

The Transforming Powers of Digitalization

Ceremonial address by Professor Jan Gulliksen at the symposium “Smart Country – Connected. Intelligent. Digital.” in conjunction with the Reinhard Mohn Prize 2017 awarded to Toomas Henrik Ilves by the Berthelsmann foundation

Digitalisation is the most important societal transformation factor of our time, since the industrialisation. Internet has given us the opportunities to do things in completely new ways, and even to do entirely new things. Old businesses, without the ability to transform, have been defeated by completely new actors on the market. New values have come into play that make us value different things in development, and particularly the UN sustainability goals provide a challenging and inspiring motivation to keep developing.

Northern Europe is among the regions in the world that are most developed when it comes to digitalization. We have early on seen investments into both soft and hard infrastructure that has provided the opportunity for development. We have a relatively high level of education and low illiteracy levels. We have a good climate for innovation and start-ups. The opportunities for development is among the best in the world. Estonia, in particular, has showed an impressive development since the country was formed, setting high ambitions, funding the right initiatives, investing in digital skills and competence but above all showing a political leadership for digitalization. And this is quite rare. Barack Obama showed great courage and wisdom when stating in a famous speech to young kids before a hackathon “Don’t just use a computer game – make one”. Canada’s president was able to speak about the importance of quantum computing in an unprepared questioning session. Toomas Henrik Ilves has showed an equally important leadership, taking his country to one of the most developed countries in the world by using digitalization. Estonia is one of Europe’s leaders when it comes to Digital Public services according to the European Union’s Digital Economy and Society Index. Nothing of this would have happened without a digital leadership. But digital leadership is needed at all levels, not only in politics but in companies,

in public authorities, in municipalities, hospitals and schools. The chain isn't stronger than its weakest link

I believe that the single most important factor when it comes to developing our future digital society is digital skills or maybe better expressed as "Skills for the Digital Society". Our ability to be a part of our digital society, to make use of all the services, support and help that digitalization can offer, not to say all the entertainment and social opportunities that digitalization has to offer, will be one of the major factors contributing to the quality of life in our future society. Robots are becoming social and appearing in our homes as support for our elderly, as teachers for our children or just as support for routine tasks. Artificial intelligence provides great opportunities for developing the richness of our future. Digitalization and automation makes hard, dirty or monotonous job tasks disappear and provides opportunities for new job tasks through digitalization.

According to a recent study from Oxford university almost half of the currently existing jobs will disappear in the next coming years due to digitalization. The jobs that will be most highly affected are routine jobs such as retail sales persons, machine operators, office clerks and truck drivers, just to give a few examples. Those that will be the least influenced are jobs that require people skills, such as psychologists, priests, teachers, managers, politicians, etc. The jobs that are disappearing are mostly middle skilled jobs and most of those that are laid off in this process risk taking jobs that require less skill instead, such as taxi driving, restaurant staff, cleaning personnel, etc. If we instead could develop our society in such a way that those who lose their jobs would make use of skills development to instead reskill themselves to a labour market in which there is a shortage of staff, we would move to a stronger and much more sustainable situation. Although there are no scientific studies, the prediction is that the European union has a skills shortage within the IT sector of almost 1.5 million people. IT is a labour market that has "negative unemployment". One of the major goals of the European union is to reduce the unemployment to make the area grow and develop economically as well as from a societal point of view, using the opportunities of digitalization.

One of the organisations that have the biggest challenge when it comes to digitalization is our higher education institutions. Universities and polytechnics are not as development oriented as the society is demanding and we are possibly facing a crisis in higher education if we do not start developing and changing our organisations to meet these new challenges. Digitalisation offers new opportunities to develop our teaching; strategically, organisationally as well as pedagogically. Higher education needs to transform with the help of digitalisation, such as bringing in for example "flipped classroom pedagogy", in which the lectures are made publically available on-line and the classroom is used to apply the acquired knowledge, rather than the opposite. It can have the ability of providing higher education universally available to everybody, regardless of physical location, functional limitation or economic circumstances. It has the opportunity and obligation to show its value for lifelong learning, something that requires a change in the views and perspectives on how higher education institutions are run, mandated to do what it does, funded and which role it is playing and could play in the society.

Digitalisation affects the entire population from young kids who can barely walk to elderly. According to a recent Swedish study 72% of two year olds are online, which is a very good thing as digital tools are an excellent source for knowledge and for learning. Mobile digital tools are a natural part of every child's upbringing from very early on and a majority of children get their first mobile phone quite early. In their pocket, they thus have an updated book of knowledge within a few clicks. Unfortunately, this resource is not used in schools or for education today as it in many cases is considered a discipline problem, or because it is not uniformly distributed among all children. It is in many cases more important that the education is equal than effective and updated.

In Sweden 93% of people over 18 years of age are using computers, broadband and internet. The figures seem to have landed at that level and we have not seen any increase in the last few years. Naturally the big drop in ICT users are the elderly. Many elderly people do not have access to the digital society and cannot make use of all the services, knowledge and up to date news that is there, and when they were asked, in the survey the reason for the majority was that they did not see any purpose for using it. However, I think that there are ways of overcoming these problems. Many of the elderly could potentially have great use of

the tools, but they never get the chance to try. I tried one approach in Sweden – to propose to have one day every year that all citizens should engage to help one of their relatives or friends that currently are not digital to come online, to show the benefits. As an example, I did it myself. I gave a tablet computer to my mother in law, who is soon turning 80. She hated computers and had made very little use of computers at her work as a psychologist before retiring, so she had not worked up the habit. She did not want help from her children, but as it turned out she went to her grandchildren to get the help and support needed and a few weeks later when I visited her I could see that she had become very digitally active. She was buying theatre tickets online, she was buying food and wine online, she was Skyping with her grandchildren and she was Word feuding with her friends. I told her “But, you have always said that you hated computers?” and she responded and said “Computers, yes, but this is an iPad...” In the era of Internet of Things or Ubiquitous computing people may use computers without actually knowing that they do...

IT affects our work environment as almost all of the work we do is done using some form of digital support, thus our digital work environments need to be developed based on the human being. In the western world, we have a well-developed legislation when it comes to the work environment, trying to avoid work environment problems and minimize problems and sick leaves due to the work environment. The legislation is quite firm and the regulations about what you are able to do and whose responsibility it is, is quite specific. But this mainly concerns the physical work environment, and in some cases the psychological or social work environment. Digital work environment is a new concept that is yet not recognized to the extent that it deserves. In a country like Sweden almost 98% of all people that work do so using some form of digital technology and more than half of the working population uses computers more than 50% of their working time. Doctors spend half of their working time in front of a computer. One should note that the work environment legislation still applies for the digital work environment, but people do not see it that way. Has anybody reported an office software as a work environment problem? Has work environment requirements ever been considered in the public acquisition of a new software system? Has a work environment audit ever considered the digital tools as a potential work environment hazard in the analysis of a work situation? It is time that we start to view the importance of

the digital work environments and put sufficient requirements on the digital working tools from a work environment perspective.

Finally, a few words about the future development of research. We have over the last decade seen a tremendous development of the different research projects that have been funded and conducted. Research is no longer done by the single talented individual, disconnected from the rest of the world, but the most profound development happens in large teams of researchers, often separated in time and space, but using digital tools to collaborate synchronously or asynchronously. Research has gone from being multidisciplinary, in which researchers from different scientific fields work with their own research problems, but in the same project, to be transdisciplinary, in which the researchers need to come to an understanding of each other's research areas. The impact of research has become much more important, and I am not referring to the scientific impact measured by the publications and citations of researchers or international ranking of the universities. I am talking about the societal impact that the research may have on important problems that the world faces today. Many people refer to the Sustainable Development Goals adopted by the United Nations as one unifying goal that can foster collaboration. Of course, this is great, even though one many times feel that the research conducted is only vaguely relating to such goals. Personally, I am very much in favour of the action research methodology in which researchers actively participate in big collaborations to solve real world problems in context, at the same time studying and trying to derive the generalizable knowledge that can be drawn out of such interactions. As a researcher, of course you have stakes in the results. You are eager that the change should be a successful one and therefore you re-plan your projects based on what is happening in the project. But by using the action research approach you can explicate your personal stakes and make it an asset in the project. The actual change in practice is of equal importance as the publications it leads to. In the future, researchers must be more creative in coming up with methods and tools to support transdisciplinary collaboration, with the purpose of contributing to actual change, to help the process from research to innovation and to be sustained in the research project, and still be clear about your ethical principles and your quality criteria.

But despite all tremendous development within research, it is the *education* conducted that is the greatest impact universities contributes to, all the excellent and innovative students that exit from the university to take their ideas further, to contribute to jobs be created, to growth and development, to a better society for all. Education and building skills for the digital society becomes more important than ever before. To be able to meet the challenges of the future we need to embrace the opportunities of digitalisation and meet the development through change and agility, we need rapidly to make use of the transforming powers of digitalisation. So, if you want to move towards a more prosperous world, digitalization is the area to focus on and for that we need to develop skills for the digital society broadly and support the development of digitalization. To be able to do that a focus on developing and modernizing our higher education institutions are needed – a digitalization of higher education – and a focus on developing digital skills and lifelong learning.

Thank you for the opportunity to make the case for this in honour of one of the true digitalization pioneers, that has shown how a digital leadership can help move a country to the forefront of the digitalization competition. Let's all focus on how we can take the digital leadership one step further and make the best possible use of the transforming powers of digitalization in the future.