a number of cloud providers will work or whether they will instead take a single-cloud approach. This will have a significant impact on the operating model and the skills needed. Organisations also need to take account of the continued growth in SaaS solutions, which require a special process for approval and monitoring process that reflects third-party risks and aspects of business continuity.

Successful migration to the cloud – particularly in the case of public authorities and administrations – relies crucially on the early and active involvement of all relevant stakeholders. It also has a significant influence on the timescale for the roll-out of cloud services.

Cloud service models

A service model defines the level of services a cloud provider delivers for its clients. Service models can be applied to all cloud provision models – public, private, and hybrid.

- **SaaS (Software as a Service)**: SaaS means applications are hosted by a third-party provider and accessed via the internet. It does away with the need for installation and maintenance by users.

- **PaaS (Platform as a Service)**: PaaS is a cloud computing service offering a platform for developing, implementing and managing applications. It does away with the need to create physical infrastructure.

- **IaaS (Infrastructure as a Service)**: IaaS offers online virtual computer resources, such as virtual machines, storage and networks. It enables users to avoid the costs and complexity of physical servers and data centres.

Interviews with experts identify the following examples of good practice for Swiss public authorities and administrations in making decisions as to where and how they can successfully implement cloud technologies:

- **Start strategic planning early:** Cloud strategies should always be part of an organisation's digital strategy, so planning implementation of cloud solutions should be one of the very first steps that the organisation takes.

- **Take a comprehensive approach:** Ensure that all needs and requirements are met from the outset; this includes regulatory issues, data and information security, design (e.g. access, georedundancy, latency periods, and scalability), resilience, and sovereignty.

- **Categorise data consistently and ensure good knowledge of your own data and applications:** This helps with making decisions about which data can be placed in the cloud. Preventing data redundancy also requires clear knowledge of where data is going. New and future applications should form part of early planning for cloud use.

- **Make or buy? Don't fall into the trap of trying to do everything yourself rather than collaborating:** Make greater use of ecosystems and communities and benefit more from the knowledge and experience of other public administrations and departments – and of the private sector. Greater collaboration between and among different administrative levels (including cantons and municipalities). An external perspective can also help with ranking existing arrangements.

- **Ensure open communication:** Ongoing communication, both internal and external, is essential to reduce public service employees' anxiety about risk and to ensure that solutions are tailored to specific needs.

- **Drive cultural change:** It is also crucial to have the ability – and the courage – to think outside the box (e.g. design thinking) and to ensure greater exposure.

- **Think about diversification:** With public cloud solutions, it can be meaningful to deploy a variety of hyperscalers to boost resilience and avoid 'vendor lock-in'.

2. What impact do they have on my organisation?

The use of cloud technologies has had a significant impact on employees, processes and tools within organisations as a whole but specifically on the way their IT is organised.

The use of cloud technologies (through special public cloud solutions and SaaS) needs to be considered in a similar way to outsourcing: the organisation must learn to operate within a new environment in which a range of services are provided by third parties. The mindset of existing organisations is often the initial stumbling block. In many cases, there is active or passive resistance and a desire to cling to the status quo, so the use of cloud technologies – and the organisational change they require – needs to be understood as a change process requiring very active support and steering from management.

Another problem is the dependency on third parties. This necessitates an exit strategy. Business continuity management also becomes much more important.

Third, the organisation needs to ensure that new job profiles are defined and that employees are recruited or existing staff retrained.

Finally, organisations should define a cloud-compatible target operating model that take account of the new demands of the cloud. Almost all units are affected, including product and platform delivery, service orchestration, cyber and security, analytics and insights, and IT strategy and architecture.

Interviews with experts identify the following examples of good practice for Swiss public authorities and administrations wishing to achieve the greatest impact with their implementation of cloud technologies:

- **Identify and prioritise use cases:** Introducing cloud computing may mean changes across the organisation, so the primary focus at the initial stage should be on strategic use cases.

- **Develop relevant roles and skills:** Provision takes a different form in the cloud from traditional IT, so new roles and skills are required. If strategic use cases are prioritised, this helps to ensure that the most crucial skills and expertise are the first to be developed and established.

- **Develop (and refine) cloud governance:** This is a core element of the successful introduction and administration of the cloud and includes the guidelines, processes and controls that ensure cloud use conforms with legislation and other regulations.

- **Centralise the management of cloud skills:** Creating a cloud centre of excellence ensures that cloud resources are administered and overseen centrally and that the framework is standardised.

- **Establish consistent provision processes:** A consistent process ensures that the introduction and operation of cloud technologies are carried out in a structured and efficient way and are successful. It also ensures volume discounts and greater bargaining power.

3. What does my roadmap look like?

These considerations form the basis of an organisation's roadmap. Adopting cloud computing is not normally a 'big bang' but happens gradually over time. The process often begins with a proof of concept, which underpins initial experience and meet initial requirements. In many cases, only new requirements are deal with directly using cloud capacity. Then, once there is sufficient maturity, existing applications can be migrated to the cloud on the basis of business cases.

A cloud roadmap is the route an administrative unit takes to this end and sets out how it reflects its individual needs and characteristics as well as consultation with stakeholders to implement its 'cloud journey'.

Interviews with experts identify the following examples of good practice for Swiss public authorities and administrations wishing to implement a successful roadmap:

- **Ensure early validation by IT and business representatives:** To avoid obstacles further down the track, the roadmap needs to be validated by major stakeholders before being put into operation.

- **Harmonise and consolidate (ongoing) initiatives:** It is essential to manage implementation centrally and to consolidate new initiatives with current ones, so that the goals of both can be met.

- **Set out activities and costs in detail:** The clear definition and communication of activities and costs can contribute to a seamless transition.

Endnotes

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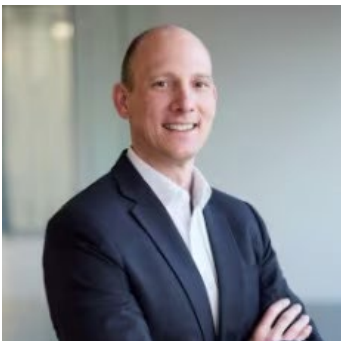
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