

# POLISH NATIONAL REPORT



## Fostering the Adoption of ICT-enabled AMTs by European SMEs



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## Referenced Documents

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1	2018-1-FR01-KA202-04780		FAME Proposal
2			

## Applicable Documents

ID	Reference	Title
1	[PARTNER ORGANIZATION]	[TITLE OF THE REFERENCED DOCUMENT]

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# 1.Introduction

## 1.1. Scope of the project

### SME in Poland.

According to the authors of "Small and medium enterprises in Poland - obstacles and development" the SME sector in Poland is still poor compared to the majority of the countries of the European Union. However, the promise of hope is that statistics showing that the SME market in Poland is growing at a significant pace. But what exactly is the SME market? The Polish Chamber of Commerce defines SME as:

*“The category of micro, small and medium-sized enterprises (SMEs) consists of enterprises that employ fewer than 250 employees and whose annual turnover does not exceed EUR 50 million, and / or the total annual balance does not exceed EUR 43 million.”*

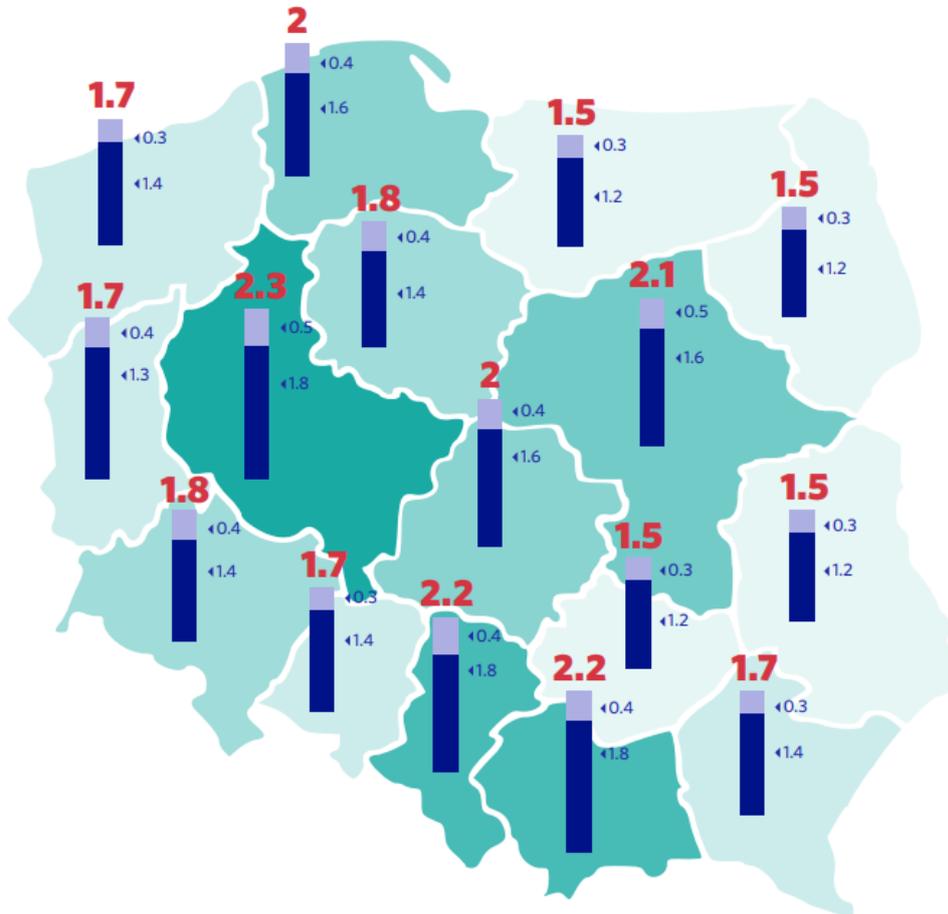
The sector of service companies is the leader in Poland - 50.8%. Behind him is Trade with a result of 26.1%. The third place belongs to Construction - 12.8%. The list is closed by Industry companies with a 10.4% result. The SME sector in Poland is responsible for the production of 67% of GDP and is the workplace of almost 70% of all working people. However, for the Polish market to be able to compete with the best developed countries in Europe, there is a need for an initiative. And here AMT has its place. New technologies and automation of production are crucial for the development of Polish companies.

The biggest numbers of SMEs per head of population are registered in voivodeships with large urban centres - Wielkopolska, Małopolska, Śląsk, Mazowieckie, Łódź, and Pomorskie. The first three voivodeships attract the biggest number of small companies (1.8 firms per 1,000 inhabitants), while Mazowieckie and Wielkopolska have the highest number of medium-sized companies (0.5).

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NUMBER OF SME PER 1000 INHABITANTS



Source: Small and medium enterprises in Poland

### 1.1.1. Key to industrial competitiveness – AMT (Advanced Manufacturing Technologies).

The Central Statistical Office in Poland defines AMT as a “computer-controlled or microelectronic-based equipment used for designing, manufacturing and moving products”. With the AMT is inextricably linked the ICT (information and communication technologies). ICT technology includes communication media such as the Internet or wireless networks, as well as information processing

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devices and IT systems. This sector in Poland is developing very dynamically (8% a year). Interestingly, Poland ranked fifth in Europe in terms of the number of registered ICT companies. The Polish market in this sector specializes mainly in software development, games and provision of outsourcing services. A good prognosis is that half of Start-ups in Poland operate in the ICT sector.

### 1.1.2. Is Poland ready for Industry 4.0?

This term appears more and more often in the media, it is talked about at scientific conferences and new publications appear which predict its impact on the economy, but what exactly is Industry 4.0, and does it affect the development of the Polish economy? To answer this question, we need to explain what is the term Industry 4.0. The term Industry 4.0 was named the fourth industrial revolution. It assumes system integration and networking. Poland is preparing to implement these technologies on a larger scale. This does not mean, of course, that Industry 4.0 does not exist in Poland. There are many recognized companies that have already successfully implemented this technology, for example - ASTOR.

## 1.2. Target group

The target group of this project are mainly companies from the SME sector that use new technologies in the food, wood, metal, electronics and electrical sectors. In addition, VET suppliers, chambers of industry and IT companies. Also all connected and interested in new technologies.

# 2. VR/simulations

## 2.1. Food Industry

The food sector in Poland is slowly introducing VR technology and simulation to increase its competitiveness. The most common examples of using this technology is to create a 3D simulation of your premises (restaurant, bar) allowing potential customers to familiarize with the interior design.

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An example of such a place is Browar Lubicz, which allows a virtual walk around your premises. You can familiarize yourself with all available rooms.

Another VR application in this sector is the use of drones by farmers. Thanks to VR glasses and drones they can check their fields in real time.

## 2.2. Wood Industry

The wood industry in Poland is still struggling with Industry 4.0, trying to implement it. However, software and applications have been created, which Poles are successfully using. iStaging and Intiaro applications are really popular. Thanks to them you can check in a virtual reality how a piece of furniture in your home would look like.

This gives a lot of opportunities for customers of furniture stores. They can at home, using the application, check which furniture will match their room / flat. Thanks to the introduction of such an innovation, furniture companies will save time, which they would have to devote to, for example, accepting returns.

## 2.3. Metal Industry

The VR in Polish Metal Industry technology is primarily designed to train future and current employees through training. Thanks to this technology, employees can learn how to replace a component or repair a specific part without physically disassembling the machine. This reduces the risk in the event of an error. This technology is also used to monitor production lines and check its various configurations. Another application of this technology in this industry is the design and creation of product models. This allows you to create a virtual version of the product before it is released to the market. For example, Philips employees had OSHA training using VR technology.

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## 2.4. Electronic and electrical Industry

Electronic and electrical Industry has adopted VR technology very effectively. Most often Polish companies reached for VR and simulations in the production of various types of games. An example is the Polish studio "Hyperbook Studio" and their game "REGENESIS Arcade Deluxe", which won the Viveport Developer Awards. This sector in Poland is growing at an amazing pace. Another example is VR One, which also creates games in virtual reality, and also works with brands such as Cadillac or Pepsi. Examples could be exchanged very much.

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## 3. Management

In Poland, a clear discussion regarding the use of big data in relation to broadly understood management (regardless of the sector) can be observed. Quoting from the source (report Polityka Insight, 2016): “the importance of SMEs for the Polish economy and indicate that this sector has great development potential. Moreover, they admitted that there is still space for activities for many new SMEs before the economy reaches a saturation of these types of companies. The SMEs sector can be characterised as follows:

- The Polish SME sector is smaller than in other EU countries.
- Industrial and trading type of activities dominate among the SMEs.
- SMEs use bank loans three times more than large enterprises.
- SMEs are growing on average at the same rate as large companies.
- The biggest barrier to the growth of SMEs is the high tax burden and bureaucracy.
- The development of SMEs is based mainly on increasing productivity.
- SMEs are investing more in people than machines. The share of SMEs in the total value of business investment is gradually decreasing, and the share of people working in the SME sector is growing steadily. Importantly, this group of companies provide in wages one-third more income than large companies.
- Difficult access to finance for SMEs inhibits innovation. According to entrepreneurs, the difficulty of obtaining funds is the biggest barrier to the development of innovation.
- Difficulty in finding skilled workers is growing in accordance with the size of the company. The lack of adequately trained personnel in the industrial and building sector is quite visible. The problem of gaps in education also applies to directors and owners of SMEs who often do not have management skills and basic knowledge of finance and accounting. Despite this, Polish companies least often (22 percent of entrepreneurs) throughout the EU send their employees to vocational training.
- The biggest barrier to growth is the small trap scale. This phenomenon is low growth in the scale of micro-enterprises, employing fewer than ten people. What's more, it turns out that

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these companies are developing more slowly than the competition, even if they have become small businesses, and will be included in the SME sector. This phenomenon results from a different development model of micro enterprises, which quite often are focused on activities only on a local scale, with high non-willingness to take business risks and deficiencies in management skills [1]. With easier and cheaper access to servers and data centres, delivered through cloud computing (CC) vendors, SMEs now face fewer constraints on upfront investment, the challenges present themselves as organisational and strategic by nature. Data is collected and analysed to provide new information and knowledge for useful business. Similar theoretical assumptions were the basis of ICT systems. Therefore, whether something new or the evolution of technology is concerned, ICT will always evolve.”

In Poland, the management concepts that apply to industrial companies are often Lean Manufacturing or Six Sigma. They are to reduce waste and eliminate unnecessary activities in production processes.

It is recognized that the increase in production will lead to an increase in employment, especially among qualified automation and engineers. However, the trend towards greater automation can result in the employment of low-skilled workers who perform simple, repetitive tasks. At the same time, the growing use of software, communications and analytics will increase the demand for employees with competence in software development and the IT industry.

The transformation of production processes and systems will affect the entire production chain from product design to sales and even after sales. Along the entire chain, production processes will be optimized using integrated IT systems, as a result of which today's production lines will be replaced by fully automated, integrated assembly lines.

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## 4. IoT tools

### 4.1. Food Industry

Polish agriculture is more willing to use IoT solutions. Intelligent sensors help to organize work, irrigate fields or manage breeding. The research company "Beecham Research" has published a report saying that IoT can increase production by 70% by 2050. Considering that there are currently 1.4 million farms in Poland, the market for this technology is very large. Here is also a place for precision farming. By providing information in real time, you will be able to take advantage of more real-time information. In Poland, IoT in agriculture is supported by Ericsson and the PLON Foundation

### 4.2. Wood Industry

In the near future, there will be a kind of communication between furniture and things. It would be based on the fact that the furniture would harmonize with each other. As an example, the e-business portal provides a situation in which, after waking up, your smartphone would send a signal to the coffee machine that would have already prepared you morning coffee. The mirror would show the weather and the wardrobe would choose your clothes for the day. Although the prospect of such a life seems remote, it is, contrary to appearances, closer than it may seem. An innovative sofa with "IoT" technology was already created, by the Italian company Carlo Ratti Associati.

### 4.3. Metal Industry

Innovation in the metallurgical industry is introduced by KUKA. The company provides robotic automation solutions. The company's business in industrial robots suited to their needs and industrial automation systems. In turn, "Grupa LOTOS", cooperates with Microsoft. The purpose of this cooperation will be the implementation of artificial intelligence and advanced data analysis.

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#### 4.4. Electronic and electrical Industry

The Internet of Things will bring a revolution for both consumers and companies operating in this industry. First and foremost, you can find more and more RTV and household appliances that have sensors and intelligent software that can optimize device performance. This will save electricity. The so-called Beacons are popular here. These devices help stores in organizing store place and sales. When the customer enters the store, the customer's behaviour can be "recreated". Specify to which shelves the equipment was approached, which product interested him and devoted the most time to him. Beacons have been tested by Starbucks.

#### 4.5 3D printing is entering polish industry

In 2018, the global market related to 3D printing will reach USD 16.2 billion. The average annual industry growth is estimated at 45%. At the same time, Boeing begins production of its aircraft components in 3D printing technology. Therefore, it is not surprising that this branch of the economy is also developing very dynamically in Poland as well.

The pace of development of the industry in our country is evidenced by the fact that during the tenth time at the end of March (2018), the Metal Processing Trade Fair, Machine Tools and STOM-TOOL Tools took place as well as three-day 3D Printing Days. In previous editions of the event they were one of the accompanying events. At this year's Fair they have become one of their most important - and certainly the most interesting media - elements of the event.

During the 3D Printing Days, 80 industry exhibitors presented themselves, presenting both printer manufacturers and service companies, but also the academic environment, actively operating in the area of technological innovations directly related to 3D printing. Thanks to this, visitors could see the full range of possibilities currently available by this fast-paced manufacturing technology.

Visitors to the Fair could see, among others printed motorcycles, medical prostheses, everyday objects. For example, at the Wolff stand, you could see weighing 260 kg design table - being the world's largest composite print, as well as a life-size model of openwork, red Ferrari lusso. It was printed using hand 3D printers by a group of students from the Warsaw University of Technology.

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Above all, during the Kielce exhibition event, one could see how the 3D printing technology enters a wide bench into the industry, and in the long run also to everyday life.

Main SMEs that are starting to implement this technology in Poland are representatives of the aviation and medical industries.

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