



Digital Transformation: Enabling Policy Principles

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KEY POINTS

- The importance of realizing the potential value of digital transformation cannot be overstated
- Benefits of digital transformation are not guaranteed
- Digital transformation is underway but not fully understood: Without action and collaboration, digital transformation will not -by itself- lead to broadly shared prosperity and growth
- WITSA calls on its members to engage with their national governments to ensure that the digital transformation will be a powerful force for the common good, valuing humans as an asset in the jobs market, fostering innovation, matching job skills with the needs of the new economy, bridging the digital gap in underserved populations, and promoting trust and security as well as driving businesses to create products that consumers rave about
- Governments must remove barriers and encourage a market-driven approach to policy focused on innovation, market competition, free flow of information across borders, mobility of skilled workers, research and development and investment in transformative technologies
- WITSA strongly urges governments to promote digital entrepreneurship by redoubling their efforts to foster national policies supporting new and transformative businesses as well as international competitiveness.

CONTEXT - WHAT IS DIGITAL TRANSFORMATION?

WITSA is pleased to provide its members and stakeholders with policy/principle papers on critically important policy and relevant issues to support the growth ICT's industry globally and in keeping with its vision of *Fulfilling the Promise of the Digital Age*. WITSA recognizes that the pace of ICT adoption, value and appreciation varies from nation to nation and that only when everyone on earth benefits for ICT's will WITSA's vision be fulfilled.

“Digital transformation provides the ICT industry an unparalleled opportunity to assist businesses to enhance competitiveness by using powerful new disruptive technologies in innovative ways. Transformation of societies and governments for larger public good hold similar opportunities.”



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Digital transformation is part of a larger technological process^[1] (see below), and is the change associated with the application of digital technology in all aspects of human society.^[2] Digital transformation may be thought of as the third stage of embracing digital technologies: digital competence → digital usage → digital transformation, with usage and transformative ability informing digital literacy. The transformation stage means that digital usages inherently enable new types of innovation and creativity in a particular domain, rather than simply enhance and support the traditional methods.^[3] *From*

Wikipedia, the free encyclopedia.

ABOUT WITSA

WITSA is a global consortium of leading ICT industry association members from over 80 countries/economies.

As the leading recognized voice of the global ICT industry, WITSA aims to drive transformation and grow the industry, given that ICT is the key driver of the global economy:

WITSA's members and stakeholders comprise national associations, multinational corporations, institutions and organizations, researchers, developers, manufacturers, software developers, telecommunication companies, suppliers, trainers and integrators of ICT goods and services. As such, they represent a large and obviously vital constituent group for whom the effective balancing of concerns and rights affecting the security, privacy and information capability provided by ICT products and services underpins business development and economic activity.

Digital transformation is underway but not fully understood

Rapid advances in digital technology are redefining our world. The plummeting cost of advanced technologies is revolutionizing businesses, industries, governments and society. And the 'combinatorial' effects of these technologies – mobile, cloud, artificial intelligence, sensors and analytics among others – is accelerating progress exponentially. Digital transformation provides users with unparalleled opportunities for value creation. Digital technologies are creating new profit pools by transforming customer expectations and how companies can address them. At the same time, digitalization could produce benefits for society that equal, or even surpass, the value created for industry – the mass adoption of autonomous vehicles and usage-based car insurance, for instance, could save up to 1 million lives by 2025.

At present, digital transformation is not well understood fostering a number of myths that are obscuring the path to realizing its potential for value creation. Action will be needed to maximize benefits. There are however, clear examples of where Digital Transformation is taking hold. This

paper will highlight these examples to provide the reader with how the world we know is changing before our eyes.

It is only the beginning! Much of the future evolution of transformation will rest on the ICT industry working with its customers to include governments as well as entrepreneurs and innovators.

Digital Transformation can address global challenges

The importance of realizing the combined value of digital transformation cannot be overstated, given digitization's central role in tackling many of the challenges we face today. The world's energy and natural resource usage is unsustainable. Further increases in life expectancy are at risk without resolving the growing cost structures of overburdened health systems. Low birth rates coupled with high youth unemployment and the trend toward national protectionism are undercurrents belying the need to transform businesses, industries, governments and society.

Benefits of Transformation are not Guaranteed

Yet the benefits of digitalization will not accrue automatically and there is a risk that the promise of digital transformation could go unfulfilled. Challenges in deriving the benefits need to be highlighted at a generic level. This will help nations and organizations to anticipate and overcome such challenges.

Digital Transformation taking hold

Internet of Things (IoT)

We live in a world where physical objects in the industrial, mobile, and home domains are increasingly being transformed from isolated systems to networked Internet-enabled devices that can communicate with each other and the cloud. This is called the Internet of Things (IoT). As society enables more and more of these "intelligent" connected inputs, companies are creating new types of revolutionary applications and services in sectors ranging from manufacturing to utilities, smart building to smart home, transportation to health care, and retail to agriculture. This extraordinary development has the potential to transform previously standalone systems into integrated networks that leverage greater computer capabilities and data analytics to increase efficiencies and productivity, address important societal challenges, and create jobs in a global new economy which is expected to grow to more than \$2 trillion by 2025.

To ensure that the IoT is capable of delivering on its greatest positive potential, WITSA urges collaboration among all stakeholders, including the private and public sectors across industries to advance the **following principles**:

IOT Principles¹

- **Investing in Internet infrastructure.** Robust broadband networks are essential to realizing the full potential of the IoT. Ubiquitous, affordable, high-speed broadband connections are critical to ensuring that consumers, as well as the public and private sectors, are able to derive the countless benefits that the IoT will offer. Given the diversity

¹ We wish to thank ITI for contributing the IOT principles; ref. "Internet of Things: Opportunity for Public-Private Collaboration"; <http://www.itic.org/dotAsset/b347f741-ff71-405b-b89a-bbe97eaccda1.pdf>

of requirements for the breadth of IoT products and services, governments should prioritize harmonized and efficient spectrum management in general, rather than IoT-specific regulation or allocations. Effective spectrum management will encompass licensed, unlicensed and licensed shared access regimes to enable the diversity of requirements for IoT products and services.

- **Enabling interoperability for global adoption and integration.** Systems of intelligent devices must be connected to each other or the network, often across geographic boundaries, to maximize the potential of the IoT. To enable broad adoption of IoT technologies and avoid IoT silos, attention must be placed on ease of connectivity and interoperability of IoT devices, platforms, and infrastructure, as well as streamlined cross-border data flow.
- **Promoting voluntary, open participation, industry-led, consensus-based global standards and best practices.** The private sector should lead the development of open standards that enable interoperability across the IoT, and partner with the public sector to encourage the sharing of best practices. Global standards can accelerate adoption, drive competition, and enable the cost-effective introduction of new technologies. They also can promote industry innovation and establish a better-defined technology evolution path.
- **Integrating privacy and security from the outset.** To motivate IoT adoption, applications must evoke trust through hardened privacy and security solutions, looking to widely accepted best practices as well as novel considerations. Most importantly, privacy and security must be designed into IoT systems at the outset using best known Privacy-by-Design and privacy engineering approaches, which contemplate the varying objectives and risks for different IoT solutions.
- **Acknowledging unknowns.** The Internet has transformed the world in ways we could never have dreamed possible, and the IoT is expected to have an even greater transformative impact. Like the Internet in the early 1990s, the IoT is in its very nascent stages. There are limitless possibilities and many unknowns. Therefore, we must evaluate existing policy tools (policy tools or polices and regulations) and use caution before adopting new laws or regulations that may inadvertently or unnecessarily impede the IoT.
- **Leveraging public-private partnerships.** Strategic national IoT plans and funding, which encourage public-private partnerships (PPPs), will accelerate IoT adoption and result in vast economic and societal benefits from the IoT in both the near- and long-term. Successful PPPs will make IoT deployments an attractive investment for government and industry, and promote innovation, scalability, and sustainability. By leveraging PPPs, we can expedite IoT research and development and our global IoT leadership.

Digital Transformation and Urban Population Boom

Towards the end of the last decade, our planet achieved two remarkable feats. First, the world population surpassed seven billion and for the first time, 50 percent of the all humans were living in urban areas. This is expected to rise to 60 percent before 2025, worldwide with the Western, developed world approaching 80 percent urbanization during the same time period.

As the global trend towards global urbanization continues, it becomes increasingly important to make cities eco-friendly, people friendly, efficient and business friendly. Many cities are already spending vast amounts of resources on smart governance, smart energy, smart building, smart

mobility, smart infrastructure, smart technology, smart healthcare and smart citizen. As a case in point, Frost & Sullivan expects Smart Cities to be a \$1.5 trillion market by 2020², with multiple opportunities to tap into infrastructure development, technology integration and energy and security services. China focuses on smart cities as a key component of its grand urban plan. In India, Prime Minister Narendra Modi envisions building at least 100 smart cities.

The digital revolution that has manifested itself in modern times has made possible the construction of entirely new cities with buildings having automatic climate control and computerized access; roads and water, waste and electricity systems saturated with electronic sensors enabling the cities to track and respond to the movement of residents. And although this sounds very attractive, developing a smart city brings a lot of challenges. The availability of data on massive scales calls into questions important societal aspects regarding security and safety of citizens, individual rights to privacy, and vulnerabilities of critical infrastructure to hacking as well as human error and technology malfunctions. These include challenges like usage of consumer IoT devices as botnets to carry out large scale cyber-attacks; and the availability and resiliency of counter devices to prevent/ control such attacks. Furthermore, competing visions of the smart city are proxies for competing visions of society, and in particular about who holds power in society.

Recommended Principals for Urban Areas (Smart Cities)

The following are an indicative list of WITSA's policy principles and recommendations for building the "smartest" cities as we enter the third stage of the digital revolution:

1. Leaders should focus on the purpose of improving their city's **productivity and competitiveness**, and its citizens' and visitors' **wellbeing** when designing and implementing a Smart City initiative.
2. **Government leaders should embrace the concept of making their cities "smart,"** not as a waning fad but as a driver for prosperity in the 21st Century in order to maximize the use of ICT to benefit their societies.
3. **Academic, public and private sectors need to join as partners in the exploration,** planning and implementation of Smart City technology, infrastructure and digital services.
4. **Cities need also to invest in innovation and new ICT networks** with high-speed broadband connections to underpin information flows and to boost city economies.
5. **Cities need to improve the management of large data infrastructures** with the aim of achieving real-time governance of increasingly automated processes in cities, establishing a proactive model for public data, and evolving the level of services provided to businesses and individuals.
6. When designing any and all aspects of Smart Cities the **citizen must be at the center** of all planning.

² Frost & Sullivan: <http://ww2.frost.com/event/calendar/smart-cities-15-trillion-market-opportunity/>

7. Government and industry must respect that at the core of **Smart Cities are sustainable**, nonpolluting technical solutions.
8. Smart cities should be designed with principles of **integrity, availability and resilience** to make them truly meaningful.
9. **Governments are advised to seek best practices** around the globe in order to avoid waste and errors.

The Future of Work

Work in the future will be driven by new generations of workers, rapid and unpredictable technological changes, competition for intellectual capital, enormous amounts of work or whether it will continually evolve. Employees will be measured on their productivity more than ever. People will not need to have offices to perform work. Virtual teams will be assembled and dismantled when work is completed. Educational requirements will change. Some work will be on demand, virtually outsourced and worked on 24 hours a day. Today the *Digital Age* holds great promise for creating new job opportunities for some who have been left out of the equation. The real questions are-Will the future of work hold promise for everyone? If not, who will be left behind?

Just as people did two centuries ago, many fear that machines will make millions of workers redundant, causing inequality and unrest. Such concerns have been prompted by astonishing recent progress in artificial intelligence (AI), enabling increasingly sophisticated machine-to-machine (M2M) autonomous operations enabled through deep learning. In 2015 a record \$8.5 billion was spent on AI companies, nearly four times as much as in 2010, according to Quid, a data-analysis company. The idea that manual work can be carried out by machines is already familiar; now ever-smarter machines can perform tasks done by information workers, too. A widely-publicized 2013 study found that 47 percent of jobs in the U.S. are at risk from technology over the next 20 years³. And while it is easy to see fields in which automation might do away with the need for human labor, it isn't less obvious that a multitude of new jobs will be created as a direct result of digitization. According to some studies⁴, technological changes planned in the future will have a positive impact on employment. Thus, we should think of digital transformation as a factor of job creation, with the demand of new types of work, training and skills that are not even identified today

There is an ongoing fundamental change in the world of work, as digital technologies increase demand for advanced skills, and many traditional skills are rendered obsolete. Current jobs will likely not disappear completely, but most will be transformed; and the numbers could drop dramatically for some jobs. New jobs that require different, usually more advanced skills could emerge, compensating at least partly the jobs lost, as has been the case with any new technology. Policy makers will need to ensure that all present and future workers can seize the growing economic opportunities arising out of the spread of these new-age technologies. Digital technologies can improve overall workforce welfare and reduce poverty, but without

³ Oxford Martin School: The Future of Employment: How susceptible are jobs to computerization; Sept. 2013: <http://www.oxfordmartin.ox.ac.uk/publications/view/1314>

⁴ World Economic Forum: "The Future of Jobs", 2016

complementary investments, they can also worsen inequality. A non-negotiable aspect of these investments are skills development. Current and future workers need to develop lifelong cognitive, technical, and socioemotional skills. Building these skills requires actions affecting all relevant environments for learning: families, schools, universities, training systems, and firms. Given the speed of technological changes, these skills will also require constant updating throughout the life cycle as workers prepare for careers that span more than skill area. Complementary reforms are also needed in tax policy, social protection, and labor market institutions to facilitate the transition of workers from old economy jobs to new economy jobs, and address the distributional consequences of the digital revolution.

The future workspace is going to be characterized by a lot more specialization, and goes beyond just skills and talent. Digital transformation will not likely cause mass unemployment, but it will speed up the existing trend of computer-related automation, disrupting labor markets just as technological change has done before, and requiring workers to learn new skills more quickly than in the past. In addition to the recommendations and findings published in our December 2016 paper, “The Global Skills Gap and the Changing Nature of Work and their Impact on the Digital Age⁵” the following are WITSA’s recommendations and principles on how to maximize the use of and value of human capital in the digital age:

Recommended Principles

1. **Embrace Innovation:** Governments must fully embrace innovation as essential for business and society as a whole, reducing costs, resulting in greater prosperity, growth and competitiveness.
2. **Treat Humans as an Asset:** Industry must realize that while technology innovations will increasingly enable businesses to replace people with robots, industry can earn money not only by reducing costs, but also by raising value of people. There’s a huge untapped resource: There are 5 billion adults on the planet, but only 3 billion workers generating a market value on the order of \$100 trillion per year (GDP). However, only 200 million out of the global workforce like their jobs. The economy is not just about money, but about human values – Industry must capitalize on that. It is essential for governments and businesses to get together to figure out how to use innovations and technology to increase the value of humans in the workplace
3. **Match Skills with Jobs of the Future:** Governments, industry and academia must come together to better match the 5 billion potential workers’ skills and needs to jobs that are in demand. The increased value creation would be tremendous. This is the untapped market and meaningful work is a very important social objective which technology innovation can help fulfill
4. **Use Technology to Integrate Underserved Populations into the Workforce:** Undervalued people, such as women, often don’t obtain satisfying work. People with disabilities are often left out of the job market despite many having valuable special

⁵ http://witsa.org/witsa-wp-site/wp-content/uploads/2013/10/WITSA-Global-Skills-Shortage_Final.pdf

abilities. Technology can help integrate these segments into the job market with meaningful work through innovation and better matching of work to skills.

- 5. Embrace Artificial Intelligence (AI):** Leaders must realize that AI can have a positive impact on the future of work. Embracing AI may drive human workforce towards enhanced cognitive jobs in the future. Done right, AI should be viewed as an opportunity to apply assistive technology, not as a threat.
- 6. Smart Investments with Social Focus:** Investments should be prioritized in technology that brings people closer together, enabling people to find new things or services that we desire from each other.

Trust, Security, and Privacy in a Transforming World

Digital technology has changed our society appreciably. Digital transformation affects nearly every aspect of business and government operations. Even software development is being digitally transformed. With Transformation comes new trust, security and privacy challenges: In IoT and digital transformation, organizations have to deal with more identities and relations than ever before. The attack surface increases constantly every day. The challenge is intensified as the attack surface of IoT is unique, and hence its consequences are very different compared with the traditional ICT/ Digital landscape.

ICT provides the world with tremendous benefits, but with those benefits the shadowy underground looks to undermine many of them. In addition to threatening benefits they threaten governments, businesses, individuals, institutions, information and data as well as just about all other aspects of the *Digital Age*. As technology innovations continue to change and add value new threats rise with them. The following actions must be taken to reduce current and future risks.

Recommended Security Principles for Transformation

- 1. Innovation Comes with Risks:** Government and industry leaders must come together to address the new threats which follow all technical innovations. Most of the attacks have financial causes. With the era of Internet of Things upon us, a whole new world of opportunities for hackers emerge, impacting cars, home, hospitals and other critical resources. With the rapidly changing technology landscape, sound policy making can only be achieved when industry and governments address these risks jointly.
- 2. Businesses and organizations must be committed to ongoing enterprise assessment** – Regular technical evaluation and monitoring of the network, devices and the efficacy of tools should be conducted to reduce risk to business operations.
- 3. Businesses must also have a risk-based approach** centered around their key assets and focus not just on prevention, but also on their sustainability after inevitable attacks.
- 4. Businesses must define their “risk appetite”** – assess the risks they are willing to take and allocate the necessary resources accordingly. However, businesses are failing at the basics now; most don't have a thorough risk assessment, and often are not aware of all their critical assets. Once the adequate risk assessment is complete, businesses need to

incorporate and promote broader risk management practices

5. **Harmonization of Regulations Across Borders:** Harmonization of regulations across borders will be key to combatting cyber-security threats in the future. This would also lead to enhanced information exchange, which could be a key lever for combatting cyber-security threats
6. **Renewed Focus on Public/Private Partnerships:** The key to resilience is more partnering among industry, sharing risk assessments as well as experiences, and sound policy can only be achieved through more public/private partnerships.
7. **Businesses and organizations must focus on corporate governance and work culture** – Addressing the human elements of cybersecurity remains a key challenge. The cybersecurity culture of an organization is reflected in the establishment of clear roles/responsibilities as well as promulgation of information security policies and practices across the enterprise. Cyber training at all levels of the organization, including cyber-security trainings, is vital to these efforts and the health of the cyber culture.
8. **Measure progress and maturity** – The establishment of enterprise metrics is critical to a culture that values continuous improvement against expanding and evolving threats. Metrics should be applied to human-oriented programs such as testing and training, as well as to technical operations and technologies. Further, structured processes should be put in place that track these metrics and act on results thereof

Mobility: Transitioning from tech-assisted to tech-driven transportation

For better or for worse, mobility has surged to the top of the political agenda as an increasing number of people become urban dwellers: for the first time in history more than 50 percent of the world's population live in urban areas; by 2050, about 70 percent of people are likely to be city dwellers, compared with less than 30 percent in 1950. Furthermore, there is a strong relationship between transportation and social mobility. Our life opportunities depend on amount of time spend for commuting to school or work.

Experience tells us that technology will always find solutions to the challenges it raised. Connected and autonomous cars are a case in point: the increasing number of vehicles on roads spread congestion and pollution. Digital Transformation has enabled navigation via GPS and soon via connected and autonomous cars will ease these problems considerably by improving interaction between both dynamic (other vehicles) and static (infrastructures) environments. This transformation of mobility will lead to fewer cars on the roads and more people in each car (e.g. though urban and long-distance car-pooling). This value proposition has proved appealing not only to users and travelers but also to ecology-conscious governments or those eager to improve public health.

Recommended Principles for Future Mobility

- **Industry must aid governments in dispelling myths and encouraging sound policy making:** Policies that encourage innovation, competition, and private investment are essential for transportation technologies to realize their maximum economic and societal benefits and be broadly available in a timely and globally competitive manner.

Nevertheless, ICT-powered mobility is both an opportunity for users and a perceived threat to government's traditional policies. Thus, policy makers are not likely to embrace innovation in transformative transportation technologies unless their reservations are mitigated through well-informed assurances by industry that encourages safe and sound implementation of new technologies. Sometimes it is more of an administrative burden than an actual threat: government bureaucracies often are stretched to the limit when multiple agencies and departments need to work together with time constraints.

- **Removing barriers and encouraging a market-driving approach to policy:** Innovation and market competition rather than regulation should be prioritized. Technology advancements that can save lives, improve transportation efficiency, and reduce harmful emissions will emerge faster than government policies and regulations often permit. Government will need to more aggressively remove such barriers.
- **One size does not fit all:** As in other areas, governments and industry must realign objectives by working together and not treat each other as adversaries at to the detriment of citizens and consumers. Though most policy makers are inclined to support innovation and disruption, they must understand that one size will never fit all. Governments should pursue technology-neutral regulatory frameworks to enable creative ICT innovation; and Industry-led, voluntary global standards to accelerate adoption, drive competition, and enable cost-effective introduction of new technologies, while providing a clearer technology evolution path that stimulates investment.
- **New private-public partnerships for transportation innovation** across the automotive, transportation, and ICT sectors. The ICT sector is a primary driver and stakeholder in the future of any country's success. Emerging automotive and transportation technology innovations offer new partnership opportunities for saving lives and improving urban planning and traffic congestion, while also improving fuel economy and reducing harmful emissions. Government should engage the ICT sector as a priority partner and help incent the ICT sector to deliver the technological transportation breakthroughs of tomorrow. Governments should also partner with industry as well as academia to help address the distinct security challenges of connected vehicle technologies, harnessing appropriate technical and policy strategies to mitigate risks and enable safe, secure, trusted vehicles, while also protecting personal, commercial, and proprietary data from misuse.
- **Research and deployment** of advanced ICT-enabled vehicular technologies should be accelerated to save lives, improve quality of life, improve personal and commercial goods mobility, and help address our nation's current and future infrastructure, environmental, and economic challenges
- **Government signals impact investment in transformative technologies:** Governments who fail to embrace new technologies and disruption, not only risk stifling innovation through outdated policies, but also discourage investors as they try to determine where they want to invest, how much and when. Policy solutions, such as

treating mobility as a service, should be adopted in order to break away from a legacy measure that sends the wrong signal.

- **A need for trust and cultural change:** In addition to political will, leadership is needed to facilitate behavioral change among citizens. Trust is key to the adoption of any and all new disruptive technologies and policy-makers must be adept at making the most of ICT to overcome current challenges just as they have done repeatedly during previous eras of disruptive transformation.
- **Release of open traffic data to the public.** Greater public availability of traffic information and open transportation-related data will help stimulate innovative new services and products for enhancing safety, fuel efficiency, and quality of life.

Innovation-The heart of transformation

Businesses have always changed—in reaction to changes in the marketplace or in capabilities. But digital transformation presents a new set of challenges that traditional approaches to transformation cannot address. In this regard, innovation has become a key priority in digital transformation efforts. **Innovation tops digital transformation initiatives in most societies today.** The following are some recommended policy principles that need to be taken in order to ensure that innovation is stimulated rather than discouraged:

Recommended Principles for Innovation

1. **Fostering a Risk-Enabled Culture:** Countries interested in fostering innovations need to understand that innovations depend on a number of factors to include instilling a culture which recognizes that failure is most times a prerequisite to success—not a career-ending endeavor. In an ideal innovation ecosystem, entrepreneurship is encouraged, failure is accepted, finances are available, mentorships are employed and educational and business resources are in place. Even when these elements are in place, 90% of startups fail, but the macroeconomic benefits of startups, both failed and successful, to the local and global economy – and especially to the IT sector – are indisputable.
2. **Developing the Local Innovation Ecosystem:** The success of innovations often depends on the strength and development of the local innovation ecosystem. In areas without innovation ecosystems, building and supporting the ecosystem is a government responsibility. Public-Private Partnerships (PPPs) as government tools effectively build ecosystems from scratch in a short period of time. Although complex to design and operate, innovation PPPs have proven successful in ecosystems around the world.
3. **Innovation Requires Political Backing and Transparency:** The success of public-private innovation initiatives depends on many factors, including but not limited to:
 - a. **Sustainability:** Innovation PPPs, however, must be backed with sufficient political will to be sustained over the long-term, regardless of external pressures.
 - b. **Simple and transparent operation:** It is very important for the partnership to be as simple and transparent as possible. In an effective PPP, the private sector drives economic growth, but can only do so if the partnership is managed simply and transparently.

4. **Innovation is Mobile and Borderless:** All players in an ecosystem must understand the fundamental dynamics of innovation, namely that innovation is inherently mobile and borderless. The public sector, academia, and industry should understand that the flow of people and information within the ecosystem is highly beneficial to all players. Technology transfer should be encouraged and facilitated, and communication across the ecosystem should be emphasized.
5. **Awareness is a critical component of fostering innovation.** Key aspects of awareness include:
 - a. Awareness of the potential of entrepreneurship and the possibility of a career as an entrepreneur
 - b. Awareness of the existence of local startups and willingness within industry, academia, and government to partner with or provide services to them.
 - c. Awareness of the micro and macroeconomic benefits of a local knowledge economy
6. **Governments Must Avoid Unreasonable or Excessive Bureaucracy:** Certain legal and regulatory conditions must exist to facilitate entrepreneurship. These include the ability to open a new company relatively quickly and to close a failed company without placing unreasonable burden on entrepreneurs. Unreasonable or excessive bureaucracy discourages innovation and entrepreneurship.
7. **Invest in R&D to enable innovation:** Governments should put a strong focus on leveraging investments in innovative products and services. Investment-based policies and regulations must include a solid digital component, as ICT and ICT infrastructure is at the heart of growing countries innovation capacity in the digital age. Governments must ensure that digital innovation will represent an important percentage of the total projects to be funded.
8. **Improve R&D funding rules:** Governments should pursue policies which encourage open access to research data. However, care should be taken not to make open access to research data mandatory and it is paramount that any provisions around open access be balanced and incentive-based as mandated policies can often have a detrimental impact on businesses and their appetite for undertaking innovative projects as a result.

Enabling Digital Entrepreneurship

Digital transformation and the growth of utility-based cloud computing is has shifted focus from technical barriers to the business environment obstacles that digital entrepreneurs must address on a regular basis. This shift puts new emphasis on the importance of government's role in implementing sound and effective policies that enable the best climate for digital service incubation, innovation, growth and successful development. WITSA therefore strongly urges governments to redouble their efforts to foster national policies supporting new and transformative businesses as well as international competitiveness.

It is of utmost importance to create a dynamic and competitive digital business environment and address concerns around digital entrepreneurship conditions in order to enable the creation of a future-oriented market economy focused on online services and applications. The failure to do so creates friction and costly regulatory uncertainty for digital entrepreneurs. In this regard, governments can help the digital entrepreneur by:

- Ensure access to skilled workers through cross-border access as well as collaboration with the private sector to ensure a domestic skills supply;
- Promoting a competitive environment by reducing barriers to entry of products, services and talent;
- Avoid policy interventions that discourages innovators and new competitive business models;
- Avoid over-regulating data collection, storage and usage while still fostering trust in transformative technologies;
- Promoting open standards and open data;
- Encouraging digital entrepreneurship by simplifying and harmonizing regulation
- Promoting access to start capital for start-ups and fostering an environment that allows entrepreneurs to take the risks necessary to innovate;

CALL TO ACTION

In recent years, we have seen incredible technological advances through the internet, mobile broadband and devices, artificial intelligence, robotics, advanced materials, improvements in energy efficiency and personalized medicine. Without action and collaboration, however, digital transformation will not by itself, lead to broadly shared prosperity and growth. WITSA calls on its members to engage with their national governments, taking into account the policy principles identified in this paper, to ensure that the digital transformation will be a powerful force for the common good, valuing humans as an asset in the jobs market, fostering trust and security as well as driving businesses to create products that consumers rave about.

Further Reading

- [Moving on : transitioning from tech-assisted to tech-driven transportation](#) (DIGITALEUROPE)
- [Enabling a digitally-powered Single Market and prioritizing Innovation](#) (DIGITALEUROPE)
- [2016 State of Digital Transformation](#) (Huffington Post)
- [Intelligent Transportation Technology Policy Principles](#) (ITI)
- [Internet of Things Opportunity for Public/Private Collaboration](#) (ITI)
- [An introduction to the Digital Transformation of Industries initiative](#) (World Economic Forum)
- [Smart Cities - A \\$1.5 Trillion Market Opportunity](#) (Frost & Sullivan 2014)
- Oxford Martin School: [The Future of Employment: How susceptible are jobs to computerization](#); Sept. 2013
- [Digital Dividends: Enabling Digital Entrepreneurs](#) (World Bank Group 2016)
- [Rethinking Productive Development: Sound Policies and Institutions for Economic Transformation](#) (Inter-American Development Bank, September 2014)