

The Application of PEST Analysis to the Creation of the Profile of an IT Product Designed to Activate and Support Senior Citizens in Poland

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Abstract: The purpose of the paper is to create a profile of an IT product, using IT tools to collect and to analyse information and enable communication between elderly people to support and activate them. PEST Analysis method was used to determine different factors of influence on the domain of elderly people activation and support. Having evaluated the factors and defined the product characteristics, the Authors focused on defining the profile of the IT product by referring the aforementioned characteristics to the structure of the product in the marketing understanding thereof.

1 INTRODUCTION

Demographical analyses in Poland indicate that our society is aging at a very fast speed. The percentage of senior citizens in the Polish population is going to increase in the years to come (GUS, 2014, GUS, 2015, AGE Platform Europe, 2013, Strzelecki, Kowalczyk, 2014). This trend is accompanied by the globalization of the economy and by the development of the information technologies (IT). The two aforementioned processes are highly connected and dependant on each other. It is impossible to imagine social and economic relations without modern IT tools. On one hand, they integrate all the entities operating on the market but on the other, they constitute a reason for the ever-deepening and permanent social divide and exclusion. Those who are particularly vulnerable in this respect are elderly people since they lacked the ability to acquire digital competencies throughout their professional careers (Ferrari, 2012, Frąckiewicz, 2009, Kucharska, 2013). This means the necessity to undertake measures designed to activate and support this social group, for example, by developing IT products suitable for their needs (MPiPS, 2014).

The **purpose** of this paper is to create the profile of such a product. The test method which

was used was PEST Analysis. PEST Analysis is a tool designed to analyse macro environmental factors. The factors analysed in the basic form of the method in question are classified into four different categories which cover Political, Economic, Technological and Social factors. The application of the said method allowed to identify and validate the macro environmental factors which influenced the analysed product (Duncan, 1972) (Ward and Rivani, 2005). For the purpose of this article the Authors adopt the assumption that the IT product in question is a platform which uses IT tools designed both to collect and to analyse information as well as to enable the communication between the users.

The structure of the article is following: section 2 – methodology, section 3 – technological factors of the PEST analysis, section 4 - IT product profile and in the last section – conclusions and recommendations.

2 METHODOLOGY – THE ESSENCE OF PEST METHOD

PEST Analysis is also referred to as PESTLE Analysis, PESTEL Analysis, PESTLIED Analysis, STEEPLE Analysis, SLEPT Analysis and LONGPESTLE Analysis (Mindtools, 2015)

(Makos, 2015) (Clulow, 2005) (Voros, 2001) (Narayanan and Fahey, 1994), depending on what factors are taken into consideration. The PEST Analysis is applied to specify political, social, economic and technical conditions in Poland in the context of their influence on the profile of the IT product dedicated to elderly people. In this paper the Authors characterize in details only the technological conditions because of this conference topics. The purpose of the analysis is to provide conclusions on the general characteristics of the IT product designed to activate and support this social group but not to specify detailed functional parameters of the product. What will be indicated in this paper are its basic characteristics resulting from a thorough understanding of the socio-political, economic and technological context. The aforementioned characteristics shall cover such factors as: the living standards of elderly people in Poland, their digital competencies and the access to the Internet in their households.

The Authors regard PEST Analysis as the first stage of research on defining the detailed profile of the IT product dedicated to elderly people in Poland.

The examination procedure involved the following steps:

- Specifying through brainstorming the most significant factors to be taken into account in PEST Analysis.
- Verification of the available research reports, including the statistical ones, and of the available resources in order to carry out a detailed analysis of the factors and in order to specify their impact and likelihood.
- Specifying the influence of the factors on the IT product profile by defining the characteristics thereof.

The summary of the PEST Analysis results is presented in Table 1.

Table 1: PEST Analysis Results

Factor	Impact (from -2 to 2)	Likelihood (from 0 to 1)	Influence (impact x likelihood)	Product characteristics
Political factors				
European and domestic policies facilitating activation of senior citizens	+2	0,5	1	Free
Domestic legal framework	-1	1	-1	Compliant with the legal framework
Prolonging working life	1,8	0,6	1,08	Oriented at offering services and entering into transactions
Economic factors				
Structure of income/expenses	-1	0,7	-0,7	Free
Level of wealth	1,2	0,5	0,6	Free
Social factors				
Age-related biological, mental, social barriers in IT perception	-1,6	0,8	-1,28	Adjusted to elderly people's perception Help desk support provided
Social mobility	1,4	0,3	0,42	Community oriented (relations and communication) Mobile Integrated with popular messengers
Technological factors				
Informatisation level in Poland	2	1	2	Available online
Level of acceptance of technology by citizens	-1,8	0,3	-0,54	Help desk support provided
Condition of telecommunication market in Poland	0,6	0,9	0,54	Using popular communication channels (text messages, e-mail)
Software provision method	1,5	0,7	1,05	Available in SaaS model
Easiness of software developing	0,4	0,9	0,36	Using web standards Open to integration
Technological progress	0,6	0,7	0,42	Easily expandable

The Authors, on the basis of in-depth resource studies, research and statistical reports as well as their own experience evaluated the factors which had been selected at the first stage of PEST Analysis by specifying their impact (on a scale from -2 to 2, where -2 was means factors with a very negative impact, +2 means factors with a very positive impact and 0 means factors of a neutral character) and likelihood (on a scale from 0 to 1, where 0 means unlikely phenomena and 1 means phenomena certain to happen). The influence was evaluated by multiplying one of the aforementioned factors by another.

Furthermore, the Authors determined in discussion the characteristics of the IT product dedicated to elderly people. The said characteristics constitute a response to a given factor and if the factor is negative, they constitute an antidote which is capable of eliminating its influence. At this stage, it is also possible to notice that according to the Authors, what influences the IT product dedicated to elderly people in the strongest, positive way is a high level of informatisation in Poland and what has the most negative influence are the biological, psychological and social barriers in the IT perception related to aging

Having evaluated the factors and defined the product characteristics, the Authors focused on defining the profile of the IT product by referring the aforementioned characteristics to the structure of the product in the marketing understanding thereof. The results of such an analysis are presented in the section 4.

3 TECHNOLOGICAL FACTORS

Activating elderly people in Poland is closely related to their involvement in the functioning within the framework of the information society, which is dependent on the IT development. Therefore, what constitutes a very important element of PEST Analysis in this case is to determine technological factors which can influence the examined field.

The first factor is a **general level of informatisation in Poland**, which determines the ability to use technologies suitable to support elderly people. Three quarters of households in Poland had the access to the Internet in 2014 and in 77.1% of households there was at least one computer. The percentage of households with the access to the Internet and to a computer varied

depending on both the type of a household and the class and degree of urbanisation of the place of residence and the region of Poland. These were the households with children which much more frequently had the access to the Internet and computer (the difference between them and the households without children but with the Internet access amounted to 30%). What gained the market was the fixed broadband (59.7%) and wireless broadband (24.4%) (GUS, 2015, Bucki, 2014, UKE, 2014). Moreover, both at the state level and self-governmental level, public services, such as administration, health, public finances, social security etc., become gradually more computerised. It has been made possible to settle official matters (entirely or partially) via the Internet (eDeclarations, Electronic Services Platform ZUS, the Electronic Public Administration Services Platform - ePUAP, Integrated Patient's Guide – ZIP etc.). What is also available is the electronic stationary equipment designed for the applicant's self-service. The web pages of the government, self-governments and other institutions get significantly enhanced so that they are capable of playing a role of information and communication centres for citizens. Implementing new technological solutions is entirely dependent on the suitable infrastructure. The data presented above clearly indicate that the Polish households as well as the state and self-governmental structures are ready to make use of common technological solutions.

What is related to the informatisation is another important factor, namely the **level of acceptance of technology by the citizens**, especially by elderly people. 39.4% of people at the age between 55 and 64 and 20% of people at the age between 65 and 74 declare that they regularly use a computer (in both groups growth by 12% approximately as compared to the year 2010). Furthermore, among retired people and other professionally inactive people (but not among the unemployed) this rate amounts to 32.4% (in this group among other professional activity groups the highest growth was observed between the year 2010 and 2014 - growth by 11.2%). Nearly 40% of people at the age between 55 and 64 use the Internet regularly (the highest growth by 14.1% as compared to the year 2010) and nearly 20% of people at the age between 65 and 74 declare such a use. It is also worthwhile to note that in the group of retired people and other professionally inactive people 30% use the Internet regularly. In the aforementioned age groups people most frequently

use the technology in question at home (GUS, 2015). The foregoing data indicates that the Internet and computer are more and more accepted and used in practice by the analysed population between 55 and 74 years of age. People belonging to this group already have skills necessary to use the operating system, the Internet browser or the e-mail. However, the fact that the majority of elderly people still lack suitable digital competencies has a substantial and negative impact on the effectiveness of implementations of IT solutions which support everyday consumption and administrative matters.

As far as more advanced technologies are concerned, cloud computing (e.g. virtual disks) still remains not a very popular solution. The said technology is used by 1.8% of people between 55 and 64 years of age and 0.9% of people between 65 and 74 years of age (it is used by 8.7% of people as compared to the test sample). Smartphones are used by 7% of people between 55 and 64 years of age and 3% of people between 65 and 74 years of age (generally 25.5% of users as compared to the entire group of respondents). The second popular advanced technology was the Smart TV, which is a television set with integrated Internet capabilities and advanced functions –14% of the total number of respondents owned a Smart TV in 2014 (GUS, 2015). These observations can determine the selection of available communication media which will respond to the expectations of elderly people.

Another factor which is worthwhile to notice is the **condition of the telecommunication market in Poland**. Saturation with telecommunication services on the individual customer market is high. Only 3% of people who are 15 years old or more use no such a service. These are the mobile phones that are most often used –88% of respondents have a mobile phone (in the group of people who are older than 60 this rate amounts to 58% and among pensioners and retirement pensioners it is 60%). A fixed telephone line is connected in 23% of households. Such telephones are much more frequently used by people who are 60 years old or more (48%) and by pensioners and retirement pensioners (46%) (UKE, 2014). What should be emphasised here is the fact that there exists a gradual trend among elderly people towards switching from fixed lines to mobile telephony. This entails the cost reduction and other practical implications (e.g. instant communication or the ability to call for help). Furthermore, there appeared a range of mobile devices which respond

to the expectations of elderly people. They are equipped with suitable, clear displays, large fronts and ergonomic buttons. Certainly, what should be taken into account in every case while developing electronic communication with elderly people are the trends which exist on the telecommunication market. A large selection of communication channels and easiness in implementing new solutions result in the fact that this factor does not play a crucial role in the process of implementing technological solutions dedicated to the social group in question.

Technological development is determined by another factor, namely by the **choice of a method of providing software** dedicated to elderly people and to the entities which provide services for this group. What is gaining importance in Poland is the *software as a service* delivery model (SaaS), which is gradually replacing dedicated or boxed software. According to the data provided by PMR, in the year 2013 the value of the Polish market for cloud services increased to 300 million PLN and more than 60% of the market share was seized by the online access to software, which is regarded as the most prospective in the service market. Audytel, which at the end of 2013 conducted a survey among 50 biggest domestic companies, indicates that 20% of the said companies already use the SaaS model and 7% declared the intention to do so (Marszałek, 2014). This model allows the purchasers to use the software in a customized way and to pay for the actual usage, which considerably reduces the costs of purchase and maintenance of the software. From the end-users' point of view, such solutions result in their easier adaptation to a new service if this service uses popular software available in this model (e.g. online shops based on the same software). It is particularly important as far as elderly people are concerned due to the fact that their ability to adapt themselves quickly to new solutions is limited. An informed and right choice of a software provision method constitutes in the majority of implementation cases a crucial factor which proves to be decisive for the successful implementation.

What is connected with the abovementioned issue, is the **easiness of software developing**, which results mostly from the application of the generally accepted standards (e.g. data exchange in XML format) and from the ability to integrate open source applications, dedicated or boxed, with the applications available in the SaaS model. Furthermore, the aforementioned open source software is absolutely free and it has open source

code, what results in the fact that new solutions, which integrate such applications with the most popular productivity apps and Internet services, are created very quickly. The vast majority of new technologies improve the software development process (e.g. due to the application of design patterns or frameworks) but also for this reason the aforementioned easiness in the context of technological support of the activation of elderly people cannot be regarded as a factor which has a significant influence on the implementation process.

What also constitutes an important factor is **keeping up with advances in technology** among both the software suppliers and its users. From the suppliers' point of view, this results from the necessity to be competitive and to optimize their activities through a higher level of efficiency and functionality/safety. Users also expect novelties, interface improvements aiming at better, more ergonomic solutions, faster applications and a higher level of safety. This mostly applies to people with higher digital competencies, including some of the elderly people, who are aware computer and Internet users – therefore, this factor is not decisive for the activation of elderly people with the application of technological support.

The technological factors in the field of activating elderly people significantly influence both the shape of information and communication processes dedicated to this social group and the selection of suitable technologies according to the level of digital competencies of senior citizens. In other words, these factors determine a range of characteristics of the IT product which is addressed to this target group.

4 IT PRODUCT PROFILE

According to the marketing definition, every object of the market exchange or anything offered to a market is deemed to constitute a product. Therefore, the notion of product shall not be interpreted as referring exclusively to material objects. Consequently, a product can be regarded as a bundle of benefits offered to the purchaser in order to satisfy their needs (Pindakiewicz, 1997). A lot of contemporary products are a mixture of material and non-material elements (Altkorn, 2000). This is particularly true of IT products. In this sense, the IT product is composed of: a specified software code compilation, the license to use the software and a set of IT services connected with its implementation and maintenance.

From the marketing perspective on the IT product, it is possible to repeat after T. Levitta his remarks on a specified structure of a product. According to him, this structure is composed of four layers similar to the rings which can be observed in a tree cross section (Altkorn, 2000):

- generic product
- expected product
- augmented product
- potential product.

Below you will find the characteristics of the particular structural elements of the IT product dedicated to elderly people. Together they will form the profile of such a product. The description was created on the basis of the conducted PEST Analysis, presented in this paper.

Generic product is a notion which specifies what the purchaser really acquires. In the case of the IT product, it is a particular compilation of its code which is made available to the user in different forms, i.e. in a form of a desktop application or in a form of a service available via an Internet browser. While bearing in mind the results of PEST Analysis as presented above, what seems reasonable in the case of the IT product dedicated to elderly people is to offer the product for the lowest possible price, if not to resign from charging senior citizens at all. Such an approach is recommendable due to the fact that senior citizens constitute a relatively underprivileged group whose expenses in most cases satisfy only their basic needs. On the other hand, the existing possibilities to obtain financing for the development of such products from the UE domestic programmes also facilitate such an approach. Nevertheless, what should be taken into consideration is the fact that because of the limited number of financing sources and because of a high level of competition among the beneficiaries, it might be difficult to obtain financial support. In order to reduce the costs even more, the IT product for senior citizens can be offered as a service in the SaaS model. This will eliminate the necessity to install software and respond to the low level of digital competences among senior citizens as confirmed by PEST Analysis. At the same time the fact that the Internet and computer equipment are common in the Polish households also advocates such a solution. It is essential for the product to be consistent with the local legal regulations and to take into account the rules on the settlement of transactions and the tax treatment of transactions. Furthermore, it should be

oriented toward service offerings and entering into transactions in a way which will enable senior citizens to offer their own services and to undertake employment in the form of a part-time job with flexible working hours.

Furthermore, what should be taken into consideration while making the decision to provide senior citizens with the IT product via the Internet is the immensity of offers which can be encountered. From the consumers' perspective, this can result in the complexity of the decision situation and in the difficulty in selecting a suitable service provider. What can constitute an additional barrier for elderly people is the complexity of a web page where the offer is presented. Furthermore, such pages are not prepared to be used by elderly people, who for example, might suffer from sight problems. Therefore, it seems justified to equip the IT product dedicated to elderly people with a plain interface, tailored to the needs of elderly people. The web page designed for senior citizens should be as simple as possible and it should give the possibility to enlarge the text or to use a voice-guided navigation. This will allow to eliminate the factor which has the highest negative influence, i.e. the age-related barriers in IT perception. Furthermore, a web page dedicated to senior citizens should be available mostly via a computer because, as the presented research shows, senior citizens relatively seldom use mobile devices such as smartphones.

What constitutes another element of the product structure is the **expected product**, understood as any additional, useful feature related to the generic product. In the case of the IT product available via a browser, there exists no implementation service which could constitute an expected product but it seems justified to provide senior citizens with the help-desk which will perform a function of a direct, telephone support for them. Thus, the help-desk, which will provide both substantive and technological help, will play a role of an expected product. It will allow to overcome the senior citizens' reluctance to new solutions and to ensure a proper level of trust in the product. The help-desk will provide senior citizens with assistance and introductory training on the use of the IT product and it will perform a function of an intermediary in transactions between senior citizens and service providers. This will allow to ensure a proper credibility of service providers. Ultimately, the role of the help-desk can be broadened to include the support provided to senior citizens in the negotiations with the service

providers and in the financial settlements. This will allow to eliminate the lack of trust among elderly people as well as the lack of skills necessary to benefit from online transactions. This is consistent with the marketing concept according to which the content of the expected product is not constant but it is highly dependent on the competitiveness of the market which offers a given product.

It is important to observe here that the elements which over time are perceived by the purchasers as elements of the expected product are initially elements of the augmented product. **The augmented product** is understood as any additional element of the product designed to facilitate the consumption of a given item. While analysing this structural aspect of the IT product dedicated to elderly people, it should be noted that many of them need a training or support before they order a service via the Internet for the first time so that they could overcome their fears related to both the use of modern IT solutions and the lack of trust in the service provider or the lack of knowledge. This problem can be eliminated by the help-desk; however, what can also be offered to elderly people as a part of augmented product are trainings which will be more product-detail orientated or such trainings whose main purpose will be to increase the general IT competencies level among senior citizens.

The term **potential product**, on the other hand, means everything which can make a product more attractive and which can attract the recipient's attention in the future. In the field of IT, what can be regarded as a potential product are its **development visions** presented in the form of the announcements of the new versions. The potential product is composed of the elements of inventiveness, imitation and adaptation and its shape depends on both the users themselves, who suggest functional improvements and on the producers, who are mostly in charge of the product adjustment to the fast changing economic and legal realities. What can constitute an example of a potential product in the case of the IT product dedicated to elderly people is its extension in the form of the smartphone or smart TV applications which will appear when their current users enter the old age.

5 CONCLUSIONS AND RECOMMENDATIONS

This paper specifies the macro environmental factors which should be taken into consideration while creating a profile of the IT product dedicated to senior citizens.

On the basis of PEST Analysis, the Authors observed that what has the strongest positive influence on such a product is a high level of informatisation in Poland. Due to the existence of a developed infrastructure and due to the falling costs of its use, elderly people have a better access to modern IT products and to the Internet. Furthermore, it should be pointed out that both the domestic and European policies support initiatives dedicated to the analysed social group by providing the source of financing. Thus, IT companies have a possibility to provide senior citizens with a free access to their products and services. At the same time, the SaaS model is gaining importance as a form of software delivery.

At the same time negative influences of several factors of the analysed environment were observed. While creating the profile of the IT product dedicated to elderly people one should take into consideration biological, psychological, social and legal barriers which constitute an obstacle for the users in question. Therefore, it is important to create suitable IT products which will respond to the needs and perception of elderly people and to undertake measures designed to educate them in this field. This will allow senior citizens to benefit from their intellectual capital, experiences and skills. Furthermore, this will help to eliminate the generation gap as well as the digital exclusion of elderly people.

Further research will concentrate around an issue of a strategic analysis of the environment and they will be designed to elaborate elderly people activation scenarios with the usage of IT tools.

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