

Executive Summary

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# Business Ecosystems for the Digital Age



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The International Trade Centre (ITC) is the joint agency of the World Trade Organization and the United Nations.

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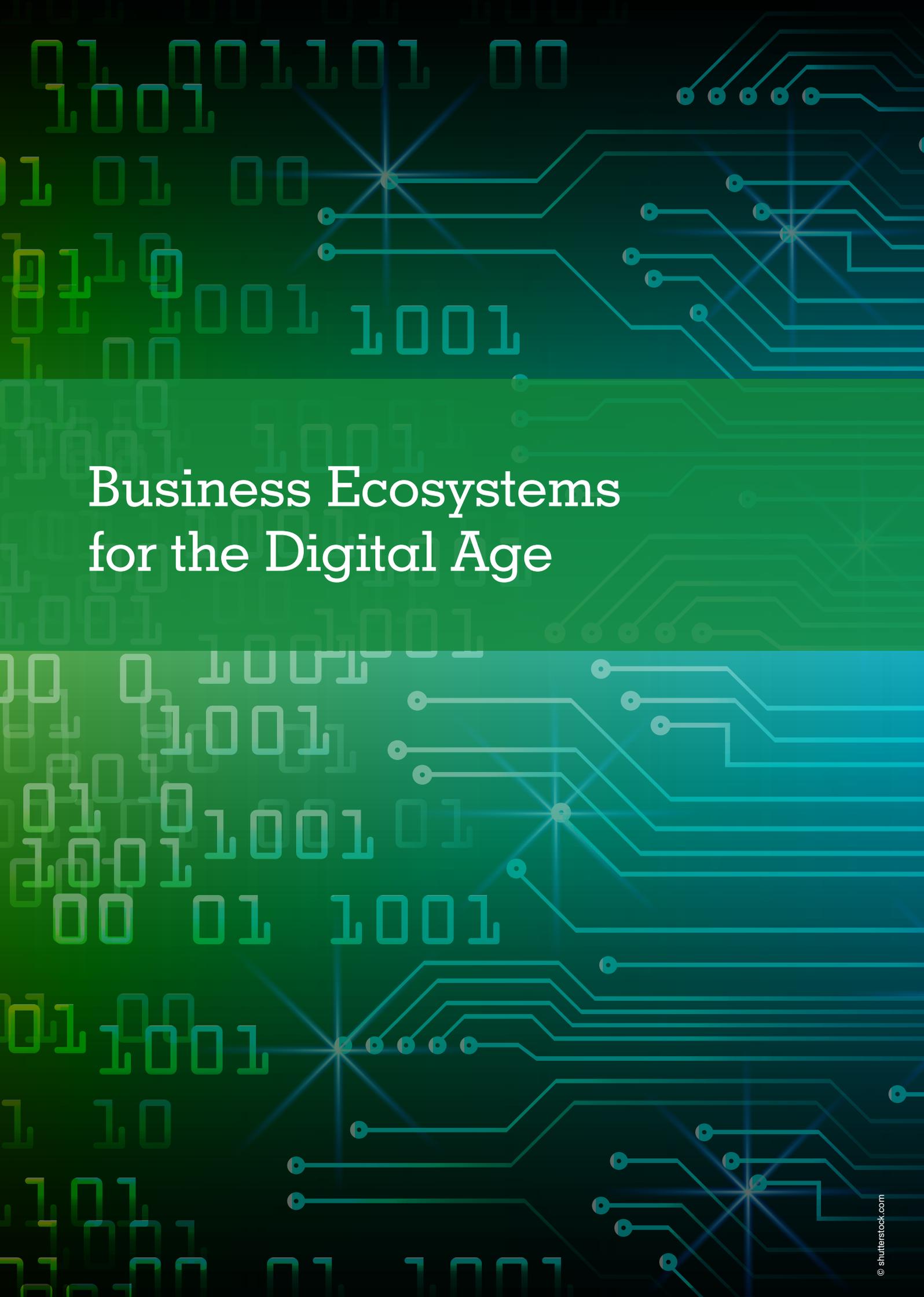
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# Business Ecosystems for the Digital Age

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## Foreword

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Digital technologies are changing the way firms do business. New technologies are connecting buyers and suppliers across more locations and activities, opening opportunities for some but putting others under pressure. Nevertheless, one thing is clear for all firms: those who do not adjust will find it harder to thrive in the digital age.

Policymakers at national and international levels are aware of the challenges ahead. The Group of 20 leading economies organized its first digital ministerial meeting in 2017. United Nations Secretary-General António Guterres established a High-level Panel on Digital Cooperation in July 2018. International organizations such as the International Telecommunications Union (ITU), the UN Conference on Trade and Development (UNCTAD), the World Bank, and the World Trade Organization (WTO) have published or are preparing major publications on the digital economy. And there is increasing focus on the role of women in the digital age reflected by the launch of initiatives such as Equals partnership, which aims to bridge the digital divide for women and girls; and the International Trade Centre's (ITC) own SheTrades initiative, which also helps support women entrepreneurs to climb the digital ladder.

At ITC, we are particularly interested in understanding how these changes affect small and medium-sized enterprises (SMEs), in keeping with our mandate to assist such businesses to become more competitive. This fourth annual edition of the *SME Competitiveness Outlook* finds that to flourish in the digital age, SMEs need a strong ecosystem with institutions providing business support and skills training.

ITC focuses on SMEs because they form the backbone of any economy, representing over 90% of firms and over 70% of employment in most countries. If SMEs remain disconnected from new technologies, the benefits of changes almost certainly will not be shared broadly

across the population. Moreover, the nature of new technologies may lead to the emergence of few dominant players, bringing market distortions that could harm consumers as well as smaller firms. Creating an ecosystem that allows SMEs to absorb technological change is therefore crucial for inclusive growth and fostering competitive markets.

In this report, we put the spotlight on three players in the business ecosystem that are key in ensuring SMEs can adjust successfully to the digital age:

- Trade and investment promotion organizations (TIPOs) and how they can effectively serve 'small' firms in the age of 'big' data;
- Education, skills and training providers and their importance for getting SMEs ready for the digital age;
- Quality infrastructure providers and their role in ensuring trust and interoperability among digital products, and in facilitating privacy and security.

The *SME Competitiveness Outlook 2018* urges these actors to become 'cautious revolutionaries' – to embrace data and technology, be open to new partnerships and innovation, and take measured risks in the face of novelty.

Trade and investment promotion organizations are a core ITC constituency; ensuring that they are equipped for the digital age is a key priority of this report. Successful trade and investment promotion relies on accessing information on target markets tailored to the needs of potential exporters or investors. Such information, traditionally provided by these organizations, is now also available from digital platforms, calling for TIPOs to adapt their services portfolio to new business realities.

Past research by ITC and the University of Geneva has found that increases in the budget of TIPOs raise export

growth. ITC findings presented in this report show that concentrating a higher share of trade promotion budgets on new exporters tends to expand the number of businesses engaged in exporting. More specifically, a 10% increase in the share of trade promotion spending on new exporters (with budgets constant) leads to a 4.6% rise in the number of exporters by destination. This implies that the tailoring of support matters. New technologies and digital platforms have the potential to change the way businesses access tailored market information. They can profoundly transform trade and investment promotion activities, enabling more effective targeting. Yet big data are most easily used to help big players with deep pockets. This report discusses what TIPOs can do to make big data work for small firms.

For SMEs to use digital technologies for internationalization, they must be connected to ICT and transport infrastructure. This continues to prove a challenge, particularly in remote areas. Currently, around 1 billion people in low income countries live more than 2 km from an all-weather road. About half of the world's population – 3.9 billion people, 90% of them in the

developing world – do not use the internet. New technologies are emerging with the potential to reduce infrastructure costs. But old problems such as inadequate hard infrastructure and connectivity issues remain. It is here that public-private partnerships need to find ways to share costs and responsibilities.

As an international organization supporting SMEs, ITC is itself a player in the business ecosystem described in this report. We take the digital challenge seriously, constantly assess our own use of digital solutions, and update our portfolio of services. Technological change will play a central role in the 2018 edition of ITC's World Trade Promotion Organizations Conference (WTPO) that will take place in Paris in October and focuses on 'Trade and Investment Ecosystems: Delivering for Growth'.

In this way, ITC aims to contribute to building the strong business ecosystems that will be key to ensuring that technological change contributes to improved and more equitable well-being, instead of triggering social disruption. Here, ITC also positions itself as a 'cautious revolutionary' to stay abreast of change, ahead of the curve, and deliver innovative solutions for our clients.



Arancha González  
Executive Director,  
International Trade Centre

# Executive Summary

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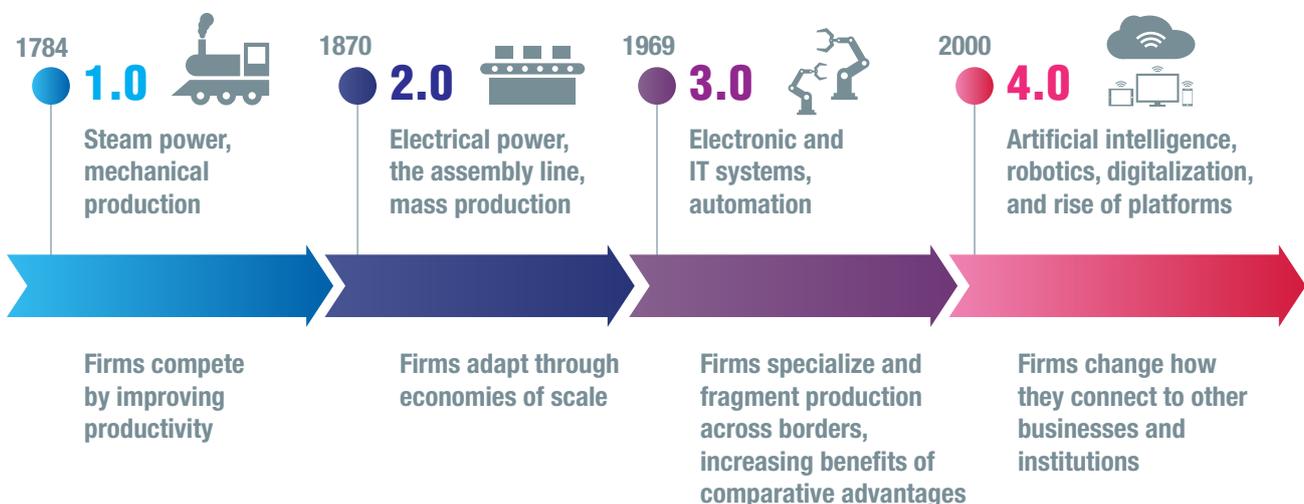
New technologies such as advanced robotics, 3D-printing, big data and the Internet of Things are rapidly changing the way firms do business. The far-reaching nature of the transformation has led many to identify it as a fourth industrial revolution, or 4.0 for short. A strong business ecosystem is necessary to manage this change. This year's *SME Competitiveness Outlook* proposes how to create it.

This report focuses on technological changes related to digitalization and the rise of the platform economy. The digital platform revolution has greatly altered the way firms connect to others, be they buyers, suppliers, peers or supporting institutions at home and abroad. It could be argued that it is entirely reshaping the business environment, or ecosystem, of small and medium-sized enterprises (SMEs) that export or intend to export.

This report suggests how to gain most from these developments and identifies potential pitfalls for SMEs. It highlights the role for traditional actors in the business environment in helping SMEs to adopt new technologies and manage risks. Such players are involved in promoting trade and investment, providing skills and education, and ensuring that products and services meet quality standards. They will have to embrace new technologies, forge fresh partnerships, build trust, and take calculated risks to help SMEs manage the transition.

Most of the potential benefits of changes in the ecosystem will be inaccessible if SMEs are not connected to physical and digital infrastructure. SMEs without internet connections cannot take advantage of services provided through the platform economy. SMEs without access to adequate and affordable transport infrastructure find it impossible or unaffordable to trade.

## Four industrial revolutions



Ensuring universal access to high-quality telecommunications and transport infrastructure is a challenge even in some of the wealthiest industrialized economies. It is therefore valid to ask how to create local infrastructure for SMEs in developing countries. This question needs to be answered if technological change is to be beneficial for SMEs, which create employment for many of the world's poorest and most vulnerable households.

### Questions addressed in this report

This report addresses a number of central questions:

- What is the nature of the changes that affect or will affect the business ecosystems of SMEs?
- How can big data be tailored to the needs of small enterprises?
- Which skills do SMEs need to cope with technological change?
- What can be done to instil trust in new technologies and to facilitate their use by SMEs?
- How can traditional market failures, such as lack of universal access or information asymmetries, be addressed?

## 1. The business ecosystem in transition

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### **Emerging technologies are changing the business ecosystem in three key ways: Information, finance and logistics**

Over the past two decades, new digital technologies have led to the creation of platforms that can instantly match global buyers and sellers in countless sectors. In addition, automation has opened the door to new ways of interacting with clients, whether in delivering goods and services or providing customer service.

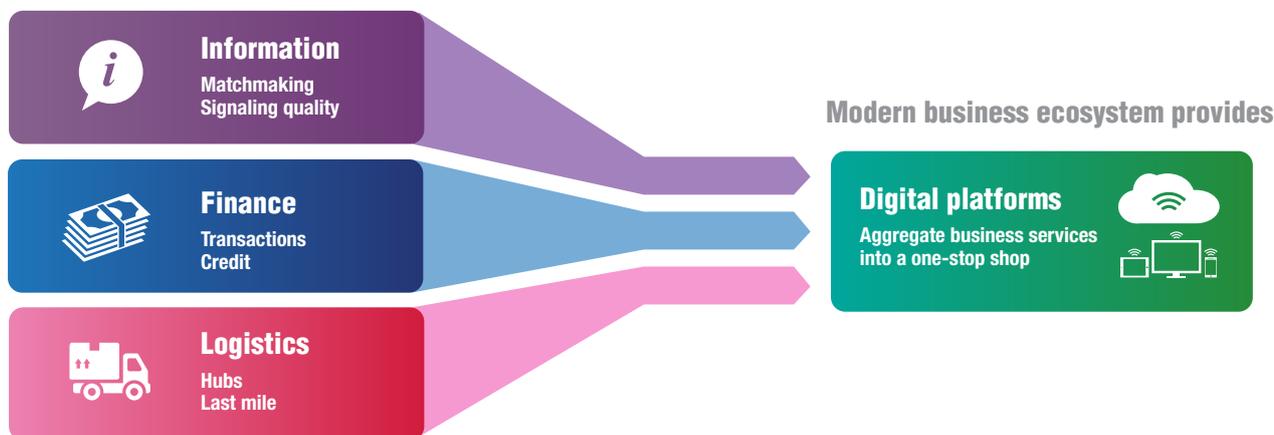
### **The consequences for SMEs are profound**

The digital platform revolution has ushered in a new era of doing business. From firms that own and control their resources to those that manage and orchestrate them, technological change has revolutionized production, connectivity and distribution. A key feature of this revolution is the digital platform – an online intermediary that links producers, consumers and service providers, and takes advantage of its reach and network.

Fuelled by cost reductions in the storage and manipulation of data, digital platforms are taking over a number of brick and mortar business activities, blurring the lines between the physical and the digital world. Face-to-face purchases are replaced with a click of a keyboard button, and money transfer operators are now an interface on a mobile phone. Digital platforms are also increasingly extending their reach, expanding the services they offer. Apple now provides mobile payments through Apple Pay, Alibaba offers logistical services, Facebook has an online marketplace, and Amazon offers cloud computing services.

## Digital platforms replace specialist providers with aggregated services

Traditional business service providers offer



### Digital platforms are extending their reach and are becoming dominant players

New technological developments offer immense opportunities for SMEs. Access to market-relevant information and customers abroad is becoming cheaper, and new ways of obtaining finance are opening up. Moreover, reputation building via the web can be more rapid than through traditional methods, and access to transport and ICT infrastructure may become more affordable in remote regions.

Yet, the high levels of market concentration that have come with the platform economy can also make SMEs more vulnerable to abuses of market power by dominant players. While the benefits of using new matchmaking systems are clear, SMEs may become overly reliant on systems and algorithms they understand little and over which they have virtually no power. The data trail left by companies, including user reviews, serves increasingly to assess creditworthiness. This may help some SMEs but can stymie their ability to raise funds if they are unaware of this use of their data trail. Moreover, rules for data use have yet to be established, opening the way for misuse of firms' data. SMEs have to enhance their understanding of these potential pitfalls.

It is also crucial that SMEs learn how to take advantage of newly available solutions while managing potential risks, and that they are able to distinguish between the technological changes that bring real gains and those that are mere fads or fashions. Lastly, they must be able to implement the technological changes that can be to their advantage.

To benefit from new digital offerings, SMEs must have access to the internet and transport networks, which is not always the case. While new technologies may facilitate such access, it is not yet clear how the combination of new delivery technologies and increased concentration within ICT and logistics systems will play out for SMEs in remote areas. Significant regulatory issues, including questions of liability, such as insurance against damage, remain unresolved.

### **Strong business ecosystems are needed for SMEs to handle change successfully**

With online platforms shaking up the ecosystem surrounding SMEs in the connect pillar and in the areas of finance and logistics, the quality of other aspects of a country's ecosystem will largely determine whether or not SMEs manage to cope with ongoing changes.

Inspired by the concept of environmental ecosystems, the term 'business ecosystem' has gained prominence in management science and business literature. As is the case with environmental ecosystems, there is no single definition for the term.

ITC's *SME Competitiveness Outlook* focuses on small and medium-sized enterprises that export or intend to export. The ecosystem described in this year's report is therefore the one most relevant for SMEs that trade or seek to trade. The business ecosystem for exporters is composed of a network of for-profit organizations – such as buyers, suppliers, distributors, financial actors and certifying bodies – and non-profit institutions – such as education providers, standard-setters and chambers of commerce. The report also considers local infrastructure to be part of the business ecosystem of exporters, as high-quality local digital and transport infrastructure is a prerequisite for using new, digitally driven technologies for international trade.

This report therefore identifies the business ecosystem as starting at the boundary of the enterprise and ending at the border of the country and at the level of national institutions or regulations. While these national institutions and regulations influence the business ecosystem, the report defines them as part of the national environment.

The business ecosystem is particularly important for SMEs, because smaller firms tend to have less control over their business environment. In contrast, large enterprises are often in a position to shape their business ecosystems, either directly or by expressing their concerns to those in positions of influence. For example, large firms can set up their own logistics systems to meet time requirements and generate investments by local or national authorities in local infrastructure. SMEs, on the other hand, tend to depend on access to external logistics providers and on the quality of existing infrastructure.

The business ecosystem also plays a significant role in a country's ability to attract investors, especially given that value chains are increasingly footloose. This report emphasizes that the ecosystem strongly influences how technological change affects future SME competitiveness in the digital age.

## **2. The digital platform revolution**

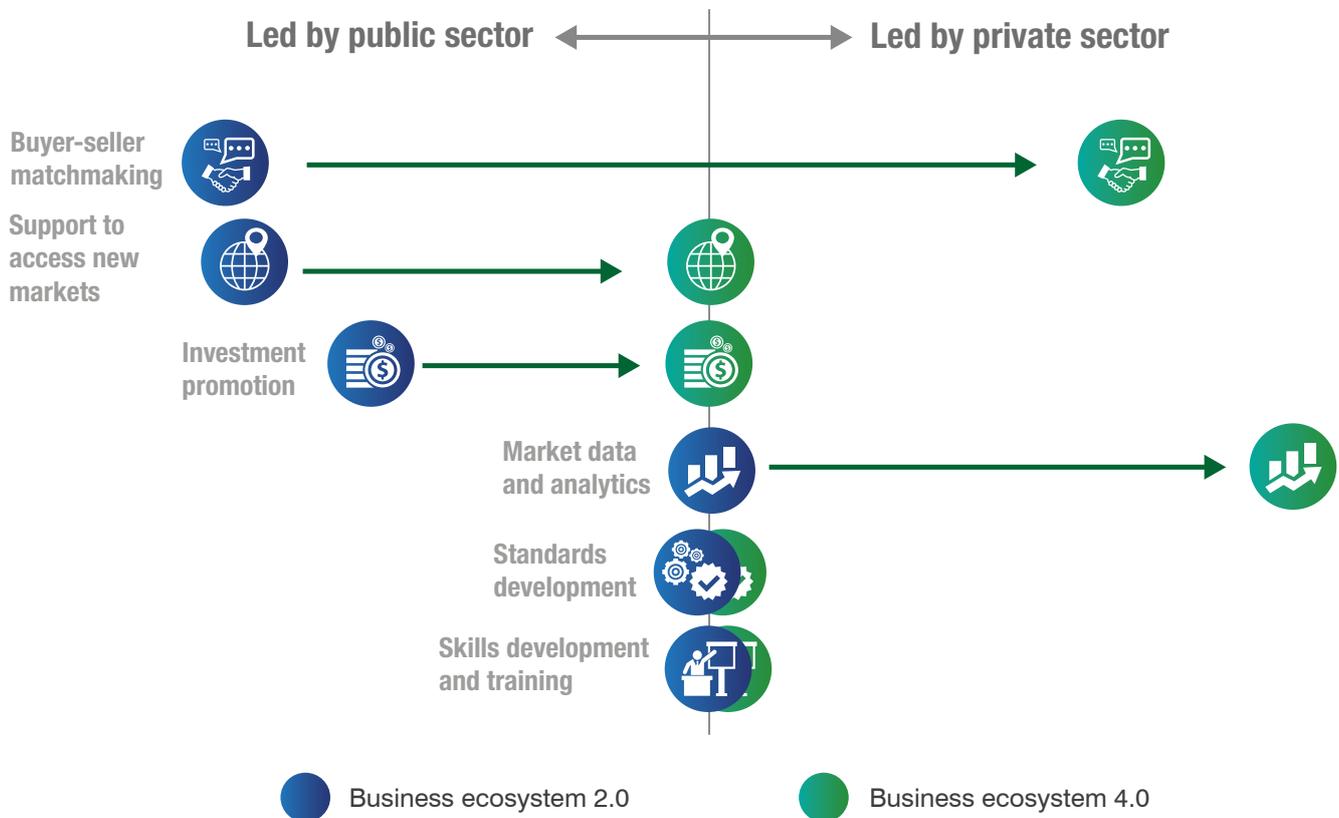
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In 2017, the market capital valuation of the top 10 internet platform companies reached more than \$3.3 trillion, a value close to the \$3.4 trillion nominal GDP of Germany, Europe's largest economy. This value also indicates positive investor expectations of these companies and their potential.

This report identifies three trends exhibited by digital platforms:

- Growing markets, as digital platforms' market share grows at a much higher rate than traditional brick and mortar markets;
- Growing scope, as platforms are able to offer aggregated services either by providing them themselves, or ensuring integration with third-party service providers;
- Growing communities, as platforms reinforce collaboration among people with common interests and play an increasingly important role in community building.

## Business support: A shift from public to private



While these changes are still taking place, it is already clear that digital platforms have significantly transformed three especially crucial areas for SME competitiveness: conduct of financial transactions, access to and use of information, including for matchmaking and quality signalling, and logistics services operations.

### New technologies are changing models for providing services

Digital technologies have contributed to significantly reducing search costs and other costs related to matching buyers and sellers. Digital platforms work as online intermediaries that connect buyers and sellers; exchange information, goods and services; and make use of network effects with every additional user. They are also increasingly important players in the matching of supply and demand.

These platforms can be different in type depending on their end-customers, inventory business model, the value unit they provide, and the extent of their open access. However, they have all grown in market reach, scope and in the communities they serve. Moreover, they have expanded from mere matchmaking to providing many more services for their customers including logistics, software and even hardware sales. Finally, with every increase in community reach, more information and knowledge is generated through them, increasing the value they provide for SMEs.

### **Platforms share information, signal quality**

Digital platforms provide SMEs with a particularly crucial tool to receive and share information about suppliers, buyers, products and services, as well as general market trends. Traditionally, trade and investment promotion organizations (TIPOs) have been providing such information to SMEs.

As most SMEs are too small to be able to generate and access such information, these platforms significantly reduce information asymmetry and improve decision-making. They also provide services such as e-marketing for sellers and the use of big data analytics for more targeted advertising. In addition, the popularity of peer platforms has turned them into quality assessment tools through ratings and reviews, which help SMEs improve their products and services further as well as build trust and loyalty with clients. SMEs are increasingly using these tools to their benefit and growth.

### **ICT-enabled services ease financial constraints**

Access to financial services is crucial when an enterprise starts operating and for its further growth and development. These services remain a constraint for many SMEs, because the banks that dominate them often have stringent requirements, cumbersome processes and high service fees. Globally, over half of trade finance requests by SMEs are rejected, compared with just 7% for multinational companies, for example.

However, while traditional banking remains the most common source of external finance, alternative financing methods have emerged, especially in developing countries. These include supply chain finance and solutions based on information and communications technology (ICT). Such solutions allow for online payments and online money transfer services, for example, as well as ease funding for SMEs based on the history of their transactions and even on their savings. Innovations through digital platforms have also allowed for a rise in peer-to-peer lending and crowdfunding. Moreover, while still in its nascent stage, there has also been an uptake of blockchain technology in trade finance.

Alternative finance and ICT-based solutions are growing in most regions, with notable increases in Europe and the Americas. In Asia, as well as globally, China is making its mark, accounting for most of the global alternative finance market, while Africa and the Middle East show potential for growth. One of the main advantages of these solutions is that they can be tailored to specific contexts, promising growth even for SMEs with a limited digital footprint.

### **Platform-based solutions are changing logistics**

Logistics services are important for the firm's competitiveness, ensuring that the right product gets to the right buyer, with reasonable costs and timeframes. Strong logistics services are a sign of a dynamic business ecosystem. Developing countries in particular assign these services great importance. Given that many SMEs do not have the resources for in-house logistics operations, many have opted to outsource them.

These logistics suppliers have in turn seen much innovation, from automated operations in warehouse and storage management to significant progress in tracking and tracing, as well as the early use of drones to deliver products to sometimes remote locations. New business models have also emerged within the e-commerce environment offering crowd-logistics and platform-based solutions to tap into the sharing economy by matching available capacity with delivery needs.

### Despite having less access to technology, women use digital platforms to their advantage

Women are 11.6% less likely to use the internet than men. Yet, where women have access to digital platforms, they use them.

- Procedural obstacles to trade that women often face can be reduced through increased use of digital single windows;
- Women-owned firms are relatively more active in e-commerce than in traditional trade;
- Mobile money solutions have allowed women in some countries to overcome traditional barriers to accessing finance.

### A business ecosystem’s strength determines whether the benefits of technology are spread evenly

Online platforms are progressively increasing SME visibility and access to markets, lowering costs of entry and exit, simplifying buying and selling, and encouraging innovation and entrepreneurial spirit. However, the new business model is increasingly raising concerns about the market power and potential monopolistic/oligopolistic behaviour of platforms: they enable intense competition by SMEs but face relatively few competitors themselves. These platforms have also highlighted a digital divide not only between countries but also within them. Finally yet importantly, there is increasing awareness that automated analyses of big data do not necessarily lead to unbiased outcomes, given that the algorithms used for the analysis may have in-built biases.

For these and other reasons, the role of not-profit institutions remains important if business environment 4.0 is to function smoothly. Those institutions will have to embrace new technologies and may have to offer services that address distortions brought by these new technologies.

## Digital platforms affect SME competitiveness



### 3. Foundations for SME success in a 4.0 world

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#### **Information, skills and quality create foundations for success in a 4.0 world**

To take advantage of new opportunities in the digital age, firms have to deal with and often adopt new technologies. Whether and how to do this depends on the skills and capacities available in firms. It also depends on signals that firms receive about the reliability of new technologies and their likelihood of standing the test of time.

For exporters, success in a 4.0 world therefore depends on a number of aspects of the business ecosystem:

- Offers related to market information, market access and export promotion are likely to change significantly over coming years and may increasingly be provided by private sector companies. It is unclear whether the relevant services will satisfy the needs of exporters, in particular SMEs.
- Exporters will have to be able to hire or generate the skill sets needed for them to function successfully in a 4.0 environment. Whether they manage to find those skills will depend on the capacity of training and education institutions to adjust.
- Exporters, especially small and vulnerable ones, will be looking for guidance on the quality, interoperability and safety of new technologies. Whether they receive adequate guidance, will largely depend on the ability of countries' quality infrastructure to react to technological change. Standard-setters and regulators may play a special role in this area.

The so-called data revolution is a key feature of the fourth industrial revolution. The rapid growth in amounts of data has led to the perception that everybody has, or will soon have, unlimited access to many types of information. This is not the case today, however. Currently, only limited numbers of economic actors have access to usable big data. While technology could allow many other individuals or firms to generate data, doing so is not straightforward. This report provides analysis and practical advice for three types of institutions – those that promote trade and investments, build skills, and ensure quality.

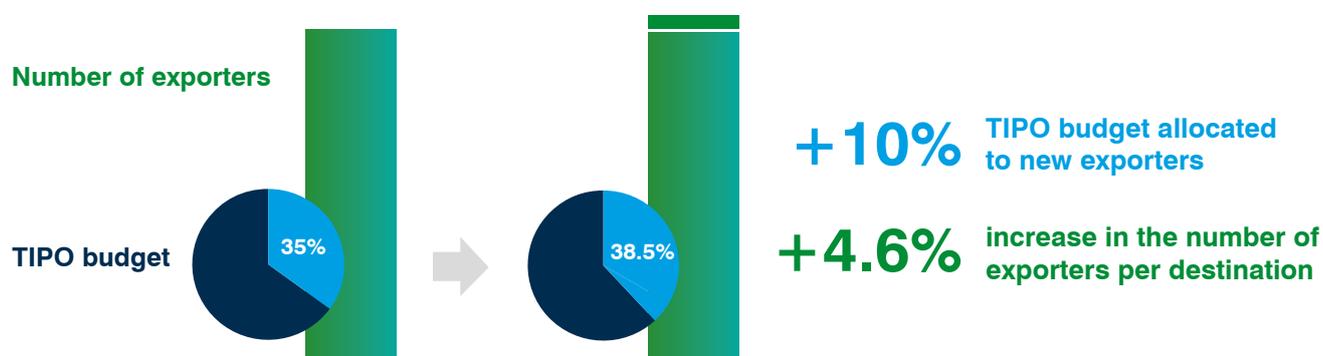
#### **Tailored support increases number of exporters**

Successful trade and investment promotion relies on accessing information on target markets tailored to the needs of potential exporters or investors. Recent ITC findings show that a 1% increase in the budget of trade and investment promotion organizations raises export growth by 0.03 to 0.08%. Regarding exports, TIPOs tend to encourage the dynamic side of exports, such as new products or markets, more than volume.

Findings in this report suggest that TIPOs have been successful in supporting national exporters to enter and survive in targeted markets. The measured ability of institutions to provide appropriate market support abroad seems to be positively linked with the survival rate of exporters.

ITC research shows that countries in which TIPOs spend a higher share of their budget on new exporters tend to have more exporters. More specifically, a 10% increase in spending on new exporters, without increasing the total budget, leads to a 4.6% rise in the number of exporters per destination. The magnitude is significant. If a TIPO with an average budget for new exporters of around \$5-\$15 million, such as the organizations PROCHILE, PROMEXICO or Turkish IGEME, reallocate another 10% of their budget on supporting new exporters (\$0.5 million to \$1.5 million) the number of new exporting companies or companies exporting to new destinations would increase by 4.6% per destination market.

## Trade Promotion: Tailor budgets to new exporters



There is less empirical evidence available to assess the impact of investment promotion agencies (IPAs). A cross-country analysis of foreign direct investment (FDI) from the United States to 124 destination countries shows that each additional dollar spent on investment promotion increases FDI inflows by \$189. Furthermore, the sectors prioritized for investment promotion experience 68% more employment than those that are not given priority.

### The rise of platforms changes the way of providing tailored information

New technologies and data platforms have the potential to transform the way tailored market information is delivered and may therefore have profound effects on activities to promote trade and investment. With digital platforms increasingly providing market information, matching buyers and sellers, and ranking the quality of offering, there is a question mark over how trade and investment promotion organizations and investment promotion agencies will adjust to this change. There is also uncertainty over whether new providers of information and matching services will be interested in and able to provide the targeted services offered by TIPOs and IPAs, which have been proven to be successful.

### Training and education systems are key for providing tomorrow's skills

Industry 4.0 also has the potential to change labour markets dramatically, particularly regarding the skills that enterprises require from employees. According to one estimate, the skills demanded across industries will change by 35% within a handful of years. Such shifts put enormous pressure on countries' education and training systems to adjust. Yet, in many countries those systems are notoriously inflexible, portending serious challenges.

Though both firms and employees have incentives to invest in new skills, markets for education and training are known for not functioning efficiently. This is among the reasons that the public sector has traditionally played a major role in education and training. Another cause for this role is concern for equality of opportunity, with government intervention aiming to ensure that low income households and SMEs can make the necessary investments in skills even if their access to finance is limited.

Governments are therefore likely to pay part of the training and education bill that will come with industry 4.0. This report addresses the question of how that bill is divided between the public sector and individuals or firms.

Another major challenge is to ensure that skills taught today remain relevant tomorrow. This is difficult, given rapidly changing skill demands. Forms of public-private collaboration, such as those inherent in technical and vocational training (TVET) systems, are likely to be instrumental in ensuring that workers get the right skills for the job. Such collaboration has been successful in countries such as Germany and Switzerland, but it has not always been easy to replicate elsewhere.

Technical and vocational education and training systems have also not always been able to react to fundamental technological change. There is uncertainty over whether they will be able to do so in the future. In this context, it is important to underline that traditional TVET systems have relied on various forms of coordination among peers in the private sector. This notion may not fit easily with business models that consider themselves 'disruptive' and a time where the peers of today are not those of tomorrow.

### **Quality infrastructure is key for trust in new technologies**

A product's perceived quality is significant in influencing consumer-buying decisions, and a product's actual quality is significant in determining whether people become repeat customers. Where customers are disappointed, sales are likely to go down, and where trust in certain products is lost, entire markets may disappear.

Emerging technologies are introducing new products and processes, many of which contain quality aspects that are not immediately discernible to consumers. Are the customer comments on hospitality webpages authentic, or manipulated? How secure are electronic banking tools? What is the likelihood that a self-driving car will crash? For markets to function well, they need quality control and monitoring mechanisms. These often involve standards or regulations designed to take into account customer expectations, industry standards and national policy objectives, such as public health or national security.

The business ecosystem in certification and standards usually consists of five core actors, each with specific roles: metrology, accreditation, standards authorities, testing and certification laboratories, and inspections authorities. Collectively these are often known as 'quality infrastructure'.

The rapid evolution of technologies requires speedy adjustments from all these players to:

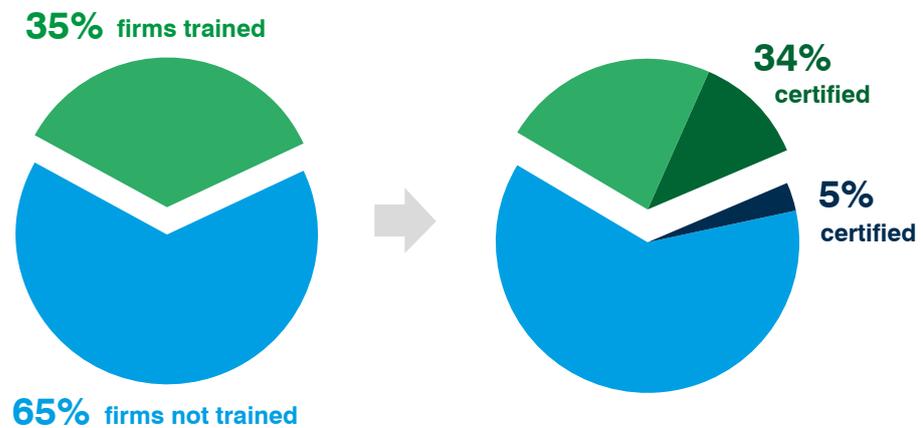
- Ensure trust for digital goods;
- Promote interoperability among digital products;
- Address privacy and security challenges.

Transmitting knowledge about quality certification and related processes is key to promoting certification. SMEs, especially in developing countries, may not be able to shoulder these costs fully, and public or public-private entities have a role to play. The returns on investment are likely to be significant.

### **SMEs may require support to be certified**

Among firms that receive assistance to be certified – for example, in a group of 14 Latin American countries – the share of firms with quality certification is about seven times higher than among firms that have not received any assistance. Similarly, firms that have received assistance in obtaining quality certification are three times more likely to export. This evidence relates to quality certification in 'traditional' goods and services. However, it suggests that supporting SMEs may also apply to the field of digital certification.

## Quality certification: 7x more likely when trained



### 4. Shortening infrastructure's last mile

The fourth industrial revolution has been heralded as having the potential to connect billions more people and to improve dramatically the efficiency of organizations. The underlying assumption is that people and enterprises are actually connected to one another and to new technologies via the internet or transport infrastructure.

#### Last mile barriers are colossal for many SMEs

In fact, however, 1 billion people in low income countries live more than 2 km from an all-weather road. About half of the world's population – 3.9 billion people, 90% of them in the developing world – do not use the internet. For industry 4.0 to benefit everyone, existing infrastructure gaps need overcoming. This will be most challenging for households and firms in remote areas. According to Amazon executive Brittan Lad, 'The last mile on average makes up nearly 30% of transport costs. And it is very hard to bring those down.'

#### New technologies may help to close the last mile

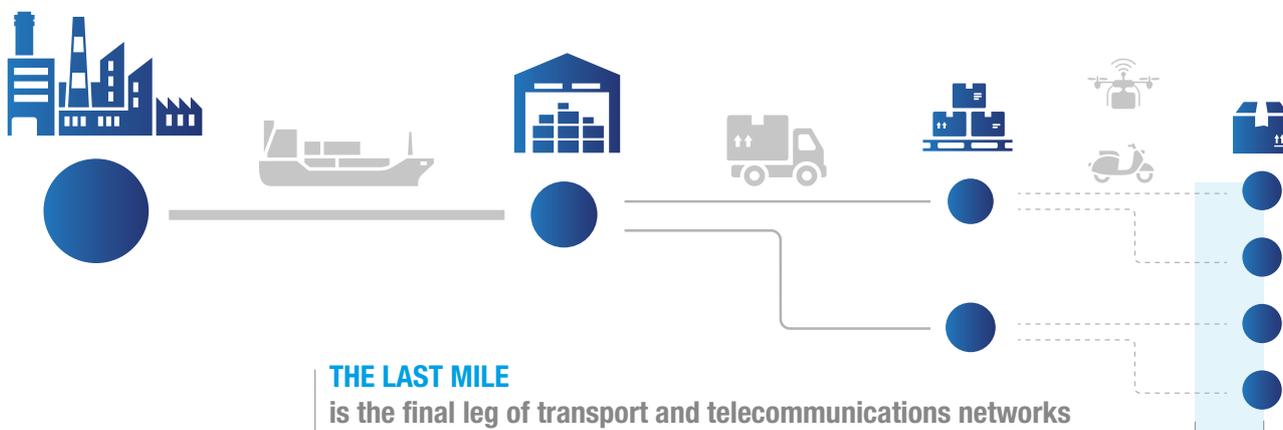
The good news is that industry 4.0 is ushering in new technologies that can make it easier to close existing infrastructure gaps, including last mile gaps, to connect remote households and SMEs to infrastructure nodes or hubs.

Many of these technologies, however, are still in the experimental stage. It is not yet entirely clear, how economically viable these technologies are, and major issues of financial and regulatory responsibilities need solutions.

The term last mile also describes the final leg of the communications networks that connect to end-consumers. The last mile is usually a speed bottleneck because the final link between the major hubs and end users such as SMEs is disproportionately expensive and technologically complex to solve, and yet the most valuable. For SMEs in remote areas, the last mile problem can equally be a 'first mile' issue when they function as suppliers to the hubs. It is a big challenge offering high-end telecommunication services in distant and rural areas because of the high costs of fitting and maintaining fibre optic cables or wireless networks.

## Last mile: Costliest but most important for inclusiveness

Shortening the last mile is possible through leapfrogging technologies



New technologies can help to close the last mile. For example, mobile telecommunications have permitted many Africans to leapfrog fixed-line networks and move directly into wireless technology. In addition, 3D printing of bridges, use of cargo drones for delivery, and balloons to provide internet access are being exploited as potential solutions. To facilitate the increased use of new technologies to close the last mile gap, financial and regulatory challenges will need to be addressed.

### Old challenges regarding funding and responsibilities remain

First, investment in last mile infrastructure solutions is not necessarily profitable. The cheaper the infrastructure and the larger the number of users, the more likely it is that such investments will be made by the private sector. Yet, traditional questions around the funding of and payment for last mile infrastructure may not entirely disappear. It is also necessary to keep in mind that the public sector remains by far the largest source of overall infrastructure financing, accounting for 70% of the total. The private sector finances about 20%, and the remaining resources come from official development assistance.

Second, there are difficult regulatory issues to be resolved, particularly regarding liability in the event of an injury. In the case of traditional infrastructure technologies, this may involve injuries caused by collapses of bridges or damage in roads. In the case of new technologies, this may refer to injuries caused through accidents involving autonomous drones. Should the manufacturer pay, the software developers who designed the artificial intelligence system, or the service provider who operates the drone?

## 5. Embracing change for business ecosystem 4.0

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The digital revolution has already transformed our economies and society. It has changed the way in which information is generated and accessed to such an extent that some have argued that data is 'the new oil'. New technologies and tools have entered our daily lives at home and in the workplace. Companies have new ways of doing business, and digital platforms now provide services that used to be the bread and butter of retailers, travel agents, banks and trade and investment promotion organizations.

These changes are creating immense opportunities for many. At the same time, however, they pose risks to economic growth and inclusiveness when the business ecosystem is not set up to harness the power of new technological possibilities.

Institutions in charge of furnishing market information, providing skills and monitoring quality have an important role to play, as they are key to determining the quality of the business ecosystem. In many places these institutions are either entirely public or are public-private non-profit service providers. In the past, they were not often known for being very dynamic or innovative. This report argues that such institutions need to fully embrace change and become 'cautious revolutionaries' to remain relevant.

In this period of disruption, those sticking to old methods may well be displaced by new actors, often from the private sector. Such a development would not necessarily benefit SMEs and inclusiveness, as weaker economic players are most likely to suffer from market failures and malfunctions that non-profit service providers can address but private sector players are free to ignore.

### **Cautious revolutionaries needed**

For the benefit of SMEs around the world, the business world needs cautious revolutionaries in the fields of trade and investment promotion, training and education, and quality control and certification.

Cautious revolutionaries:

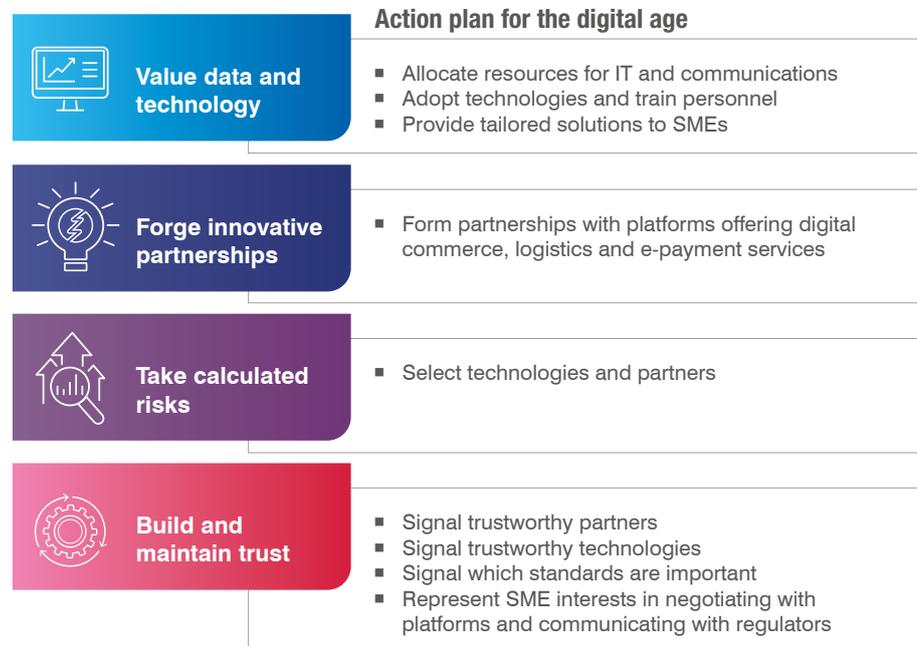
- Value and embrace data and technology;
- Are open to new partnerships;
- Take risks, as the digital transformation is too recent for evidence and experience to identify clearly what works and what does not;
- Are prudent in the face of risks and novelty, because their main role in the business ecosystem is to instil and preserve trust in markets while new technologies emerge.

### **Trade and investment promotion organizations: Make big data accessible to small firms**

Given the importance of data and the difficulties that SMEs have in accessing and using them, TIPOs should consider using new technologies and data analysis to collect their own data and learn more about clients and partners in their networks. For this purpose, they can create their own online platforms to facilitate contacts between local businesses and potential buyers in foreign markets, modernizing their traditional matchmaking services. A promising initiative – already exploited by a number of TIPOs – is to build partnerships with other digital platforms.

In this rapidly changing environment, TIPOs must manage risks associated with the choice of technology, tools and partners. They also have a role in helping SMEs to assess and manage similar risks.

## Trade and investment promotion organizations Make big data work for small firms



### Education and training providers: Anticipate, act and adjust

Training institutions must teach today the skills that trainees and students will use in the labour market years from now. This is very difficult given that skills predictions change every few months. Nonetheless, these institutions need to react even if information is lacking. Failure to adjust may put entire cohorts of young people at risk. This means that decisions about curriculums and investments in technology have to be made in an environment of uncertainty.

Recent studies on skills demand indicate that a combination of complex problem-solving skills, technical skills, and social and emotional skills will be required in the near future. As to technical skills, there is a distinction between digital skills and technical skills associated with the machinery, technology and robots that are specific to a particular job. Regarding digital skills, many experts advise that basic digital skills should be included in the compulsory school curriculum. Science, technology, engineering and mathematics (STEM) education in the compulsory school curriculum prepares students for the advanced digital skills they will acquire in tertiary education.

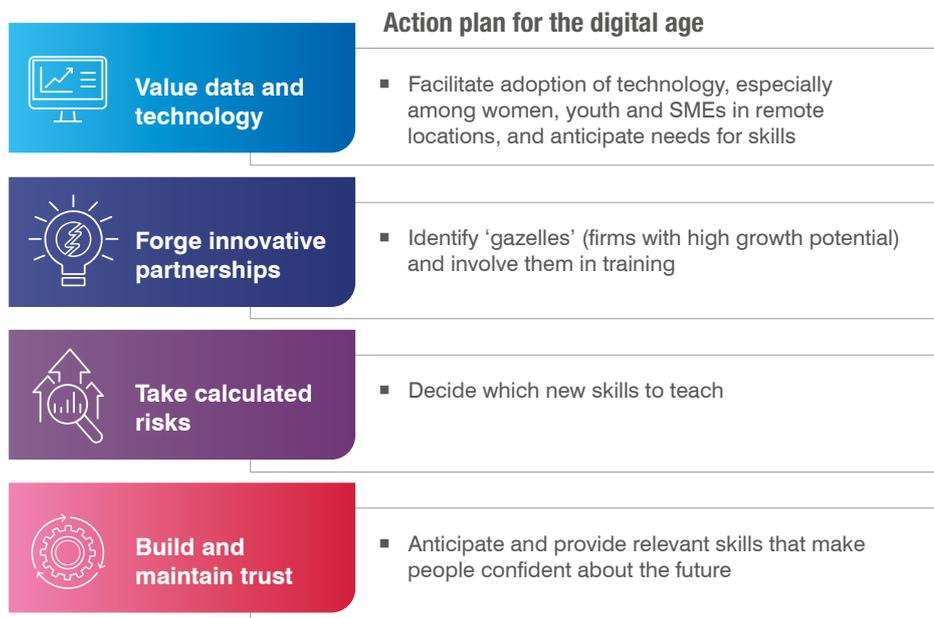
For SMEs, advanced skills in digital entrepreneurship and cybersecurity are of particular importance. They also need a thorough understanding of the platform economy, including the role of financial information in that environment.

It is harder to generalize about the technological skills needed for specific jobs. The role of design tools is different for a carpenter than for a baker. The role of robotization may vary from hotels to health spas. In such cases, technical and vocational education and training institutions may have to take difficult decisions within a context of uncertainty – and it would be inadvisable to postpone such decisions.

## Vocational education and training providers

### Anticipate, act, adjust:

### No time for perfect solutions



Partnerships between company coalitions, government and local education institutions are likely to be key for sector-specific upskilling and reskilling, combining theoretical and applied training. On-the-job training and learning by experience can be useful in a changing environment where skills quickly become obsolete. On-the-job adult learning or informal learning outside the workplace is especially relevant for SMEs, which are less likely to participate in formal training courses.

Yet, building sustainable public-private partnerships for vocational training and education is not straightforward. It has not proven easy to replicate successful apprenticeship systems, such as those in German-speaking countries, in countries that lack the relevant historical and institutional arrangements. Current technological change entails the additional difficulty of identifying the appropriate companies to work with. In fast-changing markets, some of today's successful gazelles may no longer be around tomorrow.

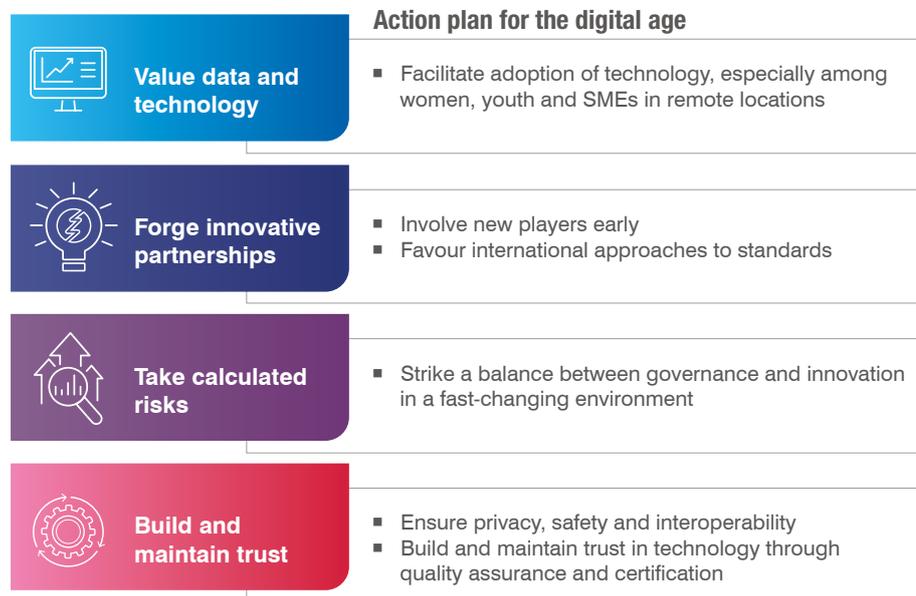
There is no time to design perfect solutions. Vocational education and training providers could identify the most successful national players in new technologies and find ways to involve them in their training and education offering.

#### Quality infrastructure bodies: Build trust in new technologies

Despite the growing share of digital goods in international trade, many national quality infrastructure systems are not fully engaged in designing and certifying standards for digital products. Moreover, roles and responsibilities for quality assurance in the digital era are less well defined than for physical goods. Standards today tend to be developed and maintained by private sector companies, trade associations, consortia or alliances, sidestepping traditional quality infrastructure.

## Quality assurance bodies

### Build trust in the digital economy



However, traditional quality infrastructure still plays a role, particularly in finding the right equilibrium between governance and innovation. Striking this balance is crucial to building and maintaining trust in new technologies. It is also key to ensuring interoperability and facilitating adoption of new technologies, especially by SMEs.

Regulation is often associated with burdens on business or innovation. Indeed, it can remove some of the freedom that is inherent to entrepreneurship. At the same time, however, it can foster innovation by creating a more secure environment. Regulation may also be necessary to prevent new technologies from disappearing because consumers lose trust in them.

In times of technological disruption, it is difficult to assess which regulation or standard strikes the right balance. To avoid a situation where the lack of regulations and standards leaves people and companies unprotected and exposed, regulators often have to intervene, taking a calculated risk that they may be overregulating.

Given that SMEs are economically vulnerable, it is in their interest for quality infrastructure bodies to be stronger and more proactive in setting standards and assessing conformity for digital goods, especially regarding cybersecurity and data privacy. National quality organizations can adopt international standards and recognize competent testing authorities outside of the country, while also participating in regional and international standard-setting bodies.

#### **Technology can close the last mile in transport and communications, but challenge of funding and responsibilities remains**

Funding is necessary to close existing transport and ICT infrastructure gaps, particularly in remote regions. The extent of the required funding is such that private sector finance will be a prerequisite, as recognized in numerous international policy documents.

New technologies hold the promise of reducing the amounts of funding needed to close last mile infrastructure gaps. Yet, two old challenges remain on how to create incentives for the private sector to invest in the last mile and how to define the roles and responsibilities of the public and the private sectors. Transport and ICT infrastructure are collective goods, and leaving investment solely to the private sector can lead to the abuse of market power resulting in high user fees or lack of incentives to invest in maintaining infrastructure.

For the private sector, disincentives to investments in last mile transport and ICT infrastructure remain, given the greater risks, lower profitability and longer timeframes for building transport and ICT infrastructure in rural areas.

Public-private partnerships can offer a path for completing the last mile in infrastructure connectivity. To boost private participation in last mile projects, governments must enhance incentives and create a conducive environment for private actors. The success of these partnerships hinges on the quality of governance and the proper drafting and structuring of contracts, while sharing costs and responsibilities.

### **Learn from the past: Build strong ecosystems to manage change**

Amid discussions of a new industrial revolution and technological disruptions, it is important to underline that this is neither the first industrial revolution nor the first technological disruption. The challenges that various stakeholders face are also not entirely new. Steam power and the electric telegraph arguably led to challenges and questioning similar to those seen today.

People who play a role in shaping business ecosystems can therefore learn from the past when deciding how to think about partnerships, how to assess risks and how to instil trust in times of change and potential market failures. This can help to avoid mistakes and build new ecosystems more rapidly.

One lesson from the past is that technological disruption and expanded globalization – particularly when combined – can trigger social unrest and popular resentment if not managed well. A strong business ecosystem will be key for managing change, and this report aims to provide practical steps towards building such an ecosystem.

## **Business ecosystem 4.0**

### **Checklist for cautious revolutionaries**

|  |  |
|--|--|
|  <b>Value data and technology</b>     |  <b>Take calculated risks</b>    |
|  <b>Forge innovative partnerships</b> |  <b>Build and maintain trust</b> |

## Featured in 2018 SME Competitiveness Outlook

### Country profiles

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1. Argentina
2. Armenia
3. Belize
4. Benin
5. Bolivia
6. Bosnia and Herzegovina
7. Botswana
8. Bulgaria
9. Burundi
10. Cabo Verde
11. Cameroon
12. Chad
13. Croatia
14. Dominican Republic
15. El Salvador
16. Ethiopia
17. Gabon
18. Gambia
19. Georgia
20. Ghana
21. Guatemala
22. Honduras
23. Hungary
24. Indonesia
25. Kenya
26. Lao People's Democratic Republic
27. Lesotho
28. Macedonia, the former Yugoslav Republic of
29. Mali
30. Mauritania
31. Mongolia
32. Montenegro
33. Morocco
34. Mozambique
35. Myanmar
36. Nicaragua
37. Nigeria
38. Pakistan
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40. Philippines
41. Romania
42. Sierra Leone
43. Sri Lanka
44. Suriname
45. Tajikistan
46. Timor-Leste
47. Uganda
48. Venezuela
49. Zambia
50. Zimbabwe

## Thought leaders



**Gabriela Michetti**  
Growing MSMEs, a path to national development



**Roya Mahboob**  
Interview with the first female tech CEO in Afghanistan



**Awa Sinyan Faal**  
Despite challenging export environment, SME agribusiness in the Gambia plans growth



**Guy Ryder**  
Skills bolster SME competitiveness



**Christophe Lecourtier**  
To boost SME competitiveness, France reshuffles its trade promotion ecosystem

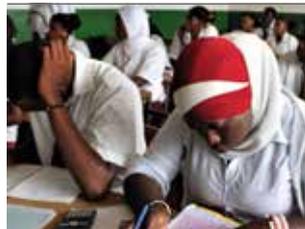
## Case studies



**Promoting SME competitiveness in Saint Lucia:** *Wider access to better market information*



**Promoting SME competitiveness in Rwanda:** *Integrating ICT in logistics services*



**Promoting SME competitiveness in the Gambia:** *Developing sectors and skills*



**Promoting SME competitiveness in Indonesia and Kenya:** *Efficient certification key to export success*



**Promoting SME competitiveness in Morocco:** *Infrastructure and logistics key to competitive advantage*



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