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# ***When the sleeping giant awakes...***

The disruptive impact of the  
Zero Cost of Control phenomenon\*  
on business and society

*\* We are aware that, strictly speaking, we should call it the Near Zero Marginal Cost of Control phenomenon.*

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# Executive Summary

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Digitalisation and disruption are key global trends in today’s economy. Their impact can be felt across all industries, from agriculture to yacht-building. We believe that while the **next stage** of the digital transformation process – **the digitalisation of public administrations** – has not yet received much attention, it will have an equally significant impact on business and society. The wave of digitalisation does not stop at the gates of the public sector, and the digitalisation of public administrations will bring **dramatic changes for the private sector**. In this paper we will show why we believe this to be the case, and what it means for you.

Many tasks undertaken by the public administration are particularly suitable candidates for digital transformation. This applies especially to areas such as **tax and regulation** that are relevant to business. Government agencies that have started to embrace digital technologies like **big data, machine learning and artificial intelligence have uncovered**

**a completely new world** where they have a whole new set of capabilities to better manage their scope of action to an unexpected, and maybe even unintended, extent. And they will be able to exercise these capabilities – in particular with regard to **control** and compliance with the law – **at almost zero cost**. In our view, this change will set off an almost **‘natural’ evolution towards overall transparency**. This development will progress at different speeds across the globe, but will nevertheless fundamentally change the way states act and interact. The private sector will experience the consequences as another disruption.

We are observing the first signs of this **next wave of digital disruption**, and believe that the overall impact will be huge for both business and the wider society. We also believe that we are approaching another hidden **inflection point**, where state productivity will suddenly dramatically increase. But the consequences are not being widely considered.



# 1. Economics of digitisation: a short introduction

To later transfer the findings and be able to fully understand the effects of the digital transformation of the public administration, we must start with a definition and some economic considerations.

## 1.1 Digitisation versus digitalisation

The phenomenon of ‘digitisation’ is simply defined as the process of encoding information as streams of bits, or in other words, it’s the transformation of text, sound, photos and other analogue data into a digital format and thus a language that computers understand.<sup>1</sup> With the costs of converting, storing and sharing data in digital formats declining, more and more elements of the global economy are being digitised – what a computer can read, a computer can analyse. This means that the availability of data increases the amount of analysis that can be done.

However, **access to more data** isn’t the whole story. For disruption to really take hold in this environment, not only do we need more data, but we need the power to be able to handle large volumes of data accurately. Until recently, processing power couldn’t keep pace with the increase in data volumes. Only with the access to technologies like advanced analytics, machine learning, artificial intelligence and robotics are we able to **work with these volumes of digital data** in a meaningful way. These

technologies will take the automation process to the next level and help unlock the full potential of digitisation. This use of digital technology (so far mainly in business) is generally referred to as digitalisation.<sup>2</sup>

## 1.2 The characteristics of digitised goods and services

It is important to understand that digitised goods and services have some different economic properties than ordinary goods and services. Firstly, they are **non-rival**. Secondly, the **marginal costs of reproduction and distribution are close to zero**. And thirdly, the **replicate is identical to the original**. Or as Brynjolfsson and McAfee put it, they are not ‘used up’ when they get used, and they can be consumed by many people or things at the same time. Even more importantly, it’s extremely cheap to make another perfect copy and send it around the planet.<sup>3</sup> These unique features of digital goods and services will lead to some starkly different economics.

## 1.3 Effects of digitalisation on productivity

It is widely accepted that **productivity growth** is driven mainly by **efficiency and innovation**.<sup>4</sup> Owing to the different economic properties of digital goods and services, and the impact of automating their manufacture, we can now observe some very profound effects on efficiency.

Non-rivalry and zero marginal costs, for example, make it possible to offer a **digitised service or product** at the same or even a better quality level to many customers in parallel and thus substantially increase output on the supplier side. This kind of productivity gains enable the manufacture of the same quantities of (now) digitised goods and services at significantly lower cost as before. Or viewed from a different angle, they enable the manufacture of **digitised goods and services in much higher quantities and/or with better quality at the same cost**.

The potential productivity gains extend even on **tangible goods and services**. The use of digital technologies makes it possible to manufacture the **same tangible goods and services as before, but at lower cost**. Even though the precise channel through which digitalisation triggers productivity remains somewhat controversial in academia, it can already be empirically shown that firms making heavy use of information technology show higher performance and productivity growth.<sup>5</sup> Put simply, there is a reason why it would take the average American only 11 hours of work per week today to produce the same amount as in 40 hours of work in 1950.<sup>6</sup>

Another important driver of efficiency is **automation**. Here again, technologies like advanced analytics, machine learning, artificial intelligence and robotics will

play an important role as enablers. From this point of view, digital technologies are the latest form in a process of automation that has been going on for about 200 years.<sup>7</sup>

When thinking about the time horizon for these changes to have an impact, one should always bear in mind that digitisation and the increased use of digital technologies like machine learning and artificial intelligence in traditional industries will not automatically lead to productivity growth per se. Rather, **complementary innovations** such as changes in business processes and organisational innovations and investments are needed.<sup>8</sup> These **‘business innovations’** are only possible with digital technologies, and we will therefore only see the full impact of digital technologies on productivity when the technology is combined with business innovations.

But the effects of digitalisation don’t stop with steep productivity growth.

## 1.4 Effects of digitalisation on outcomes and returns

The different economic properties of digitised goods and services also have a dramatic effect on market outcomes and returns – a phenomenon that has so far been observed primarily and naturally in the private sector.

Very often, winner-takes-all or (more accurately) **winner-takes-most markets**

and so-called superstar markets can be observed in digitised markets. These markets demonstrate a power law or Pareto distribution with the infamous ‘long tail’.<sup>9</sup> Going by the rule of thumb, this means that 20% of the participants in a given digitised market will get 80% of the gains.<sup>10</sup>

While this is encouraging for those in that 20% of a digitised market, it’s important to remember that even in these markets, the first copy remains expensive. This is because it’s still costly to produce the content, information or service to be digitised. Digitalisation therefore often comes with **high initial investment costs**: digital technology has to be built, content or services have to be created, and data has to be cleaned and prepared. This means that in some areas where the investment costs are substantially higher, the evolution towards a different market outcome is significantly slower.<sup>11</sup> Digitising a business is a time-consuming and costly exercise, but in our view the ongoing benefits of having completed such an exercise far outweigh the upfront costs of delivering the change.

The effects of digitalisation in terms of productivity and market outcomes and returns are already turning the business world upside down (‘disrupting’ it). We will show why – in a shorter amount of time than you think – the same thing will happen to public administration, triggering another disruption cycle and **turning the business world upside down again**.

<sup>1</sup> C. Shapiro and H.R. Varian, “Information Rules: A Strategic Guide to the Network Economy”, Harvard Business School Press, 1998, p. 3.

<sup>2</sup> <https://www.pwc.ch/en/services/digital/digitalisation.html> [May 2018].

<sup>3</sup> E. Brynjolfsson and A. McAfee, “The Second Machine Age”, W. W. Norton & Company, 2014, p. 62.

<sup>4</sup> Y. E. Kim and N. V. Loayza, “Productivity and its Determinants: Innovation, Education, Efficiency, Infrastructure, and Institutions”, World Bank Working Paper, 2017.

<sup>5</sup> E. Brynjolfsson, L. M. Hitt and H. H. Kim, “Strength in Numbers: How Does Data-Driven Decisionmaking Affect Firm Performance?”, available at SSRN, see <https://ssrn.com/abstract=1819486>. However, this topic is or, more accurately, was highly controversial in the academic world. It is known as the (Robert) Solow Paradox: “We see the IT everywhere except in the productivity statistics”. The discussion is currently being revived by the deceleration in measured productivity growth since 2005. The dispute is mainly about whether digitisation is already leading to higher productivity (and simply isn’t measured appropriately), or whether the great leap will only be seen in the future. The solution to the paradox is connected to the need for complementary investments and infrastructure. For an overview, see E. Brynjolfsson, D. Rock and C. Syverson, “Artificial intelligence and the modern productivity paradox: A clash of expectations and statistics”, NBER Working Paper 24001, 2017. For further evidence regarding Switzerland, see U. Lewrick, L. Mohler and R. Weder, “Productivity growth from an international trade perspective”, Review of International Economics, 2017, p. 1–18.

<sup>6</sup> Robert Solow spent most of his life showing that increases in labour and capital input could not explain most of the increase in total output, see e.g. in J. Rifkin, “The Zero Marginal Cost Society”, Palgrave Macmillan, p. 85. For the numbers, see E. Brynjolfsson and A. McAfee, “The Second Machine Age”, W. W. Norton & Company, 2014, p. 99.

<sup>7</sup> D. Acemoglu and P. Restrepo draw a direct line from the spinning jenny to the steam engine to electricity to computer chips to automation, see D. Acemoglu and P. Restrepo, “The Race Between Machine and Man: Implications of Technology for Growth, Factor Shares and Employment”, NBER Working Paper 22252, 2017.

<sup>8</sup> E. Brynjolfsson, “The Productivity Paradox of Information Technology”, Communications of the ACM 36, 1993, p. 66–77.

<sup>9</sup> E. Brynjolfsson, A. McAfee and M. Spence, “New World Order: Labor, Capital, and Ideas in the Power Law Economy”, Foreign Affairs, Vol. 93, 2014, p. 50.

<sup>10</sup> The reason for this can again be found in the special characteristics of digitised goods and services. On the one hand, businesses can offer and distribute their goods and services to many more different customers at the same time without restrictions on number or distance. On the other hand, it’s easier for the customer to find a suitable offer and compare offers from many different parties all over the world. Why should the customer purchase the second-best product in the world if he or she can get the best for the same price? This generally different outcome may be further reinforced by at least three other effects. Winner-takes-most markets are often reinforced by a so called network effect, with the increased harmonisation of demand and the ability to scale without mass.

<sup>11</sup> M. Blix, “The economy and digitalisation – opportunities and challenges”, Report on behalf of the Confederation of Swedish Enterprise, 2015, p. 7.

## 2. Large parts of the public administration are particularly suitable candidates for digitalisation and disruption

So far the effects of digitalisation have been discussed broadly in the business and academic world, but, as far as we can observe, almost exclusively in relation to the private sector. The public administration is often only viewed as a bystander responsible for governance and regulation.<sup>12</sup> What is often not considered is **the public sector<sup>13</sup> as an object of disruption** itself. While the impact of digitalisation and digital technologies on companies and enterprises and the disruption of whole industries are covered extensively in mainstream media, the effects on public bodies, and the consequences of disruption in this area (including its impact on the private sector), are largely left unconsidered.

This might be because the **digital transformation of the private sector is a prerequisite for the digital transformation of the public sector**, and right now everybody is preoccupied with the first stage. Or it could be due to the assumption that the authorities will be slow to adapt, in particular when it comes to technological change. This assumption might be a mistake, and we believe that misjudging the pace of technological transformation in the public sector could lead some private businesses to underestimate and underprepare for the massive change – and be caught out.

**Certain parts or functions of the public administration are particularly apt**

**candidates for automation through digitisation.** We believe this trend will be identified soon. The very first signs of this can be observed already (more details on that in our other paper, “What happens when the taxman gets superpowers? – The consequences of the Zero Cost of Control phenomenon for your business”).

Why do we think that digitalisation will very soon start to change the landscape of public administration? To answer this question, we have to understand what the real tasks of the public administration are.

### 2.1 Tasks of the public administration: governance and control

The North American Industry Classification System defines the public administration as a sector typically engaged in the organisation and financing of the production of public goods and services. This covers very different areas and activities, such as public finance and taxation; legal and regulation; public order and safety; the administration of public education and health; the provision of public infrastructure for transport, electricity, water, etc.; urban planning; national defence; immigration services; foreign affairs and international assistance; and providing information.<sup>14</sup>

At a first glance these activities appear very different. But how are they delivered

in practice? A closer look reveals that all **these very different activities have one thing in common**: at their core, they simply **give effect to the law** by implementing it, monitoring compliance with it and enforcing it.

Even in the material domains of technical infrastructure, for example roads, bridges buildings, water supply, communications, etc., and the hard infrastructure for national defence or public order, the state usually awards contracts to the private sector, and isn’t involved in manufacturing itself. So we must conclude that most of the work of a public administration is **brain and paperwork**.

Produced by politicians and formulated in an abstract manner, the **law has to be understood, interpreted and translated** into tasks, duties, responsibilities, and so on.<sup>15</sup> To fill them with life, the administration enacts decrees, directives, administrative acts, orders, permits and the like, with external or internal impact, to induce a certain behaviour.

**Compliance with the law** is usually monitored by observation or reviewing documents, licences, certificates and other data sources, or checking lists, numbers and statistics, and so forth.

Because the vast majority of citizens and companies comply or try to comply with the law at least upon request or threat,<sup>16</sup>

most **law enforcement** is again ultimately performed by way of paperwork. The authorities issue parking tickets, tax bills, court rulings and so on. Only in a very small number of cases is the use of force actually employed.<sup>17</sup>

What distinguishes private business from the public sector is the amount of real physical or tangible goods produced by the latter. **To a very high degree, the output of the public administration is not necessarily physical in nature.**

This applies not only to public services, but also to some public goods. A classic example of a public good is climate protection. How do countries protect the climate? They issue rules and regulations which, for example, cap carbon emissions or levy a carbon tax. What they don’t do is start to produce filters or similar physical goods and services.

Of course there are exceptions to this rule, but these are limited and lead us to conclude that much of the work of public administrations can be categorised as brain or paperwork.

### 2.2 Suitability of the public administration for digitalisation

So why do we think that large parts of the public administration are suitable candidates for technological change? There are **five reasons**:

#### 1. *The nature of tasks carried out by the public administration as described above*

As mentioned earlier in this paper, a prerequisite for digitalisation and automation is that information that was in analogue format be converted to digital formats. In the case of public authorities, the **digitisation of the primary materials used can be done very easily**. To accelerate the digitisation of materials, authorities could start to issue internal and external decrees, directives, permits, licences, certificates or tax bills, court decisions, and so forth, in digital form, without detracting from their effect. New data extraction tools can even turn existing documents, files, etc., into digital information reasonably quickly and cheaply, given the high volumes of documents with consistent formats (the cost of digitising 10,000 tax returns is not much higher than digitising a single return when advanced extraction tools are used).

Added to the ease of digitising working materials, advanced data analytics and robotic process automation (RPA) tools can be deployed to **process the huge amounts of data** handled by the authorities a lot faster and more efficiently than today. For example, these tools could help to sort and distribute data and detect anomalies such as fraud and evasion. Automated decision

support systems could help evaluate and distribute tasks much more quickly than a human doing it.

Techniques like image recognition and tagging and speech and face recognition, or the use of data from sensors, actuators and RFID chips, have the potential to **drastically reduce the need for control observations by humans** or their physical presence.

And even a complex task like understanding and interpreting law can be enhanced by techniques like natural-language processing.

#### 2. *The volumes of data available to train advanced algorithm*

Another significant consideration is that the current crop of digital technologies, in particular machine learning and artificial intelligence,<sup>18</sup> relies on huge amounts of data to work efficiently. Leaving aside the huge intermediary technology companies, the **authorities already have one of the largest repositories of data in any given country**, because they are allowed to collect data from the whole economy<sup>19</sup> and compare it. Businesses, by contrast, are usually restricted to collecting and understanding their own data and perhaps that of their customers (although we now see regulation seeking to limit control over this).

<sup>12</sup> E.g. S. Greenstein, A. Goldfarb and C. Tucker, “The Economics of Digitisation”, Edward Elgar Publishing, 2013, Part IV.

<sup>13</sup> We are aware that the public sector will probably need significant help from the private sector to digitally transform. This might lead to an increased transfer of responsibilities from the public administration to the private sector in the future, in particular in connection with digitalisation. When talking about the public sector or public administration, we include this kind of outsourced public task, public-private partnerships and the like.

<sup>14</sup> North American Industry Classification System (2017), Executive Office of the President Office of Management and Budget, Section 92, p. 591 ff.

<sup>15</sup> For more information, see F. C. Mosher, E. C. Page and B. Chapman, “Public administration”, Encyclopædia Britannica, <https://www.britannica.com/topic/public-administration> [May 2018].

<sup>16</sup> For example, according to the Tax Foundation, Americans spent 8.9 billion hours complying with IRS tax filing requirements just in 2016. This is equal to nearly 4.3 million full-time workers doing nothing but tax return paperwork, resulting in costs of an estimated USD 409 billion; see S. A. Hodge, “The Compliance Costs of IRS Regulations”, Tax Foundation Fiscal Fact No. 512, 2016.

<sup>17</sup> For the reason why people follow the law, see T. R. Tyler, “Why People Obey the Law”, Princeton University Press, 2006.

<sup>18</sup> This applies primarily to supervised learning.

<sup>19</sup> Which is doing business in their jurisdiction or even from other jurisdictions, if the respective countries exchange information.



As mentioned earlier, the private sector is leading the digital change. It's widely accepted that digitising information sources within an organisation can help it to deploy technology to become more efficient and reduce costs. There is therefore an incentive to convert analogue information to digital formats as quickly as possible (time really is money in this case). Following this intrinsic drive to digitise information, **business and society as a whole are producing and processing more and more data**. In doing so, they are **laying the foundation for the digital transformation of the public administration**. Think of the amount of data (soon to be) produced by the Internet of Things and industrial analytics, or on social media and e-commerce platforms – most of it stored centrally in the cloud. The authorities may not have access to this data right now, but they could with a 'simple' amendment of the relevant law. From this point of view, the digital transformation of the public administration is largely dependent on and driven by the digital transformation of the private sector. Hence, the digital transformation of the public administration can be seen as the next logical step in a more general development.

### 3. Scientific research on automation

Next we'll take a closer look at what scientific research suggests might be the types of jobs at risk of automation in the short to medium term.

In several extensive studies<sup>20</sup> Frey and Osborne show how **digital technologies are now starting to put a broader range**

**of non-routine tasks potential at risk of automation, in addition to the more routine tasks that we're able to automate today**. They describe, for example, how occupations that require subtle judgement or involve report writing will be enhanced or replaced by algorithmic recommendations, or how technology is entering the domains of legal and financial services. More concretely, they have investigated 702 detailed occupations<sup>21</sup> and ranked them by risk of digital automation. Jobs at an extra high risk include administrative assistants, file, information and procurement clerks, office clerks, billing and posting clerks, paralegals and legal assistants, surveying and mapping technicians, inspectors and testers, data entry keyers and, explicitly, tax preparers. It's easy to see that many of these roles are directly connected to the public administration, or at least fulfil the same task as jobs in public administration.

### 4. Pressure for change

The public administration is coming under growing pressure from different sides to digitally adapt.

Constantly rising levels of government debt are confronting most government bodies with continuing constraints on budget and human resources while at the same time forcing them to accept new responsibilities. **This leaves them with the general challenge of delivering more with less**.<sup>22</sup>

Moreover, government agencies that are not enhanced by digital technologies will simply be too slow to act appropriately

in a world of technological change. Digitalisation will be the inevitable answer to the **challenge of administering growing complexity in the world**.

In addition, as businesses and citizens get used to the new technologies and expand their skills, they will expect the same of the public administration.

However, the public sector has already been heading in this direction for some time now. All major public administrations over the past decade have attempted to make government more efficient, effective and economical.<sup>23</sup>

### 5. Significant resources available (if the political will exists)

Finally, if the state wants to jump, it can. While the authorities do have budgetary constraints under normal conditions, if the external political will matches the desired internal change, the public administration has the **resources to invest enough in digital technologies** to completely revolutionise the way it operates.<sup>24</sup>

For all these reasons, we believe we're at the start of a change in the public administration which will result in disruption for everyone else. We have already seen some change, but we are approaching an inflection point after which **there will be a step change in the capabilities and productivity of the public administration**. Few are aware of this inflection point, and even fewer have considered the subsequent impact on the private sector.

<sup>20</sup> E.g. C. B. Frey and M. A. Osborne, "The Future of Employment: How Susceptible Are Jobs To Computerisation?", Technological Forecasting and Social Change (2017), 114, 254–280; C. B. Frey and M. A. Osborne, "Technology at Work", Citi GPS Report, 2015; C. B. Frey, M. A. Osborne and C. Holmes, "Technology at Work v2.0", Citi GPS Report, 2016. For PwC's own study with similar results for clerical workers see J. Hawksworth, R. Berriman and S. Goel, Will robots really steal our jobs?, <https://www.pwc.co.uk/economic-services/assets/international-impact-of-automation-feb-2018.pdf> [May 2018].

<sup>21</sup> Not differentiating between private and public sector.

<sup>22</sup> For the area of tax administration, see OECD (2017), Tax Administration 2017: Comparative Information on OECD and Other Advanced and Emerging Economies, OECD Publishing, p. 120.

<sup>23</sup> G. Peters and J. Pierre, "Introduction: The Role of Public Administration in Governing" in G. Peters and J. Pierre, "The SAGE Handbook of Public Administration", SAGE Publishing, 2012, p. 7.

<sup>24</sup> The digital transformation plan of the British tax authority (HMRC) envisages investment of more than GBP 1 billion over the next five years just in digital technologies; see HMRC Annual Report and Accounts 2015–16, p. R39, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/539608/HMRC\\_Annual\\_Report\\_and\\_Accounts\\_2015-16-web.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/539608/HMRC_Annual_Report_and_Accounts_2015-16-web.pdf) [May 2018].





### 3. The consequences of digital transformation for the public administration

Now the most interesting questions are as follows: what will the wider implications of digitalisation in the public administration be? **How will this development change the landscape of public administration?** And why is this relevant to me, business and society at large?

Answering these questions isn't easy, but since the private sector is ahead and large parts of the business world are already going through a similar transition, a look over the shoulder might help. Even though from a classical standpoint the public administration is not a competitive market, and findings cannot therefore be transferred one to one, the economics of digitisation may provide some insights and point to the direction of travel.

#### 3.1 Effects on productivity, or the Zero Cost of Control phenomenon

Digitalisation will completely change the game for the public administration as it has for the private sector.

The non-rival nature of digitised tasks and services and the near-zero marginal cost of reproduction, for example, will allow the authorities to carry out countless tasks and duties at the same time or offer many services to an increasing number of businesses and citizens in parallel.

Digitisation in combination with automation and increased efficiency will mean we're soon witnessing **enormous growth in productivity within the public sector and subsequently a 'productivity dividend'**. This dividend can be treated in two ways. You can either decide

to achieve the same as before with significantly fewer people, or plough the dividend back into new capabilities and platforms to do a lot more with the same number of people. We believe that the majority of authorities will take the latter option (for more information on that see our other paper, "What happens when the taxman gets superpowers? – The consequences of the Zero Cost of Control phenomenon for your business").

But what does this mean more specifically?

Productivity growth in the public sector is not the same as productivity growth in the private sector.

If we quickly bring back to mind the core tasks of public administration – implementing, controlling compliance with and enforcing the law – we will see potentially huge differences as a result of the effects of digitalisation.

Digitalisation of the implementation of the law will result in **better, easier and cheaper services delivered and offered by the public administration**, at least in the long run.<sup>25</sup> The digitalisation of the control of compliance with the law, and thus of the enforcement of law, has potentially greater and more far-reaching implications for business and society.

The new world of digital information and major productivity growth will enormously enhance the authorities' capabilities for controlling compliance with the law. But it's not just that. Once the necessary digital systems are live and running, expanding the scope of the systems, and thus extending the reach of control and monitoring further and

further, will cost almost nothing. This means that soon, after the initial leap has been made, **we will enter a world where the state can execute incremental control and monitoring almost for free**.<sup>26</sup> This is a world dominated by the phenomenon of near zero marginal cost of control or, in short, the **Zero Cost of Control phenomenon**, as we call it.

The emergent Zero Cost of Control phenomenon will fundamentally change the relationship between administration, business and society. The consequences will feel like an additional disruption. This will be a true game changer. But it's not the only way in which the landscape of public administration will change.

#### 3.2 Effects of digitalisation regarding outcome and returns

The Zero Cost of Control phenomenon predominantly influences the external relationship of public administration to business and society. But another effect suggests that **the internal landscape will change as well** – which of course will also have major implications for business and society, albeit indirectly.

As described above, in the private sector digitised goods and services very often lead to winner-takes-most markets. What could a similar effect imply for the public administration?

The first government agency to acquire great knowledge and skills in the use of digital technologies will be able to perform its duties faster, better, cheaper and in greater numbers than other agencies. If, for example, revenue generation is involved, it will be able to generate more revenue. It

can then free up resources to take over other tasks from other overburdened authorities. The government body with the best systems (and this can even be a minor one)<sup>27</sup> could **shift the internal power structure of the authorities** and become the most powerful one over time. A development like this is even more plausible if you bear in mind that bureaucracies have an **inherent tendency to centralisation**. This provides an additional incentive for authorities to invest in new capabilities within this area.

Note that this development in the public sector is not driven by the pursuit of profit to the same extent as in the private sector. Rather, it is driven by politico-economic reasons: for example, a head of an authority may not always act in the best interests of the general public, but they will sometimes act out of self-interest, seeking to wield more power.<sup>28</sup>

The special characteristics of machine learning and artificial intelligence would strengthen this development even further. The government body which serves or controls the most companies or citizens and/or completes the most tasks will have the biggest access to data. This will enable it to train and get the most sophisticated (read: accurate) machine learning algorithms and AI systems to further enhance its knowledge and skills. This would be the counterpoint to the network effect<sup>29</sup>, and would result in **fewer and more centralised, but stronger and more efficient, government bodies** with so far unprecedented capabilities.

It's likely that the described internal and the external effects will set off an almost **'natural' development**,<sup>30</sup> which will lead

**to a fundamentally more transparent environment**, impacting companies and citizens alike.

So are we resigned to a future of an all-seeing, all-knowing central authority? Was 1984 actually an accurate forecast of events to come? Is this the whole story? No, at least not in all parts of the world.

#### 3.3 Forces that might slow down or restrict the development

The developments we have described in this paper will be mainly driven by economic principles, technological capabilities and politico-economic interests. But there might be multiple **opposing forces** resisting change, which may **limit this trend towards transparency** and a data focused public administration.

These forces will primarily have to utilise **legal institutions and mechanisms** to accomplish their goal. These include **the separation of powers rules, constitutional rights and privacy laws**. But the potential benefits of digitalisation are not equally high for every country, the legal institutions are not equally strong, and the opposing forces (freedom of choice, individualism, ownership of personal data, for example) are not cherished in the same manner in all parts of the world.

**The speed and degree of digital transformation in the public sector will therefore vary from country to country around the globe**. The many factors involved make predictions difficult. Nevertheless, we have identified **two main directions of travel** – one

predominant in autocracies and similar forms of government, and the other in western-style democracies – which may result in the world being split in two in this regard.

#### *Autocracies and similar forms of government*

Government and administration in this group of countries already favour centralisation and the concentration of power. Accordingly, opposing legal institutions usually haven't developed. Separation of powers rules either don't exist or aren't applied. Simultaneously, many individual rights are not granted in these countries. Protecting privacy is often not a priority, and can sometimes be seen as a threat that undermines supervision.

In addition, specific cultural characteristics in some parts of the world may not even allow opposing forces to gain strength in the first place. For example, in collectivistic societies, privacy concerns will never be as pronounced as in societies upholding individualism. For other countries efficiency, social control or the fight against corruption might be more important assets than individual rights.

This means that in these countries, resistance to change will either be weak and/or lacking instruments and leverage to have greater impact. We expect **no significant slowing down or restricting of the 'natural' development** in autocracies and places with similar forms of government. Quite the contrary: the new capabilities of digitally transforming the public administrations come in handy for these countries because it lends additional impetus to the urge towards

<sup>25</sup> The property of the identical replicate, for example, will result in services of better quality, because human errors and careless mistakes will be reduced and local misuse of power or corruption prevented.

<sup>26</sup> China's Citizen Score might give a hint of one possible direction, and what the full potential of this development, might be.

<sup>27</sup> Because it is possible to scale without mass.

<sup>28</sup> For more on this view see, for example, D. A. Wittmann and B. R. Weingast, "The Oxford Handbook of Political Economy", Oxford Handbooks, 2008.

<sup>29</sup> In this context, an increasing return of scale would mean, for example, that the more citizens or companies are controlled by a government agency, the 'better' control the citizens and companies get (whether they want it or not).

<sup>30</sup> 'Natural' because the development is not necessarily driven by an identical political will.



supervision, centralisation and the concentration of power.

We therefore conclude that the **countries in this group will generally take the lead in the digital transformation of public administration**. Indeed, we are already witnessing this in some countries that fall into this category (more details on that in our other paper, “What happens when the taxman gets superpowers? – The consequences of the Zero Cost of Control phenomenon for your business”). This doesn’t mean that major turmoil isn’t also possible in these countries. Technology might reshuffle the pack, and shifts of power among the current stakeholders are likely.

#### Western-style democracies

Western-style democracies will probably take a different path – or more likely many different paths – finally resulting in a more **fragmented and heterogeneous picture**.

In this group of countries, **resistance is potentially stronger** and can usually rely on more potent legal institutions and mechanisms to exercise its strength. Nonetheless, there are some pitfalls lurking along the way.

**Separation of powers rules**, for example, are designed to prevent a concentration of power by dividing the legislative, executive and judicial functions. But digital transformation and the Zero Cost of Control phenomenon will concentrate and expand power mainly within the executive function.<sup>31</sup> That’s why this mechanism will probably fail here. The **federalist mechanism**, on the other hand, is more likely to put on the brakes. But federalism is implemented very differently from country to country. In addition, a consensus seems to be emerging in many societies that federalism should be weakened in favour of ‘more important’ questions like public order and security and tax revenue.<sup>32</sup> The same applies to the path of **individual rights**. While some countries are trying to implement strong privacy laws, others are showing less enthusiasm.<sup>33</sup>

In the end it will be a **matter of negotiation**, with very different outcomes in the various democratic countries depending on many factors, including the specific strength of the opposing forces and their ability to organise themselves, the strength and characteristics of legal institutions, and so on.<sup>34</sup> All these factors make it **hard to predict the speed and**

**degree of the digital transformation of the public administration in western-style democracies**. To make matters worse, completely new forms of regulation are likely to arise in response to the development.<sup>35</sup>

We conclude that **in western-style democracies, the development will be significantly slower and probably less far-reaching** than in autocracies and similar countries – not because they lack the technical capabilities, but because they choose not to use them. **Countries with strong federal mechanisms**, like Switzerland<sup>36</sup>, **or with pronounced privacy concerns** on the basis of their own history, like Germany, **will take a back seat** when it comes to digitalising the public administration.

What can be said for sure is that the benefits of digital transformation are too high and the main drivers too strong for the incipient development to be halted. And **even slowed-down and somewhat restricted digital transformation will bring major changes, and will fundamentally alter the way states act and interact**. The rules of the game will be different then.

One question remains: *why should I care?*

<sup>31</sup> Most likely the fathers and mothers of the constitutions regarded a separation of executive power as natural and unavoidable given the complexity of the tasks involved. They simply could not foresee the possibility of AI and machine learning with such processing power and skill sets.

<sup>32</sup> This consensus is further backed by technological demands also seeking more central responsibility, see, for example, in Germany, M. Schallbruch, “Schwacher Staat im Netz – Wie die Digitalisierung den Staat in Frage stellt”, Springer, 2018, p. 242 ff.

<sup>33</sup> The European Union, for example, has just recently enacted its General Data Protection Regulation (GDPR). The GDPR has yet to prove its value and effectiveness. In light of its complexity (99 articles), implementation costs, the potential benefits of extensive data collection and other factors such as the need of valuable AI algorithms in a global competition, we believe our assumption that the GDPR might never be fully implemented, or will be significantly weakened during the process of statutory interpretation, is justified.

<sup>34</sup> It should also be mentioned that the opposing forces have to overcome a structural disadvantage in this process. For them it’s kind of an uphill battle. Instead of simply preventing certain competences from being granted to government bodies, as they are used to, they now have to actively prohibit activities that government bodies can engage in by themselves.

<sup>35</sup> New legislation might limit the power of government bodies or the concentration of power within the executive function in new ways. A new technical or legal form of data protection might empower business and society to control access to their data and restrict the capabilities of the public administration in this way.

<sup>36</sup> Egovernment-landkarte.ch tracks the status of the implementation of e-government services in Switzerland. For 78 services there are currently 196 technological solutions from 72 different providers listed [May 2018].



## 4. Why is this relevant to me, and what do I have to consider?

In the long run, the digital transformation of the public administration could lead to a state that provides better services to companies and citizens. It could equally end in a dystopian nightmare. Either way, we're about to enter a **transitional phase of rapid change** where the **future conditions will be negotiated** at short notice. This will be challenging for everybody involved.

### 4.1 For business

The Zero Cost of Control phenomenon and the changing landscape of public administration, as well as the **overall move towards drastically increased transparency**, will have a major impact on the authorities' approach to companies and their interaction with government agencies.

Businesses entering the transitional phase can expect a **time of uncertainty that is potentially full of surprises**. Let's have a look at tax and regulation, two areas that are key to business and particularly prone to digitalisation. Tax authorities all over the world have already started to collect a lot more data, including third-party data and openly available information from trade platforms and social media. They are increasing their operational capabilities, and to a growing extent are expanding collaboration and the exchange of data with other public bodies (for more information on that see our other paper, 'Tax disruption management'). Added to this is the other long-term trend resulting in a change in the public sector landscape: the centralisation of tax and regulatory matters in one agency, for example,

would result in even greater possibilities in terms of information and supervision.

The newly available information and additional processing power will enable authorities to build a detailed picture of a company, its activities and value chain. This means that any **regulatory inconsistencies will now come to light** – inconsistencies companies themselves might not even be aware of.

In addition, it's important to understand and prepare for the shift in the modus operandi that will occur in terms of the interaction between companies and the authorities. Until now, companies have been able to operate ex post, in other words develop a narrative for past transactions and narrow cases. But they'll soon have to **switch to a proactive approach** and to provide an all-embracing (global) narrative in real time.

Companies have no other choice than to understand the trend and **invest in technology and new capabilities**, especially in the area of tax and regulation. They also have to make sure that they can **respond on the same data-driven level**. Indeed, they should aim to be understanding their data more quickly than the authorities do, particularly if they want to limit uncertainty and prepare for the level of scrutiny that will soon emerge.

### 4.2 For society

The consequences for society are pretty much the same as for business, just more severe, since the move towards

transparency and the resulting **loss of privacy** could be seen as 'harm' per se – although as we mentioned before, this might not apply equally in every society.

The role of society is also different when it comes to action, at least in western-style democratic societies.

In **autocratic states** the path is pretty clear. Until now, the extension of control was limited by monetary constraints. At some point it simply became too expensive, and the return was too small, to spend more money on control. But this economic boundary is dissolving as we move to a world of almost Zero Cost of Control.

In **democratic societies** it's more complicated. Firstly, society as a whole – or major social institutions such as the media, civil society organisations and members of political parties – has to **understand the 'natural' development that is being set in motion** by incipient digitalisation of the public administration, and the way this is driven by economic principles, technological capabilities and politico-economic interests. Society also has to understand where this development will almost inevitably lead unless specific effort is made to change direction. In other words, it has to grasp the huge appeal for public agencies (or the government) of being able to **control and supervise citizens on a really large scale at almost zero cost**.

Secondly, society has to **form a collective point of view** on how it wants to handle privacy and the looming transparency vis-à-vis the state. For example, it has to

decide how it rates the value of privacy or the separation of powers versus the value of convenience and efficiency. We are starting to see this conversation taking place with regulators and at some internet companies, but a broader debate on this topic is required in many countries.

Thirdly and most importantly, it's fundamental to realise that the opposing forces trying to alter the 'natural' development we've been talking about will find themselves having to deal with a sudden and structural disadvantage in the **negotiation process**. For them it's kind of an **uphill battle**.

Until now the authorities were bound by budgetary constraints. This meant that if they wanted to expand their operational capabilities, they needed not only authorisation by law, but also an increase in budget and a way of justifying the decision to voters. Any **expansion involved obtaining approval and convincing multiple stakeholders beforehand**.

If government bodies manage to cope with the 'less for more' challenge with the help of technology, and if they have the Zero Cost of Control phenomenon on their side, they can **expand their scope of supervision on their own** without significant financial constraints. They might not even need authorisation, as the area in question might not be regulated at all, or might be regulated in a way that allows the authorities many different ways of taking action (because regulation lags innovation, and the people who made the rules had no idea of the technological possibilities that would emerge in the future).<sup>37</sup>

It's essential to be aware that the development towards **transparency** won't necessarily be driven by a political will. It's more likely to come as a **by-product of the digital transformation process**. That's another reason why we speak of an almost 'natural' evolution towards transparency.

This has serious consequences. In this environment, the process of negotiation has to involve actively withdrawing capabilities from government agencies before they've even developed them (which requires a lot of foresight, which is usually not the case), or forbidding the use of capabilities after agencies have already started reaping the benefits. **Retracting something already established is much harder than not permitting something in the first place**.

The really important thing is to understand that the **rules of the game are changing fundamentally**, and that the **time for action is now**. Negotiation at a societal level has to start, and investments have to be made on a business level, to be adequately prepared for the transition into a new age of digitally transformed public administrations.

<sup>37</sup> Our prediction would be that the strong incentives for the authorities will overcome even privacy concerns over time and will undermine legislation, as might be happening, for example, with the recent General Data Protection Regulation.



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