
Digital Vision for Cloudification



Trusted partner for your Digital Journey

Atos

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We would like to thank all of the contributors. If you wish to send feedback, please tweet using [#DVfCloud](#) or email: sacha.klingeleeers@atos.net



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Foreword



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Cloud applications and platforms are the new normal, with cloud and agile development providing the tools for modern software creation. With cloud as the foundation, providing flexibility and scalability, you can optimise your IT architecture to enable new digital services and applications that will underpin business success.

A sustainable cloud strategy involves collaboration between centralised and distributed applications on legacy and multi-cloud environments. The orchestration of these applications relies on unified hybrid platforms to create and manage policies within your IT landscape, enabling the best usage with consistent governance, compliance and security. As this is not an easy assignment, it requires a well-prepared journey and excellent cloud professionals.

To adapt and survive in this data-driven world, enterprises need to combine deep technology and vertical business expertise. It is for this reason that we have created a strategic alliance with Google, which enables us to provide our customers with access to best-in-class Google Cloud services, delivered through the enterprise and market expertise offered by Atos.

There is no question that cloud underpins digital transformation within the enterprise. Only by undergoing this transformation will organisations remain competitive and differentiated in their chosen markets. Atos is here to help customers through each step of this decisive journey.

Cloudification, as an essential ingredient of every digital transformation journey, should be viewed as more than just a technology project. It represents a powerful tool to prepare businesses for current and future markets. It is therefore essential that companies involve their CIOs, as well as all business management in the design of their transformation strategies.

This is what makes cloudification journeys so unique; each company has its own priorities and strategic focus, and will need to adapt its technology roadmap accordingly. There simply is no 'one size fits all'. Companies looking for a strategic partner must bear in mind that their partner will require both comprehensive technical expertise and a strong understanding of their business.

One thing is certain: there's no time to waste. Instead of being intimidated by the scale of your cloudification and digital transformation projects, focus on taking the first step to total transformation. You will then be able to overcome native limitations and make the best choices to serve your strategy.

Atos Belgium is delighted to present its Digital Vision for Cloudification, tailor-made to the reality of the Belgian market.

This Digital Vision aspires to provide a holistic view of Cloudification in Belgium by combining the insight of local Atos subject-matter experts with that of strategic partners of Atos, its customers and their representatives and user groups, as well as thought leaders in the Belgian IT ecosystem.

The result provides answers to the questions most customers are currently debating in their IT leadership teams: Is cloud only for large corporations and not for SMEs? What about the increasing focus on security? Which cloud should we move to? Is cloud a strategic necessity? What about the rise of edge and swarm computing? Is ROI still a valid KPI, or should organisations move to Return on Partnership?

These and many more thought-provoking questions are the subject of this Digital Vision. We are confident that each article will add value to help guide your transformation towards a new, cloud computing-enabled business model.



Cloudification enables businesses to become truly digital and agile

Organisations all over Europe are facing unique economic and digital challenges. While digital transformation provides tried and tested answers, many Belgian organisations remain reluctant to embark on this journey.

Transformation is affecting businesses at an ever-increasing pace. Think only of the impending Brexit, the ongoing requirement to meet GDPR guidelines, or the internal pressure on IT departments to cut costs and move from a CAPEX to an OPEX model. These are just a few examples of change that is either ahead of us or already taking place.

In the digital transformation age, organisations have a plethora of solutions at their disposal to radically reshape and innovate their business models; however, they also face competition from international challengers, who have already discovered and are taking full advantage of the available opportunities.

Even Chinese companies such as Alibaba (which has opened a distribution centre near the city of Liege) have already started rolling out their innovative services and are ready to take on national and European retailers. Meanwhile, organizations such as Uber and Airbnb have amply demonstrated how industries can be disrupted in a very short timeframe. And other industries are about to follow: car manufacturing (with the connected car), pharmaceuticals (with a far more personalized level of healthcare), financial services (becoming increasingly mobile and automated)... Belgian organisations must understand that in terms of digital transformation, it's not almost 12 o'clock - it's already past 12 o'clock!

The time to act is now, and cloudification will play an important role in the success of their digital transformation journey.

What is cloudification?

Cloudification means more than just 'moving towards the cloud'. It also refers to the immense business opportunity that follows when you transform to a new business model, enabled by cloud computing and other technologies. No journey towards the cloud can be considered successful if not accompanied by the adoption of other technologies such as IoT, blockchain and AI.

Even though the journey to the cloud requires a thorough technical makeover and transformation, the ultimate goal for organizations should be to focus on those business aspects that differentiate them from the competition. This focus can be lost when having to deal with all the administrative and technical complexities involved in crafting the best cloudification strategy. However, when you focus on the aspects that are at the core of your business and outsource those that are not, you are on track to achieve the best possible cloudification result. You will have all the building blocks available to become a smart enterprise: digitized and automated processes in a mobile and data-centric computing environment where decisions are based on the available knowledge and intelligence.

Wanted: reliable cloud broker

It is clear from the above that a thorough cloudification strategy requires a significant level of focus and dedication, as the world of available technologies is changing rapidly and becoming increasingly complex. Most organisations are better off relying on an external party to accompany them on their cloudification journey. Such an external partner can be called a 'cloud broker' or 'cloud agent'.

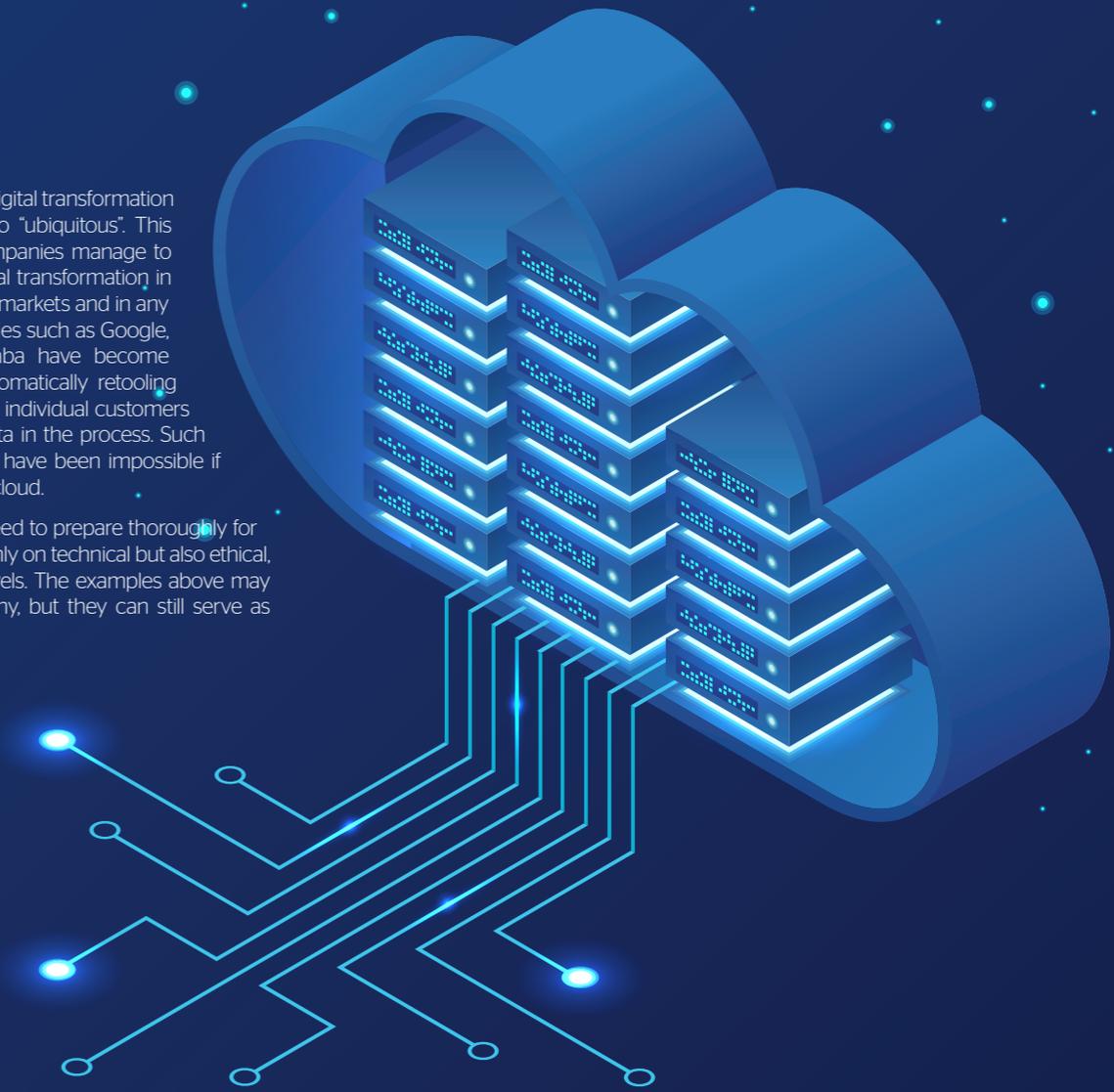
Typically, a good cloud broker can be relied upon to bring their experience across the cloud ecosystem. Their vast experience in both legacy and cloud environments will enable them to offer companies the best of both worlds in terms of choice and best practice and provide them with the ideal roadmap for their cloudification journey.

A cure for (some of) our pains

With all the complexities of embarking on a cloudification strategy, the rewards at the end of the journey are well worth the effort - particularly with the added value of a reliable cloud broker partner. In some cases, cloudification may simply become a necessity. According to some studies, for instance, the cost of healthcare will skyrocket - from 6% of the GDP in OECD countries today to 14% of the GDP in 2060¹ - if governments don't embark on their cloudification journey straightaway.

In the long run, the path of digital transformation will lead from "intelligent" to "ubiquitous". This is what happens when companies manage to repeat their successful digital transformation in new environments, for new markets and in any geographical area. Companies such as Google, Netflix, Amazon, and Alibaba have become extraordinarily good at automatically retooling their offerings for millions of individual customers and leveraging real-time data in the process. Such successful strategies would have been impossible if they had not moved to the cloud.

This is why organisations need to prepare thoroughly for the journey right now, not only on technical but also ethical, organisational and other levels. The examples above may be out of the reach of many, but they can still serve as guidance and inspiration.



¹ <http://www.oecd.org/health/healthcarecostsunsustainableinadvancedeconomieswithoutreform.htm>



Belgian companies are about to make a leap into the cloud

Cloudification, digitalisation and business transformation: they are no (longer) hype or buzzwords - but rather an undeniable reality which may become a real threat if you don't jump on the transformation train yourself.

Belgian organisations have always been more cautious than, for instance, their Anglo-Saxon and Scandinavian counterparts. But the impending threat of companies who have already fully embraced cloud-enabled digital business models (or who have been cloud-based from the start) is gradually forcing Belgian companies to fully adopt the cloud as a strategic necessity if they want to remain competitive.

Even banks are now experiencing increasing competition from unlikely entrants such as Google and Apple. Traditional business models are clearly becoming obsolete, and eventually only those organisations willing to embark on the journey to the cloud will survive.

This journey will look different for every organisation, and each CIO will have to consider very carefully how this will impact their ICT architecture and management. As one CIO once said: "The number of traditional ICT vendors I deal with has decreased from 100 to 15 in just a few years. But in that same period, the number of SAAS vendors has increased from 1 to 35." The biggest challenge for them is to integrate these SAAS vendors into the existing architecture and to create a viable policy to deal with a heterogeneous environment.

That is where strategic cloud partners can make a difference. They can help companies on their gradual path towards the right level of cloudification. In Belgium, this usually starts with one carefully selected cloud project, allowing companies to learn as much as possible. On a next step, they will typically try out several cloud vendors and increase the number of cloud projects. Judging from our surveys with hundreds of Belgian CIOs, we expect the usage of cloud in the ICT infrastructure to grow from about 5% to more than 25% in the coming years

Cloud partners who wish to make a difference should focus on the needs of specific businesses. Only if they truly understand their customers' needs and ambitions, will they be able to offer the best possible advice. Of course, they will need to fully understand and enable integration, compliance and strategic roadmaps, but in the end knowledge of and intimacy with the customer will define the success of any long-term cloud service partnership.

Judging from our surveys with hundreds of Belgian CIOs, we expect the usage of cloud in the ICT mix to grow from about 10% to 50%





Cloud and SMEs: a love story waiting to happen

When looking at the percentage of organisations that have already adopted cloud computing, we observe a significant difference in terms of size: the larger the organisation, the bigger the appetite for cloud computing. A striking observation, because cloud computing seems even more fit for smaller companies.

Looking at the Eurostat figures¹, it is remarkable that the percentage of small enterprises adopting cloud computing (36%) is not even half the percentage for large enterprises (79%). The smaller the organisation, the bigger the reluctance to embrace cloud computing.

This huge difference is all the more remarkable because logic would dictate that smaller companies should be more eager to embrace cloud computing than their larger counterparts, as the advantages offered by the cloud seem to be even more tailor-made for small companies.

- Cost-efficiency: you pay for what you use, and nothing more. No upfront investment required.
- Internal IT departments don't need to worry about running infrastructure. Instead they can focus on core activities with higher added value.
- Cloud computing is flexible and scalable, allowing smaller organisations to (re)act fast when an opportunity is spotted, and to scale back if a project has ended unsuccessfully (which is an inevitable risk for any innovative start-up).

- Cloud computing environments tend to be safer and more mobile than anything a small organisation can afford internally.
- Their customers will enjoy a higher uptime and reliability, which in turn will lead to higher customer loyalty.

To summarize: cloud computing allows small companies to reach a level of performance, safety and reliability that once was only within reach of larger companies. Cloud computing can therefore be called the ultimate 'ICT democratisation tool'. And yet, this message seems to have reached a rather limited group of smaller companies.

At FEB, we try to bridge this gap by communicating as much as possible about these advantages, mostly in collaboration with industry-specific organisations such as Agoria, through information sessions, brochures, online materials, etc.

On the bright side: recent Eurostat figures seem to suggest that Belgian companies are increasingly eager to adopt cloud computing. A promising observation, but no reason to rest on our laurels. On the contrary, this should encourage us to speed up our cloud adoption rate even further.



¹ <http://appsso.eurostat.ec.europa.eu>

The keys to success in the cloud: business and technical transformation

Cloudification - the move to the cloud - can never be an isolated project; very often, it becomes part of a larger business and IT transformation project. Even if this is not clear at the beginning of the journey, cloud transformation often develops into a larger endeavour in order to fully realise the benefits of the cloud - like cost reduction, faster time to market and agility.

From our experience and from what we have seen in the market, digital transformation and business transformation go hand in hand. Transformation journeys are almost always initiated in response to a business need: whether the requirement is to process data more efficiently and more securely, to extend the business into the mobile and social space, or to adapt the capability of an organisation to respond to business growth and changing customer needs.

Moving to the cloud is no exception to this rule. Organisations move to the cloud to reduce costs or to quickly build and modify applications that would otherwise have taken several months to complete. Nowadays, cloud computing has become an important weapon in any business transformation project. The level of maturity and standardisation that cloud technologies have reached today has become an important driver for the increasing cloud adoption that we witness every day.

This does not mean, however, that we are well on our way to a fully integrated and optimised environment. Most customers are still facing a huge legacy of data and applications running on old platforms. It would therefore be senseless to move all of it towards the cloud. Firstly, not all applications or data are cloud-ready. For some applications, it makes more sense to start from scratch than to try and migrate them to the cloud. Secondly, simply moving the current infrastructure to the cloud would mean transferring your old problems to the cloud as well.

Careful preparation, thoughtful integration, reliable operation

Almost every cloud migration project will therefore be either the trigger for, or the consequence of, a larger transformation project. If it isn't, the

benefits of cloudification will always remain suboptimal. Cloudification should be part of a general business process improvement exercise, and of a technology overhaul making the apps and data more flexible, accessible and more easily integrated. A successful cloudification strategy will always include careful preparation, thoughtful integration of cloud and non-cloud assets, and a revised set of Service Level Agreements driving Business Level Agreements to ensure reliable operations.

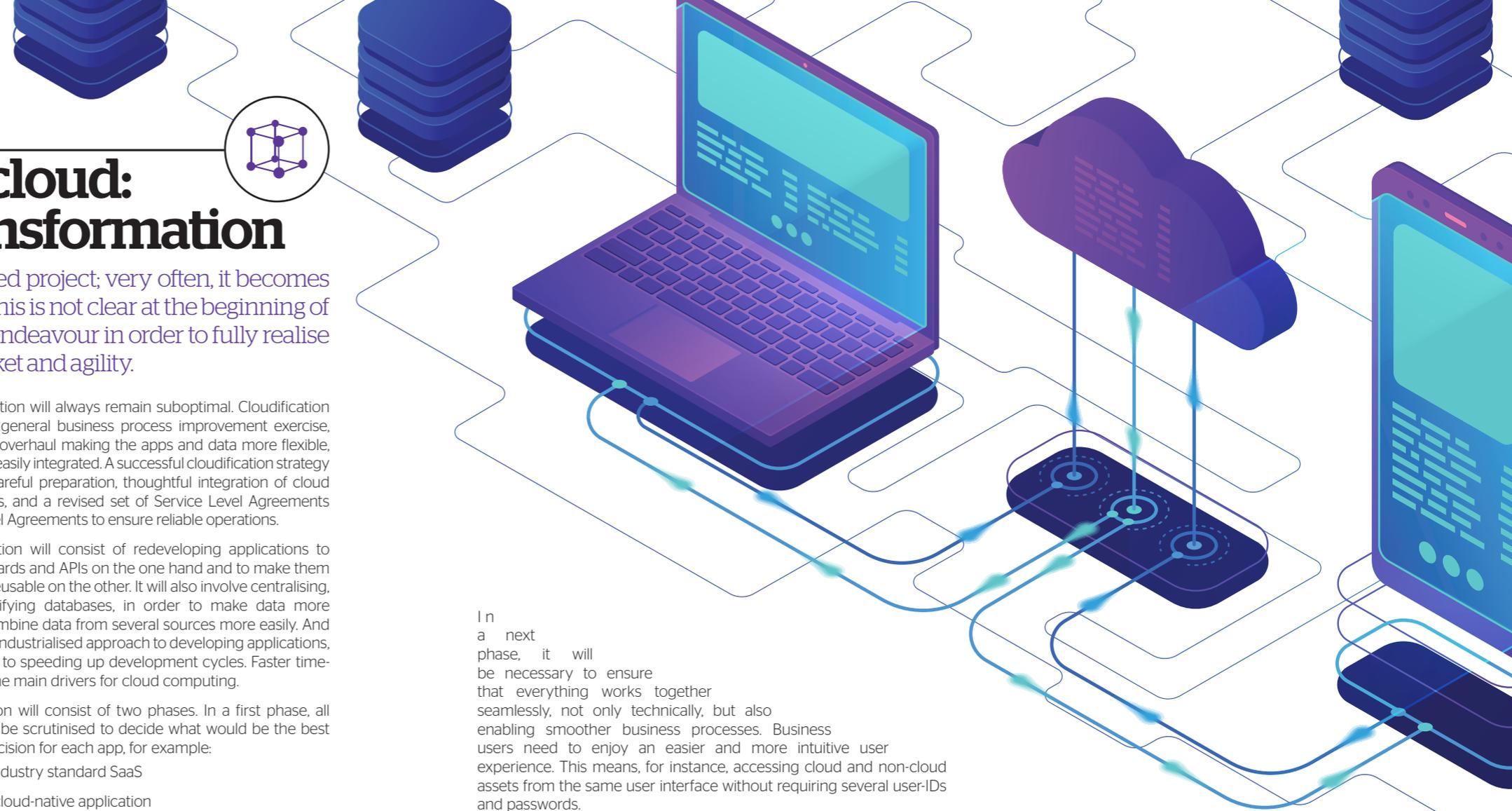
Part of the preparation will consist of redeveloping applications to leverage open standards and APIs on the one hand and to make them more modular and reusable on the other. It will also involve centralising, clustering and modifying databases, in order to make data more accessible and to combine data from several sources more easily. And it will require a more industrialised approach to developing applications, which will contribute to speeding up development cycles. Faster time-to-market is one of the main drivers for cloud computing.

Thoughtful integration will consist of two phases. In a first phase, all apps and data must be scrutinised to decide what would be the best possible business decision for each app, for example:

- standardise to an industry standard SaaS
- develop a custom cloud-native application
- modernise the app and moving it to a PaaS
- wrap the existing application and move it to IaaS
- leave the application as-is
- phase out applications that can be made obsolete or redundant

In a next phase, it will be necessary to ensure that everything works together seamlessly, not only technically, but also enabling smoother business processes. Business users need to enjoy an easier and more intuitive user experience. This means, for instance, accessing cloud and non-cloud assets from the same user interface without requiring several user-IDs and passwords.

When implementing the cloud transformation, two main principles need to be upheld: 'think big' and 'use small steps'. When you combine the big picture with small subsequent steps, you usually get the best results at the highest possible speed. Cloud technologies are a key enabler for agile development processes. This provides you with a headstart on this important transformation journey.





Usually, between 70% and 80% of all applications can be moved relatively easily towards the public cloud, as they are non-core to the organization and allow for a bit of latency.



The pace of cloudification is accelerating, start preparing for it today!

Global digitalisation will leave no one unaffected. Every organisation in every industry will need to consider when they will hop on the digitalisation train, and to what extent they will make use of public and private clouds. Our advice? Get started as soon as possible, because the pace of technology-led disruption is accelerating.

Technology is impacting our economy and our daily lives more than ever. Predictions vary, but we often hear that in the next few years, technology's share in the global economy will grow from 5 to 10%. Translated into our customers' business realities, this means that every single organisation in every single industry is considering which business processes can be automated, or how business models can be transformed. The shift towards digitalisation is most notable in industries such as automotive, manufacturing and the entire health industry. But eventually no one can ignore the digitisation trend.

The strategic question on what, how and when to disrupt is usually followed by another inevitable question: what will be the cloud strategy? What will be moved to the cloud and what type of cloud will it be moved to? Cloudification also challenges the definition of the core scope of IT departments; for example, IT departments won't have to focus as much on the security or scalability of their environments, because public cloud providers are better equipped to handle these challenges.

Even mission-critical e-business software is ready for the cloud

Traditional wisdom dictates that between 70% and 80% of all applications can be moved relatively easily towards the public cloud, as they are non-core to the organisation and allow for a bit of latency. A small minority of applications will be too critical to be outsourced to a public cloud, where you can still have some minor issues with respect to latency and connectivity. This percentage is shrinking rapidly, though, and an increasing number of organisations is opting for a public-cloud-first strategy. Early last year, it was considered inconceivable by many to host a mission-critical e-business environment, such as SAP, in the public cloud. Nowadays it is considered almost common practice. Moreover, an increasing number of financial and public institutions is moving some or even all of their core apps to the cloud.

The move towards the cloud solves another growing problem for most organisations: the never-ending war for ICT talent. The scarce entrants

on this market can afford to be very selective and will not choose a function that requires them to spend most of their time resetting routers or switching servers. They will want to make a difference and organisations with a sound cloud strategy will enable this far more than their counterparts, whose IT teams spend most of their times firefighting and ensuring maximum uptime.

No time to waste

On top of all other arguments and considerations, there is one inescapable truth looming over everyone's heads: we cannot afford wasting any more time deciding on our cloud strategy. If you start implementing your strategy right now, you will not be considered a laggard - but we all know that decision cycles can take quite a long time. If you instead decide to build your own datacenter, an endeavour that can easily take 2 to 3 years, you may end up realising your ICT ambitions 3 to 4 years from now, at the earliest! Needless to say, many competitors will not wait for you to get started.

Take the example of autonomous cars. Microsoft experts are predicting that fully autonomous cars will be technically feasible within 2 years. Assuming that it takes another eight years for autonomous cars to reach a significant level of adoption, what would you do if you were Brussels Airport, experiencing a steep increase in passenger numbers - would you still invest in modernising or expanding your parking infrastructure? And if you were a car insurer, would you still have a business when the number of accidents is reduced to virtually zero?

Autonomous cars are but one example of imminent technological change that demands careful forward planning from organisations. Companies should be just as discerning and prescient when it comes to their cloud strategy; moving to the cloud will give them the agility and flexibility to adapt their business models in the context of a disruptive future. Opting for the public cloud is not only the logical choice, but the only choice for companies to remain competitive.



Addressing practical concerns in companies' cloudification strategies

Beltug, the organisation representing corporate ICT customers, keeps close contact with its members and can thus rightfully claim to be one of the most vocal representatives of Belgian CIOs and IT decision makers. Beltug's latest survey on CIO priorities, containing many questions concerning cloud computing, is living proof that cloudification is truly happening. Danielle Jacobs, Beltug's general manager, highlights the most striking findings.

The most general observation from our priority survey is also the most important one: concerns around the organisation's ICT architecture are a top priority, not only for every single industry, but also for individual businesses and ICT functions. Everyone understands the importance of choosing the right infrastructure, making the right technology choices and preparing for the impending digital revolution. And everyone is equally convinced that this must involve a sound cloud strategy.

However, this understanding does not mean that companies are willing to rush into any form of cloud. There are many questions and concerns they want to see addressed before making any definitive decision. Below you can find an overview of the most critical concerns regarding cloud, according to our members' feedback.

1. Integration with legacy environment and applications

This particular concern grows with the size and age of the organisation. The more legacy applications can be found within the organisation, the higher the challenge to get everything connected, either with the existing APIs and connectors, or by creating new ones. Younger companies are definitely in advantage here, as their applications are more likely to be cloud-based, even when hosted within the company walls.

2. GDPR and other data concerns

Last year kept many companies busy struggling with the privacy and security requirements surrounding the GDPR. While striving to become compliant, companies understood that data protection and privacy will never be managed efficiently without a more centralised data architecture. This centralised data approach will be a head start when considering moving data to the cloud, and is therefore a major priority for organisations as well.

3. Security: less worries - and more

Most Belgian companies do understand that public cloud providers can offer a higher level of security than they could ever reach by themselves. But they are equally aware that people are the weakest link in any secure

environment, and that this link becomes even weaker with the added sense of security of moving to the cloud. One of the recurring priorities is therefore employee education and increasing awareness of the importance of secure behaviour in the cloud.

4. How to choose the right public cloud vendor?

Perhaps the most pressing concern of all: how can you make sure you choose the cloud vendor that fits your needs the best? How can you avoid unpleasant surprises, such as your data being 'held hostage' by a cloud provider when you are trying to switch vendors? These concerns are currently being investigated by Beltug's task forces. We are working on checklists containing all relevant questions you would want to ask your cloud vendor before embarking on a cloud journey together. In fact, one of the most important questions you should ask your vendor when starting a partnership is: how will we end it? How much will it cost? How does the vendor assist (or not) with the migration away from their cloud? Asking the right questions can help you save thousands, if not millions of euros.

5. How to avoid vendor lock-in?

This is a logical follow-up on the previous concern, but a very important one. Next to ensuring a smooth exit scenario, you want to make sure that the partnership works. This means that your cloud vendor should be open and flexible enough to allow interaction with other applications and data outside the cloud. After all, very few (if any) organisations will have a single cloud vendor hosting all their applications and data. You want to make sure the interaction with external data and applications is as smooth and seamless as possible.

6. Network access speed

When data and applications are literally around the corner (within your own datacentre, for instance), access speeds are rarely a real issue. But when they are hosted in a faraway cloud, the reaction speed or latency may become a genuine obstacle for your business processes. Trying to guarantee an optimal access speed through SLAs often proves to be

an expensive exercise. Belgian companies are therefore looking for ways to obtain transparency in this domain before closing an agreement with any cloud vendor.

7. Capex becomes opex

One of the most often cited advantages of cloud computing is that you get rid of this part of the infrastructure in your capital expenditure because you're moving it to recurring operational expenses. This is good news for many organisations, if only because you create more transparency and visibility of future expenses. But some organisations are not happy with all capex becoming opex: it has an adverse impact on their balance sheet. This too is a concern that should be addressed.

8. Other concerns

There are numerous other concerns that were voiced more than once. Upgrades by your cloud vendor may mean you have to manually update several APIs before everything functions as required (and some cloud vendors do upgrade very often!) In addition, some vendors are not afraid to change the pricing in the course of the agreement without consulting the customer at all.

At Beltug, we have listed all concerns and we are now actively working to provide our members with useful tools to help them address these concerns. We have established a work group to set up a checklist with questions to ask your vendor before entering an agreement. Next to that, we also voice our members' concerns towards the Belgian and European governments and follow up on any decision taken in these public organisations, to evaluate the impact and to discuss the consequences.

Ultimately the vast range of benefits of cloudification will drive companies to address their concerns even more swiftly and to continue their journey, wherever they seem fit, without any delay.



Atos expertise

In order to maximize the benefits of a cloud-based environment, companies must take into account their existing infrastructure and processes as they embark on their cloudification journeys. This requires producing a detailed analysis of current business and technical environments, identifying future business objectives, and assessing thoroughly what is the best future for each asset.

While on their journeys to fully realise the potential of a cloud-based strategy however, companies can greatly benefit from the guidance of experienced business and IT partners - who must be familiar with both legacy and current cloud environments.

With a track record of successful cloudification journeys, Atos holds strong credentials as a trusted partner. Our expertise is illustrated by a range of large-scale successful projects, including the Olympic Games PyeongChang 2018 - which saw all critical applications hosted 100% in the Cloud. This was a first in the history of the Olympic Games and led to a 30% reduction in operational costs.

We can also provide relevant success stories across countries and industries. For example, in Belgium alone, a team of 260 employees - including 80 local cloud experts - is currently working on Orchestrated Hybrid Cloud Solutions for 30 local cloud transformation projects.

This is the power of Atos: an experienced team of local experts, supported by a global specialist team with both technical and business consultancy knowledge.

Statistics global

 **68%**
of our Top 100 clients are utilising Atos Hybrid Cloud

 **#1**
Ranked European #1 for Hybrid Cloud

 More than **5,000**
Cloud experts

 **15,000**
transformation experts

Statistics Belgium

 **260**
employees working on Orchestrated Hybrid Cloud Solutions

 **80**
Cloud experts

 **30**
Cloud transformation projects





From Return on Investment to Return on Partnership

Cloudification has a more profound impact on organisations than you might expect at first. Once in the cloud, the traditional 'Return on Investment' (ROI) of IT projects gets replaced by the concept of 'Return on Partnership'. And, as the traditional, horizontal IT infrastructure gets replaced by end-to-end vertical cloud solutions, the role of the CIO may become 'cloudified' as well.

Organisations are 'cloudifying' more and more each day. According to a global survey conducted by Bettercloud.com, by 2018, half of all organisations were already running 80% of more of their business applications in the cloud, as SaaS. By 2022, this figure may reach 80%.

Many of these cloud solutions are 'end-to-end', vertical solutions including hosting and infrastructure, as well as the business application logic and the front-end. As this trend increases within organisations, their reliance on the traditional horizontal internal infrastructure will gradually diminish. Business users and customers do not need to worry about the company's infrastructure nor about functional application development. Instead, all they really need is a decent internet connection to access their vertical, cloudified solutions.

So, what does this mean for the CIO of an organisation? Until recently, the I in CIO stood for four equally important aspects of this role: Innovation, Intelligence, Infrastructure and Integration. With the advent of a myriad SaaS, IaaS and PaaS offerings, the responsibility for Infrastructure, Intelligence and Innovation will gradually become outsourced to these vertical platforms and SaaS applications in the cloud. Eventually, the only responsibility truly remaining for the CIO will be Integration.

This is still a very important assignment though, as data integrity and asset protection remain a core responsibility of CIOs: they must make sure that all corporate data, the organisation's most important asset, remains available and integrated at all times.

Return on Partnership

The cloudification trend also means that managing IT revolves less around infrastructure management and becomes more of a partner management story. The increased reliance on external capabilities has placed collaboration with external partners at the heart of many companies' growth strategies. The need to sustain these business relationships, whilst maintaining high levels of customer (and end-user) satisfaction, has led to new ways of quantifying the success of IT strategies.

Return on Investment (ROI) is gradually becoming obsolete: organisations no longer need to invest in IT assets, in huge new development projects, in IT talent recruitment or retention, or in alignment of business and IT. ROI is making way for a new KPI: 'Return on Partnership'. The burden is placed on innovative models for relationship management rather than on technical innovation.

Ironically, the technology needed to manage the partnership processes will usually be a cloud solution as well. This may seem like an additional threat for the CIO: even managing the relationship with cloud partners is handled by a cloud partner. However, this can also be seen as an opportunity; if the CIO is in charge of integrating partner management into the organisational structure, the corporate processes and the tooling suite, he or she can become an important orchestrator within the company: a partnership integrator. This role will significantly exceed that of technical master of data management.

That is precisely where the CIO can earn additional corporate accountabilities in the coming years: starting from their expertise in master data management, they have an opportunity evolve into management of the information flows and of the processes using these information flows. This will inevitably mean that they should become managers of the relationships with all partners needed to cover all business processes, including all types of cloud vendors and partners. If CIOs succeed in orchestrating and integrating all of these, they will secure their position as full-blown strategic partners who deserve their seat at the executive table - particularly as data and information flows cement their status as the 'new gold' for organisations.

The changing role of the CIO illustrates a more general truth: cloudification is significantly more than the migration of data and applications to the cloud. It impacts the company's structure, the executives' respective responsibilities, the KPIs to measure the performance of the organisation and its managers, and more. For both organisations and top managers, the secret to survival and success will be to adapt to this evolving environment and seize the opportunities created in this new landscape.

By 2018 half of all organisations were already running 80% of more of their business apps in the cloud, as SaaS (Software as a Service). By 2022, this will be about 80%.

This cloudification trend also means that managing IT revolves less around infrastructure management and becomes more of a partner management story.



Private, public, hybrid? Some guidelines for choosing the ideal cloud

The cloud comes in many flavours, and essentially organisations have the choice between three basic types of cloud deployment: private, public and hybrid. The key question is: how does one decide which cloud fits their strategy best? Rather than thinking of it as a strategic infrastructure-based decision, they should look at it from an application perspective.

When developing new applications to drive their business towards a digital transformation, organisations need to consider where they want the application to be hosted. As they will usually be developed with cloud hosting in mind, they can thrive in both environments. – Generally speaking, the public cloud will allow them to benefit most from the advantages offered by the cloud: ease of deployment, less concerns around management and support, etc.

Legacy applications, written in older languages or in the pre-cloud era, are an entirely different matter altogether. They have almost all been developed without a cloud strategy in mind, and cloud deployment is therefore less obvious for these applications. Moving them to the cloud will require a careful consideration whether the advantages outweigh the inherent obstacles.

The true added value of the public cloud can be found in the applications written specifically for cloud environments or when using 'Platform as a Service' or 'Software as a Service' solutions. When one uses the public cloud to host legacy applications in an 'Infrastructure as a Service' model, the public cloud offers no true value-add. Moving legacy to such an environment does not intrinsically change the application architecture. Or, to put it differently: the application is not becoming digital because it is running on Infrastructure as a Service, one simply moves the existing legacy from a legacy environment to a new computing environment, without reaping any cloud benefits.

If organisations want these legacy applications to benefit from the public cloud environment, they should first redevelop them into a microservice container-based solution. Else, these applications should stay legacy for the time being, and be deployed on a private cloud until they get phased out and replaced by a cloud-native solution. The value-add of keeping the legacy applications on a private cloud infrastructure is that private clouds can be more flexible in meeting the requirements for hosting legacy applications than the public cloud can.

The most obvious conclusion can be summarised as follows: for the time being the best solution will always be some form of hybrid cloud, offering applications in the public cloud when advisable and keeping legacy applications in the private cloud until further notice. On top of that, organisations need a fully transparent environment, allowing the users to have a seamless experience regardless of where their application is hosted.

Providing a seamless experience that allows the transparent deployment of both legacy and cloud-native applications, while enabling a gradual migration of the legacy applications into cloud-native solutions is not an easy task. This gradual migration, or cloudification, can be a long journey and should be planned meticulously. In order to travel this journey successfully, most organisations should consider hiring a third party to accompany them along this road.





Cloud and security: harmony built on shared responsibility

One of the most frequently used arguments for moving towards the cloud is “for security reasons”. Cloud vendors are almost always better equipped to ensure maximum security but that doesn’t mean organisations can just ignore security altogether. In the end they will still be held accountable for breaches or anything else happening to their applications or data. That’s just one of the important lessons to learn before embarking on your cloud journey.

The inherent dangers related to cloud security mostly date back to previous generations of ICT infrastructure. Before the cloud era, web developers were used to working on pre-defined servers with built-in security. These days, security concerns are usually directed towards the cloud provider, something which perfectly suits developers as this is historically something that they haven’t had to worry about - so they are happy to leave it to others once again.

And why shouldn’t developers leave it to cloud providers? They have far more experience in securing environments against even the most abundant and sophisticated attacks, so why not fully entrust them with this field of specialisation?

This seems like perfectly valid reasoning, with just one important objection: in the end, organisations are still responsible for their own security - not their cloud providers. A business can outsource the security operations and management as much as it likes, but in the end, they will be held liable if anything goes wrong. So, organisations should at the very least fully understand what level of security is being applied to their data, even if they don’t manage it themselves.

Additionally, data residing in the cloud is just one vector of security; the data traveling to and from the cloud server needs to be secured as well. This is an entirely different architecture compared to the traditional client/server setup with the server residing in the locally hosted data centre.

An entirely new paradigm

The migration towards the cloud has caused an entire paradigm shift, which also impacts security. The traditional LAN network has disappeared and made way for external servers and different routes toward these servers. Twenty years of network experience are being replaced, and new habits, new focus areas and new reflexes need to be shaped. This is no easy feat,

especially because most companies don’t even know how many cloud applications are in use throughout their organisation. Moreover, organisations need to understand that the IT infrastructure is no longer the fortified castle it used to be, but rather a vault in plain sight containing all valuable data. This too can be adequately secured but it requires a whole new frame of reasoning.

An additional obstacle on the road to secure cloud architecture are organisations’ concerns around cloud security – both false and genuine. Often, we can hear CEOs arguing against cloud adoption because of so-called GDPR concerns, but these concerns are not valid at all. Most cloud providers can offer a genuinely GDPR-compliant environment, including servers residing within the EU or even Belgium.

A more imminent threat for the success of organisations’ cloud journeys is the concern over the financial impact of cloud computing weighing on other factors such as security. The quest for cost-saving may eventually lead them towards cheaper but less reliable cloud providers. But these compromises on the level of security may end up costing them far more than they have saved by choosing the cheaper provider. That is why we would argue in favour of a legally imposed minimal service requirement, so that every cloud provider is forced to provide a reasonably secured environment.

Last but not least, the move towards cloud computing is inevitably and inextricably linked to the increasing adoption of mobile computing. Cloud security and mobile security should therefore never be viewed separately but rather as a whole.

It has become clear by now that cloud security is no easy matter and cannot be left to the cloud provider alone. Organisations should always consider turning to a security service provider who can help tie the loose ends together, and thus create a reliable computing infrastructure, from any user device to any type of application and data, wherever they reside.

Such a provider should be able to help public cloud providers to safely provision these services to their employees and their ecosystem. Security service providers such as these can also integrate the cloud providers’ security with their own managed security services platform and take control of the entire security environment. That way they can provide their customers with exactly the amount of security they require and set the priorities that matter to their organisation.





Cloud, AI and open source: the ultimate life hack for organisations

Life hacks telling you how to enrich your life are all over the internet, but the most important life hack for organisations in this age of innovation is definitely cloud computing. When combined with open source and AI (Artificial Intelligence), it is the main engine for innovation and disruption in this exciting new era. Public clouds such as Google's not only contain many useful examples of life hacks, but they have actually become a life hack of their own.

It is universally known that drastic cost reduction can lead to massive adoption, and vice versa. Remember the massive interest in solar panels a few years ago? Government funding made the technology affordable and suddenly everyone considered buying them. This in turn caused prices to drop, which generated even more interest, and so on.

A similar phenomenon can be observed with cloud computing, especially the public cloud, which has changed the game for countless applications. Think only of e-mail. A traditional mail application would charge organisations 1.000 euro per user, per year. Nowadays, when using Gmail, the cost has dropped to about 40 euro - 25 times less. This has obviously changed the market of collaboration software but has also caused entirely new collaboration models. The additional advantage of universal accessibility has made collaboration not only much cheaper, but also far more effective.

The same rationale applies to storage. We used to be limited to one or a few gigabytes if we were lucky; organisations and private users can now afford to store literally everything they ever create. That is not only reassuring for our family pictures and videos, it also contributes significantly to the amount of data available for analysis.

A winning trio

Enter the next big contributor to innovation, Artificial Intelligence and Machine Learning (ML). One cannot overestimate the importance of data in this age of cloud computing - the more data we have available, the better the results of any analysis will be. I am convinced that if we had all healthcare data of all patients worldwide bundled in one giant data pool, and if we anonymised the data and gave access to all researchers to perform advanced analytics, we would find a cure for all cancers within the next 5 years!

We shouldn't underestimate the importance of open source as a contributor to innovation and disruption either. At Google, we strongly believe in the

power of sharing; we share most of our breakthrough innovations with the community, knowing that whoever uses it will share their results as well. This willingness to share insights and technology is a recent phenomenon - the tech giants who dominated the digital era a decade or more ago would never have done so. But without this open source movement, we would probably never have seen the rise of Hadoop, the giant data handling and storage platform which have been instrumental to the explosion of data-based decision making.

When you combine AI and ML with open source and the public cloud, you get possibilities that one would never have dreamed of only a few years ago. Organisations in need of a powerful engine for a short but intensive machine learning project no longer need to buy 8,000 machines - they can simply rent them for a couple of hours to get the job done, at a fraction of the cost. This general availability of huge amounts of processing power means that a significant obstacle for innovation has disappeared altogether for organisations across industries. At Google, we have equipped our servers with TPUs (Tensor Processing Units) that are said to catapult computing power seven years into the future, which is equivalent to three generations of Moore's Law (stating that the number of transistors on a chip and consequently its processing power doubles about every 18 months). This should give you an idea of the performance capacity and speed available for cloud-based machine learning.

Local presence

Meanwhile, the traditional argument against public clouds has vanished as well. The requirement for (especially public) organisations to keep their data within the national or European borders may not be feasible for every cloud provider, but at Google, this is no longer an issue. We already have local datacentre infrastructure near the Belgian city of Mons, and we have been expanding that datacentre extensively over the past few years. We can thus provide the best of both worlds: global expertise and capacity as well as local presence and support - and, if required, local storage and computing power.



“Government services will work in one cloud, resulting in larger scale and lower costs, pooling knowledge and stimulating innovation.”

Alexander De Croo
Deputy Prime Minister

Deputy Prime Minister Alexander De Croo, who as the former Minister of Digital Agenda gave the impetus for the launch of ‘Government Cloud’ or G-Cloud in Belgium. In the first phase, the government services Social Security, IT (Fedict), Economy, Finance and Internal Affairs will join G-Cloud. Later the cooperation will be expanded with other government services, such as Justice. The aim is that all public services will join the new system.



Atos at the heart of the digital transformation of the Olympic Games

Competition data was beamed around the world in less than a second

Atos has, in its role as Worldwide IT Partner to the International Olympic Committee (IOC), run and orchestrated the key IT systems that helped secure the success of the Olympic & Paralympics Winter Games PyeongChang 2018. For the first time in the history of the Olympic Games, all critical applications were hosted 100% in the Cloud, utilizing the Atos Canopy Orchestrated hybrid Cloud. Atos ensured that the results were delivered around the world in 0.3 second.

Supporting the IOC in delivering the most sustainable solutions ever

By building its new, permanent Central Technology Operations Center in Barcelona, Spain, and using Cloud to support the running of the IT backbone, Atos performed a paradigm shift for the IT of the Olympic Games, by replacing a “build each time” model with a one-time build.

This new delivery model, scalable for every future Olympic Games, has helped significant reductions of:

- Carbon impact of people travelling to the Host city
- Number of physical servers
- Power usage
- Square meters
- Heat emanation

PyeongChang 2018 was Atos’ ninth consecutive Olympic Games as the worldwide IT partner to the International Olympic Committee. Atos has provided IT solutions to the Olympic Games since 1992.





The best match between candidate and job can be found in the cloud

Cloudification is not a choice, it's a necessity. I am convinced that, by now, not a single organisation will be wondering whether they should move towards the cloud. 'If' has made way for 'when' and 'how fast'. At VDAB (the public employment service of Flanders), we have started our 'Journey To The Cloud' program and are already experiencing the benefits with both SaaS and PaaS functionalities.

This move towards a new architecture can hardly be called a new phenomenon. In the past, we have witnessed transitions from established to novel platforms more than once: from mainframe to open systems, from client-centric PCs to server-based computing, for example. On all of these occasions, there was some reluctance at first, but in the end, everybody benefited from the advantages of the new architecture. In a similar way, we should not shy away from the move towards cloud computing.

Pushed and pulled towards the cloud

At VDAB, we continue to find credible reasons to take further steps towards the cloud. The most obvious one is probably the observation that more and more vendors are moving towards a cloud-first (and eventually a cloud-only) strategy. As a customer, you are left with the question "why not move to the cloud", whereas until recently "why move to the cloud" was the first reflex.

But there are other, more compelling reasons to make the move to the cloud. There are many specific projects where it would be unproductive to try to keep data and/or applications on-premise rather than in the cloud. One good example is our recent large-scale AI project, Jobnet, which would have been far too expensive and time-consuming to implement in-house. The project had a fluctuating workload, and thus called for a scalable environment. Furthermore, it came with a hard deadline and some very intensive computing demands on very large datasets. Without significant investment in extra hardware, this would have been difficult to achieve on-premise.

Jobnet: result in the cloud was worth our while

Moving to the cloud may not always be a walk in the park, but it can also be well worth your while. We can now boast the excellent result of our cloud-based AI project. This is a cloud-native app which offers users a service that is core to VDAB's mission: matching ideal job seekers with the ideal job offering. This matching system is powered by AI and deep learning technology, resulting in a powerful search engine that is capable of analysing huge amounts of data in a wide array of data and providing users with unexpected and yet very targeted results.

One of the most notable examples was a man whose professional history included some unique career moves. His very diverse list of jobs and employers included experience in working with children and, most recently, a job involving manual labour and craftsmanship. Thanks to Jobnet, this man was offered his dream job: creating a playground with wooden toys he could craft himself.

Proof of the success of our new platform is the fact that, in the short time since its launch, many job seekers started to use Jobnet in the hunt for a new job. This clearly demonstrates the power of cloud computing: even core activities within an organisation can be hosted in the cloud, complementing and in the future maybe outperforming traditional or legacy alternatives.



The future of cloud computing? Keep an eye on the edges!

When we founded the Atos Scientific Committee 8 years ago, cloud computing was still the next big thing. Nowadays, cloud computing has reached an advanced level of maturity, and the Committee's focus has moved to new areas of innovation. One of the most exciting and promising areas within cloud computing is the rise of edge computing and swarm computing, created to get the most out of the Internet of Things (IoT).

My role as co-founder of the Atos Scientific Committee is to monitor and detect, together with around 150 colleagues, which technologies will shape the future of IT and business, and to report on these technologies and their potential to disrupt current business models. When we first started, cloud computing was considered a disruptive technology. Today, we can safely say it has realised its promise and gone even further. Cloud computing covers the entire spectrum, from consumer applications, such as Gmail and YouTube, to sophisticated delivery models that provide businesses with the flexibility to consume exactly as much computing power and storage capacity as they need, for as long as they need it.

And yet, the business environment continues to evolve apace, setting fresh technical requirements that will necessitate a new generation of technology solutions. Take, for instance, this practical obstacle: Sometimes, when machines need instant access to cloud data to process a request, you want this processing time to be as short as possible. If the time required to access a remote data server and receive a response does not meet your criteria, you have to come up with an alternate solution.

IoT will cause a paradigm shift

This need for proximity to the data has become more apparent with the recent breakthrough of IoT (Internet of Things): billions of devices equipped with sensors, providing valuable information that organisations can use to improve the quality of their services and products. Gradually, organisations are realising that the data can also be used by intelligent devices to make better decisions on the spot. But if this data needs to move to a central cloud first, and then be retrieved from that cloud before it can be used locally, the process of transferring data can add an unacceptable delay to these decisions.

The most obvious example is the self-driving car: you don't want the never-ending stream of incoming data to move to a central cloud and back before the car can decide whether it needs to brake before a sudden obstacle. The

same also goes for less obvious examples: in many cases, you cannot afford the time needed for the data to move back and forth, and you need a "satellite" cloud to harbour the data and the required computing power nearby, or even within the device.

Edge computing: your local cloud

This is what we call edge computing: a cloud computing solution that performs the same functions as a central cloud computing or storage server on a decentralised location closer to the local devices. Edge computing thus becomes a local extension to the more centralised cloud computing.

The benefits of this extension will become increasingly evident over the next few years, when we can expect steady growth in demand for edge computing. Currently, around 10% of enterprise-generated data is created and processed outside a traditional centralised data centre or cloud, Gartner research director Santhosh Rao¹ claims. By 2025, this figure will reach 75%.

The success of edge computing is already leading to a more heterogeneous landscape. For instance, we can already observe the rise of peer-to-peer edge computing, which allows various edge computing platforms to talk to one another instead of to the central server. A typical example can be found in electricity grids, where power stations, along with the solar panel infrastructure in local households and other forms of alternative power supply, can exchange status information and thus optimise power distribution and usage without requiring a central server at all.

Another significant trend within the edge computing world is increased miniaturisation, which allows organisations to bring computing power closer and closer to the devices, up to becoming integrated within them. When the edge computing platform consists of a cluster of intelligent devices working in tandem, we have what we call 'swarm computing' - in which the many independent devices are grouped together to become one 'swarm' of interconnected units, each supplying a small amount of data and processing power which, when combined, provide enough information, intelligence and independence to enable localised, time-sensitive data processing and decision making.

Machine learning added to the equation

The availability of information and intelligence at the edges immediately raises the question: "can we add machine learning to the edge computing equation, too? Can we allow the local intelligence to learn independently, without resort to central platforms?" The answer is yes, but this will probably require a phased transition.

During the first stage, the local

intelligence will be handed centrally devised algorithms and will then start refining these algorithms based on the locally gathered sensor information. Think, for instance, of traffic lights acting on the basis of centrally implemented logic. When the local sensors notice that this leads to long queues on either or all traffic lights, the algorithm can be refined to address this problem.

At the second stage, the algorithms will be developed at the edges, without any interference from the central cloud server; they will be based on the local environment and will then be tuned to the changing local conditions until they are fully optimised.

Distributed intelligence: handle with care for best results

Edge computing is in many ways the ideal local extension to cloud computing, providing solutions to the inherent limitations of a centralised architecture. These solutions also involve some inherent downsides, which should be considered before massively deploying and relying on edge computing. For example, the decentralised model leads to an environment which is harder to secure and control, especially when machine learning is introduced at the edges; in these cases, a form of automated control is also required on top of a strong security protocol. Otherwise, the surface for (cyber-) attacks might become too large and anomalies or unwanted behaviours may take too long to get discovered.

That is one of the reasons why, even with the best possible technology available, we may still have to wait a while before we can fully embrace edge computing, including machine learning. People will need firm reassurances about the reliability and security of these solutions; the responsibility and liability in case of functional failures and unwanted data exposure will have to be clearly decided upon; and the resulting legal framework will have to be designed before we have a chance to witness a complete breakthrough of this technology.

But the ultimate result will be worth the wait!



¹ <https://www.gartner.com/smarterwithgartner/what-edge-computing-means-for-infrastructure-and-operations-leaders/>

Lexicon



AI (Artificial Intelligence): Applies advanced analysis and logic-based techniques, including machine learning, to interpret events, support and automate decisions, and take actions.¹

API (Application Programming Interface): A set of subroutine definitions, communication protocols, and tools for building software.²

Blockchain: An expanding list of cryptographically signed, irrevocable transactional records shared by all participants in a network. Each record contains a time stamp and reference links to previous transactions.³

CIO (Chief Information Officer): Oversees the people, processes and technologies within a company's IT organisation to ensure they deliver outcomes that support the goals of the business.⁴

Client/server setup: The splitting of an application into tasks performed on separate computers connected over a network. In most cases, the "client" is a desktop computing device (e.g., a PC) or a program "served" by another networked computing device (i.e., the "server").⁵

Cloud orchestration: The process to manage multiple workloads, in an automated fashion, across several cloud solutions, with the goal being to synthesise this into a single workflow.⁷

Deep Learning: Part of a broader family of machine learning methods based on learning data representations, as opposed to task-specific algorithms.⁸

Digitalisation: The use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business.⁹

Edge Computing: A cloud computing solution that performs the same functions as a central cloud computing or storage server on a decentralised location closer to the local devices.¹⁰

GDPR (General Data Protection Regulation): A regulation in EU law on data protection and privacy for all individuals within the European Union (EU) and the European Economic Area (EEA). It also addresses the export of personal data outside the EU and EEA areas.¹¹

Hybrid Cloud Computing: Refers to policy-based and coordinated service provisioning, use and management across a mixture of internal and external cloud services.¹²

IaaS (Infrastructure as a service): A standardised, highly automated offering, where compute resources, complemented by storage and networking capabilities are owned and hosted by a service provider and offered to customers on-demand.¹³

IoT (Internet of Things): The network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment.¹⁴

LAN (local-area network): A geographically limited communication network that connects users within a defined area. A LAN is generally contained within a building or small group of buildings and is managed and owned by a single enterprise.¹⁵

Latency: Measure of the responsiveness of a network, often expressed as the round-trip time (in milliseconds); that is, the time between initiating a network request and receiving a response.¹⁶

Legacy application: An information system that may be based on outdated technologies, but is critical to day-to-day operations.¹⁷

ML (Machine Learning): Advanced machine learning algorithms are composed of many technologies (such as deep learning, neural networks and natural-language processing), used in unsupervised and supervised learning, that operate guided by lessons from existing information.¹⁸

Moore's Law: The observation that the number of transistors in a dense integrated circuit doubles about every two years.¹⁹

Multicloud: The use of multiple cloud computing and storage services in a single heterogeneous architecture.²⁰

Open source: Describes software that comes with permission to use, copy and distribute, either as is or with modifications, and that may be offered either free or with a charge.²¹

PaaS (Platform as a service): A PaaS offering, usually depicted in all-cloud diagrams between the SaaS layer above it and the IaaS layer below, is a broad collection of application infrastructure (middleware) services (including application platform, integration, business process management and database services).²²

Private Cloud Computing: A form of cloud computing that is used by only one organisation, or that ensures that an organisation is completely isolated from others.²³

Public Cloud Computing: A style of computing where scalable and elastic IT-enabled capabilities are provided as a service to external customers using Internet technologies—i.e., public cloud computing uses cloud computing technologies to support customers that are external to the provider's organisation.²⁴

SaaS (Software as a service): software that is owned, delivered and managed remotely by one or more providers.²⁵

Swarm Computing: a cluster of intelligent devices working in tandem in which the many independent devices are grouped together to become one 'swarm' of interconnected units, each supplying a small amount of data and processing power which, when combined, provide enough information, intelligence and independence to enable localised, time-sensitive data processing and decision making.²⁶

TPU (Tensor Processing Unit): An AI accelerator application-specific integrated circuit developed by Google specifically for neural network machine learning.²⁷

¹ <https://www.gartner.com/it-glossary/artificial-intelligence/>
² https://en.wikipedia.org/wiki/Application_programming_interface
³ <https://www.gartner.com/it-glossary/blockchain/>
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⁶ <https://www.gartner.com/it-glossary/cloud-computing/>
⁷ <https://www.techradar.com/news/what-is-cloud-orchestration>
⁸ https://en.wikipedia.org/wiki/Deep_learning
⁹ <https://www.gartner.com/it-glossary/digitalization/>

¹⁰ See article 12
¹¹ https://en.wikipedia.org/wiki/General_Data_Protection_Regulation
¹² <https://www.gartner.com/it-glossary/hybrid-cloud-computing/>
¹³ <https://www.gartner.com/it-glossary/infrastructure-as-a-service-iaas/>
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¹⁷ <https://www.gartner.com/it-glossary/legacy-application-or-system/>
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¹⁹ https://en.wikipedia.org/wiki/Moore%27s_law
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²¹ <https://www.gartner.com/it-glossary/open-source>
²² <https://www.gartner.com/it-glossary/platform-as-a-service-paas/>
²³ <https://www.gartner.com/it-glossary/private-cloud-computing/>

²⁴ <https://www.gartner.com/it-glossary/public-cloud-computing/>
²⁵ <https://www.gartner.com/it-glossary/software-as-a-service-saas/>
²⁶ See article 12
²⁷ https://en.wikipedia.org/wiki/Tensor_processing_unit

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About Atos

Atos is a global leader in digital transformation with 120,000 employees in 73 countries and annual revenue of over € 12 billion.

European number one in Cloud, Cybersecurity and High-Performance Computing, the Group provides end-to-end Orchestrated Hybrid Cloud, Big Data, Business Applications and Digital Workplace solutions through its Digital Transformation Factory, as well as transactional services through Worldline, the European leader in the payment industry. With its cutting-edge technologies and industry knowledge, Atos supports the digital transformation of its clients across all business sectors. The Group is the Worldwide Information Technology Partner for the Olympic & Paralympic Games and operates under the brands Atos, Atos Syntel, Unify and Worldline. Atos is listed on the CAC40 Paris stock index.

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Let's start a discussion together



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