

The opinion of farmers and small and medium-sized enterprises on the importance of ICT in Hajdú-Bihar County, Hungary

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Received 20-12-2019

Accepted 13-01-2020

Available online 28-01-2020

Responsible Editor: M. Herdon

Keywords:

ICT, SME, primary producer

ABSTRACT

The purpose of this study is to gain a better understanding, conceptualization, and measurement about the usage of ICT among SMEs that could enhance and transform their business to be more efficient and resilient. A more specific aim is to explore the state of ICT adoption as well as to examine the drivers and barriers of digital transformation through the lens of SMEs. In the primary (quantitative) phase of our research, we conducted a questionnaire survey among micro-enterprises and primary producers on the use of ICT in Hajdú-Bihar County, where 237 people answered the questionnaire. In all cases, the respondent was listed as a primary producer or in a joint primary producer certificate.

We were investigated which tools are using in communication with suppliers, customers and government organisations, which type of cloud services are used and the safe storage by Internet Service Providers. We get about the same results in the case of the suppliers, customers. In the case of the governmental institutions, Internet usage was bigger, because of a significant number of them require national or EU grants, which can be submitted electronically. The secure data storage is the safest possible for the farmers.

1. Introduction

In Hungary, the concept of a farmer's certificate is provided by the Governmental Decree 436/2015. (XII. 28.). At the end of 2017, there were 1 million 720 thousand registered enterprises in Hungary, which consist of 256.758 primary producers. The number shows that we are talking about a non-negligible economic form. Its peculiarity is we can talk about one or more person's economies. We know many benefits of Information and Communication Technologies (ICT), including financial efficiency and sustainability (Gouvea et al., 2018). At the same time, Information and Communication Technologies (ICT) have become the engine of economic growth today (Fleischer, 2003). It is also important to note that due to the continuous acceleration of technological development, not only new markets can be opened, but also competitors may appear (Heteyi, 2001).

The food sector is increasingly becoming a closely interconnected system with a whole network of complex relationships. Consequently, supply chains are highly complex systems and they are built on a lot of partnerships and forms of cooperation. The length and complexity of the chains have a significant effect on the quality of information flow among chain members and the number of inventory levels. Information and Communication Technologies (ICTs) play an increasingly important role in supply chain management. The use of ICT is unavoidable in business relationships and analyses on the scientific level can only determine their effect on business activities. The present paper aims to overview the level of ICT infrastructure of the Hungarian SME sector and the primary producer sector at a regional level. At this stage of our investigation, we rely on primary data from Hajdú-Bihar county. We used data for 2018 and 2019, on the other hand, our investigation we rely on secondary data (HCSO - Hungarian Central Statistical Office - and Eurostat) in case of the cloud services. We used data for 2015 and 2016 as these are the latest data available.

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Small and medium-sized enterprises (SMEs) are the engines of the European and Hungarian economies (Billing, 2017). The adoption of the European Charter also demonstrates this for Small Enterprises in 2000 (European Commission, 2004). Their specificity is greater flexibility, better innovation capacity, lower fixed costs, smaller market power, and less capital characterize them (Motwani et al., 1998). There are a strong presence of SMEs in Europe and their contribution to employment and growth. According to the Annual Report on SMEs produced by DG Enterprise and Industry in 2014, SMEs account for 99 percent of all businesses, provide 67 percent of all employment, and almost 60 percent of the value-added in the EU (Billing, 2017).

These enterprises have intuitive and unstructured decision-making style (Gilmore et al., 2001). One of the main objectives of SMEs, like any business, is to enhance their competitiveness. If an enterprise wants to achieve long-term competitiveness, it must be cooperative in order to obtain knowledge and technological devices (Nyíri & Szakály, 2010). In 2014, 99.8 percent of Hungarian enterprises were SMEs, which employed 69.8 percent of the employees (Nemzetgazdasági Minisztérium, 2016). According to Holicza (2016), the significant problems the SMEs are faced with are the followings:

- education does not prepare for starting a business,
- insufficient financing,
- if no success is achieved, losses may be significant, complicated administration procedures.

It is to be noted that the Master course of Business development has been launched in 2009 at the Faculty of Economics and Business of University of Debrecen and one of its main purposes is to reduce these failures as mentioned above. To reduce administrative burdens „The Small and Medium Enterprises Support Strategy 2014–2020” supports the „Think small first” principle (EC Vállalkozáspolitikai és Ipari Főigazgatóság, 2016). The lack of further training and IT knowledge are among the problems of the SMEs (Chikán et al., 2014).

The use of ICT remains a key challenge for most companies. The major part of the enterprises lacks the appropriate knowledge about the opportunities of ICTs. It is a quite complex system and one of its crucial points is the quality of the Internet access (availability, speed, and bandwidth).

Meanwhile, the European Commission cites that SME is among the catalyst that spurs economic growth, innovation and social integration in the EU (European Commission, 2019). Hungary is among the member of the EU that receive a positive impact on their economy as EU policy helps make the industry and business more competitive since joined in on May 1st 2004.

Towilson (1993) said Hungary is one of the fastest moving central European countries in the shift towards the market economy. Their SMEs sector was dominated by micro firms and makes an important contribution to the domestic labour market when created an additional 25.000 jobs from 2002 to 2008 (Azam, 2014).

In the past few years, the growth in ICT usage has increased tremendously across industries around the world. Various studies (Moghavvemi et al., 2011) found that SMEs have a high potential to develop their businesses by taking proper advantage of Information and communications technology (ICT). ICT has an enormous role in enhancing the growth of SMEs not only through an increase in efficiency and productivity but also in expanding their market reach.

According to Azam (2014), the previous study revealed that ICT would enhance their performance. However, the usage of ICT in helping to facilitate one or more strategic choice is debatable. Harindranath et al., 2008 have expressed the opposing views to the value of IT in achieving superior business performance. Thus, the adoption is widely seen as critical for the competitiveness of SMEs in the emerging global market.

2. Materials methods

There is no doubt about the relevance of this topic, as solutions enabling traceability in supply chains are becoming more widespread today. This is especially true for the food industry. A good example of this is the “From the Ground to the Table” directive, which aims to track the lifecycle of

the product purchased fully. Among the primary producers and micro-enterprises on this topic, focusing on ICT.

The purpose of this study is to gain a better understanding, conceptualization, and measurement about the usage of ICT among SMEs that could enhance and transform their business to be more efficient and resilient. A more specific aim is to explore the state of ICT adoption as well as to examine the drivers and barriers of digital transformation through the lens of SMEs.

Two main objectives had been identified in this study. The objectives are:

- To identify how the SMEs evaluate the ICT tools that enable SMEs to grow their business and enhance their organizational performance.
- To examine the factors that contribute to the adoption of ICT at regional level (Northern Great Plain region)

In the primary (quantitative) phase of our research, we conducted a questionnaire survey among micro-enterprises and primary producers on the use of ICT in Hajdú-Bihar County. Data collection from the other two counties in the region (Jász-Nagykun-Szolnok and Szabolcs-Szatmár-Bereg) is ongoing. In our questionnaire, closed-ended questions were chosen in the hope of getting an accurate answer.

When designing the questionnaire, we have considered the following:

- Exact defining questions (subjects of research, hypotheses).
- Choose how to ask questions (in groups or individually).
- Choosing the right structure
- Formulation of questions (closed or open)
- Questionnaire format (striving for a short, clear questionnaire)
- Small sample testing (small group pre-testing, filtering out possible misunderstandings)

The data of the questionnaire published in this article, which collected in the fourth quarter of 2018 and in the first quarter of 2019 with the help of the Farmers' Network of the Hungarian Chamber of Agriculture.

The questionnaire was filled by SMEs and primary producers from the listed 3 counties, which contain 3 question groups with 21 questions. The question groups focused on the main objective of the study.

The sampling was random, and the farmers who came to the extension with problems answered their current questions. 237 people answered the questionnaire. In all cases, the respondent was listed as a primary producer or in a joint primary producer certificate. Answers came from all 10 districts of the county. Taking into account the economic activity, data were provided by producers, processors, and persons carrying out both activities.

The main objective of the article is how the surveyed primary producers evaluate the importance of internet interfaces, mobile phones, wired phones in corporate communication (suppliers, customers-clients, government institutions). Respondents scored on a 5-point Likert scale.

3. Results

3.1. The importance of tools in communicating with suppliers

Figure 1, shows the results of the communication with suppliers, the wired phone is the worst (value 1 on Likert scale: 39%); the most important thing is to communicate with the mobile phone (value 5 on Likert scale: 70%), but the internet also plays an important role (value 5 on Likert scale: 45%). It can be understood because most of the chain operators mainly use mobile devices for communication instead of the wired phone. The other possible way is Internet services (which are working via the Internet – e-mail, information system, etc.) because in more cases the processors requested the usage of his system on the Internet.



Figure 1. The importance of tools in communicating with suppliers (Own edition 2019)

3.2. The importance of tools in communicating with customers

The next step was to investigate the importance of tools in communicating with customers, where results are illustrated in Figure 2. The communication with customers, the wired phone is the worst (value 1 on Likert scale: 36%); the most important thing is to communicate with the mobile phone (value 5 on Likert scale: 70%), but the internet also plays an important role (value 5 on Likert scale: 49%). So we can conclude, the same tendency can be seen in customer relations as in the case of the suppliers. The percentage values are about the same as was in the case of the suppliers.



Figure 2. The importance of tools in communicating with customers and clients (Own edition 2019)

3.3. The importance of tools in communicating with governmental institutions

The next step was to determine the communicating with the governmental institutions. The results shown in Figure 3. The communication with suppliers, the wired phone is the worst (value 1 on Likert scale: 32%); the most important thing is to communicate with the mobile phone (value 5 on Likert scale: 61%), but the internet also plays an important role (value 5 on Likert scale: 62%), here is the highest value. Here are about the same percentage use of mobile phones and the Internet. The usage of a wired phone is about the same as was in Figures 1 and 2.

Not all primary producers, but a significant number of them require national or EU grants, which can be submitted electronically. Therefore, the usage of the Internet is probably higher here than in the other case of communication of customers or suppliers, because not only took the request on the Internet but also one of the methods of changing the data in various registers and the most up-to-date information can be found here.

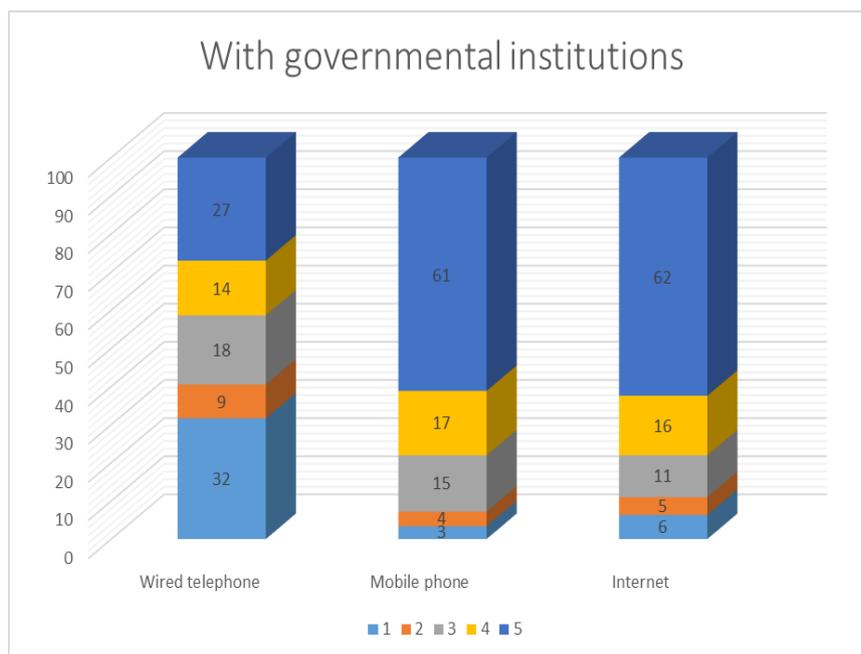


Figure 3. The importance of tools in communicating with governmental institutions (Own edition 2019)

3.4. Use of cloud services

The essence of the cloud services is that no considerable ICT knowledge is required for the enterprises and primary producers, also they do not have to employ ICT experts. Thus, the labour-related costs become available and the resulting savings can be used to purchase services, often for a smaller budget. Cloud services have several advantages, it will not only improve competitiveness but simultaneously enhance the efficiency and by correct use it may also increase data protection.

Data traffic from cloud services is steadily growing because economic competition requires the enterprises to react faster to the environmental changes. There are three kinds of cloud service models (Harding, 2011):

- IaaS, Infrastructure as a Service,
- PaaS, Platform as a Service,
- SaaS, Software as a Service.

IaaS (Cloud Infrastructure as a Service): This model is the basis of cloud services. Enterprises access memory space and installed applications in a virtual environment, however, maintenance has to be done by the users.

Paas (Cloud Platform as a Service): The service provider installs the required applications written in the selected programming language. Maintenance is also the responsibility of users.

SaaS (Cloud Software as a Service): Applications of the service provider run in the cloud infrastructure and can be accessed via web browsers. They do not require large-scale investment and can be used immediately. The usage level of different cloud services by the Hungarian small and medium-sized enterprises presented is in Figure 4.

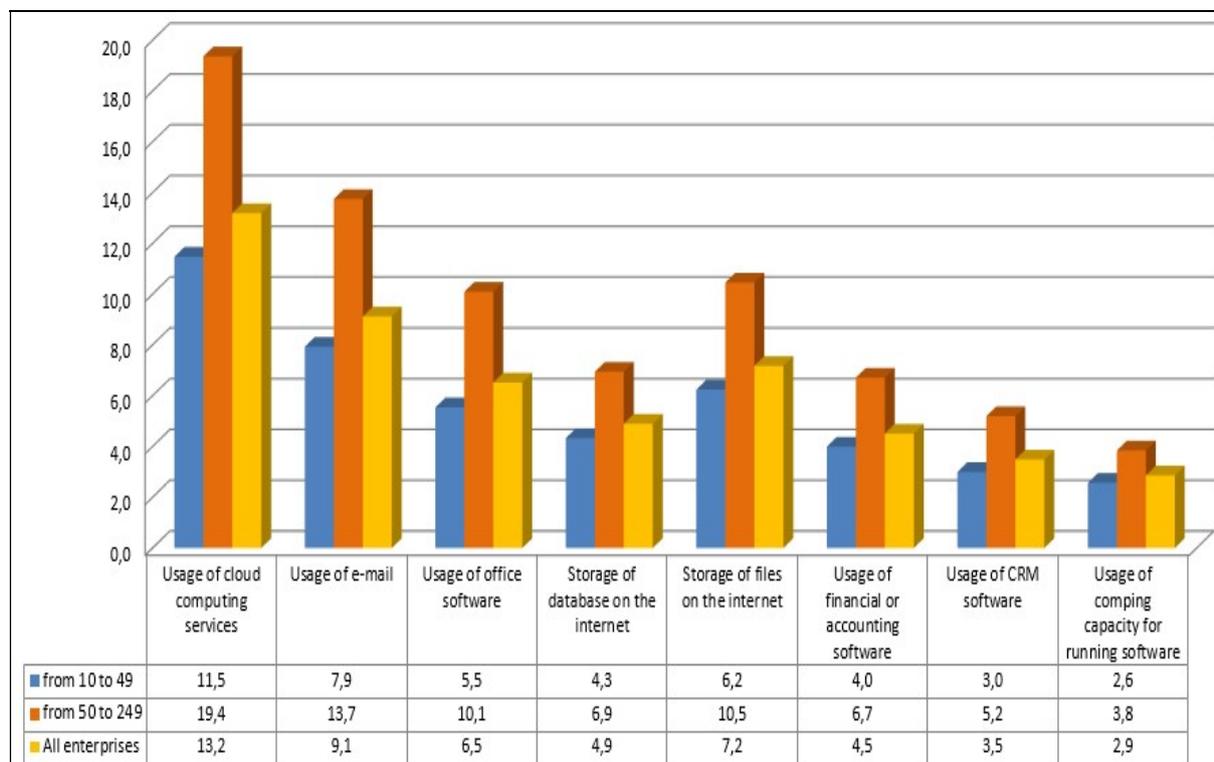


Figure 4. Usage of cloud services by size class (in the percentage of enterprises using the internet). (Own edition based on Eurostat data 2016)

Figure 4 shows a clear difference in the usage level of cloud services between small enterprises and medium enterprises and considers everything the latter enterprise category (with 50-249 persons employed) places more emphasis on the use of cloud services.

3.5. The importance of safe storage by Internet service providers

In the survey (Figure 5), we also asked farmers for their opinion on the importance of secure storage of data with Internet Service Providers (1-not important, 5-very important). The percentage of values shows the distribution of secure storage data. Only 9% said it is not too important. Maybe they never lost important data. Nearly the half part (44%) said it is important. maybe they understand how important these data, what they stored in the cloud. In addition, 20%-20% on the Likert scale was chosen the 4 and 3, which strengthen the importance of secure data storage at the Internet Service Provider.

Based on the results, it can be concluded that, regardless of the fact that few people use cloud-based services, the reliability of cloud providers is particularly important. The average age of the farmers who rated question 5 was 47 years, while the number of respondents who ranked 1 was 56 years. They have not informatics knowledge and most of them understand, what the cloud is and store data in the cloud. Maybe some years later the younger farmers will understand the importance of the secure data on the cloud.

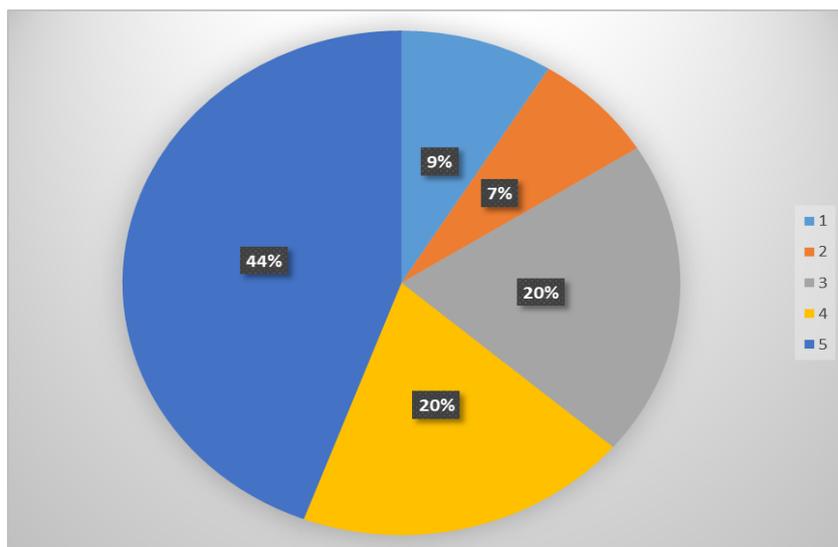


Figure 5. The importance of secure data storage by Internet Service Providers (Own edition 2019)

Conclusion

There is digital development when enterprises fully make use of the opportunities and advantages offered by digital technologies. In terms of several ICT usage indicators, the Hungarian SME sector and the primary producer sector are far lagging behind the EU average.

Appropriate usage levels of these basic IT devices and services enable this gap to be overcome and it is essential. By appropriate use of opportunities offered by ICT tools to maintain or boost the competitiveness can be easier achieved.

The ICT usage level of enterprises highly depends on the degree of IT development. We hope that the online sales proportion of enterprises will grow and they will increasingly focus on the opportunities by methods as targeted consumer access with marketing campaigns.

There are advantages in terms of procurement as well, for example, comparing products, purchase without having to queue or travel and with a short period of time for delivery at the address indicated. In light of the above, we conclude that the opportunities existing in the neglected sectors and regions which lagged behind in terms of IT are under-utilized, however, all enterprises try to adapt to the phenomenon of data boom while new market activity types and roles are developed.

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