



Europe - Getting Ahead with the Cloud

A BCCD White Paper
Business and Politics Series
August 2017



Foreword

Marianne Dahl Steensen
CEO, Microsoft Denmark

We live in an amazing time where technology is changing almost every aspect of our lives - at breathtaking speed. At a time when technology-driven transformation is disrupting our lives, we need a balanced set of policy and technology solutions that will promote positive change and ensure the benefits of cloud computing are broadly shared.

I am therefore pleased that the topic of the latest White Paper from the British Chamber of Commerce in Denmark is Cloud Computing.

By enabling the collection, storage, and analysis of data at unprecedented scale, speed, and depth, the cloud makes it possible to find correlations that used to be too small to detect and discern the inner workings of systems that have been far too complicated to comprehend. And with cloud computing and advanced analytic capabilities as a foundation, we're seeing rapid advances in artificial intelligence, robotics, genomics, materials sciences, 3-D printing, and much more.

So, with the advent of cloud computing, we've arrived at the beginning of an era of even more profound transformation than we are used to. A new generation of technology innovation is delivering capabilities

that promise new ways to expand access to economic opportunity and address some of humanity's most pressing problems.

However, the cloud is creating disruption in other ways as well. People question the safety of their communities the sustainability of their job, and the prospects of their children. There are deep concerns about whether and how this technology can be used to benefit everyone, rather than just the fortunate few. Clearly, we've reached a critical crossroads where we must rethink how people interact, companies conduct business, and governments protect public safety, manage economic growth, and deliver services.

Creating a trusted, responsible, and inclusive cloud

Obviously, we don't have all the answers. No single person, enterprise, or organization does. The issues are too important and the stakes are too high. But, as a company at the forefront of the cloud computing revolution, we believe that to achieve this change, we must work together to create a cloud that is trusted, a cloud that is responsible, and a cloud that is inclusive. Now, at a time when technology-driven transformation appears to be inevitable, we have an opportunity - and a responsibility - to acknowledge the uncertainty that people face.

We must therefore work together to create a future in which the benefits of cloud computing are universally accessible and equitably shared. If the cloud is powering the Fourth Industrial Revolution, then the cloud needs to benefit everyone.

It's a task that will take a framework of laws and agreements crafted by governments and shaped by open discussion among all who have a stake in the outcome; citizens, business people, advocates, academics, parents – everyone.

We urge everyone who has a stake in the outcome - to come together to weigh the benefits and challenges inherent in this incredible wave of technology innovation, as we work to craft a framework for cloud computing that will help us create a cloud for global good.

I was therefore delighted that the British Chamber of Commerce in Denmark hosted the conference 'Harnessing the Power of the Cloud' on March 22, and assembled leading figures from business, national governments, EU institutions, international organizations and citizens to discuss the development of cloud computing and the challenges and opportunities it presents.

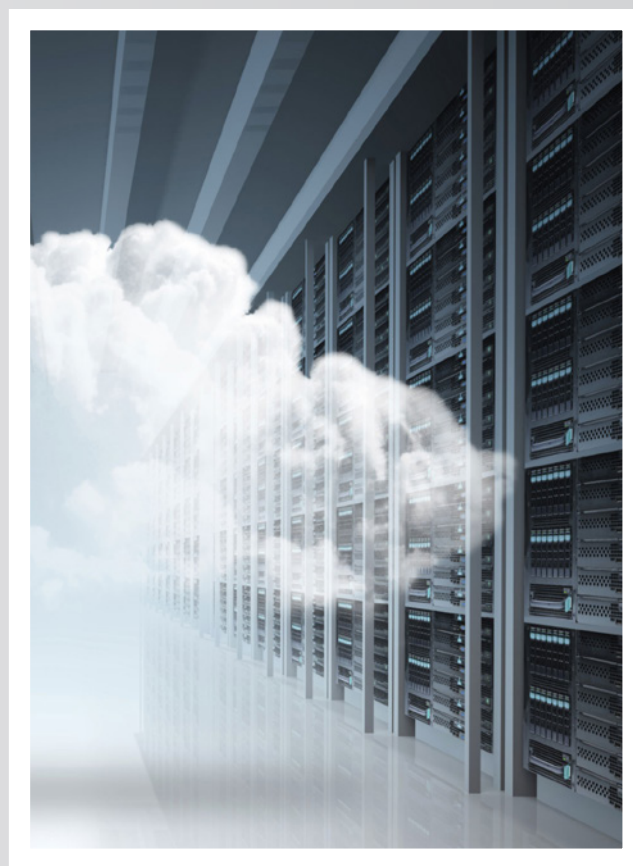




Table of content

The Issue – The Cloud Over Europe

6 “A Cloud for All”

The Cloud – Getting ahead with the Cloud

- 8 The Next Step for an Advanced E-Society
- 10 The Customer is King of the Cloud
- 12 Small Businesses: The Power of the Cloud to Transform Industries
- 14 Cloud – A Transformation Enabler in Healthcare
- 16 Defence as a Platform – Secure Mobility and Cloud
- 18 Building a Cloud that serves the broader good

Conclusion

Appendix





Global Mobility Management services that enable successful implementation of your Business Strategy!

IPM, your global mobility needs in one place, offering:



Assignment Management

- ✓ Planning
- ✓ Consultancy & Advisory
- ✓ Risk Analysis & Mitigation
- ✓ Compliance Audits
- ✓ Policy Development
- ✓ Costing & Budgeting
- ✓ Calculations of Hypothetical Taxes
- ✓ Assignment Letters
- ✓ Tax & Social Security Planning
- ✓ COLA & Remuneration



Relocation Management

- ✓ On-going Payroll, Tax & Expense Management
- ✓ Work Permits & Visas
- ✓ Home & School Search
- ✓ Language & Cultural training
- ✓ Familiarisation Visits
- ✓ Assignee Briefings
- ✓ Monitoring of Critical Dates & Reporting
- ✓ Repatriation & Reassignment



Talent Management

- ✓ ROI Coaching
- ✓ Minimise Risk of Assignment Failure
- ✓ Value of Global Assignments
- ✓ Measure Value of Global Talent
- ✓ Development of Global Leaders
- ✓ Cultural Diversity
- ✓ Training & Workshop Programmes with **IPM's Academy, GlobaliseMe**

A personalised service for all.

Find out how we can help with your Global Mobility Programme

Simply call and speak with one of our Global Mobility experts who will explore some of the common challenges and issues that you may be experiencing. They will provide independent advice and highlight any possible cost-savings available to you. Put our problem-solving to the test, that's what we are here for!



+44 (0)845 458 5643

info@ipmglobalmobility.com
www.ipmglobalmobility.com



Deo Delaney
*Head of Business Development
 EU & International Trade,
 British Chamber of Commerce in Denmark*

The Issue: The Cloud Over Europe

“A Cloud for All”

Cloud computing presents a fundamental change in the way we transfer, store and consume data in Europe, offering opportunities for government, businesses and private consumers.

As Europe moves into the digital age, data flows are becoming more and more significant in our modern economies. Perhaps the most important strength of the cloud is the way it allows us to manage this data, at a scale and speed that has never been possible. If data is the new oil, a material with the capacity to drive growth across modern economies, the real power of the cloud lies in how it can unlock the spillover benefits of this material. Opportunities presented by cloud-based solutions include the reduction of barriers to entry for entrepreneurs due to access to lower cost computing power when starting a business. Governments can expect to see improvements in the provision of public services, as well as internal operations and efficiency in interaction between public servants and citizens.

The British Government recently renewed its Cloud First policy, which aims to secure cross-government economies of scale in its procurement activities. Here in Denmark, Prime Minister Lars Løkke Rasmussen has created a Disruption Council which is tasked with assessing the pros and cons of globalization, digitisation and the Fourth Industrial Revolution, including cloud based services. The cloud is at the forefront of the policy agenda, with global revenues generated from public cloud computing services already significant.


Across Europe, there is also the potential to forge further market integration amongst EU member states, as the cloud reinforces the EU drive towards a

European “digital single market”. The adoption of the new General Data Protection Regulation (GDPR) provides the regulatory framework, which is a step in the right direction. The Juncker Commission’s goal of creating a seamless EU digital single market is within reach, one could argue. A completed digital single market could add as much as 400 billion Euro to the European economy, maintaining Europe’s position as a global leader in the digital economy and improving public services, with the cloud at the heart of it.

With clouds come rain and lightning

This cloud is no different, with many concerned about whether it is trustworthy. Consumers must be able to trust that their rights are honoured and that their privacy is respected. Newspapers the world over have reported incidents of individual’s sensitive, private information being leaked from public authorities due to cybercrime. Clearly, cloud service providers must be able to provide assurance to consumers that their data is protected, as a lack of trust in the cloud presents a very serious hindrance to its growth and auxiliary services.

Another challenge is creating regulations that are capable of reining in the excesses without hindering growth opportunities. Regulators in Europe face the challenge of striking the right balance between protecting citizens and businesses, and providing the certainty required for the benefits of the cloud to be maximized, while at the same time trying not to stifle

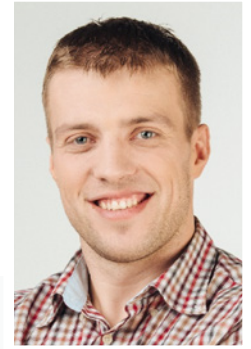


innovation, growth and competition. At the BCCD, we were delighted to host the Conference “Harnessing the Power of the Cloud” on 22 March in Copenhagen, to bring all stakeholders together and discuss the best way forward, and how to ensure that the cloud is legitimised, but with a clear oversight for regulators. Getting the regulatory bit right will be crucial in ensuring that the cloud reaches its full potential.

The rainbow

On the bright side of things is the potential for the future. We are already witnessing the rise of platform economies facilitated by the cloud. Uber may be controversial here in Denmark and in other parts of Europe, but it is already the world’s biggest ride hailing service, even though it does not own a single vehicle. Companies like Uber and Airbnb generate growth, encourage innovation and are popular with citizens and consumers due to low prices and employment opportunities, all of this on the back of the cloud revolution.

The new business models of these companies do pose questions for regulators, to keep a level playing field and find a reasonable level of taxation for different businesses. As governments engage in dialogue with these new upstarts and other stakeholders, regulators will craft better and more effective regulation to fit the complexities of the digital age. In doing so, businesses and regulators will pave the way to take society on to the next revolution. 🌈



Mikk Lellsaar

Executive Officer, Estonian Government Cloud

Co Authors

Andres Kütt,

Advisor, Estonian Information System Authority

Kaur Virunurm

Cyber Security Expert, Estonian Information System Authority

The Cloud

The Next Step for an Advanced E-Society

Estonia is a digitally-advanced society* which needs to comply with cloud technology, in order to maintain the level of quality of its e services in the ever-developing world of ICT.

Plenty of our critical registries only exist in digital format, for example the Land Registry (containing information about land ownership) and the State Gazette (consisting of all the regulations and laws which are applied in Estonia), among others. It is therefore of critical importance for the Estonian Government to ensure that these services are always available, even in cases where data centres located within Estonian territory are not capable of operating themselves due to emergency events.

In total Estonia has more than 1000 public digital services and information systems¹. All those public services are managed and operated by various public sector agencies, which means that the quality and security of those services is fragmented. Using public clouds as well as the government cloud platform ensures the certified level of security and quality of the services, and raises the continuity of our e-society. Furthermore, the main components of Estonian Government IT architecture eID² and x-road³ don't depend on the platform where they are running, and are therefore cloud capable. Using those components will ensure secure authentication and the integrity of data exchange within the cloud.

The Estonian e-residency project⁴ is another factor which gives an additional push to use cloud technology. It provides a unique opportunity for people all over the world to receive a government-issued secure Estonian

digital ID (eID) and enables most of the Estonian public to use government services. It also provides private services a location independently and makes those services available globally (most common services are Business Registry, Land Registry, digital signing and bank services). The E-residency programme aims to have 10 million e-residents by 2025, which means that our services must be scalable. Currently Estonia is offering its public services to 1,3 million eID owners and the e-residency project will both significantly increase the customer base and provide high quality services. Cloud technology will definitely help to increase the availability of those services.

“...by using cloud technology we are able to increase the quality and security of our public sector's digital services.”

Two new EU-wide regulations, the General Data Protection Regulation⁵ (GDPR) and the Directive on security of network and information systems⁶ (NIS Directive), are also supporting countries to move towards

* <https://ec.europa.eu/digital-single-market/en/scoreboard/estonia>

1 <https://e-estonia.com/facts/>

2 <https://www.ria.ee/en/public-key-infrastructure.html>

3 <https://www.ria.ee/en/x-road.html>

4 <https://e-estonia.com/e-residents/about/>

5 <http://www.eugdpr.org/>

6 <https://ec.europa.eu/digital-single-market/en/network-and-information-security-nis-directive>



clouds as they frame the overall guidance and standards on how to buy, supply and use the cloud services. The cloud is global business and small countries themselves are not able to develop and enforce the kind of frameworks and requirements for global cloud providers. Small countries have very few tools to employ which could affect those cloud providers. Therefore, EU initiatives such as the GDPR and NIS Directive are needed, as they give governments some basis and legal support which they can rely on moving towards using various cloud services.

Economic assessments have revealed that the usage of cloud technology is not efficient cost-wise for Estonia. Estonian public sector IT agencies are capable of operating their IT systems more cheaply by themselves than operating those systems in the cloud. However, by

using cloud technology we are able to increase the quality and security of our public sector's digital services. Additionally, consolidating various services and systems in the cloud will probably have some beneficial side-effects, compared to operating information systems fragmented by different public agencies.

Every country's public sector faces three choices with regard to cloud technology: either ignore cloud technology, build your own (private) cloud or use public clouds. Estonia has chosen to use the combination of private and public clouds⁷. The hybrid cloud solution is accepted and it is the most suitable way forward, especially if Estonia is opening its IT infrastructure to e-residents. Overall cloud technology is complex and expensive to implement but we need to implement it to take the digital society to the next level. 🌱

⁷ <http://riigipilv.ee/> (in Estonian)



Morten Hall Schou
CIO
Bluegarden A/S

The Customer is King of the Cloud

My claim is that we only consider artificial intelligence as such while we are in the process of getting used to it.

As soon as it becomes familiar to us, we stop thinking of it as artificial intelligence and start considering it as either a pure mechanical function or a natural function of our own actions. Think of driving in slippery weather conditions.

Our car's electronic stability program works to prevent the car from sliding out, and there are probably not many of us who think of it as artificial intelligence that just helped us. Through lightning fast processing of data, including the wheels' rotational speed, the position of the steering wheel, and the car's directions compared to its axis, artificial intelligence has potentially prevented an accident while we barely even noticed the problem.

Despite the system's impressive efficiency, it is important to remember that there was a time when we were not totally at ease with it. We felt great safety in knowing that we could turn it off again and regain control.

The same now applies to the new possibilities within the area of artificial intelligence. Perhaps we can still be surprised and impressed, such as when our (smart) phone already knows where we are going and how long it will take us to get there, when we get into our car after work. Some of us might even experience a small triumph on the days when we are not going home directly, and in that way "deceive" the system. However, it does not require a lot of imagination to foresee a day where we would sorely miss the proactive suggestions to alternate routes. A day where we would consider it an increased hassle to have to tell the car where to go; it should just figure it out, based on all the data we possess.


The balance of being surprised and impressed by the new possibilities and keeping control is very important for us in implementing cloud computing in our business. At Bluegarden, we deliver IT-based solutions for salary

and HR administration for our 65,000 Scandinavian customers. Salary and HR administration contains highly sensitive data and it is our responsibility to handle the data with the utmost professionalism and integrity. As for cloud computing, this greatly influences our approach and we solely implement changes that we are certain will align perfectly with our customers' needs and their high expectations for data security.

.....
"...cloud computing provides some very interesting perspectives for a company such as ours."
.....

At the same time, we are on a constant lookout for opportunities to improve our products, and here cloud computing provides some very interesting perspectives for a company such as ours. By using artificial intelligence on the vast amounts of data we receive and process, we will be able to offer our customers a unique insight into their own business and industry. An insight that will make it possible for them to increase efficiency and avoid costly mistakes.

The computer power required to perform these analyses is only accessible in the cloud. It is therefore our objective, within the near future, to be able to utilize these new tools, to lead the path for our industry. We want to lead in the direction of better and more effective utilization of the knowledge which already resides in the data we process every day, but which we are still unable to use in a way that fully benefits our customers.



Just as your car today has the capability to analyse the data it receives and warn you if there is danger ahead even before you realise it is there. In the future, we aim to be able to offer our customers tools which will not only provide the opportunity to optimize their business, but also be able to warn them about upcoming challenges, possibly long before any human intelligence is able to interpret the inconsistency between the layers of data reported.

Cloud computing applied to salary and HR data is therefore far more than just a dream for IT professionals. It is a method to give power to the customers and let their data work for them.

This is our focus at Bluegarden: “The Customer is King of the Cloud”. 🌱



Sergio Llorian
CEO
VoiceBoxer

Small Businesses: The Power of the Cloud to Transform Industries

The advent of the Cloud in supporting enterprises has resulted in opportunities to start and scale a business with faster speeds and lower initial investments.

The power of the Cloud allows small players to enter and shape industries. The language interpretation industry, for example, is currently undergoing a transformation as the power of the Cloud to cross borders and open markets creates opportunities and capabilities that had not been possible before.

For all start-ups and small businesses, Cloud-based computing and software-as-a-service make establishing a fully functioning organisation simpler and easier. Without the obligations to invest in costly software, servers, and other systems that mark more mature businesses, start-ups can build a robust operation in a faster, leaner way. Companies can store their data remotely, subscribe to browser-based CRM software, and cobble together varied technologies for their unique purposes. The ability to store, access, and use data via the Cloud enables even the smallest, youngest business to operate at a high level, overcoming the entry barriers that might otherwise have held them back.

The Cloud has created opportunities to transform whole industries. The language services industry, in which VoiceBoxer operates, has experienced major changes as a result of the power of the Cloud. Written translations no longer require a hard document to work off, as data is transmitted and returned remotely. Voice translations have also taken on new strength, as Cloud-based communications technologies have allowed access

to valuable foreign-language interpretation services for smaller meetings, virtual, conferences, and hybrid configurations that could not otherwise be served by traditional equipment and technologies. Companies like VoiceBoxer harness the power of the Cloud to provide multilingual communications for organizations and people across the world, breaking down language barriers across borders, allowing global participation and engagement from anywhere.

.....
“The Cloud enables novel capabilities that can shape even the most traditional industries.”
.....

Within language services, small businesses and self-employed linguists see new opportunities through the Cloud. No longer must language services providers rely on local professionals for translation and interpretation production; now a global pool of trained experts are able to market and provide their services to new customers, through new partners, and in new ways. The power of the Cloud means that a Hungary-based interpreter specialising in English-to-French interpretation can



partner with another interpreter based out of the United Kingdom to serve an event originating out of Switzerland. The provision of these traditional services is no longer local, but rather expanded to reach anywhere their value is required.

The language services industry is just now beginning to harvest the potential represented by the Cloud, as more suppliers and purchasers of these services experience traditional services in a novel way. Turn-around times are shorter as access to services approaches on-demand capabilities. Small players compete with industry behemoths, leveling the playing field and fostering a more competitive environment. Entrepreneurs offer novel solutions to reach underserved markets in ways people will soon grow accustomed to expect.

The Cloud provides opportunities for start-ups to compete at a high level with reduced investment and with shorter ramp-up time. The Cloud provides opportunities for small businesses to expand their reach and efficacy. The Cloud enables novel capabilities that can shape even the most traditional industries. Only through the Cloud would a start-up like VoiceBoxer have had the opportunity to create access to valuable language services for online events and conferences. Now that the power of the Cloud is unleashed, the language services industry will be reaping its potential for decades to come. 🌐





Freddy Lykke
CEO
Sirenia

Cloud – A Transformation Enabler in Healthcare

Healthcare is currently undergoing a significant transformation where new types of healthcare providers are entering the market.

A core part of the solutions they offer is based on digital services, and through the Internet their market access has become much easier and much faster than for traditional, geographically constrained providers.

Furthermore, tech-enabled users with a myriad of devices and mobile solutions are ready to take healthcare into their own hands. The consumers expect to engage directly with the healthcare providers and will “shop” for the best and most relevant service at any given time.

These new healthcare providers base their services on digital platforms, with scalability and access at the core of their business. For new healthcare apps the data that the app is collecting is stored by the app provider. In order to scale and provide easy access, most healthcare apps are based on cloud platforms whereby the app, and thereby the services, are made available globally just by having the app included in the app stores.

This also has an implication for citizens in UN classified LDCs (Least developed Countries), where some of these app and cloud-enabled services will suddenly be available from a smartphone. It is estimated that by 2018 65% of interaction with healthcare facilities will occur by mobile devices.

Also, the more established and in this context the more traditional healthcare providers (and insurance companies and doctor’s offices), will store patient medical records in the cloud, enabling patients to access data online at their convenience, for example their test results. A HiMSS Analytics conducted survey shows a significant transition of healthcare IT solutions to the cloud. Where one third of the Healthcare Information Exchanges have already moved into the

cloud, the back office and storage solutions have a significant increase in transition to cloud.

The area of highest increase is not surprisingly “Compute Cycles to Analyse Big Data”. Cloud computing offers an easily accessible and practically unlimited computing capacity, which is vital in order to achieve real benefits from the use of big data.

“Patient Engagement and Empowerment Tools” are already widely based on the cloud. During 2017, 75% of such solutions are planned to be cloud-based – a main driver being easy access for patients and the scalability of the cloud-based solutions as more patients adopt them.

.....
“...new healthcare providers base their services on digital platforms, with scalability and access at the core of their business.”
.....

There is also a significant increase in startups that focus on transforming healthcare with Artificial Intelligence (AI). Artificial recognition of x-rays and pictures of cancer tumours or bone fractures are the most obvious cases.

Startups are also using machine learning algorithms to reduce drug discovery times, which can lead to a significant reduction in overall costs for drug discovery. AI is also used within psychiatry, to support patients with conditions including depression and anxiety, in order to be proactive in alerting patients of deterioration in their condition. The result can not only help to prevent



hospitalisation, but also generally improve the patient's quality of life.

The only way these solutions can “learn” and improve is by having access to large amounts of data. With more solutions and data moving to the cloud, such data becomes more easily available for startups, and with good and appropriate governance, security and privacy these solutions will over the coming years provide a significant transformation and improvement within healthcare. 🍷



Steve Latchem
Chief Architect and Head of Architecture
Information and System Services, Joint Forces Command
UK Ministry of Defence (MOD)

Defence as a Platform – Secure Mobility and Cloud

Cloud and Mobility solutions are powerful capabilities for private industry, but have often been criticised as potentially unsafe, particularly for personal data and documentation.

At the Ministry of Defence in the UK, we have a transformation portfolio, entitled 'Defence as a Platform' that targets modernising and ever-greening our ICT portfolio, using industry best practices and technologies. This enables Digital-pace for our solutions and embedded innovation. We comply with, and help to drive forwards, the UK Government's Digital agenda, including a strategy for 'Cloud First'.


Cloud technologies have received enormous investments across the globe, to enable the elastic and variable performance and storage required for the digital age. However, this investment in flexibility has been mirrored by the investment in innovative security and control technologies, which enable secure processing and storage. In the MOD we recognise this, and have developed an architectural blueprint which utilises this advanced security capability, to enable us to implement cloud solutions for our information and business processing. Targeting an eco-system of cloud providers in the UK, we will be able to reduce our internal data centre and server estate, and utilise secure cloud hosting for our business. Using Containers (a cloud technology which enables rapid componentisation of applications, and deployment to multiple clouds), and TOSCA (Topology and Orchestration Specification for Cloud Applications) cloud data blueprints, we are able to instantiate secure cloud services, and deploy applications in seconds, where historically this may have taken many weeks to months.

Mobility is also a pivotal digital enabler, smart phones and tablets out-strip laptop and desktop sales by a significant margin, and mobile working is the increasingly requested model in all businesses, including Defence. Mobile devices are designed to enable freedom to collaborate in social media, download and experiment with applications, and traverse internet services freely.

“Cloud technologies have received enormous investments (...) to enable the elastic and variable performance and storage required for the digital age.”

However, this also means that the cyber risk of data/activity monitoring, data theft and viruses is increased. Industry has responded to this with increasingly sophisticated protection, from bio-metric access to devices (fingerprints and facial recognition), through to encryption and secure communication. MOD is leveraging this private sector innovation, to provide secure mobile devices with advanced protection to protect our personnel and information. Mobile Device Management (MDM), linked to the devices bio-metric

controls, and awareness of where the device is geographically, and what data connection it is using, enables the device to intelligently decide on information and application access. These controls effectively enable a secure 'enclave' to be used for business purposes, with the 'low side' of the device remaining as powerful and flexible as any device purchased privately.

Investment in security by technology providers is significant and ongoing in the digital age, ultimately, any business that is offering, or using, cloud and mobility services, cannot afford the reputational damage and potential revenue loss of data theft or breach. This investment means that traditional physical measures (e.g. walls and secure perimeters), whilst still valid, are out-paced by the controls and measures which security software can deploy on the cloud and on mobile devices. The digital age is driving not only a revolution, but also increasingly safe and secure mechanisms to access, protect and manage information and business processes. 



Brad Smith
President
Microsoft Corporation

Building a Cloud that serves the broader good

The world is undergoing a transformation unlike anything we've seen since the First Industrial Revolution.

The rapid advancement of data analytics, mobile devices and artificial intelligence is not only changing every aspect of how we live, communicate, work, and learn, but promises to solve some of the world's most pressing problems in areas such as health, education, and the environment.

At the heart of these advances is cloud computing. Here in Denmark, the cloud is transforming enterprises big and small. A new generation of cloud-powered business across the country, like web-based accounting firm Dinero and water technology provider Grundfos, are tapping into the cloud to build new products and services and boost employee productivity.

But as we realize the benefits of cloud-based innovation, it's important we recognize the disruptive impact that technology has on society. Damaging cyberattacks have increased worldwide. People raise important concerns about their personal privacy. Access to public services isn't equally distributed. Business that don't transform digitally risk being left out. And workers must learn new skills to compete in the digital era.

At its finest, Europe's history is about bridging differences through citizens' trust in both civic institutions and private commerce. Today, that trust is challenged, leaving institutions struggling to solve important social problems and maintain viable democracies.

Governments and businesses must ensure that technology moves forward without leaving people behind. At Microsoft, we are committed to transparency,

privacy, sustainability, affordable access, digital literacy, education, and skills. We believe that people need to retain rights to their personal information and governments need the ability to work together to protect public safety. As a company at the forefront of the cloud computing revolution, we recognize that we have a responsibility to address these issues, which we have done in our book *A Cloud for Global Good*.

"Governments and businesses must ensure that technology moves forward without leaving people behind."

In Denmark, there is growing momentum for embracing the cloud in ways that can benefit the public and broader society. The Danish Government is embracing digital innovation and services as an opportunity to lead in Europe, to drive national growth and security, and to build a more cohesive and efficient public sector that better serves individuals and businesses.

A great example of the cloud's potential in the public sector can be seen in Vallensbaek Municipality, which is on its way to becoming Denmark's smartest city. Using cloud-enabled data insights collected by digital sensors, Vallensbaek can efficiently heat and cool public buildings, cutting costs and enhancing the quality of life





of students, citizens and government employees. The city has now set its sights on improving parking and traffic, and reducing public noise and waste with digital data.

While cities like Vallensbaek are breaking new ground, Denmark's public sector at large still lags behind Danish business standards and public sectors in some neighboring countries. Danish Minister for Public Innovation, Sophie Løhde (V) recognizes this and has made important strides to accelerate Denmark's digital

transformation, including creating a new IT strategy and establishing a Tech Ambassador to advance the public-private collaboration on growth and data security.

Microsoft looks forward to working with the Danish government, and governments across Europe, to power new services through the cloud. Our goal is to help empower people across the country to achieve more. It is critical that we partner together to build a cloud in Denmark that is trusted, responsible, and inclusive. A cloud that serves the broader good. 🇩🇰





Gareth Garvey
CEO

British Chamber of Commerce in Denmark

Conclusion

The British Chamber of Commerce in Denmark's "Harnessing the Power of the Cloud" conference saw global, European and Danish leaders from industry, government and civil society engaging in a constructive dialogue about the cloud, its potential and the challenges it presents. These included leading figures from Microsoft Corporation, the UK and US governments, several SMEs, European governments and civil society. Acting as a platform for dialogue and exchange of ideas and opinions, these leaders were given the opportunity to share the opportunities that the cloud presents for them and others, as well as discussing common solutions to common problems.

Past industrial revolutions have dramatically changed labour markets, how governments regulate and the way people live. The cloud revolution is no different. The opportunities presented by the cloud are extraordinary and span many different areas. The capabilities of SMEs are expanding to a level that was unthinkable just 15 years ago, increasing the scope for innovation and entrepreneurship. Quality and accessibility of healthcare is being improved significantly by the cloud, not just in developed economies, but also in developing countries. With many job functions potentially moving into the freelance industry, many citizens might see a much larger degree of personal control over their personal work tasks and working hours. Governments can also benefit from the cloud from the opportunities to break down unnecessary bureaucracy and improve services. Estonia has, despite – or perhaps because of – its size been able to position itself at the cutting edge of the movement towards a digital society, improving access to services and increasing the quality and security of these services. These are just a fraction of the areas the cloud is revolutionising. From a broader societal perspective, the potential benefits are enormous. They all have the potential to lead to better and more efficient welfare

services and rising prosperity in both developed and developing countries, ultimately improving the lives of ordinary citizens.

However, with such a large shift, major challenges are bound to present themselves. Some have already surfaced. Uber recently pulled out of Denmark following the introduction of the new taxi law. Rather than being an expression of resistance towards technological development, this should be seen in broader terms as an expression of the difficulties in adapting regulation built up over decades with a new fast-moving and booming industry. The solution does not lie in closing off the market for companies like Uber or undercutting industry standards. Representatives from businesses, governments and unions should attempt to find common ground that enables both businesses and consumers to reap the benefits of new booming platform-based industries, while also adjusting regulation in an appropriate manner.

.....

"...the Copenhagen Conference showed how businesses, governments and other stakeholders are reaping the benefits of the cloud revolution..."

.....

Another challenge presented by the cloud is the massive wave of automation threatening the livelihoods of millions of people in the West. During the conference, it became clear that leaders across the board were determined to tackle this issue. The consequences of inaction have already shown themselves in elections across the West, where large groups of voters have

THE CLOUD

voiced their dissatisfaction with the status quo. Governments must ensure that proper requalification programmes are in place, so that citizens experience the benefits and are not hurt by the massive changes.

The ownership of data is another area of concern. Our mobile devices and the applications supported by them, have become part of who we are. As one of our speakers said, "we are all cyborgs now". Many, if not most of us, are indiscriminate or perhaps lacking in awareness when we allow access to our data, our views, our browsing or buying habits and our location. We do this as we see it as the price we pay for participating in many internet based services for "free". There are clear risks to personal privacy, human rights and public safety associated with the data held in the cloud. We all have a responsibility for our own data but many of us do not have the skills or knowledge to take this responsibility. We need to help our citizens understand the issues but we also need companies to establish standards and governments to implement laws to protect our data and to provide remedies for breaches of these standards and laws.

All in all, the conference showed how businesses and governments and other stakeholders are reaping the benefits of the cloud revolution, while also displaying willingness from all sides to tackle the issues that are inevitable with any industrial revolution. It is essential that a pragmatic solution is found to the problem which does not undermine anyone's interests. Nevertheless, just like industrial revolutions before it, the cloud has presented enormous opportunities. It has the potential to make things easier for businesses, improve the quality and efficiency of public services and ultimately improve the lives of millions of people. Perhaps this is not something that will only benefit the privileged few, but rather something we all can benefit from. ♡



Appendices

Authors:

Editor-in-Chief:

Gareth Garvey

CEO, BCCD

Contact: gg@bccd.dk

Lead Author:

Deo Delaney

Head of Business Development,
EU and International Trade BCCD

Contact: dd@bccd.dk

Contributing Authors:

Marianne Dahl Steensen

CEO, Microsoft Denmark

Mikk Lellsaar

Executive Officer, Estonian Government Cloud

Andres Kütt,

Advisor, Estonian Information System Authority

Kaur Virunurm

Cyber Security Expert, Estonian Information System
Authority

Morten Hall Schou

CIO, Bluegarden A/S

Sergio Llorian

CEO, VoiceBoxer

Freddy Lykke

CEO, Sirenia

Steve Latchem

Chief Architect and Head of Architecture
Information and System Services, Joint Forces Command
UK Ministry of Defence (MOD)

Brad Smith

President, Microsoft Corporation

Research and Text Development:

James Gordon-Orr

Editing, Assistant Business Development Manager, BCCD

Contact: jgo@bccd.dk

Thi Tham Thomasen

Trade Analyst & Head of Administration, BCCD

Contact: ttt@bccd.dk

The British Chamber of Commerce in Denmark (BCCD) is a bilateral Chamber for British and Danish business people in Denmark and international business in general. The vision of the BCCD is to be a prominent promoter of business and culture between Britain, Denmark and the international business community.

Public Relations and Graphic Design:

Hill+Knowlton Strategies, Public Relations

Aubertin - Design & Graphics





You're welcome!

For membership and advertising enquiries:

James Gordon-Orr
jgo@bccd.dk

Disclaimer:

The British Chamber of Commerce in Denmark is a non-political association that wishes to provide its members with information and opinion relevant for business.



BCCD Sekretariat
Odd Fellow Palace
Bredgade 28, 1.sal
DK-1260 Copenhagen K
☎ + 45 3118 7558