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EcoAgriTourism, in the light of its multidisciplinary character, is a wide-open journal which brings together the opinions of specialists from both academic and economic environment, fostering fruitful collaborations.

The journal's structure covers all aspects of the fields approached, the focus being on original and current researches with applications in agriculture, food industry and rural tourism. Collaborators may feel free to undertake biological and technical aspects as well as aspects with social, cultural and environmental impact. Information of general interest is also welcome for the agriecology-food-tourism axis

Prof. Romulus Gruia Ph. D.

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Coronavirus and the New World

We intuit that we are living a historical moment with coronavirus pandemic, when the future changes its direction. Today mankind is at the crossroads, the crisis directing itself towards a bifurcation. Can we take a road towards a new world?

Unsolved disharmonies first led to a major impasse, but with a further saving potential. Practically, the world, as we know it now, is breaking up. Behind it a world at another level begins, i.e. the construction of a *BIOHARMONIST GLOBALIZATION*.

Let's imagine bio-harmonized social kindness (kindness that has rapidly disintegrated itself until the year 2020), let's even see a routine concerning tele- and videoconferences, tele-work and other applicative forms of the digital era (rare until the year 2020), and observe the natural relation between technology and culture (blurring the controversies of literates' culture who marginalize the scientific, technological and philosophical culture) noticing (slower) changes, but already visible, of the modification of men's individual behavior (so damaged until the year 2020).

Bioharmonism generator of another societal behavior connects us with the future at punctures between today and tomorrow: there is in fact created a „*Mind of the Future*”, also sustained by futurologist scientists by hypothesis linked to the *intelligence of the future*.

From here another political behavior too, based on BIOHARMONIST IDEOLOGY. Malicious politics, of separation and hate, does not correspond to the new world, and the disharmonies of „*fake news*” categories and the fact that conspiracy theories are in fact commercial and very little real ones make aware the need of change. More than that, when things become serious, the destructive aspect to be found behind populism and illiberalism becomes evident and unbearable. In essence the POLITICS OF THE BIOHARMONIST WORLD modifies the initial meaning of politics, the one to be *trainer of social responsibilities*, PLUS getting a new legitimacy, a new credibility through elements of equilibrium and ethics. In short, *bioharmonist politics may create trust in the social media and becomes a bases of constructing and RENEWING the new world*.

Director of the publication,
Prof. Romulus GRUIA,
PhD, PhD supervisor

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NUTRITIONAL AND FUNCTIONAL CHARACTERISTICS OF NEW CONCENTRATED BEE PRODUCTS

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Abstract: The skimmed hemp seeds, a by-product of the manufacture of the hemp seeds oil, became more and more interesting because of their composition. *Cannabis sativa* L. and its seeds, has an important functional potential, being a significant source of omega 3 and omega 6, fibers and minerals.

The aim of research was to determine the nutritional and functional characteristics of concentrated bee products (honey, pollen, propolis, royal jelly, bee bread) in addition with partially skimmed hemp seeds. The analysis of the nutritional properties of samples from the new bee products enriched with different levels of hemp seeds (20%, 40%, 50% and 60%) was done to demonstrate their functionality.

Keywords: hemp, honey, dietary fiber, minerals.

1. Introduction

The seeds of *Cannabis sativa* L. has been an important source of nutrition for thousands of years. In the 20th century, its cultivation has been prohibited in many countries, due to the presence of the phytochemical drug component delta-9-tetrahydrocannabinol (THC) (Oomah et al., 2002). Non-drug varieties of *Cannabis sativa* L., commonly referred to as hemp, have not been studied extensively for their nutritional potential, nor has hemp seeds been utilized to any great extent by the food markets.

On an average, hemp seed contains over 30% oil and about 25% protein, with considerable rate of dietary fiber, minerals (Cozea et al. 2016) and vitamins A, B, C and E (Pejcz et al. 2015). Further, the hemp seeds contain two main proteins edestin and albumin. Both of these high-quality storage proteins are easily digested and contain nutritionally significant amounts of all essential amino acids.

In addition, hempseed has exceptionally high levels of the amino acid arginine (Ruban A et al., 2016; Callaway, 2004). In his studies, Wirtschafter (1997) concluded that hemp seeds protein is complete, meaning that all the essential amino acids are present in nutritionally significant amounts.

Hempseed oil is over 80% in polyunsaturated fatty acids (PUFAs), and is an exceptionally rich source of the two essential fatty acids (EFAs) linoleic acid (18:2 omega-6) and alpha-linolenic acid (18:3 omega-3) (Galasso et al. 2016; Callaway, 2004;

The omega-6 to omega-3 ratio (n6/n3) in hempseed oil is normally between 2:1 and 3:1 (Leizer et al. 2000; Callaway, 2004), which is considered to be optimal for human health. Hempseed has been used to treat various disorders for thousands of years in traditional oriental medicine.

Recent clinical tests have identified hempseed oil as a functional food, and feeding studies demonstrate the utility of hemp seeds as an important food resource.

At present, there are few studies that reveal valuable the potential of partially skimmed hemp seeds flour and its use in the food industry. Therefore, the main objective of this study was to demonstrate the beneficial influence of the addition of partially skimmed hemp seeds in food supplements based on bee products.

The combination of the partially skimmed hemp seeds and mixtures of bee products could contribute to the creation of new, nutritive and better balanced functional food products.

2. Materials and methods

Materials

The mixture of honey, pollen, propolis, royal jelly and bee bread was prepared at SC APILIFE RO. The skimmed hemp seeds flour, a by-product obtained during manufacture of the hemp seeds oil, was kindly supplied by SC Hofigal Export Import SA (Bucharest, Romania).

This by-product has been obtained from hemp seeds on a large scale through hulling, grinding

and degreasing at low temperatures, less than 45⁰ C. The degradation of the components of this material may be considered to be low because all steps were performed at low temperature.

Four samples of mixtures of bee products with different proportions of partially skimmed hemp seeds flour were prepared by mixing in the following ratios: 80:20, 60:40, 50:50 and 40:60 (w/w) were obtained. The types of mixtures used in this study are presented in table 1.

Table 1. The types of mixtures used in this study

Category	Mixtures	
	Mixtures of bee products	Partially skimmed hemp seeds
P	100%	0%
P1	80%	20%
P2	60%	40%
P3	50%	50%
P4	40%	60%

Chemical analysis

Moisture content was determined at SR 2213-4:2007. The ash content was determined by incineration at 525 ± 25⁰ C (SR 2213-6:2009). Total fat content was determined by extracting 10 g of sample with petroleum ether at 40-65⁰ C (SR 8613-5/2009), using a semi-automatic Soxhlet Foss Extraction System 2055 (Foss, Sweden).

Total nitrogen (N) and crude protein content (N· 6.25, conversion factor) (SR EN ISO 20483:2014) was determined by the Macro Kjeldahl Method (Kjeltec System, FOSS, Sweden). The carbohydrate content was calculated by difference: 100 - (ash content + protein content + fat content + moisture content). All experiments were performed in triplicate.

Crude fiber content analysis

Crude fibers include cellulose, hemicellulose, and lignin. The crude fiber content of the samples

was determined using a Fibretherm-Gerhardt apparatus.

The method for determination of crude fibers begins with treating the sample with an acid detergent solution (20 g *N*-cetyl-*N,N,N*-trimethylammonium bromide dissolved in 1 L sulfuric acid 0,5 M). In this solution, cellulose and lignin from the analysed material are insoluble, unlike all other components. Using special FibreBags, the dilution and filtration steps are simplified. The most important aspects of this method of analysis of fibers are adherence to strict boiling times and to weighing procedures.

After treatment with the acid detergent solution, the insoluble residue is dried, weighed and then calcinated. The acid detergent fiber (ADF) content represents the insoluble part of the sample that is left after boiling in acid detergent solution from which the ash obtained upon calcination is subtracted:

$$\%ADF = \frac{((\chi - \alpha) - (\delta - \xi)) * 100}{\beta}$$

$$blank\ value\ (\xi) = \gamma - \psi$$

Where:

α = mass of FibreBag (g);

β = sample mass (g);

χ = mass of crucible and dried FibreBag, after digestion (g);

δ = mass of crucible and and ash (g);

ζ = blank value of empty FibreBag (g);

γ = mass of crucible and ash of the empty FibreBag (g);

Ψ = mass of crucible (g).

Mineral content analysis

Mineral content was determined using an atomic absorption spectrophotometer (ContraAA

700; Analytikjena). One gram of sample is calcined at 550 °C in an oven then treated with 5 mL HCl 1:1; after evaporation to dryness, another 5 mL of HCl 1:1 is added then is filled to 100 mL with deionized water.

Analysis was performed using an external standard (Merck, multi element standard solution) and calibration curves for all minerals were obtained using 6 different concentrations.

Statistical analysis

All analyses were performed in triplicate and the mean values with the standard deviations were reported. Microsoft Excel 2003 Program was employed for statistical analysis of the data with the level of significance set at 95%. Analysis of variance (ANOVA) followed by Tukey's test was used to assess statistical differences between samples.

Differences were considered significant for a value of $p < 0.05$.

3. Results and discussions

Influence of Partially skimmed hemp seeds flour incorporation on physico-chemical characteristics of concentrated bee products

Partially skimmed hemp seeds flour should be regarded as an interesting source for enriching bee products and other food products in carbohydrates, particularly crude fibers with known prebiotic properties, useful in the formulation of healthy foods. (M. Dinu et. Al, 2016; S. Medjakovic et al., 2016).

The chemical composition of the samples from the new concentrated bee products enriched with different levels of hemp seeds are shown in Table 2.

The ratios of the samples from the new bee products enriched with different levels of hemp seeds that were incorporated is shown in Table 1.

Table 2. Chemical composition of concentrated bee products enriched with partially skimmed hemp seeds

Composition %	P	P1	P2	P3	P4
Ash	1.16 ± 0.03	2,26 ± 0.04	3,61 ± 0.04	4,27 ± 0.03	5,02 ± 0.04
Protein	9.39 ± 0.15	11.69 ± 0.15	15.60 ± 0.16	17.40 ± 0.18	19.74 ± 0.17
Lipids	0.04 ± 0.02	2.25 ± 0.05	4.45 ± 0.07	5.62 ± 0.11	6.47 ± 0.11
Sugar	53.25 ± 0.50	42.28 ± 0.30	27.76 ± 0.25	21.72 ± 0.20	14.29 ± 0.20
Carbohydrates	72.56 ± 0.20	60.37 ± 0.20	46.42 ± 0.18	39.51 ± 0.15	33.19 ± 0.15
Brute fibers	0.00	8.65 ± 0.11	15.91 ± 0.12	19.33 ± 0.14	22.82 ± 0.19

* Results given as: M ± SD (mean ± standard deviation) of triplicate trials

It is obvious that enriching the mixtures of bee products with partially skimmed hemp flour improves the nutritional qualities of these products.

The partially skimmed hemp seeds have a good potential to be used as a valuable source of nourishment, contain high amounts of protein with all the essential amino acids are present in nutritionally significant amounts (Wirtschafter, 1997), lipids with over 80% in polyunsaturated fatty acids (Callaway, 2004) and total carbohydrates including crude fibers.

It can be seen that the samples of P1 - P4 contains more than 3 grams of raw fiber to 100 g total, which allows the supply of nutritional source of fiber.

These data (fig. 1) confirm that partially skimmed hemp flour is a good source of bio-compounds, especially raw fibers. Partially skimmed hemp seeds should be considered a source of interest for adding value to carbohydrate compounds with potential known prebiotic potential properties, useful for formulating functional foods as well nutraceuticals.

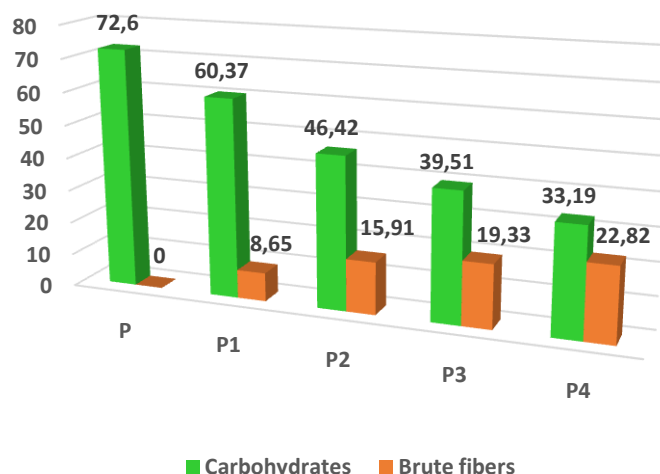


Fig.1. Crude fiber and carbohydrate content (in %) in mixes of products

Effect of incorporation of with partially skimmed hemp seeds on the minerals content of concentrated bee products

In the present study, the contents of six biologically essential mineral elements were analysed:

potassium (K), calcium (Ca), iron (Fe), magnesium (Mg), and manganese (Mn), as well as an additional one essential trace elements: zinc (Zn).

Table 3. The minerals content of concentrated bee products with partially skimmed hemp seeds

Sample	K	Ca	Fe	Mg	Zn	Mn
	mg/100 g					
P	23.2	24.59	2.58	23.00	3.54	0.34
P1	190.01	39.59	12.56	96.10	8.17	1.27
P2	385.2	87.75	18.1	192.87	8.54	4.00
P3	482.05	109.89	26.55	240.92	8.79	5.35
P4	579.61	131.03	31.05	288.87	8.85	6.70

The mineral contents of the samples are given in table 3. From performed analyses regarding minerals content it can be observed that partially skimmed hemp seeds flour is a material having important minerals content.

It is easily noticeable that, compared to the low mineral content of the bee products sample (P), concentrated bee products with partially skimmed hemp seeds have higher contents of minerals, in direct proportionality with the percentage increase of partially skimmed hemp seeds flour added in the mixtures.

Daily dose of iron (RDI) recommended by the FDA (2011) is 18 mg. It is easily noticeable that the mixtures with 40, 50 and 60% partially skimmed hemp seeds flour fulfill this recommendation, and therefore, these mixtures can be regarded as a valuable Source of iron (FDA 2011).

Thus, as can be seen in figure 2, magnesium content increased significantly, from 23mg/100 g (P) to 288.87mg/100 g (P4), iron content increased twelve times from 2.58 mg/100 g (P) to 31.05 mg/100 g (P4), zinc content increased almost 2.5 times, from 3.54 mg/100 g (P) to 8.85 mg/100 g (P4) and manganese content also increased 19 times, from 0.34 mg/100 g (P) to 6.70 mg/100 g (P4). From the performed analyses, it can be observed that the partially skimmed hemp seeds flour represents a material with important mineral contents, 100 g of this material providing the daily intake for some of these elements according to The Reference Daily Intake (RDI) of macronutrients and micronutrients recommended by the FDA (2011).

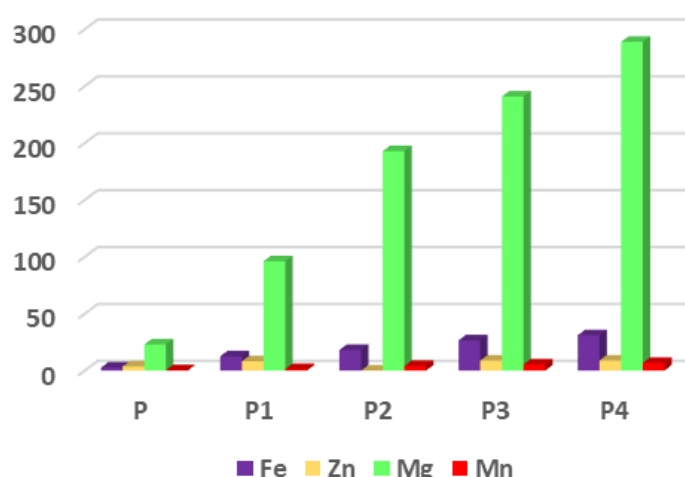


Fig. 2. Influence percentage of partially defatted hemp seeds flour on the mineral content of mixtures

Conclusions

The aim of this study was to evaluate the functional potential of bee products rich in addition with partially skimmed hemp seeds. The chemical composition analysed in this study proved that partially skimmed hemp seeds are a valuable source of nutritional components, mainly fiber and minerals content, especially iron, zinc and magnesium.

Under Regulation (EC) no 1924/2006 and Directive 90/496/EEC, all products may deliver the mention „source of ferum”, „source of magnesium”, „source of zinc”.

All the the samples of products contains more than 3 grams of dietary fiber per 100 g total, which allows the provision of nutritional term "source of fiber".

The total protein content for products whose base is made up of bee products is between 9.39% and 19.74%.

The fat content increased, as the percentage of the ingredient increased, from 0.04% to 6.47%.

This study suggests that partially skimmed hemp seeds flour can be used as a nutritional improver ingredient in the food matrices.

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MEASURING DIGITAL READINESS IN FOOD INDUSTRY

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Abstract: *The digitalisation of food production is changing the business environment, and companies are confronted with challenges during progress. This paper seeks to assess the digital readiness of Hungarian food companies, taking into account sub-sectors and company size. Based on the 202 evaluable responses of the questionnaire, it can be said that the network connectivity rate of Hungarian food companies makes a significant impact on the digitalisation of enterprises, and the integration of digital technology within the company.*

Keywords: *Food sector, Hungary, Digitalization, ICT, ERP, BI.*

1. Introduction

Various technologies, such as robotics, nanotechnology, sensor technologies, will completely transform the individual production processes and sectors in the coming decades. With the rapid advancement of information technology, the digitalisation and automation of industrial processes pose new challenges for food business operators. Food businesses will be able to keep up with their competitors and be successful in the coming decades if they can successfully adopt these technologies. However, this requires a strong focus on digitalisation, digital strategy, and directing investment, technological change, and R&D activities in this direction. Digitization is one of the decisive directions of the future, so I considered it important to investigate the level of digitization readiness and the most important characteristics of Hungarian food companies.

The "Food Industry Concept of Hungary 2017-2050" approved by the Government gives priority to the development of the food industry (MINISTRY OF AGRICULTURE, 2017). Strengthening innovation, technology change, and digitalization in the food industry is also crucial for more efficient use of resources, reducing losses, increasing productivity, quality assurance, and addressing labor shortages.

In terms of production value, the food industry is the third-largest industrial sector in Hungary and the first in Europe. If we look at the number of employees, the Hungarian food industry is the third processing industry in Hungary, and the first

one in Europe, as well as a significant user of resources (ÉFOSZ, 2019). Therefore, increasing productivity and efficiency in the food industry is extremely important, and the application of Industry 4.0 and digitization offers many new opportunities. In this way, new products, new services, new solutions, and approaches can be developed to use resources better, improve quality parameters, create new skills and competencies.

The digital transformation of businesses has been affecting business models, production processes, and corporate governance. Modernization of information and communication technology (ICT) infrastructure and the development of analytical capabilities during the past decade have supported the process of innovation at all levels of business models. Digital Business Strategies (DBS) offers important opportunities for businesses to increase their competitiveness (GROVER et al., 2013; BLEICHER et al., 2016). However, the scope for digital transformation is wide, and the degree of digitization and integration results from a combination of several elements, such as enterprise information system (IT) resources (ASHRAFI et al., 2015), the industrial environment (MITHAS et al., 2013) and public policies (GTAI, 2013).

Today's accelerating industrial development is transforming managerial decisions: today, there is no decision without digitization. There are also many types and tools for Decision Support Systems (DSS). DSS is actually an information system that supports decision-making. When we make a decision, we make alternatives and choose

from them to solve the problem. Thus, DSS supports the preparation, evaluation, and/or comparison of alternatives, thus helping to make the right decision (ALTER, 1980).

Several authors have examined some sectors and segments of the Hungarian agri-food sector. Botos et al (2018) investigated the use of ICT in a preliminary study. Füzesi & Herdon (2010) and Herdon & Füzesi (2011) examined product tracking implementations and quality assurance solutions for information systems in the meat industry. Herdon et al (2012) presented a prototype of a Digital Business Ecosystem for SMEs.

The planned Hungarian food digitalization strategy focuses on the entire food economy from the raw material production chain to the final consumer. At present, this is the area of the Hungarian food industry where problems such as productivity, resource efficiency, labor shortage, and lack of qualifications need to be solved as soon as possible.

Today, a wide range of management support systems and tools are available for the efficient operation of the company. Adequate digitalization of businesses and digital readiness is a prerequisite for the application of these systems. However, in order to develop the digitization of the food industry, it is necessary to explore what development opportunities are available. What is the level of digital development of businesses, in what tasks, in what decisions, in what functional areas do current tools be used, how do you assess the applicability of systems and tools, and what plans do you have for improving digitization?

In this article, I examine the digital literacy of Hungarian food companies in terms of connectivity, business digitalization, e-commerce, enterprise information systems, management information systems, and business intelligence tools and applications.

1.1. Possibilities and methods of digital skills measurement

As digital transformation is widespread in all sectors and affects every aspect of society, measuring its specificity and dynamics is a growing challenge. Digital transformation can be felt in all dimensions of data production and use. For example, qualitative information is increasingly becoming a source of quantitative evidence. Several international organizations are contributing to the measurement of digital transformation through initiatives, some of which are described in the G20 Toolkit for Measuring

the Digital Economy. These include, but are not limited to, work on key ICT indicators for measuring ICT used in development under the leadership of the ITU, UNCTAD and the United Nations Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics (UIS). The OECD works closely with several of these organizations, including the World Trade Organization (WTO), on the issue of measuring digital trade, and the IMF on measuring the implications of the digital economy for macroeconomic statistics (OECD 2019). KOTARBA (2017) summarizes the analysis of indicators used to measure digitization activities.

Readiness is a developmental stage that describes inclination, willingness, and preparedness to perform an action. Meanwhile, digital is defined as the device and application of digital technology. Thus, digital readiness is defined as inclination and willingness to switch to and adopt digital technology and the readiness to create new innovative opportunities by using this technology in order to bring an individual, organization, industry, and country to achieve their goals faster and with greater results.

There is a need to develop indicators that can show how far businesses in different sectors have progressed in the digital transformation journey, i.e., how digitally mature they are. The digital maturity indicator combines four components to provide a comprehensive picture of how digitally mature Swedish companies are (OECD 2017). The four components are systems for enterprise resource planning (ERP), systems for customer resource management (CRM), social media, market, and integration (systems for e-invoice, e-sales, and supply chain).

Digital Economy Metrics is commonly viewed that the term “digital economy” was introduced by Don Tapscott in his publication: The digital economy: promise and peril in the age of networked intelligence (Tapscott, 1997). Digital Density Index (DDI) is developed by Oxford Economics and Accenture jointly a Digital Density Index (DDI) measuring how digital technologies impact economic growth (MACCHI et al. 2015). Digital Economy and Society Index (DESI) is developed within the framework of “Europe 2020 Strategy”, the European Commission introduced a performance measurement system to track the evolution of the EU member states in digital competitiveness (European Commission, 2016). Digital Society Metrics can be described as a society in which the usage of ICT is common across demographic

parameters of the population. Digital citizens function in the digital economy using the available digital public and commercial infrastructure for conducting life activities.

Digital Industry Metrics for the purpose of this paper, the term “digital industry” is defined as the application of digitalization in any type of industry. It is, therefore, not limited to the ICT/new technology sector that produces digital solutions, but it covers all manufacturing or service delivery where such digital solutions are used. Digital Enterprise Metrics is for the level of a single enterprise digitalization can be measured with industry metrics presented in the previous section. However, there is a large additional measurement area that is not covered explicitly by the IDI.

RUIZ-RODRÍGUEZ et al. (2018) constructed a synthetic index of digital development (Enterprise Digital Development Index –EDDI-) and analyzed the countries in the EU and Spanish regions. The variables of the index come from the “Community survey on ICT usage and e-commerce in enterprises” of Eurostat. Many companies fail to understand that the use of digital technologies requires different preparations. One of them is the requirement of an adequate level of digital readiness provides a viewpoint of the adequacy of existing models. NASUTION et al (2018) describe future directions to evaluate the readiness of companies.

2. Materials & Methods

The research goal defined the research method. The use of information and decision support tools to support management was at the heart of the assessment of the situation of the digitalization of food business enterprises. The research (in 2019) examined the role and relationship of integrated enterprise information systems (ERP) or decision support, business analysis tools (BI), which are used independently of one another in the Food Industry 4.0 technology change.

The research was designed and prepared for the assessment of the digital readiness of food processing companies based on similar studies carried out by KSH, EUROSTAT, OECD, and various studies. During the preparation of the questionnaire, the National Institute for Agricultural Research and Innovation (NAIK-AKI) and the National Chamber of Agriculture (NAK) supported the questionnaire by providing comments and requests for completion of the questionnaire (by posting on a website or sending

it to businesses). The anonymous online questionnaire was completed by Hungarian food companies.

The anonymous online questionnaire was filled by Hungarian food industry companies, which contain 6 question groups with 44 questions. The question groups focused on the main IT topics in the digitalization transformation. The survey was only possible with a questionnaire survey.

2.1. Main features of the questionnaire survey

The survey was conducted in the form of an online questionnaire. In the first phase, after studying the literature, I designed the content, the questionnaire groups, and the questions. In the second phase, once the LimeSurvey system was selected, and the Q&A planning was completed, it was sent to corporate professionals, NAK, and AKI for comment. Based on the suggestions received, the questionnaire was finalized and sent to the companies of a pre-created mailing list in the third phase (April-May) and published on the NAK and AKI websites. The progress was checked every week, so we considered it advisable to extend the deadline for completing the questionnaire by one month.

After stopping the questionnaire and clearing the data, the statistical evaluation and analysis started based on the answers given to the questions.

2.2. The online survey system of LimeSurvey

Limesurvey is a professional questionnaire engine with a pre-installed environment and database. Once you have entered the system, you can create the questionnaire you want to do by first defining the frame of the questionnaire, then the question groups, and the questions themselves.

The questionnaire produced can contain a wide variety of question types and layouts, among which a conditional relationship can be established. You can also parameterize the number of respondents to the questionnaire. An introductory and closing text can be added to the question list.

The results of the completed questionnaire are stored in a database, which can be extracted in doc, xls, csv, pdf, html or even SPSS statistical formats. Besides, the application can automatically generate preliminary statistical indicators and diagrams from the results.

Questions groups were:

- General enterprise information
- IT infrastructure and Internet usage
- Enterprise information systems (ERP)
- Using Management Information Systems (CIS)
- Using Business Analytics (BI) Tools
- Industry 4.0

Within the above question groups, the following types were used: Yes/No, List (radio), Multiple choices, Array (5 point choice), Date/Time, Array (Yes/No/Uncertain), Array dual scale, Short free text.

2.3. The measurement model of digitalization development, the demarcation of measurement

The Digital Economy and Society Index (DESI) measures the progress of EU countries towards a digital economy and society. As such, it brings together a set of relevant indicators on Europe's current digital policy mix (EUROPEAN COMMISSION 2019).

The index allows four main types of analysis:

- General performance assessment: to obtain a general characterisation of the performance of individual Member States by observing their overall index score and the scores of the main index dimensions.
- Zooming-in: to pinpoint the areas where Member State performance could be improved by analysing the scores of the index's sub-dimensions and individual indicators.
- Follow-up: to assess whether there is progress over time.
- Comparative analysis: to cluster Member States according to their index scores, comparing countries in similar stages of digital development so as to flag the need for improvement in relevant policy areas.

The DESI was developed following the guidelines and recommendations in the OECD's "Handbook on constructing composite indicators: methodology and user guide". The data included in the index were mostly collected by the European Commission services (DG CNECT, Table 4).

The questions (and their sub-questions) that provided the data and thus served as a basis for

Eurostat) and by ad-hoc studies launched by the Commission services.

The DESI has a three-layer structure. It is composed of five principal dimensions (Table 1), each divided in a set of sub-dimensions, which are in turn, composed by individual indicators.

Table 1. The five dimensions of the DESI

Dimension	Description
1 Connectivity	Fixed broadband, mobile broadband, fast and ultrafast broadband and prices
2 Human Capital	Internet user skills and advanced skills
3 Use of Internet Services	Use of internet services and online transactions
4 Integration of Digital Technology	Business digitisation and e-commerce
5 Digital Public Services	e-Government and e-health

Source: Own editing based on EUROPEAN COMMISSION (2019)

In my research focusing on the technological development of enterprises, I used the indicators of some sub-dimensions of 1. Network interconnection, 3. Use of Internet services, 4. Integration of digital technologies to measure the digital readiness of enterprises, and comparing it with the EU average, which provides an opportunity to identify where the sector is lagging behind and where it needs to be developed. In the Human Capital and Digital Public Services dimensions, there are fewer indicators that would be relevant to research and industry.

In addition to the analogue indicators used in DESI, I introduced new subdimensions and related indicators based on the questions and questions groups in the questionnaire.

These sub-dimensions are Enterprise Management Information System (ERP), Management Information System (VIR) and Business Intelligence tools/applications (

the calculation of the composite index are listed in Table 2.

Table 2. The questions (* with their subquestions in the questionnaire)

ID of Question	Question
8	Does your company have a local (internal) computer network? *
9	What type of Internet access does the company have? *
10	What is the Internet used for business purposes? *

ID of Question	Question
12	Does your business have a website? *
14	Does your company have a subscription to any of the following cloud-based services? Free services are not included! *
15	Does your company have an integrated or independent corporate governance information system? *
21	Please indicate which activities are supported (or in which area of the company operation) the corporate governance information system is regularly used. *
24	Does your company have a management information system? *
29	What are management information systems used for? *
31	Do you use business intelligence tools/applications? *
32	Evaluate which business analytics technologies are relevant to your company! (1 = Not relevant, 5 = Very relevant) *
35	Indicate whether you intend to use or plan to use the following technologies in the future. Please tick the appropriate answer for each item listed. *

Source: own work, 2019

The information technological aspect for companies links to the connectivity, use of internet services and the integration of digital technology. I used these aspects to evaluate the companies and branches for the Hungarian food-processing companies by the created Digital Enterprise Index for Food-processing Sector (DEI-FS).

The DEI-FS has a three-layer structure and it is composed of 3 principal technological dimensions, each divided in a set of sub-dimensions, which are, in turn, composed by individual indicators.

Each dimension, sub-dimension, and the indicator has values between 0 and 1, some are more relevant than others and are therefore given more weight. The weights were determined using DESI and other methods, as well as literature references. Of course, it is possible to change the Table 4.

weights in the hierarchical weight structure in the created calculator. The variables and weights assigned to the dimensions are listed in Table 3 below.

Table 3. Variables assigned to the "DEI-FS" dimensions and their weighting

Dimension	Variable	Weight
1 Connectivity	connect-i	42%
2 Use of Internet Services	netserv-i	25%
3 Integration of Digital Technology	digitech-i	33%

Source: own work, 2019

I also assigned variables and weights to the subdimensions, which are summarized in

Table 4. The "DEI-FS" sub-dimensions, their associated variables and their weighting

Sub-dimension	Variable	Weight
1a Fixed broadband internet access	wired	15%
1b Mobile broadband internet access	mobint	35%
1c Use of internal local computer network	lan	50%
2a Transactions	e-trx	100%
3a Business digitalization	bizdigi	15%
3b e-commerce	ecomm	10%
3c Use of enterprise information system (ERP)	erp	25%
3d Use of management information system (MIS)	eis	25%
3e Business intelligence tools / applications	bi	25%

Source: own work, 2019

In DEI-FS, the aggregation of indicators into sub-dimensions, of sub-dimensions into dimensions, and of dimensions into the overall index was performed from the bottom up using

simple weighted arithmetic averages following the structure of the index.

As an example, the top-level DEI-FS score for enterprises, branches, enterprise groups E was calculated using the formula:

$$DEI-FS(E) = connect-i(E)*0.42 + netserv-i(E)*0.25 + digitech-i(E)*0.33,$$

where

$connect-i(E)$ is the score obtained by enterprise E in the Connectivity dimension:

$$connect-i(E) = wired(E)*0.15 + mobint(E)*0.35 + lan(E)*0.50,$$

$netserv-i(E)$ is the score obtained by enterprise E in the Use of Internet Services dimension:

$$netserv-i(E) = e-trx(E),$$

$digitech-i(E)$ is the score obtained by enterprise E in the Integration of Digital Technology dimension:

$$digitech-i(E) = bizdigi(E)*0.15 + ecomm(E)*0.10 + erp(E)*0.25 + eis(E)*0.25 + bi(E)*0.25.$$

The subsector indices were calculated as the arithmetic average of the enterprises in question.

I examined the strength of the dependency relationship between them by correlation analysis. There are several approaches from correlation value to relationship inference. To test the significance of the relationship between the examined variables, I used a t-test. The necessary calculations and statistical procedures were performed with the Data Analysis function available as an extension of Microsoft Excel.

Strong correlations between variables may indicate that cluster analysis can be performed. Cluster analysis was used to create groups among the indicators belonging to each dimension of DEI-FS, calculated by sub-sector and size. Since I used the k-means algorithm, I already recorded the number of clusters at the start. In each case, I searched for five clusters using the k-means clustering method. During the clustering procedure, I used standard normalization; that is, the values were normalized based on the mean and standard deviation.

The normalized value a_j is a'_j , which can be calculated using the following formula :

$$a'_j = \frac{a_j - \bar{A}}{\sigma_A}$$

where \bar{A} is the mean of A and σ_A is its standard deviation.

After the data is normalized, we assign each point to the cluster that is most similar to its representative element, that is, each data point is assigned to the closest center, and the resulting clusters will be the initial clusters. After classification, we select a new representative point, the center of the cluster. The iteration steps for classification, new center selection, are repeated until a change occurs (DEBRECENI, 2016).

The aim of the SSE (sum of the squared error) function given by the formula below is to minimize the objective function and to determine the new cluster center in each iteration.

$$SSE = \sum_{i=1}^K \sum_{x \in C_i} d(c_i, x)^2$$

where:

K - number of clusters,

I - index of the examined cluster,

C_i - the i -th cluster,

c_i - center of the i -th cluster,

x - is a data point in cluster C_i whose distance from the center is examined.

The points that minimize the objective function should be selected as the center. If the SSE value is the smallest, this means that the centers of this clustering better represent the points in the clusters than in any other case.

I made the necessary calculations in Microsoft Excel using the Solver function available as an add-on, which minimized the sum of squared errors (SSE) to find a cluster with lower errors.

3. Results

3.1. Analysis of the food industry with complex indicators

Examining the level of development by sub-sector, Fig. 1 shows that the most advanced sub-sectors are the production of oil, the production of other foodstuffs, the production of mill products and the processing of vegetables and fruits. The most backward in this respect (not counting the fish processing and tobacco production sectors, where 1-2 fillings came) are dairy, bakery, pasta, and feed production.

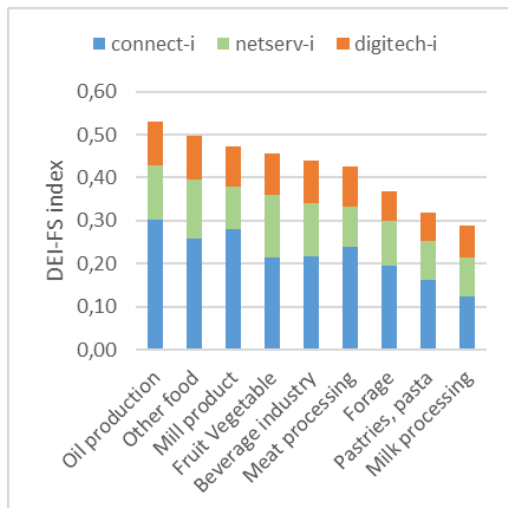


Fig. 1. Respondents level of digital development according to DEI-FS index by subsector (Source: own work, 2019, N = 202)

Fig. 2 shows the level of connectivity by subsector, according to the variables assigned to the subdimensions.

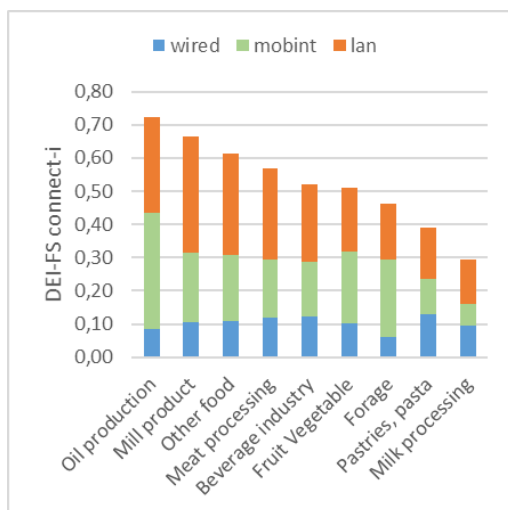


Fig. 2. The development level of respondent companies based on DEI-FS connectivity index by subsector (Source: own work, 2019, N = 202)

Compared to Fig. 1, milling companies are more advanced in terms of connectivity than companies in other food manufacturing subsectors. It can also be said that while meat processing companies have advanced by two levels, fruit and vegetable processing companies have fallen by two levels in the connectivity ranking.

If we look at the level of development of respondents according to the e-procurement/e-commerce indicator (Fig. 3), we can say that the ranking has changed significantly: fruit and

vegetable processing companies have taken the lead, and respondents producing mill products have slipped below rankings.

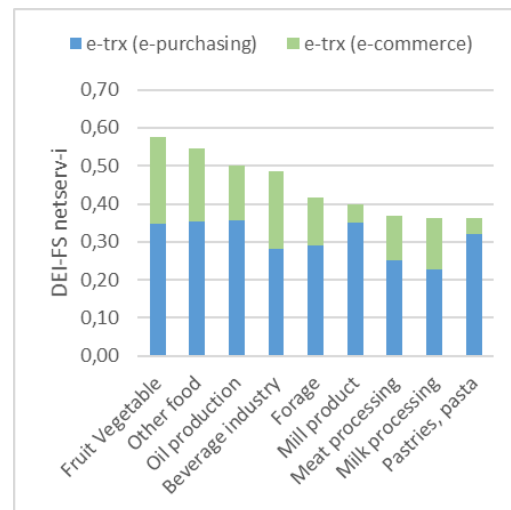


Fig. 3. The development level of respondent companies by subsector DEI-FS Internet Services Index (Source: own work, 2019, N = 202)

For all subsectors, electronic purchasing is the most widely used Internet service. E-commerce is the least popular in the sub-sectors of the milling industry and the manufacture of bakery and farinaceous products.

The sub-sector rankings by DEI-FS third dimension variables are illustrated in Fig. 4, which shows that there is no surprising change at the end of the rankings, whereas beverage companies ranked third after oil and other food production sub-sectors.

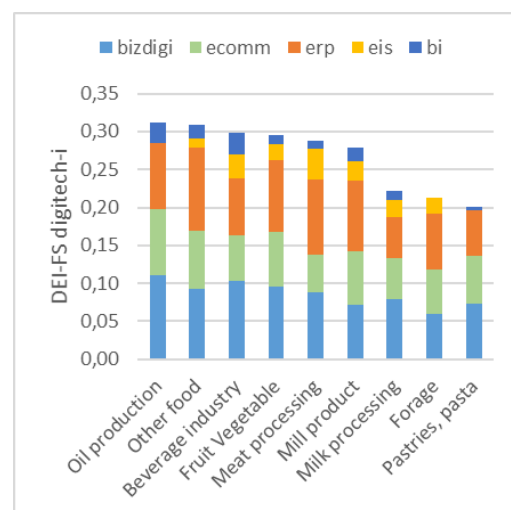


Fig. 4. The development level of respondent companies by subsector DEI-FS Digital Technology Integration (Source: own work, 2019, N = 202)

Furthermore, companies in the oil and bakery and pasta industries do not use management information systems but do use business intelligence tools/applications. The reverse is true for companies in the feed production sector.

The following Table 5 shows a high correlation of 0.79 between the connectivity index and the integration of digital technology, which suggests a strong relationship between DEI-FS dimensions 1 and 3 ($r = 0.7904$; $t = 0.0112$).

Table 5. Correlation matrix of variables of DEI-FS dimensions calculated by subsectors

	<i>connect-i</i>	<i>netserv-i</i>	<i>digitech-i</i>
<i>connect-i</i>	1.00		
<i>netserv-i</i>	0.45	1.00	
<i>digitech-i</i>	0.79	0.69	1.00

Source: own work, 2019

A value of 0.69 indicates a significant

The clusters obtained by the k-mean clustering method are shown in Fig. 5 below:



Fig. 5. Clusters obtained for DEI-FS Dimension 1 and 3 indicators (Source: own work, 2019)

The sectors belonging to the clusters shown in the figure, taking into account company size, are:

relationship between the use of Internet services and digital technology integration ($r = 0.6947$; $t = 0.0378$).

The significance of the 0.79 and 0.69 values in the correlation matrix was verified by using t-statistics. There is a typical relationship between the connectivity index and the digital technology integration index ($r = 0.7904$; $p = 0.0112$). A similarly significant correlation was found between the use of the Internet services index and the index of digital technology integration ($r = 0.6947$; $t = 0.0378$).

Subsequently, I created clusters by cluster analysis, based on the values of the DEI-FS Dimension 1 and 3 indicators calculated by subsector and company size. Since I used the k-center algorithm, I already recorded the number of clusters at the start.

I searched for five clusters using the k-means clustering method.

- Cluster 1 (AMBITIOUS): Other food - small; Fruits and vegetables - small; Mill

- product - small; Oil production - small; Other food - medium; Fruit, vegetables - middle; Meat Processing - Medium; Mill product - medium; Oil production - medium; Bakery, pasta - middle; Bakery, pasta - large.
- Cluster 2 (LEADERS): Beverage production - middle; Beverage production - large; Feed - large.
 - Cluster 3 (LAGGARDS): Other food - micro; Fruit, vegetables - micro; Meat Processing - Micro; Beverage production - micro; Mill product - micro; Bakery products, pasta - micro; Feed - Micro; Milk processing - micro; Pastry, pasta - small; Feed - small; Milk processing - small; Other food - large.
 - Cluster 4 (AVERAGE): Oil Production - Micro; Meat Processing - small; Beverage production - small; Feed - medium; Milk processing - medium.
 - Cluster 5 (ADVANCED): Fruit, Vegetable - large; Meat Processing - large.

The coordinates of the cluster centers are shown in Table 6 below:

Table 6. Cluster center coordinates

Cluster ID - Name	Connectivity	Integration of Digital Technology
1 - Ambitious	0.80	0.06
2 - Leaders	0.98	2.27
3 - Laggards	-1.14	-0.72
4 - Average	-0.29	-0.29
5 - Advanced	1.53	1.49

Source: own work, based on calculations made in MS Excel, 2019

Based on the centers of the clusters, we can

describe the five clusters as follows:

- 1.) The first cluster includes those who are above average in terms of connectivity and moderately advanced in digital technology.
- 2.) The second cluster includes those who are at the forefront of digital technology integration and have a high connectivity index.
- 3.) The third cluster includes those who are lagging behind the others in both indicators.
- 4.) In the fourth cluster, both connectivity and digital technology integration are around index average.
- 5.) Individuals in the fifth cluster are good in both values.

4. Conclusions

Network connectivity and the extent to which Internet services are used have a significant impact on the digitalisation of businesses and the integration of digital technology within companies.

This is supported by the high correlation ($r = 0.79$) between the connectivity index and the integration of digital technology, which was also confirmed by the statistical t-test ($t = 0.01$). This suggests a strong relationship between the 1st and 3rd dimensions of DEI-FS. A similarly significant relationship was found between the index of the use of Internet services and the index of digital technology integration ($r = 0.69$; $t = 0.04$).

Categorizing the subsectors by the degree of connectivity and integration of digital technology by cluster analysis, I concluded that the vast majority of respondents belong to the group of lagging behind and developing. Only a few have average values according to both indicators.

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BIOACTIVE SUBSTANCES FROM INVASIVE KNOTWEED SPECIES

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Abstract: Knotweed is in Europe and America a highly invasive plant, originating from Asia. Three different taxons are identified in Europe, namely Japanese knotweed (*Fallopia japonica*), Sakhalin knotweed (*Fallopia sachalinensis*) and Bohemian knotweed (*Fallopia x bohemica*). The best-known among them is *F. japonica* that has been since ancient times used in traditional Chinese medicine for treatment of different kind of diseases (e.g. inflammatory diseases, hepatitis, tumors, burns and hyperlipidemia). Several studies have recently been performed to confirm that the Japanese knotweed extract possess several different bioactivities, namely antioxidant, antidiabetic, antiviral, antibacterial, and antimycotic activity. It was shown that many different bioactive components are responsible for this. However, much less studies have been performed on the other two knotweed species, particularly on the Bohemian knotweed, which is the most widely spread due to its highest invasiveness among the three taxons. The results of our study confirmed antioxidant and antimicrobial activities of extracts obtained from different tissues (rhizomes, leaves, stalks and flowers) of all three knotweed species.

Keywords: knotweeds, antioxidants, antimicrobial and antidiabetic activity.

1. Introduction

It is well established that variety in food is important to provide essential nutrients in the human diet. Oxidative stress is a major induction factor in many chronic and degenerative diseases [1]. Antioxidants, which allow the organism to defend against oxidative stress, environmental pollution and other toxic insults, play an important role in the healthy human nutrition. A great number of plants contain chemical compounds exhibiting antioxidant properties as well as antimicrobial activity. For that reason, they can be used in food industries to prevent food degradation and alteration and to minimize the undesirable effects of synthetic food preservatives in human health. In addition to plant foods, the nutrition recommendations are suggesting to consume a variety of food supplements based on plant extracts to avoid synthetic medications.

2. Knotweed in traditional medicine

Knotweed is in Europe and America a highly invasive plant, originating from Asia. Three

different taxons are identified in Europe, namely Japanese knotweed (*Fallopia japonica*), Sakhalin knotweed (*Fallopia sachalinensis*) and Bohemian knotweed (*Fallopia x bohemica*), the hybrid of these two species. All three species are often only referred as a source of environmental and social problems, but in some parts of the world these plants have an important role in maintenance of human health and are included in the everyday human diet [2].

The best-known among them is *F. japonica* that has been since ancient times used in traditional Chinese medicine for treatment of different kind of diseases (e.g. inflammatory diseases, hepatitis, tumors, burns and hyperlipidemia). Among tissues, the most commonly used are rhizomes for reducing fever, treatments of high blood pressure and body detoxification. Dried stems are used in alternative medicine for treatment of inflammatory diseases, hepatitis and diarrhea. Furthermore, in China and Japan, Itadori tea is a traditional herbal infusion used for treating heart disease [3].

3. Recent studies of knotweed bioactivities

Several studies have recently been performed to confirm that the Japanese knotweed extract possess several different bioactivities, namely antioxidant, antidiabetic, antiviral, antibacterial, and antimycotic activity [3-12]. It was shown that many different bioactive components are responsible for this, among which stilbenes (e.g. emodin, resveratrol and resveratrol derivatives), anthraquinones, flavonoids (e.g. catechin, epicatechin) and lignins are the most predominant. Resveratrol, one of the most powerful antioxidant and recently also among the most studied polyphenols, is a naturally occurring polyphenol typically associated with grapes and red wine, but also abundantly present in knotweed. There are already a few supplements on the market with resveratrol originating from the rhizomes of Japanese knotweed.

It has been also shown that different tissues of all three taxons contain several other polyphenols, e.g. polydatin, quercetin, and epicatechin, which besides antioxidant properties possess significant antimicrobial and anti-inflammatory activities. It is therefore expectable that these plants will be in the future used for the development of new functional foods and for the isolation of novel food ingredients and

pharmaceutical molecules. So far, research in the study of secondary metabolites have mostly focused on Japanese knotweed and its rhizome. In the future, it would be important to accurately analyse also the components of the aboveground parts of these invasive plants and special attention must be given to the other two taxons.

3.1. Polyphenols and antioxidant capacity

In our study [5], different tissues (rhizome peels, rhizomes, leaves, stalks and flowers) of all three knotweeds were freeze-dried and extracted with 50% ethanol. The presence of resveratrol, polydatin, (+)-catechin and (-)-epicatechin was detected by a HPLC/DAD system, the content of each was quantified and expressed as mass per gram of freeze-dried tissue. It can be seen from Figure 1 to Figure 4 that content of all determined representatives of polyphenols depend not only on taxon, but also on the tissue of the particular knotweed. Bohemian knotweed flower is the richest source of resveratrol (476 µg/g), while Japanese knotweed rhizome peels are the richest source of polydatine (23.3 mg/g). The richest source of (+)-catechin (13.3 mg/g) is Sakhalin knotweed rhizome, whereas (-)-epicatechin (27.1 mg/g) is the most abundantly present in flowers of Bohemian knotweed.

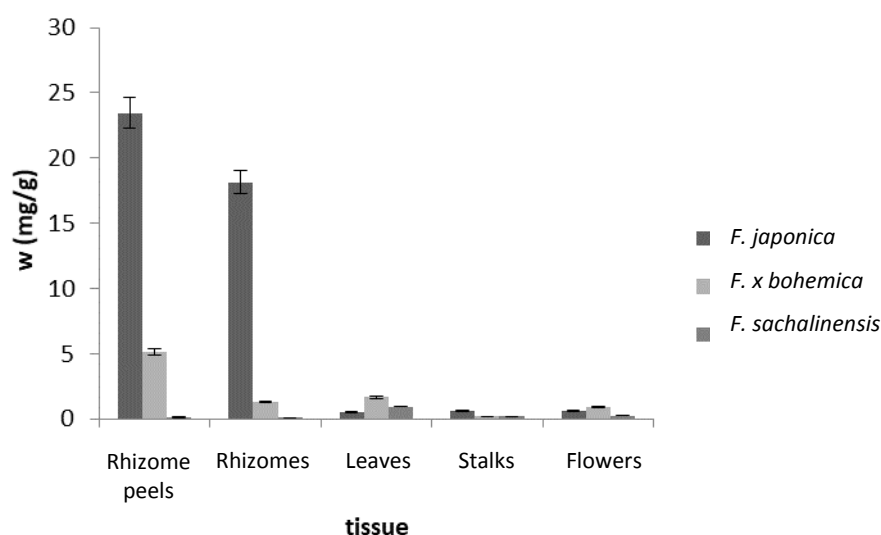


Fig. 1. Mass fraction (*w*) of polydatin in different tissues of three knotweed species

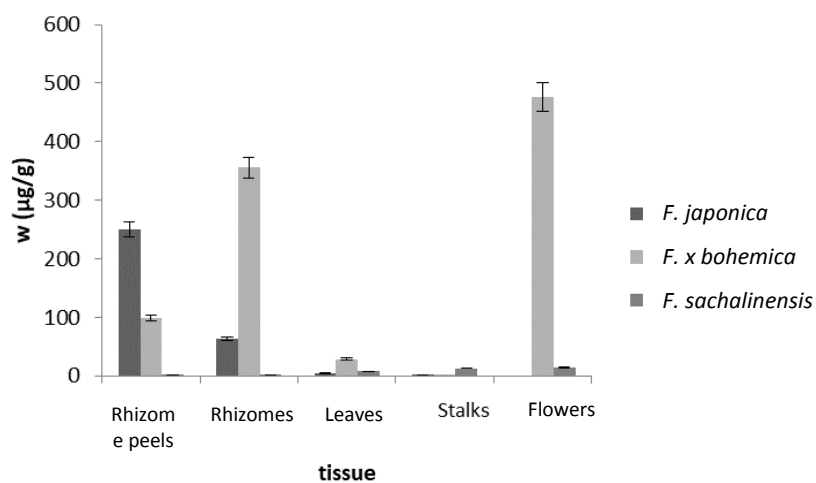


Fig. 2. Mass fraction (w) of resveratrol in different tissues of three knotweed species

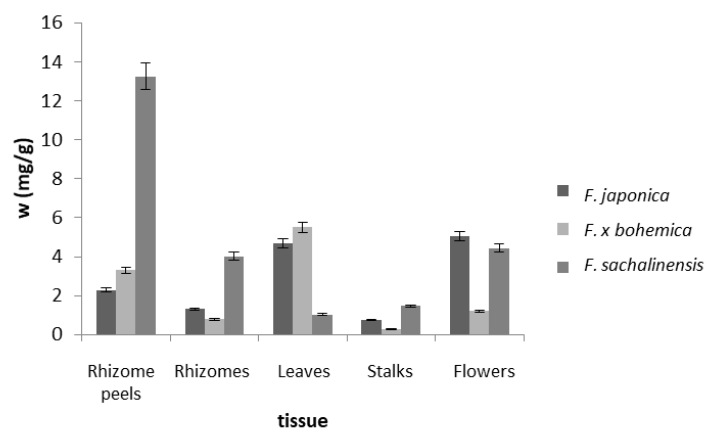


Fig. 3. Mass fraction (w) of (+)-catechin in different tissues of three knotweed species

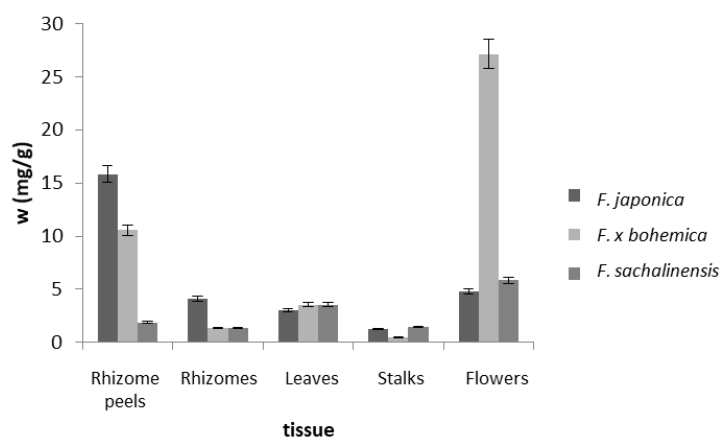


Fig. 4. Mass fraction (w) of (-)-epicatechin in different tissues of three knotweed species

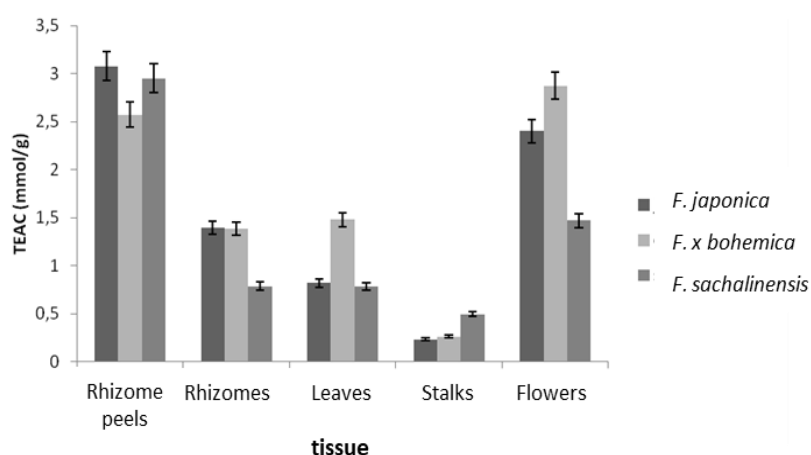


Fig. 5. Trolox equivalent antioxidant capacity (TEAC) in different tissues of three knotweed species

Antioxidant capacity was determined with ABTS• assay and results were expressed as trolox equivalent antioxidant capacity (TEAC) per gram of freeze-dried tissue (Figure 5). Similarly to the above results, the highest TEAC was determined in rhizome peels and in flowers of all three taxons. The highest TEAC among tested extracts was determined in rhizome peels of Japanese knotweed (3.0 mmol/g), while the lowest was detected in stalks of Japanese knotweed (0.23 mmol/g).

3.2. Antimicrobial activity

In order to determine antimicrobial activity of ethanol extracts of rhizome peels obtained from all three taxons, the tissues were freeze-dried and re-dissolved in less ethanol to obtain the concentration of dry extract equal to 600 mg/mL. The antimicrobial activity of concentrated extracts was evaluated with gram-positive bacteria *Listeria monocytogenes*, gram-negative bacteria *Escherichia coli* and yeast *Candida albicans*. Minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) of extracts were determined by combination of broth microdilution and plate-count methods [6]. The highest antimicrobial activity of the knotweed extracts among tested microorganisms was observed on the gram-positive bacteria *L. monocytogenes*. The Japanese knotweed extract was bacteriocidal at a concentration of 12 mg/mL, whereas the extracts of Sakhalin and Bohemian knotweed at a concentration of 23 mg/mL. Gram-negative bacteria *E. coli* was more resistant, since all the extracts were inhibiting its growth at a concentration of 19 mg/mL, and a Japanese

knotweed extract with concentration 75 mg/mL and more was bacteriocidal. The most resistant among tested microorganisms was the yeast *C. albicans*, since its growth was inhibited by Japanese and Bohemian knotweed extracts only at concentration of 75 mg/mL and 37 mg/mL extract of the Sakhalin knotweed.

Japanese knotweed was the only taxon with bactericidal activity against *E. coli* (75 mg/mL). Also, at a concentration of 12 mg/mL, bactericidal activity of the same extract was observed on bacteria of *L. monocytogenes*. Sakhalin knotweed extract with concentration of 37 mg/mL was the most effective in inhibition of yeast *C. albicans*. Regarding Bohemian knotweed rhizome extract, the bacterial growth was inhibited at the same concentrations as the Sakhalin knotweed extract, namely bacteria *E. coli* was inhibited at a concentration of 19 mg/mL and *L. monocytogenes* at a concentration of 23 mg/mL. The yeasts *C. albicans* where the extract of the Sahalinsk hauler was more effective. It was also found that knotweed taxons with higher TEAC had higher inhibition and/or bacteriocidal activity against selected microbial strains.

4. Conclusions

The results of our recent studies confirmed antioxidant and antimicrobial activities of extracts obtained from different tissues (rhizomes, leaves, stalks and flowers) of all three knotweed species. It has to be stressed that the previous studies have mostly been performed on Japanese knotweed, so analyzing Bohemian knotweed, which is the most widely spread due

to its highest invasiveness among the three species, has a very big importance for the future. The lack of studies on this taxon can be attributed to the fact that this species was created by the natural crossing of the other two taxons in Europe and appeared much later than the other two and it was many times also misclassified as Japanese knotweed. Based on our analysis, further research would be a great challenge and motivation to find other possible bioactive substances besides the ones identified in our study and to study their bioactive effects

Acknowledgements

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THE CONCEPT AND MODEL OF PEDAGOGIC FARM

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Abstract: *The study approaches conceptual and pragmatic aspects regarding making and functioning pedagogic farms. There are thus described a series of definitions, regulations, classifications, as well as pedagogic farm utility and objectives. At the same time, there are highlighted a series of educational measures referring to the population alienation in relation to the Environment. There is underlined the importance to get closer to Nature and know the environmental problems by the contact of children and youngsters born in urban environment with animals and plants from rural space farms. In the paper there is analyzed the modality to transform a farm into an „educational farm”, respectively aspects linked to the necessity of investment based on an attentive project, but also for the farmers to acquire pedagogic competences. It is described a specific pedagogy, of active and participative type, so that beyond getting a little dirty and using the five senses, children receive in fact information, learn while amusing themselves. As study objectives we mention the idea to diversify revenues, as well as modalities by which farmers may become militants convinced of their role of mediator and educator and thus they may communicate with the urban world through educational farms and position themselves as important players in the territory development. The study also lays the groundwork of the achievement of a strategy regarding the development of pedagogic farms (with corresponding legislation) in Romania too.*

Keywords: *education, farm, management, nature, pedagogy.*

1. Introduction

As we can all see, the world is in a continuous and ever accelerating change. Modifications are beneficial as a rule, but may appear pervert effects too. The technological development, the 4th industrial revolution, the biologic revolution, the digital era etc., volens nolens induce the globalization process with European integration as its initial stage. From here uncontrolled effects linked to the impact on Nature and Society, to climate modifications and so on and so forth. What becomes obligatory is awareness and then solution of the cultural impact, having EDUCATION as basic pillar. As for education, in this study we will refer to population alienation in relation to Nature. More precisely, we take into consideration the accelerated urbanization tendency, so that the proportion of those living in town will get nearer to 80 %. In Romania this tendency is not that stringent, but it becomes opportune to educationally prepare ourselves in this case. One of the variants is to approach Nature and know the environment

problems by the contact of children and youngsters born in urban environment with animals and plants from specific to rural environment farms. We specify that transforming a farm into an educational farm needs certain investment and an attentive project, but also pedagogical competences. The OBJECTIVES of the development of the concept and especially of the activity are linked to the social interest concerning education, as well as directly linked to the motivations of the implied farmers. Thus, besides income diversification, farmers also want to communicate with urban world through educational farms and position as important players in the territory development. They often are militant farmers convinced of their role of mediator and educator. The double exchange modifies the consumers' practices, as well as the farmers' ones that doubt their practice.

2. Methodology, Definition And Utility

The already existing model, with notable results, is the French one. Political and

administrative preoccupations, such as those from France, have elaborated a strategy concerning the development of pedagogic farms (with afferent legislation), beginning with the precise definition regarding the pedagogic farm notion.

PEDAGOGIC FARMS are those units in whose structures there are present animals of zoo technical production and/or vegetal species of culture, locations that **regularly host** both children with pedagogic purpose, youngsters within school or extra-school program, as well as other interested persons who wish to develop this activity.

There may be observed several types of pedagogic farms, they being classified in function of the business figure that comes from the hosting activity and from the agricultural production. Pedagogic farms organize three types of **basic activities**: - one or several days school visits; - internship during school holidays; - anniversaries at the farm. The **utility of pedagogic farms** is more and more evident. Concretely, the children going to pedagogic farms discover farm animals, play and may touch rabbits, may gather eggs, may feed calves with the nipple, may have a ride by tractor...etc., i.e. these are simple gestures that most of them don't have the opportunity to make when at home. More than that, they have the opportunity to see where food they eat comes from and to

understand the respect for nature. All these will be well stuck in their memory. Pedagogic farms are genuine agricultural exploitations in activity, with different technologies (traditional-extensive, conventional-intensive, ecologic and biologic agriculture) in which children are gladly met and hosted by passionate farmers and entertainers. These ones support and militate for theoretical and practical *bio harmonization* given by vivid agriculture and a rural environment adapted to our days, in the idea to discover numerous connections of the respective children with daily life, with natural environment, with alimentation and others. Therefore, the implementation of this type of „knowledge” is achieved through a **specific pedagogy**, of active and participative type, so that, beyond a little dirt and use of the five senses, in fact children receive information, learn while amusing themselves! There are of course traditional activities based on the farm functioning, but also more original activities, as for example: observations regarding the pond biotope, different games in the open, discovering ecologic agriculture and healthy food etc. There is thus imagined something different for all groups of children and all likings and ages, from nursery to gymnasium. Without entering into details, we mention as an example in this direction the logos for main activities from different farms, to be seen in fig.1.

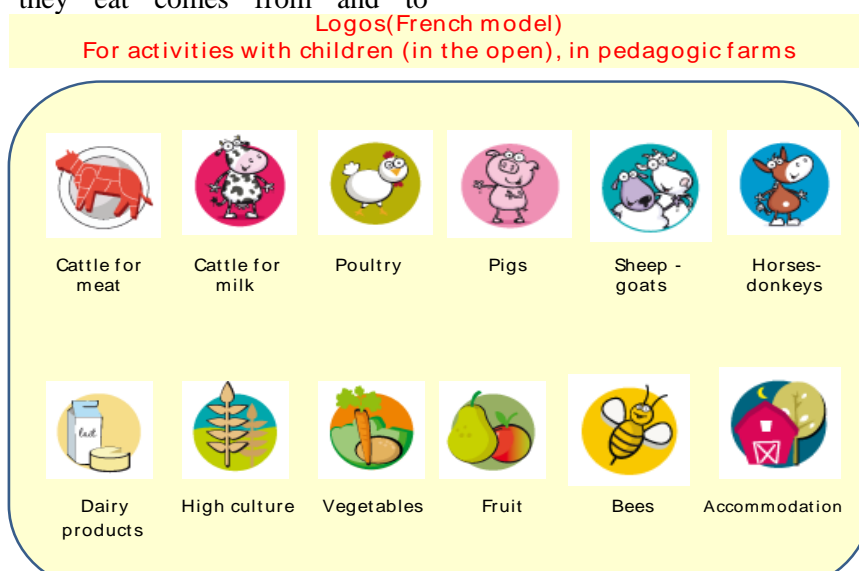


Fig. 1. Necessary logos in participative pedagogy, showing children main practical activities of farms

3. Discussions and recommendations

CONCEPTUALLY, in function of a series of factors linked to objectives, the target group, the

applied management, geographic, but also social, juridical conditions and others, pedagogic farms may be developed on several directions, distinguishing a certain typology (table 1).

Table 1. Types of pedagogic farms

No.	Types of pedagogic farm	Short description
1.	Animation farm	Its main aim is to meet public with educational aims. These are especially animal farms situated near towns and meant to present the agricultural world to the town inhabitants. Therefore, it has a small agricultural production or not at all traded one. Standard example: the Farm from Paris from Bois de Vincennes.
2.	Agricultural exploitation	Some farmers - to continue their activities – open their exploitation structure to the public that may thus discover the animal husbandry environment or vegetal cultures, understanding the production, trade and environment problems. The farmer has as motivation to get supplementary revenues.
3.	Mixt educative farm	When the income from the farm is equivalent to the one of public reception, we speak about a mixt educational farm. This is especially when there is a hosting offer .
4.	Itinerant educative farm	It is a farm that shifts with animals in schools, retired homes, certain therapeutic units, recreation centers etc. The farmer proposes to describe the farm and his animals' history, the environment and nature, in general, by interactive workshops, stories etc. Adapted to the public to which he addresses. Some of these farms, preoccupied by animals' maximum comfort, limit shifting distances only to their region. But others travel by lorry (especially with young animals) on longer distances too.

The types of different pedagogic farms may function in different conditions, being approached certain activity directions and target groups that are described in synthesis in table 2.

Table 2. Target group and the approach organisatoric manner

No.	DIRECTION OF ACTION	SPECIFICATION
1.	In school context	During school program, visits at educational farms are submitted to the school director's approval, with financing from the budget. I.e., if visits are obligatory, they must be for free. Then they enter the educational project and must start a reinvestment in the class. It refers mainly to primary classes and kindergarten.
2.	Extra-curricular frame	The educational farm may receive minors too out of school periods in two situations: (a) in case of reception without accommodation, but an accreditation is necessary;. (b) in case of accommodation, they must be declared as holiday centers (camp type)
3.	Other public	The educational farm also receives non-scholar persons, as for example: families that practice ecotourism, group of retired persons, persons with disabilities etc.

PRAGMATICALLY, the proposed activities vary from a simple free visit to discovering a circuit. They must cover a variety of approaches: sensible ones, sensorial, scientific, creative, and ludic and allow education to be anchored in real and in concrete. The public may be just spectator or become an actor, learning for example how to transform milk in cheese or butter, or how to make bread, compost etc. There is also offered training: alimentary education, food hygiene, sustainable development (durable), and environment education.

There are educational farms for domestic animal breeding or more exotic animals, others may be oriented towards oyster breeding, pisciculture, sericulture or beekeeping, then others towards culture. There are also itinerant farms that present animations in the agricultural world by shifting in a school or in town markets.

This is, for example, the case of the well-known farm: „*La Ferme qui roule*” (ig. la ferme de Kerlavic). At the same time with the offer of these educational activities it is also offered a diary of pedagogic farms as well as promotional materials. Also as a pragmatic element we approach the problem regarding the insurance of health **and safety** in pedagogic farms. In this direction it is taken account of the fact that domestic animals (poultry, sheep, pigs, goats), but also dogs and cats, are potential carriers of many zoonosis. The contact animal-man needs certain hygienic precautions. For example there may be problems with *Escherichia coli* a destructive bacteria that may create health problems (being producer of *Shiga toxins*), or *Campylobacter spp.*, *Salmonella spp.* The hygiene recommendations for animals, places and users lead to a limitation of the risk of

transmission of the zoonotic agents during educational visits at the farms designed for urban population. The collaboration with the structures from the veterinary medicine field becomes obligatory.

3.1. The french model of the evolution of pedagogic farm development

The basic idea is to increase the link and knowledge in the relation Urban-Rural or Man-Nature in accelerate urbanization context in developed countries.

It is known the fact that France has been preoccupied by pedagogic farms for many decades, which may represent a beneficial example for Romania too. Thus, in the year 1994, there were about 350 educational farms organized in 22 networks, but their number has significantly increased since then. In the year 2007, in France there were approximately 1.400 educational farms gathered in 129 **departmental networks or relays**. The main networks are the „*Bienvenue à la ferme*” net (a brand of the Agriculture Chambers, more than 400 farms in 2012), then *CIVAM*, *GIFAE* (international groups of educational animation farms), „*The knowledge seeds*” net (net of pedagogic farms from public agricultural pedagogic farms), the „*Accueil paysan*” (*farmers’ hospitality*) and others.

To be added at these **local networks** that are NOT included in any national net, but that offer their members educational instruments, instruction and insure relations with authorities and sometimes promotion, contributing to raise of life quality in local communities. Organizationally, „Networks” have founded a control and approval commission, so that educational farms are subject to ***control and approval***. But there are also almost 15 % from educational farms that have not joined any network, but that are ***pedagogically evaluated***. In Europe there already exists an association, namely: the European Federation of City Farms that reunites agricultural educational farms for townsmen’s children in Europe.

4. INSTEAD OF CONCLUSIONS – eloquent images

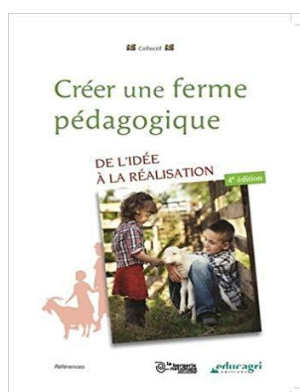
Essential in pedagogic farm activity is the ACCOMMODATION. Thus, these farms as a rule receive a school age public (especially from kindergarten of primary school). If initially that is how they have appeared, at present they have diversified so that there are also educational farms addressing high school students, families or public in difficulty.



Fig1. <https://www.tiniloo.com/blog/2017/06/top-10-des-fermes-pedagogiques-en-france/>



Fig. 2. *Original pictures*



This book is a real guide for those who wish to make their project of educational farm a reality, a structure that becomes now one of the main communication instruments for agriculture. There are analyzed different audiences and proposed a project methodology that may allow to achieve these ideas, step by step. In order to pass from project to achievement, there must be taken into consideration the regulations and rules in the field (from agriculture and education) and a series of technical, economic, juridical and educational conditions linked to this démarche.

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CALORIC ANALYSIS OF THE WOOD BIOMASS FROM SOFTWOOD SPECIES

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Abstract: In the hereby work, it is shown the importance of the renewable power resources that represent one of the options for the replacement of the fossil fuels in our country and worldwide with a future long- range development. It is taken in consideration, at the national level, the mobilization of all the efforts to introduce and implement the renewable power sources. Biomass is plant or animal material used for energy production (electricity or heat), or in various industrial processes as raw material for a range of products. It can be purposely grown energy crops wood or forest residues, waste from food crops, horticulture (yard waste), food processing, animal farming (manure, rich in nitrogen and phosphorus), or human waste from sewage plants.

Keywords: fir, calorimetric bomb, calorific value, energy density

1. Introduction

The renewable power resources represent one of the options for the replacement of the fossil fuels in our country and worldwide. In Romania, it is forecast an energy consumption of 34.9 millions of tons (millions of tons petroleum equivalent) until 2025. One of the main current strategic directions, that Romania has to put into practice, lies in the mobilization of all the efforts to introduce and implement the renewable power sources.

In comparison with other fossil fuels (coal, petroleum), the biomass is outspread everywhere and can be found under different forms (wood, wood species, agricultural species, waste). Each country on this planet has the obligation to take over the green energy from biomass. Currently, a significant part of the power used by mankind is made out of fossil fuels. At the legislative level, the implementation of the alternative sources use in order to obtain the power has developed a lot.

During the Kyoto Protocol, a policy for the significant decrease of the gas emissions was enacted. According to the studies of the International Energy Agency, in the following years, it will be noticed a high- order increase in terms of the fuel quantity, that is exported from the Middle East.

The biggest danger during the process of using the fossil fuels is held by the harmful emissions that are discharged in the atmosphere.

The extraction, processing and use of the fossil fuels release in the atmosphere approx. 98% of the total carbon dioxide quantity. This issue has a negative influence upon the evolution of the live microorganisms and human life.

The significance of using the wood biomass in the heat achievement field is due to the fact that the wood biomass is an ecological matter and the carbon dioxide emissions are neuter during the burning process.

The exploitation of the wood and wooden products can allow the assurance of an energy potential for dwelling houses by the use of the green energy.

2. Materials and method

The evaluation of the caloric power for the wood biomass from the coniferous trees is almost similar to the one of the coal.

The equipment used to find out the caloric power of the wood biomass from the coniferous trees is the explosive burning XRY-1C type calorimeter, manufactured by Shanghai Changji Geological Institute from China (fig.1).



Fig.1. Calorimetric bomb

The method of evaluating the caloric power of the wooden material is referring, first of all, to the putting in readiness of the raw material and equipment and then to specific assessment and in the end, to the achievement of the final result. The preparation of the wooden material in order to be verified implies the extraction of a small

part, having the dimension of approx. 0.6- 0.8 g. from the entire material. The sample is weighted with a margin of 0.0002 g.

The sample must be clean, from freshly- cut wood because the old wood does not have all the volatile and inflammable substances, which might influence its caloric power. This sample is put into a porcelain melting pot and is driven into a laboratory stove, within the aim of drying it, at a temperature of 105 °C.

The achievement of the anhydrous status of the wooden material is checked through successive weightings until the difference between two successive weightings is smaller than the double of the weighting margin or for the specific part, by overlay for at least 2 hours of keeping the sample in the stove. After drying, the samples are kept in the dessicator for cooling, keeping unchanged the humidity content, until being driven in the calorimetric bomb.

The stages for the assessment of the lower and higher caloric power are mentioned in fig. 2.

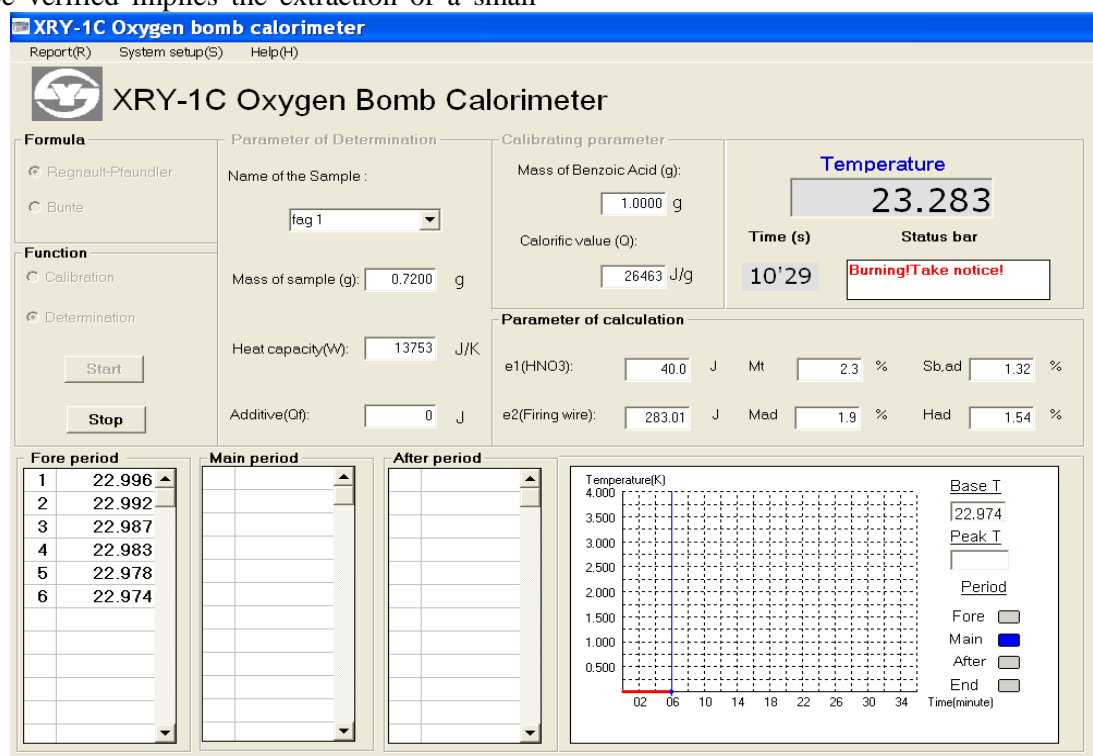


Fig. 2. Description of the process to assess the caloric power

The final result of the wood biomass burning is asserted by the caloric power, a term by which it is understood the quantity of heat achieved while burning the mass unit.

For the fuel materials with a high content of water and hydrogen, such as the wood biomass, one can distinguish between two types of caloric powers, i.e. the higher caloric power and the lower caloric power.

The higher caloric power is assessed directly by the calorimetric bomb, where the water vapours built-up by the combustion of the hydrogen from the wood as well as the ones built-up by the water decomposition are condensed into the container of the bomb, releasing approx. 2510.4 kJ (600 kcal) for each kg of condensed water vapours (the so- called condensation heat).

The computation ratio for the assessment of the higher caloric power is shown below:

$$PCS_s = k \cdot \left(\frac{(t_f - t_i)}{m_l} \right) - q_s - q_b \text{ [kJ/kg]}$$

where:

k- calorimetric parameter, in kJ/degree

tf- final temperature, in degrees

ti- initial temperature, in degrees

ml- wood mass, in kg

qs- spent heat for the burning of the copper nickel wire, in kJ

qb- heat achieved by the burning of the cotton wire, in kJ.

For the fir, at U= 0%, m= 0.6800 g, higher caloric power= 19117 kJ/kg, lower caloric power= 18622 kJ/kg, energy density= 13.380 kJ/cm³, burning speed= 589 kJ/min, at U= 10%, m= 1.0494 g, higher caloric power= 17081 kJ/kg, lower caloric power= 16883 kJ/kg, energy density= 12.730 kJ/kg, burning speed= 398 kJ/min, at U= 20%, m= 1.0536 g, higher caloric power= 15293 kJ/kg, lower caloric power= 14897 kJ/kg, energy density= 12.643 kJ/cm³, burning speed= 322 kJ/min, at U=50%, higher caloric power= 9929 kJ/kg, lower caloric power= 8939 kJ/kg, energy density= 8.496 kJ/cm³, burning speed= 215 kJ/min.

The variation of the energy density for the fir is shown in fig.3.

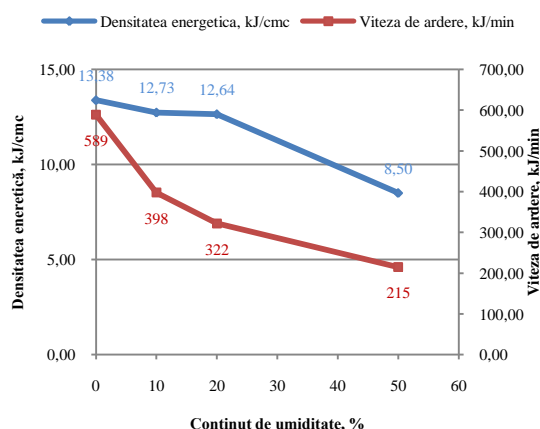


Fig. 3. The variation of the energy density for the fir

Conclusions

The need to assure the heat during the winter season is a meaningful issue of the humankind existence;

The accessibility of the population to the fuels that are needed to assure the daily energy, becomes significant in terms of logistics and financial level;

The wood biomass will remain a fuel material with a high level of interest in the people's life.

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SYNTHESIS OF MAIN THEORETICAL AND PRACTICAL ELEMENTS OF BIOHARMONISM VISION

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Abstract: *It is schematically and in synthesis presented the Theory of Bio-Harmonism and its application in the politic field, namely the Bioharmonist Ideology. In the study it is being pursued that, by essential rendering of things to lay the foundation of understanding another angle of approaching today reality, respectively through the specificity of the bioharmonism vision. There are presented newness elements of the new paradigm, of the afferent ideas and applications. There are specified the objectives of this approach, the definition of basic notions, the types of pragmatic action, as well as basic principles. There are analyzed and exemplified a series of concrete activities to follow, keeping in mind the most important themes to make public policies in the 21st century society.*

Keywords: *bioharmonism, ideology, paradigm, policy, society.*

1. Introduction

The In order to clarify the bioharmonism vision we will start from a series of questions that we ask ourselves concerning the relation between today reality and the new vision (in a schematic presentation).

1.1. Understanding the new manner to approach reality

BIOHARMONISM is a theory based on a series of concepts referring to how to put the humanity's creation (that has reached a crossroads) in agreement and in a new order with „the planetary model”, by reorientation towards a NEW socio-economic and cultural MODEL, taking the Living („bios”) and Life as marks in their understanding on the basis of Complexity ideas, i.e. in relation to Nature's non-linear model.

All these are approached by a perpetually dynamic reorganization of information and of harmonization based on methods and means of systemic reorganization by „fractal and integronic models”, with tendency towards efficacy and dynamic balance. The pragmatic aim is to prepare the understanding and achievement of the Knowledge Society on a first stage and, on long term, the transition towards the Conscience Society.

➤ How to regard the present reality through the Theory of Bio-Harmonism ?

- taking Nature's non-linearity as a model, it being deeply hierarchized and unequal, but at the level of a „whole” being in fact in perfectly harmonized dynamic balance, offering favorable conditions to life existence, as well as continuous development of the living and intelligence emergency;

- to rethink the societal model it is first necessary to remediate today's disequilibrium and failings, which makes necessary to change the paradigm required to solve the world's disharmonies by another organization of priorities, as well as by new methods and techniques with „bioharmonization effect” of human society components.

➤ What is bioharmonized in essence?

- theoretically it is pursued a principled reorganization of the existential Triade (Substance-Energy-Information), omnipresent in the existence of all phenomena, things and processes, taking as a mark the Living and Life as a whole with the existing resources, Triade that we perceive and retrieve in infinite forms as a reality of the present, but wrongly interpreted in human actions (including political ones) over time.

- practically a new approach and reorganization of the societal model is pursued, an economic and technologic reorientation and another cultural level, demarche based on the harmonization of the three spheres that govern Terra: Economy, Society, Environment, having as a mark the present disharmonies diagnosis (and to a great extent the failure of present policy).

➤ What does bioarmonization consist of?

- making new socio-economic and cultural multiply integrated models, that are essentially based on balanced organized relations, i.e. there are put in accordance fragmentary elements of Reality by common or special analyses and synthesis methods (that take into account the harmonized inflexion between fractal and integronic), in relation to the existential Triade that is the basis and mark of the new concept. We are referring to „Information (I)” (as structural information), that we discover to be omnipresent in today reality complex systems and that may be realized at another level, through bioharmonism, as energetic expression or as substance (matter).

[N.B.: Fractal: a fractal („broken”, „fractured”) is a fragmented or broken geometric figure that may be divided in parts, so that every one of these parts may be (at least approximately) a miniature copy of the whole; it represents a deep process of analyses in complex systems (v. Fractal analyses). Integronics: it is the science of system coexistence, based on the General Theory of Integration, that studies processes of integration and their composing elements, respectively integrated systems; methodologically the process practically represents an aggregation manner, of synthesis, through a flow of multiple, successive and in diverse combination integrations (sometimes of disintegrations), that, in special conditions (syncretic, synchronic, synergic) lead to emergent effects, with the emergence of the new of a superior order.]

1.2. Elements of thoretic newness of the concept

THE AWARENESS AND EXPRESSIN OF THE NEW REALITY MODEL presuppose a new conceptual approach manner, respectively to elaborate a demarche that sums up a multiple knowledge that is to be found in the zone of **harmonized inflexion between analyses and synthesis**, (as for example between *fragmentation* and *aggregation*, respectively between : „fractal” and „integronic”), aiming to basic elements in approaching reality, i.e.: (a) the existential Triade and (b) the Triade of the spheres that govern the world.

(a) – **Concerning the existential Triade:** We refer to the fact that, in the present approach to

reality, mankind first sees what Matter is (everything material around us), therefore Substance (S) is perceived. Then people little by little begin to know aspects linked to Energy (E) and lately they begin to understand Information (I), the present order being: Substance (Matter, at the basis) - Energy - Information [S-E-I].

The new vision OVERTURNS this order, in the sense that “everything is Information”, so that Energy may be considered a restructuration or „condensation” of Information, and Matter as a „super condensation” (we are referring to models of structured information, respectively to a series of aspects sustained by mathematical and astrophysical models from Einstein to Hawking and others), in the new approach order being: Information (as a basis) - Energy - Substance [I-E-S].

(b) – **Concerning the spheres of Terra governess:** The Theory of Bio-Harmonism **applies mechanisms of overturning the societal pyramid**, i.e. OVERTURNING consecrated structures of today reality. We speak about the present model that has Economy in the foreground (Ec), with systemic imbalances caused by big consumption of natural and social resources (amalgam given by *pollution*, by *income polarization etc.*), but which, even imbalanced, sustains Society (So). In the end, unfortunately left in derisory, there are also aspects regarding Environment. The Triade order in the present model is: Economy-Society-Environment [Ec-So-E], in “**linear**” **interpretation (of cause-effect type)**.

The new vision (the bioharmonist model) OVERTURNS the pyramid and brings in foreground ENVIRONMENT, with potential of *resource bioharmonization in relation to development*, in order to sustain human SOCIETY in balance, without resource consumption of generations to come, and in the final to sustain ECONOMY in an optimized way, i.e. sustainable development generally accepted by the world’s governments.

We refer to sustaining a new order by natural and social resources (*including human resource quality and, implicitly, the cultural component*), a new order, namely: Environment-Society-Economy [E-So-Ec], in a “**non-linear**” **interpretation** as everything is in Nature, but also in Society (*of quantic, fractal, constructal etc. type, based on the Complexity Sciences*).

1.3. Basic objectives of the theory of bioharmonism

Without entering into details, we consider it useful to have three more important objectives in view:

(1). **Establishing principles and methodologic achievement** of certain optimized and harmonized managerial, socio-cultural and economic models, that in essence reflect the actual transition of the „biological-informational” society and the knowledge accumulation (multidisciplinary, holism, border sciences - biotechnology, bioeconomy and others - , applications in the revolution of *Industrial 4.0* type, but also „Ethic multiculturalism,, and „Bioharmonist globalization”), therefore transition towards the direction of understanding and applying elements specific to the *Knowledge Society*.

(2). **Polyvalent and concentrated action against the disharmony of the present reality**, of the imbalance, by dismantling perturbing factors and finding solutions for dynamic balance of complex systems of economic, social, cultural and moral type, in relation to Nature model, to biologic and cultural diversity, at planetary, regional and local level, in specific to the 21st century conditions and interests.

(3). **Finding balance elements of the human essence** by the reconceptualization of the adaptation, evolution, high human quality education idea, by putting into concordance and by „resuscitation” humanity values severely affected in many parts of the world (honesty, common sense, meritocracy, honor, the social role of the family, man’s individual rights and liberties, mentality, spirituality etc.), by a harmonization process of the existential Triade and of permanent perfection through knowledge.

2. Definition of basic notions and action typology in the vision of bioharmonism

BIOHARMONISM is in essence an **informational restructuration that conceptually resets man and society**. MAN can direct himself towards *a superior level of conscience*, and SOCIETY may institutionally change (beyond current technological and legislative change), so that bioharmonist vision may really open the way towards *change of institutional culture*. In a pragmatic light, in the last analysis, we speak about an innovative approach through **bioharmonist doctrine and ideology**.

BIOHARMONISM DOCTRINE

- It represents the application of the integratory theory of present reality, with its ideas, theses and principles, that reflect the harmonized and complex model of Nature, Living and Life in its complexity, as political, scientific (intense and thorough one) and religious system, that expresses **nonlinear** reality, strongly **hierarchic**, dynamic and adaptable, respectively the totality of principles as typology on the general direction of liberal-moderate reformism, necessary to understand and in a first stage achieve the *Knowledge society* and, on long term, the transition towards the *Conscience Society*.

THE BIOHARMONIST IDEOLOGY

- It represents the totality of balanced concepts and contrary to doctrinaire extremisms multidisciplinary ones, ideas that develop a socio-economic and info-cultural system after the harmonized and complex model of Nature, Living and Life, model sustained by the interests and aspirations of the social group that desires a coagulated and integrated policy regarding society organization and lead, in the rationality of progressive and reformist liberal democracy, with **moderate center-right** positioning, with harmonization of the flows of the ontic Triade and the societal model structures, having as emergent result the stimulation of knowledge and growth of economic efficiency correlated with systemic efficacy, at local, regional and world level.

TYPOLGY OF IDEOLOGIC ACTIONS

- **ECONOMIC BIOHARMONIZATION** (bioeconomy, industries and circular economy, green economy, blue economy etc.).
- **EDUCATIONAL BIOHARMONIZATION** (the essential disharmony of our days being educational polarization, it is necessary a mass domestication, a re-literacy of 21st century, on the knowledge line).
- **CULTURAL-SCIENTIFIC BIOHARMONIZATION** (taking also into account the principles of the Knowledge Society).
- **LEGAL AND MORAL BIOHARMONIZATION** (a new constitution, State law, European liberties and values etc.).

- **SOCIAL BIOHARMONIZATION**
(demography, family, active solidarity etc.)

3. Work methods used in the implementation of the bioharmonism vision

Without entering into details and bibliographic indications, we will just make an exhaustive enumeration of its methodology and components with which the bioharmonist concept and ideology concretely operate:

- diagnoses;
- prognoses;
- RE-gnosis technique, i.e. to look from „the future” backwards and not to look „towards the future” through PRO-gnosis classical techniques;
- statistic processing;
- forecast management methods / after conception: extrapolation, comparison and reflection methods; operative methods: plan, budgets, projects, objective etc.);
- management methods / after the pursued objective: optimization, impact, creativity stimulation and others;
- multidisciplinary processing by: analyses, syntheses, comparisons, extrapolations, logical combinations, connections between diverse paradigms;
- eco-energetic analyses (eMergetics);
- methodological applications of the Complexity sciences (analyses and processing by approach of fractal geometry, of quantic physics, of psychology and neurosciences);
- harmonization techniques: consideration, reconsideration or alignment to theories, principles, laws, regulations, norms; improvement, yields proportionalities;
- numeric optimization methods (mathematical and informatics methods, especially for nonlinear optimization).
- methods of systemic bioharmonization through computer programs.

4. Applications of the new paradigm: the bioharmonist ideology

The bioharmonist ideology is the support of the world pass from the stage of developing society to a super-developed society (as we know, the world states being in different stages of this transition). The bioharmonism vision may be practically applied in all fields of activity from which we are enumerating the most important ones:

- Economic bioharmonism - (ex.: bioeconomy);
- Technologic bioharmonism - (ex.: Industry 4.0, biotechnologies, digitalization and others);
- The bioharmonism of applied biology branches (ex.: medicine, agriculture, food, forestry etc. with their modern forms);
- Social bioharmonism (ex.: education, cultural diversity, social harmonization and others);
- Ecologic bioharmonism (ex.: biosphere model, biodiversity, bio-geo-chemical cycles of the planetary ecosystem and others)
- Political bioharmonism = bioharmonist doctrine and ideology.

SPECIFIC DIRECTIONS OF ACTION

little by little towards a world where the societal model based on bioharmonist principles is also refund:

(1). **Technologic reorientation** on „sustainability” idea (more precisely: the environment sustains the human activity, on the basis of available resources), resulting a systemic dynamic balance that prejudices the future generation interests, but covers the demand and contemporary development.

(2). **Achievement of quality products**, as for example by achieving „eco-health generating products” (alimentary and non-alimentary products; „products for man’s health and wellbeing, in harmony with nature”)

(3). **Reformed education** for a new world, of transition towards the *Knowledge Society*, i.e. another humanity evolution step, with the construction of the *socio-economic and cultural model*” based on knowledge and analyses of **nonlinear** reality.

(4). **Improvement of the civilisation degree and spiritual level** of transition towards the *Knowledge Society*; the transition towards another understanding level of the world and life: a philosophical touch based on bioharmonism (material and spiritual), namely: „*Biosophy*”.

4.1. Causality and aim of the bioharmonist ideology

THE BIOHARMONIST POLICY holistically examines and achieves a new socio-economic and info-cultural model (in short named „societal model”). The model materialization imposes legislative projects that aim to eliminate obstacles out of the development way, in idea to guarantee the dynamic balance between Environment, Society and Economy. There will be possible to

achieve this wish taking into account cultural and democratic values, liberty and human rights (as known elements of policy), at which there will be added mechanisms of optimization, balance and re-balance of *disharmonies in society*^{*)}, of multiple integration and yield and economic efficiency improvement in direct relation with systemic efficacy and sustainability, with natural resources, with living beings biodiversity and health and especially of the human population, as well as with *biogeochemical cycles* of the planetary ecosystem.

*) Examples of lacks of the present societal model:

- **Disharmony with Nature** / with „The Living planet”; Pollution; Climate Changes; Disharmony with natural resources; Disharmony of genetic resources etc.;

- **Demographic disharmony**, complicated problem today, especially with globalization unresolved aspects;

- **Economic disharmony**, with different shades (especially post-pandemic);

- **Social disharmony**, transition and adaptation at a new world, of stimulation of the improvement of the living standard, concomitantly with attenuation of social polarization;

- **Educational disharmony** – the digital, technological and cultural gap becomes a major obstacle in „knowledge” (education precariousness is also a limitative factor in the awareness and application of the societal mode based on bioharmonism);

- **Political disharmony** – quasi generalized disorientation (doctrinaire „hunger” of the present) etc.

In the case of our country ANOTHER TYPE OF POLICY is urgently necessary, taking into account the *failure of Romanian politics in the last 30 years* (example of Eurostat, Rosstat, 2018 statistics):

- emigration of about 4-5 million Romanians;

- perinatal mortality in Romania is on average 9 ‰ to occidental countries, where it is on average 2 ‰

- school abandon in proportion of 16-17 % to the European average about 10 %;

- the living standard by the existence of the toilet in the yard: 27, 7 % in Romania to under 1 % in European developed countries (!);

- the lack of economic development, given by the reduced level of investment in all fields (on average 2, 5-3 % from GDP in the last years), to the average of developed countries,

about 4-5 %), not to speak about concrete figures (taking into account that the weight is calculated from GDP, and Germany, for example, has a GDP of about 4000 billion dollars, and Romania of about 240 billion dollars);

- the Romanian political mess led to the fact that in most of the statistics Romania is situated on the last places etc.

In conclusion: **bioharmonist ideology** is one of the solutions of **another kind of policy**, especially after the COVID 19 pandemic, its specificity being detailed in the following.

4.2. Positioning on the political exchequer and bioharmonism ideology principles

The bioharmonism vision in relation to the political decision has a well-argued positioning on a specific corridor, so that bioharmonist ideology is constituted as a *moderate centre-right ideology*.

Argumentation in 3 steps of the positioning:

(1)- Why in the liberal right zone and not in the left socialist one?

Because the „Living planet” model means fight for existence between species, competition, ranking, and at the human species: initiative, liberty of action, accumulation of wealth etc., i.e. „liberalism”, therefore THE RIGHT ZONE (and not equality, centralism, distribution of wealth etc., i.e. „socialism” from the left zone).

(2)- Why isn't it a center or of the „green” ideology?

Because a center policy with contradictory theses and specificity of null result is ineffective, with a development in a reduced or stagnant speed, with a baffling policy of „hinge” type. On the other hand, neither the green policy is embraced, as it slides towards extremisms with no economic logic and, as a rule, with utopic left ideas, but there are adopted the progressive ideas of the „reformed ecologies”, that passes from ecologist mythology to post-truth, then to the „Complexity” revelation and to an ethic consolidation of the political dynamics.

(3)- Why „moderate center-right” and not aggressive center-right or classic right?

Because the *Living planet* model is a **nonlinear** system with tendencies of **equilibrium** condition: *the dynamic equilibrium* (planetary

georezy) and with moments of *optimum balance* (planetary geostazy), i.e. a model on which bioharmonism folds and respectively the afferent societal model, harmonization presupposing dynamic balances. There is in fact avoided „compulsion” on profit problems, on large consumption of resources, on differences and

ranking many times beyond normal ethics. Bioharmonic policy has mechanisms to counteract the previously mentioned lacks, which confers its solid positioning on the moderate center-right corridor.

STRUCTURAL COMPONENT OF THE BIOHARMONIST IDEOLOGY

comprises the complementarity between **ethic liberalism** (progressist and reformist, of moderate touch), as ideatic bases and **reformed ecologism** (of balanced-centrist touch), interconnected as weight after Pareto's principle in 80%-20 % proportion.

Principles and basic directions in political actions based on bioharmonic ideology:

BASIC PRINCIPLES

- (1) **The principle of liberty and creativity defense**
– centered on the liberty to innovate, which assures the humanity existence on long term by „knowledge”;
- (2) **The principle of the right to education and universal access to information;**
- (3) **The principle of sustainable development and societal harmonization by achieving dynamic economic and social balances and active policies;**
- (4) **The principle of Life and Environment protection, with natural, material, financial and human resource harmonization,** on local, regional and global plan;
- (5) **The principle of salvation and harmonization of biologic and cultural diversity,** (that has today as a specificity a demographic „semi-controlled” non- homogeneous and dynamic policy / ex.: migration, globalization with ethic deficiencies etc.);
- (6) **The principle of complementarities** with the values of progressive liberal and neoliberal democracy;
- (7) **The principle regarding the improvement of professional and moral quality of the human resource,** with emphasis on educational stimulation, respectively on performance capacity, discernment, tolerance, respect, meritocracy;

5. Directions of action and approached themes in order to launch public policies

From the multitude of directions and themes, we consider to be essential three operational pillars in the bio-harmonic policy, with

„concomitant functionality”, respectively ECONOMIC activities based on adequate MANAGEMENT and on EDUCATION with a thoroughgoing study of the idea of „knowledge”, of ethics and, implicitly of professionalism.

- (1) - **ECONOMY** (with its doctrines / ex. bioeconomy) is the practical basis to sustain bioharmonism. The economic doctrine with in-depth and detailed *analyses* of economic reality, so that to highlight „(bio)harmonized relations” in a new model, solutions linked to: - systemic yield and efficacy; - technologic optimization; - economic efficiency; - active social balance; - differentiated, ethic and equitable globalization etc.; As it has been specified, a component of the economic doctrine is BIOECONOMY that draws the attention upon severe disequilibrium and the effects of systemic entropy that “standard” capitalist economy produces, to which „retouches” are imposed for survival, respectively harmonization and major rebalances between the offer of natural resources, technologic reorientation and disposal of its social impact, all of them in relation to yield, economic efficiency and especially with sustainability, respectively with (eco)systemic efficacy.
- (2) - **MANAGEMENT** organizational and political reoriented in the sense of *syntheses* based on holist valences, so that the economic & social system may be managed as a

balanced and bioharmonised „whole” (i.e. in „*syncretic + synchronic + synergic*” optimized and complementary conditions, with *emergent effect*), in the sense of the apparition of a „new” of a superior order, respectively **the pyramid of the sustainable model** to become operational in the future decades. This model is characterized by the fact that it has *the Environment and bioresources* as basis, that rationally sustain *Economy* and, by data automatic processing, a „bioharmonised management” may unroll, that will pilot the system by objective information that are the basis of taking correct decisions.

- (3) - **EDUCATION** necessary to improve the quality of the human resource and professional training adapted to a society based on **knowledge**, by the following elements:
- **KNOWLEDGE DEVELOPMENT** and exchange of knowledge, on principles of humanity values and of the present Reality (the „Living planet” model, of the „metabolic” society);
 - Education will focus on continuous innovation, i.e. **LONG LIFE LEARNING (LLL)** is necessary;
 - **DIVERSIFICATION OF FORMS OF EDUCATION** is due to many modern sources of information, having also a valence result with that education should have the after school dimension too;
 - **EASY ACCESS TO EDUCATION** to acquire a **new level of understanding**, as knowledge is „*information with understanding*” and „*information that acts*”, which presupposes democratization of information, of communication, of financing and cooperation.
 - **NEW PERSPECTIVE OF HUMAN RESOURCE FORMATION** by gradual transition towards a superior formation and information level. In short, the new education approach imposes the change of the present model in which there is observed the existence of a certain structural and of mentality „*ossification*” of a large part of the teaching staff and a *curriculum* too much broken from real economy. Thus, in the future decades **BIOHARMONIST EDUCATION** may impose a new order that will have *national and European economy demands and the resource necessary* in the foreground, with support through bioharmonisation mechanisms (legal, financial, curricular, joining theory to practice etc.) of the transposition into practice of a new education concept, adapted to the 21st century demands (with adaptations towards the quantic, fractal, constructal vision, a real „complexity” understanding etc.).

• Applications on themes of interest in public policies based on the bioharmonist ideology

The BIOHARMONIST POLICY may sustain the new societal models by specific **legislative projects** that as a rule aim the general interest, eliminating at the same time obstacles out of the development way. It is envisaged the idea to guarantee the balance between *Environment, Society and Economy*, taking into account cultural and democratic values, liberty and human rights, as well as a high sustainability level in relation to natural resources, to biodiversity and living being health and especially the human population's one. The theme is vast, that is why we will exemplify several zones of interest, in the following:

- **EDUCATION AS PRIORITY.** It is pursued to reform the educational system and it is boosted (not in words, but in facts) the accumulation, processing and utilization of „knowledge” on multiple plans, which is essential in the present

transition towards the Knowledge Society (see also the theses concerning „Knowledge Europe”); (Obs.: We must be realistic and specify that the education level is in fact a *major limitative factor* in a rapid adoption of the bioharmonist ideology.)

- **WEALTH ACHIEVEMENT** in conditions of sustainability and moderate and balanced liberal democracy (harmonization between resources, demography and climate changes at local, national and global level);

- **APPLICATION OF BIOHARMONIST MODEL IN ECONOMY** inspired from the „*Living planet*” model in all reality landings, based on digitalization and bioeconomic model (in industry, agriculture, energy, etc.; including the social impact: connections and active networks; achievement of legislative projects that aim to apply the principles of sustainable development etc.);

- **POLICY REGARDING RESOURCES.** Support of human society models by optimization of utilization of all resource types (material, financial etc.) and orientation of actions towards protecting the living

(biodiversity), but also natural resource conservation and regeneration;

- STATE REFORM. For countries such as Romania too, there is necessary a constitutional reform and harmonization of equilibriums between powers, between environment and economy, between environment and society, as well as boosting of harmonization in the democracy zone: liberty, civic, meritocracy, decentralization and debureaucratization.

Conclusions

1. If „few people have reality imagination” (J.W.Goethe), because „everything they have known was but shadows of the reality” (D.Mirahorian), then let’s unite in „mind and senses” (A.Mureșanu) so that, being more powerful, „we may go together” (Papa Francisc) to decipher „the most beautiful thing we may experiment: mystery” (A.Einstein), the hidden world mystery regarding universal equilibrium and harmony. The vehicle built by the afferent theory and ideology regarding bioharmonism vision (R.Gruia) may lead us towards understanding the reality of the present and future world.

2. The bioharmonist ideology shapes a moderate center-right ideological specter, in order to counteract today’s world disharmonies and find solutions to maintain Society and the Environment in a dynamic balance both at local level and at regional or global one. The new demarche is an expression of the biology & informational post-industrial society from the Digital Era that is looking for as coherent as possible political decisions, correct and honest ones, to achieve a socio-economic and cultural model of systemic convergence in a period in which the speed of world change is bigger and bigger. It is only education and „knowledge” that may “curb” disequilibrium that more and more threaten society and environment (see the potential crises regarding food and health, climate changes, uncontrolled migration etc.). Practically, the bioharmonisation principles and processes become basic mechanisms for decision elaboration, and the bioharmonist ideology becomes a reference component for public policies.

Selective bibliography



The Theory of Bio-Harmonism has the valence to imagine a positive scenario from a new perspective, capable to contribute to the creation of the Knowledge Society. Practically it is a new theory, necessary in order to bring things on the path of the balanced and harmonized, in the *Living planet* constants and model and of its natural cycles. In essence it is an economic and sociocultural model, an adapted paradigm for the 3rd Millennium world, of the Biologic Revolution from the Informational Era. All these emerge from the demarche of the First part of this book.

We find the theory applications in all the aspects of the perceived Reality, but because the political field is by far the most influent and with a strong impact upon humanity evolution, in the 2nd Part of the book *Bioharmonist Ideology* is analyzed.



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The Bioharmonist Ideology is a polyvalent ideology, with moderate center-right attitude, that may be a „seed” for an honest, balanced and efficient policy, but also a „vehicle” that aims to accomplish the Knowledge Society. The ideological demarche consists of the totality of concepts that develop a socio-economic and info-cultural system after the harmonized model of large complexity of Nature, Living and Biologic & Informational Life. It is an ideological model that builds a „coagulated” and integrated policy concerning society organization and lead, in the rationality of progressive and ethic liberal democracy and of the reformed ecologies, harmonizing socio-economic flows with bio-geo-chemical cycles and interconnections of different types of resources.

It is marked out the fact that *bioharmonist ideology* has the vocation to shape an integrated concept and a manner of action that ideally resets man and society. *Man* can direct towards a superior conscience level and *society* may institutionally change, respectively, beyond technologic and legislative change, the path towards the change of institutional culture is opened.

SPECIES APPLYING BIOHARMONIST PRINCIPLES TO A RENEWAL POLICY

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Abstract: The paper proposes to ideationally structure a new policy trajectory, adapted to present times marked by deep changes. The analyses is double arrowed, from general to particular, from simple to complex, from citizen to society, and backwards. There is made a short diagnoses of the present, as a realistic bases to establish certain new principles and notions that are analyzed in this direction, intending to widen the standard policy vision towards a distinct **Renewal Policy**. There is emphasized the importance of a new approach to nowadays society, especially characterized by the biologic revolution in convergence with the digital era, i.e. the present socio-economic and cultural model that does not have a coherent political expression. On the bases of the demarche of the Theory of Bioharmonism, the paper has as an objective to ideologically apply the theory to the innovating ideas of the Renewal Policy, as well as to structure a conceptual model of strategic political communication, for the present and, of course, for the future.

As an application, in the multidisciplinary themes regarding environment, agriculture and tourism (in short: „EcoAgriTourism”) we approach in fact a large part of the human society structure, in which it becomes more than necessary another conceptual and pragmatic understanding for a harmonized evolution of these aspects. The paper thus also describes a general frame for these three socio-economic dimensions aiming to enlarge the vision and approach for future solutions „well anchored” in the present reality and especially for the decades to come.

Keywords: bioharmonism, policy, renewal, strategy.

1. Introduction

Taking into consideration that during these present times there are all sorts of deep changes, to imagine alternative variants and solutions becomes not only opportune, but also compulsory. Societal polarization is accentuated in all directions, and older „illnesses” come back under severe forms (to see the right or left extreme, from racial hate to class hate). Therefore nowadays being more evident the world change from many points of view, in the context that up to now *Reality* has been fragmentarily understood, in the change equation, we consider that the big problem is ourselves, with mentality *stiffening* [1,3,9,22]. First of all, it is important to become aware of the idea, so that afterwards to have the availability to understand the world we are living in, and thus be prepared to differently understand the surrounding reality, as well as corresponding policies.

In the sense of all that has been mentioned, we may observe that there are a series of **objective** aspects, such as climate changes, the demographic or cultural ones, that are difficult to be controlled, but also **subjective** aspects with unpredictable effects, but that may be harmonized in many directions by innovating concepts and models, including of the socio-economic, political and geostrategic type. The phrases we hear refer to the ideas that „the world is changing”, „climate changes modify everything”, there will be „another word after the pandemic”, there is foreseen „another world order” etc., which more and more seriously induces the question: What policy will we have under the new conditions? Although problems are complicated, sometimes having the sensation not to understand the apparent „chaos”, we consider that any approach that proposes to solve the problem is allowed. One of these attempts is to **apply the principles of the bioharmonist**

theory and ideology for a new policy that aims renewal, trying to clarify our individual or collective „flounders”, but also hoping to get better and better decisions for society, which in essence constitutes our study **basic objective**. To add at this a series of *supplementary objectives*, as for example to establish new action notions, and especially principles and directions, with the declared intention to enlarge the standard political paradigm towards a distinct *innovating policy*, applicable in the present and future decades, that we have named in the vision of the European spirit: **RENEWAL POLICY**.

2. Short politico-civic diagnoses of the current society

Once entering the 21st century, there is generated another political and civic perspective

in which there becomes necessary to highlight ethical and moral landmarks that, in essence, are permanencies of the spiritual-human life, but that are rather „forgotten” in politics. There is little by little shaped a new ethic-moral profile specific to the today society major crossroads, in the new conditions created by the end of the year 1989 revolutions from the Center and East Europe.

A hypothetical answer to the above mentioned demand may be the ethic of moral values and virtues that we put in relation both with the new value indicators of the global social system and with moral faculties and virtues. Without pretending to exhaust the subject, we shape in table 1 a possible profile of ethics, moral values and virtues, on the basis of five coordinates [19].

Table 1. Ethic and moral profile of the present society

DIRECTION	TPOLOGY	SPECIFICATION
<i>Coordinate 1</i>	SYNCHRONIZATION OF SOCIAL CHANGES	- the changes following the conservative revolution crosstalk of the year 1989, as a consequence of widening inter-human contacts, of reforming norm internal systems, as well as the reforms of Pan-European and Northern-Atlantic institutions.
<i>Coordinate 2</i>	ATTENUATION OF CONTRASTS BETWEEN EAST AND WEST	- attenuation of cultural and of civilization contrasts between East and West, by coherent programs and actions.
<i>Coordinate 3</i>	REORIENTATION OF HUMAN LIFE	- life organization in being as compliant as possible with nature and with the human essence (from protecting mother and as harmoniously as possible children raising, to decisive fight against selfishness and socio-moral anomie, against free hedonism, against exposure of sophisms and “paralogisms”).
<i>Coordinate 4</i>	ETHIC RELATIONSHIP WITH SCIENTIFIC KNOWLEDGE	- ethic relationship with analytic epistemology in present philosophy of knowledge, within the context of the direction towards the Knowledge Society.
<i>Coordinate 5</i>	INTERTWINING POLITICS WITH MORALITY	- as a resulting convergence from the erosions produced by more or less intended manipulations and misinformation of today moral acts.

In the policy field, ethics and morality are the most acute aspects, noticing an accentuated degradation and a distancing from these values. No doubt the result is the need of political renewal beginning with ideas linked to ethics.

All these also within the context of the older preoccupations, because we shouldn't forget that the opinion in conformity with which ideas generate demands addressed to the public administration organs has been first formulated by Frank Fischer and John Forester and first applied in the process to establish a political agenda by Deborah Stone even since the end of the *80's.

In the vision elaborated by Stone, establishing the agenda usually presupposes to construct a

script about the **public problem causes** in discussion [4, 5].

Such a structured opinion comes in „collision” with the political motivation of individuals and groups, that do not really take into account the causes of the problem, or the demands towards the public administration, but it rather takes account of aspects of individual order. This fact leads us to the idea to begin our study analyses by **defining the individual political ambition**. Therefore, participation at political life, especially on behalf of those who are undecided or politically demotivated, has different causes and from here a „Gradation” of the political ambition, as well as a differentiation of the implication level. Political motivations and

ambitions are of course in a continuous dynamics, they are also linked to courage or determination, they are permanently modifying from a „degree” to another, or they may manifest in different combinations in time (table 2).

Table 2. *Analyses regarding the gradation of political motivation*

LEVEL OF POLITICAL AMBITION	TPOLOGY OF MOTIVATION	ORIENTATIVE DIRECTIONS OF POLITICAL INTEREST
1st degree ambitions – of total implication	Incisive, executive motivations (for example the party active)	- to have political functions; - to have administrative functions; - to have functions in organizations, institutions or state economic units.
2nd degree ambitions – permanent implication, with emphasis on „key” moments	Conceptual motivations, of counseling (party technocrats)	- to contribute to conceptual directions and to information and formation of the own party members, as well as to social communication by media means; - to contribute to the construction of public policies; - to contribute to the establishment and monitoring of <i>meritocratic criteria</i> necessary to objective selection for different aspects of the party life: local or central political functions, local or central administrative functions, functions specific to the executive (governmental ones), functions specific to national or European legislative etc.
3rd degree ambitions – partial implication, when needed	Civic motivation of coagulation of common ideas and interests platform and of political support (party members with civic spirit)	- to contribute as a member, by mechanisms of <i>participative democracy</i> , to find solutions and support optimal political decisions for the society segment (voters) loyal to values sustained by the party; - to be an image and persuasion vector in relation to society and voters at individual level (citizens ‘attraction and conviction).

Passing from the person level to the level of the social segment policy aimed by a certain policy, we note that a first fundamental element for a successful public policy is represented by a correct *definition* of the problem and *identification* of its *causes*, because all the subsequent run of the public policy process invariably depends on this moment. When we do not have a clear image about the problem, it is good to cause discussions with all implied potential actors (stakeholders), to analyze

available data (quantitative and qualitative ones). A poorly structured problem or whose causes have not been correctly traced may lead to a failure of the public policy [13, 16, 21, 24].

If we analyze the today world, simplifying things, we may in synthesis get to a DECALOGUE, inventorying a series of ascertainments, as objective premises that are at the bottom of supporting the structure of a policy of human society renewing, including of course the Romanian one too (table 3).

Table 3. *A decalogue of today world tendencies*

TENDENCY	SPECIFICATION
1st ascertainment:	<ul style="list-style-type: none"> At the moment mankind is at a crossroad: either it evolves (integration, harmonization), or it destroys itself (irreversible disharmonies, disintegration, decadence, final disaster).
2nd ascertainment:	<ul style="list-style-type: none"> Climate and biologic changes at planetary level, with impact upon biodiversity, health, food and drinking water, but also upon socio-economic models.
3rd ascertainment:	<ul style="list-style-type: none"> Massive demographic modifications at global and local level.
4th ascertainment :	<ul style="list-style-type: none"> Probably irreversible existence of the globalization process, complementary to the glocalization one.
5th ascertainment:	<ul style="list-style-type: none"> Informational explosion with specific dynamics of the digital era with society polarization between adapted and non-adapted ones (self-sufficient ones and unable to compulsory modifications in education, knowledge, technology, 4.0. Industry, artificial intelligence etc.).
6th ascertainment:	<ul style="list-style-type: none"> Increase of social uncertainty and poverty over relatively large areas (terrorism,

	crime, economic crises, unemployment, poor hygiene etc.).
7th ascertainment:	<ul style="list-style-type: none"> • Involution of political phenomenon and of afferent policies (politicians' value counter-selection, lack of vision etc.).
8th ascertainment :	<ul style="list-style-type: none"> • Theological exhaustion and need to „restart” religion and ecclesiastic culture, adapted to the 21st century (including organizational culture of religious institutions).
9th ascertainment:	<ul style="list-style-type: none"> • „Knowledge” (education, research) becomes a worldwide priority, with effects of irreversible cleavage of the world, but with precise target: edification of the Knowledge Society.
10th ascertainment:	<ul style="list-style-type: none"> • Civilization collision with a result in cultural and spiritual disorientation of the beginning of the 21st century, with „remodeling” self-consciousness and species consciousness (transition towards the Society of Consciousness).

Without having the pretention of an exhaustive approach, we will analyze some landmarks at the **level of society** that may give a general idea from which we start in the substantiation of a new policy: – identifying the target-group that will be affected by this policy, analyzing the main characteristics of this public and the relations between this group and public agents and private partners; – inventory of actions led by public authorities, analyses of coherence and connections between these ones, of conflicts of logics and interests between participating actors, study of previous evaluation analyses; – identification of the external environment effects upon the observed phenomena at the aimed population; – emphasis of major interactions between citizens, public authorities and external environment; – analyses of the public action relevance in the game of these mechanisms [2,6,17].

Continuing the diagnoses with simplified analyses **at individual level, as a citizen**, there may be observed his preoccupations and demands. In short, *defining the problem* shows the demands for which a (bona fide) citizen gives

his vote or, in other words, what concretely interests the citizen in relation to society. In many situations even empiric studies (as a rule forgotten by politicians) show that the CITIZEN is interested to have a job and money to be able to eat, to dress himself and decently live, to be able to raise and educate his children, then to feel safe from the point of view of his health and social environment (without crime), plus recreation and leisure (sports, tourism, social, cultural, spiritual events etc.) for an as normal as possible life.

As it is known, productive resources are rare, and **man's needs** are continuous and unlimited, which imposes to take into consideration „*the naturalness*” of daily life by the analyses of population's demands, especially in electoral context, i.e. when citizen's vote is requested. In other words, policy must first fulfill minimum demands, which unfortunately in too many cases has been neglected (!). The prioritization of the 8 elements frequently found among citizens' demands referring to life quality that should be taken into consideration in a **realistic and honest policy**, appear in the box below:

- | |
|---|
| <p>(1) JOB AND REMUNERATION /
 (2) FOOD / + level of food prices
 (3) EDUCATION / + raising children
 (4) HEALTH / + medical tariffs and drug problem
 (5) LIVING CONDITIONS / inhabitation, infrastructure etc. /
 (6) SOCIAL SECURITY / ex. Crime and others
 (7) RECREATION / tourism, sports,
 (8) LEISURE / culture, events and others</p> |
|---|

Realistically speaking, although too many politicians „forget” their promises from the electoral campaign, we still believe that one may *per total* get to a better world. In this idea, analyzing present reality, we observe that, as any other type of human aspiration, policy may be an ugly game: clan against clan, party against party, candidate against candidate, with falling

governments because of peddling reasons etc. Desire for power in the general interest in from today conditions inhibits the desire to practice policy, which has in a large extent led to a counter selection and, from here, to the „present crises of political leadership” [5,20]. It is even worse when the precarity of politics superposes over the complexity of reality. For example, the

cruel reality shows us that in today world *death* is a permanent visitor. A virus, a bacterium, a parasite, drought and hunger, floods, plus soldiers and mercenaries may bring it any time and to anybody, especially when from the „shadow” decide characters guided by a policy of mean group interests and lack of honesty to population (i.e. for the most part the politics of the present). It becomes clearer and clearer that in any society values count, but it depends what values we speak about. There are values that create and perpetuate poverty and tyranny, oppression of certain categories of population (as for example women in the Islamic area), in counterweight with Euro-Atlantic values for example (to a large extent). Starting from these aspects naivety becomes counterproductive, but hope does not. Transition towards a modern society is extremely difficult, being a permanent fight against the „old” part within or outside us. Education becomes fundamental for ourselves, and the new doctrinaire and ideological concepts based on coherent ideas and values become essential for society and for afferent political decisions. It is true that an open society is vulnerable, but it is stubborn to support *safety and freedom*. The freedom to think is a right and a practice in a culturally and democratically evolved world. As we have already previously mentioned, **AN OPEN WORD BEGINS WITH AN OPEN MIND**, and the open mind is the resultant of an education in-depth and of knowledge. Only thus people will have the capacity to understand ideas and values and then the discernment capacity. For eloquence we give only two examples. For instance, beyond being claimed, *liberty of expression* becomes fundamental in a „new policy” of a really democratic and honest society (in antitheses, see the „saying”: „*In Russia we guarantee freedom of expression, but not freedom after expression too*”). Likewise *meritocracy* must not only be claimed but, in an „otherwise policy” there must be created mechanisms and objective criteria of implementation. That is why we consider it opportune to „open our mind”, i.e. to impose ourselves as an **objective** to apply the principles of the **bioharmonic ideology** towards what we have previously named the **RENEWAL POLICY**.

2.1. Establishment of models and principles in renewal policy

From the behavior necessary to a new policy one passes to an effective construction of principles, rules, methods, structures, the

functional system that shapes the new policy. Both to formulate the policy and to apply it will imply more participants, with different manners to understand the problem that policy is trying to solve with pre-established objectives too. The execution represents the phase of the policy process through which objectives must be reached, and the implementation represents that public policy phase during which there are generated acts and effects starting from a normative framework of intentions, texts or political speech namely [10]. In practice we meet cases in which a general policy and especially a public policy are applied in a certain manner and not in another one. Practical experience shows that applying a public policy is under the form of an equation with three parameters, namely: the program characteristics, the behavior of those charged to apply it, the reactions of the target-groups. In the specialty literature [16] it is talked about the existence of four theoretical implementation models of public policies, which is of course valid for the renewal policy too:

- (1). *The authoritative model* – that emphasizes instruments such as instructions and orders of the leadership, planning, control, hierarchy and responsibility;
- (2). *The participative model* – it rather refers to indirect control instruments, such as to establish objectives, spontaneity, training, adaptation, negotiation, cooperation and trust, as methods and conditions to follow within implementation;
- (3). *The model of actor coalition* – it results from the presupposition that there exists an actor plurality who participate at the update of a certain policy and who communicate between them, negotiate, make compromises and who, at the same time share the same common set of values and who endeavor to fulfill the same objectives.
- (4). *The model of continuous learning* – in which the ones that legislate policy, by trying to gradually reach the optimal solution, optimize the structure of their objectives and techniques used to reach them. We notice that in the present moment real policy (see EU, France and others) has exceeded the conceptual one that offers in fact the general framework and the margin of political movement, situation in which it becomes necessary to re-analyze reality in order to elaborate as correct as possible paradigmatic landmarks.

2.1.1. The model of the french political movement „République En Marche”

République En Marche is a political and civic movement in France that follows up to

reunite members of the population who share a certain **basis of values** and have **the will to face reality** in order to improve it. The movement fundamental level and, at the same time, the main link is represented by “local Committees”. There is thus aimed the civil society that is intended to be associated with the movement and, in a certain phase, to be institutionalized in the executive function (everything being in fact specifically foreseen in the movement status).

Among the **principles** of this political movement the following aspects stand out [28]:

- (1). It is a democratic and strongly decentralized movement, in the sense that the *Local Committees* are associated to the movement territorial organization.
- (2). The aim is to respect the common values and rules (concretely reflected in the statute)
- (3). The collective responsibility to organize the best territorial network possible.
- (4). There is sustained the principle of the free membership, so that in order to accompany the *political recomposition* in course, to allow in a first phase movement members to be members of another political party, as long as this last one is carrying republican values, thus remaining a political movement open to all those who recognize themselves in the values of this political movement.
- (5). Diminishing bureaucratization, meaning without intermediary structures (of federation or district type) similar to classical parties, to avoid the formation of local „baronets”.
- (6). There are envisaged possibilities that modern technologies offer for coordination at local and national level.
- (7). Flexible organization only through „reviewers” as relays between the movement and local committees that does not exercise

guardianship upon them, but ensures territorial anchoring „a La République En Marche”.

(8). Permanent encouraging renewal within the movement by limiting in time mandates in different functions and also in order to limit the “baronet” phenomenon.

(9). Attachment at the European project is a cardinal value of the movement, that prefigures a mechanism of affiliation and cooperation with the European parts that have the same value basis and engagements, meaning a mechanism that will allow to form alliances with existing parties, or even to support the creation of progressive parties in other states.

2.1.2. Model of a new approach by the *Renew Europe* political group

It is known the fact that Euro-deputies constitute themselves in political groups, not in function of nationality, but in function of their political affinities. At the moment, within this context, there are 7 political groups within the European Parliament. To be mentioned that, on innovating direction, a first strategic approach that aims a new political model has been recently structured among the political Groups from the European Parliament, namely *Renew Europe* [27, 29]. **Renew Europe** is the third largest political group from the European [Parliament](#), with 108 members from 22 countries of the European [Union](#), with close political guidelines (liberal, democratic, progressive ones and others). Between 2019-2024 The Renew Europe political groups from the European Parliament is the third largest one from the 7 MEP groups (after the „popular” and „socialist” ones, but before the „green”, „democrat”, „conservative” and „left confederate” ones). There must be mentioned that Mr. Dacian Cioloș has been elected leader of the Renew Europe group (fig.1).



Fig. 1. Mr. Dacian Cioloș, leader of the Renew Europe group
From the European Parliament, promoter of innovative political ideas

2.2. One of the doctrinary launching pylons of the new policy by the bioharmonist theory and ideology

Of course, in a parliamentary group formed by several political formations, a renewal policy presupposes different ideological and methodologic nuances, but with common values. We consider that bioharmonism theory and derived bioharmonist ideology constitute a conceptual and operational pylon that will give consistence to the *Renewal policy*.

2.2.1. Universal bioharmony strategy

Among the major concepts of the today world we consider that an important landmark may also be the BIOHARMONY idea that characterizes the Terra components and probably the cosmic ones too [8, 23]. Empirically inferring the problems and generalizing, we consider „bioharmony” to be a sort of programmed cosmic „fussiness” of the Information perpetual dynamics (I) as an existential element conducted in different „information bubble” of the infinite space-time.

Within this context, starting from the general to the particular, in the present case getting to policy level, we have the possibility to analyze the Information (I) „ballet” from the most abstract structures until the most concrete ones, meaning to find the informational program both as structural manifestation of Energetic type (E), and also as „super dens” as structural organization of Substance / Material type (S). The most subtle forms of organization and structure of Information may be found with the passing from the nonliving to the living, where we talk about bioharmony complexity. At its turn, „bioharmony” differentiates in numerous categories in relation to the structure of information and its action environment: in the real world or in the spiritual one. As for the present theme, it is obvious that we are referring to the world and its complex life reality that we

all perceive around us. Therefore, the expression of the world bioharmony from the simple to the planetary complexity is rendered by the *bioharmonism theory* and, respectively, by the *bioharmonist ideology* [8].

The Bioharmonism Theory has the valence to imagine a positive script from a new perspective, able to contribute to the achievement of the Knowledge Society. Practically it is a new theory, necessary to bring things on the beech of the balanced and harmonized „natural”, in the constants and *Living Planet* model and of its natural cycles. In essence it is an approach that expresses the opinions of the world most enlightened minds, interpreted in a certain manner so that the result may shape a new economic and sociocultural model, a paradigm adapted to the 3rd Millennium world of the Biologic Revolution from the Informational Era [7].

The Bioharmonist Ideology is a **moderate Centre-right** attitude that may be a „seed” for a NEW POLICY, but also a „vehicle” (among others) that has as a target to accomplish the Knowledge Society. The ideological demarche sustains the development of a societal system after the harmonized planetary model and the Life *nonlinear* complexity, in the rationality of the progressive and ethic liberal democracy convergent with the reformed environmentalism [11, 12, 14, 23]. The concrete solutions pursue the dynamic balance of the socio-economic flows in relation to bio-geo-economic cycles, as well as the connections of the types of resources in relation to sustainable (durable) development, factually contributing to what has been imagined by the RENEWAL POLICY of the human society. That is why the **renewal policy** is at its turn, by the bioharmonist ideology too, a spring of political regeneration in a changing world [7, 8, 25, 26], idea that we suggestively propose by the image from figure 2 as well (source: <https://pixabay.com/ro/vectors/>).



Fig. 2. In an agitated world, a real hope may be brought by the *renewing policy*

Adapted to reality, the bioharmonist policy stimulates liberty, civism, meritocracy, decentralization and debureaucratization, in the idea of balanced and ethic convergences. As it has already suggested, the new paradigm brings together, in a real harmony, the elements of the today great themes: the biologic revolution, the

digital era, sustainable development, knowledge society and even penetration towards the society of consciousness. Concretizing, we are referring to the principles of the *bioharmonist ideology* as a conceptual basis for the *renewal policy* (table 4).

Table 4. Bioharmonist principles to support the renewal policy

No.	SET OF BIOHARMONIST VALUES	SPECIFICATION
1	Defense of liberty	- Liberty to innovate, as creativity means humanity existence on long term;
2	Education as a priority	- Universal access at information and equal access to education
3	Societal harmonization	- Sustainable development and economic and social harmonization
4	Nature protection	- Life and Environment protection, on local, regional and global plan (planetary georezy: dynamic balance generated by non-linearity specific to Nature);
5	Supporting diversity	- Acceptance, salvage and harmonization of biologic and cultural diversity in conditions of demographic dynamics (migration, globalization, g localization);
6	Supporting liberal ethics and democracy	- Supporting the principles of progressive liberal democracy (that keeps up with the „new” identified in perceived reality);
7	Stimulating human quality	- Supporting on all sides the ideas of: performance, discernment, morality, tolerance, respect, meritocracy, positive thinking and faith in values.

2.2.2. Concept and directions of action in the renewal policy

The conceptual framework that aims renewal in policy is based on a relatively large ideological basis, in which we think the input that *bioharmonism* may bring is of good Oman. As it has already been said, the ideological demarche sustains the development of a societal system after the harmonized planetary model and Life *nonlinear* complexity, with accent in the rationality of the progressive and ethic liberal democracy convergent with reformed environmentalism, characterizing the direction of action as a Centre-right moderation and harmonization [8, 15, 18].

Effective transformation of productive resources in goods and services of final consumption that we also call „resources allocation or affectation” also depends on collectivity’s intellectual and practical *know-how*, as well as on the effectiveness of its organization. Resource waste that derives from this fact determines a loss of wellness for the collectivity that may justify the necessity of an intervention to correct the functioning of the public section. This part is not only limited to resource allocation, it also has in view to achieve a just placement of wellness and macroeconomic

balance, as a fundamental basis in an innovating policy.

Starting from the analyses of market dysfunctionality and from equity research concerning wellness repartition, we distinguish as a mechanism the fact that there are groups of *interest*, but they sometimes chaotically, other times manipulatively manifest themselves etc. The organization of these interests becomes useful so that there is highlight the idea that **neocorporatism** is the system in which all interests are organized and in which government negotiates with all affected interests in all the stages from the process of policy elaboration and implementation, harmonizing problems and shaping mentalities.

Beyond the implications of the difficulty to change a mentality, in this moment it becomes obligatory to look for alternatives. Respecting the proposals from the paper analyses, namely the 5 coordinates of the present society ethical and moral profile, the analyses concerning the Gradient of the political motivation and the 10 observations of the today world tendencies, everything in relation to the prioritization of the 7 elements frequently found among the citizens’ demands referring to life quality, it becomes clear that there is necessary a change of political concept and that in fact these basic elements must

be respected in a **policy of the common sense, a realistic and honest one**. Considering the applicative principles of bioharmonism, the alternative is shaped by conceptual structuring of

synthesis (proposing another Decalogue) towards a new mentality sustained by the RENWAL POLICY (table 5).

Table 5. *A decalogue of the support ideas of the transition towards the renewal policy*

IDEA	PREDOMINANT SPECIFICITY IN PRESENT POLICY	Gradual transition	OFFER FOR THE „NEW” POLICY
<i>1st idea:</i>	From a selfish policy (group and personal interests are preponderant, that generates corruption, theft, lie)	<i>towards</i>	An altruist policy (it is desired to become as much as possible a general interest policy of the general interest, to raise the „others” ’ quality of life, situation that will generate: honesty, truth, common sense)
<i>2nd idea:</i>	From subjectivism and personal ideals, namely a profile of the „ without character ” politician (based on party internal political fight without any clear criteria, on „small groups”)	<i>towards</i>	Objectivism and ideals of the party and community, namely a profile of the honest politician (based on party internal competition on pre-established criteria, on value and principles)
<i>3rd idea:</i>	From the exclusive principle of loyalty and obedience, but also the one of relationship „ fabric ” (based on friendship, mafia relationship, kindred, lovers etc.)	<i>towards</i>	Meritocracy principle (based on clear criteria specifically formulated for every position, function, type of application, decision taking etc.)
<i>4th idea:</i>	From non-democratically (or dictatorially) imposed party discipline; a policy of fear and blackmail	<i>towards</i>	Participative democracy (based on pre-established criteria and mechanisms), a policy in courage to express opinions (based on free consented discipline and values assumed by the party)
<i>5th idea:</i>	From excessively philtered communication and policy of lie and aberrant manipulation („one is said and another is done”)	<i>towards</i>	Representative democracy characterized by a honest policy , with transparence of information in communication (including of own members of the political formation)
<i>6th idea:</i>	From tendency towards corruption and privileges of certain categories of members with functions (financial, material or moral ones)	<i>towards</i>	The incorruptibility tendency and legal stimulants established as financial level or of another nature and specification of grant criteria
<i>7th idea:</i>	From ideological amalgam , meaning of unclear and contradictory principles and directions of action	<i>towards</i>	Orientation and clear definition of the ideology on the bases of unanimously assumed principles and directions of action
<i>8th idea8:</i>	From citizen as a „ story ” of the electoral campaign	<i>towards</i>	A policy centered on the citizen
<i>9th idea:</i>	From static approaches and limited and on short term thinking („circular” thinking)	<i>towards</i>	Dynamic political approaches based on medium-term („linear” of cause-effect type) or long-term („non-linear”, quantic, fractal, integronic, constructal etc. Thinking, similar to Nature and Universe) thinking
<i>10th idea:</i>	From to see at the level of looking down (<i>where you step</i>)	<i>towards</i>	The level to have vision , looking up (<i>to see the direction</i>)

Although transition is not easy, it results from the table that the RENEWAL POLICY is first of all a policy of **changing mentality**, of the politicians that may do a policy **centered on the citizen**, but guided by an ideological and

doctrinaire framework specific to the 21st century evolved society.

From those presented one may extract some ideas linked to bioharmonization methods with multiple connotation (concomitantly

approached), that indicates **directions of action in the innovative policy**: (a) *Economic bioharmonization* (bioeconomy, industries and circular economy etc.); (b) *Social bioharmonization* (demography, family, active solidarity etc.); (c) *Cultural-scientific*

bioharmonization (principles of the Knowledge Society); (d) *Juridical and moral bioharmonization* (state law, property, humanity liberties, European values, Euro-Atlantic principles etc.).

3. Applications of the renewal policy

The transition to the **Renewal Policy** in Romania, as a *Case Study*, needs a *diagnosis* of the Romanian policy, especially in relation to recent history, in order to know where we start from and on what basis is "renewal" supported. We refer to the democratic hiatus beginning with the years before and after the second world war (see right-wing, royal or left-wing dictatorships), as well as democratic and societal sideslip after the 1989 revolutionary year („the truth” from the Revolution, from „calling the miners”, downright endemic corruption, weak justice independence etc.), so important aspects especially for young people education in order to understand and not to repeat the regress suffered by our country on political line and development in the future policy.

For the present situation we register structural provocations with on long term effect, especially on maintaining competitiveness at world level, climate changes, energy, population getting older, competences and knowledge are **priorities of the renewal policy**. It goes without saying that any ideology with its specificity influences the aimed policy, having a certain macro and microeconomic impact, but directly on citizens as well. *Bioharmonic ideology principles* applied in **integrated programs of renewal policy** are in relation to the resource offer, shaping the following DIRECTIONS OF PREGMATIC ACTION:

- **state structural and functional renewal - constitutional, institutional and managerial reforms - ex. education, health and others.**
- **coherent public policies on reference themes, as for example:**
 - ❑ creation of as stable as possible jobs in economy: - by investments „harmonized” with market and available raw materials; - circular economy with investments of yield growth by recycling waste and residues;
 - ❑ bioharmonic ideology and renewal policy induce professional formation of youth in new jobs specific to the 21st century and generates conditions of citizens' adaptation

- to change and globalization process, especially through the gloCalization prism;
- ❑ climate change reduction or even stop by production harmonization with resource offer and market requirements, after models of Nature circuits and flows, policy by which technical, biological and managerial yield grows, by the transition from *economic efficiency* towards *system effectiveness* (technologic reorientation and implementation of the 4th industrial revolution technologies);
- ❑ people may benefit of products of a better quality (including an agro-alimentary one and production valorization by agro tourism), with beneficial effect upon consumer's health, even if prices will be higher, the medium and long term gain is well worth it;
- ❑ improvement of health conditions by reduction of pollution of (urban, but also rural) localities and growth of hygiene degree by processes that aim sustainability and from here population gain, but the environment one as well;
- ❑ the care for biodiversity conservation directly supports food and water security, which is fundamental for the citizen and for the *environment-agriculture-tourism* axes.
- ❑ Major benefits of the application of the principles of the renewal policy in education and research at integrated level: both in connection to early, personalized, diversified, harmonized between theory and practice etc. education, and by another level linked to science evolution from today (see: quantic physics, fractal geometry, nanoscience, biosciences, digitalization, artificial intelligence and other), which will lead to *educational convergence* with the European Union (and from here pragmatic aspects regarding recognition of diplomas and upholding the right of free professional circulation, the Romanian citizens being able to stand up to the European requirements).

❖ Applications to the convergence field of the „Agriculture-Tourism-Environment” (ATM) axis

The problem complexity is very high, which makes it difficult to select problems and priorities, but a series of aspects seem to be commune and applicable, including to the axes with „EcoAgroTourism” acronym or the *Agro-alimentation-Tourism-Environment axis (ATM)*, so that bioharmonization mechanisms may support the RENEWAL POLICY, at least having in view the following aspects:

- The local community has become an important component of Romania's policy of rural development, following its implementation during the previous funding, but relatively not enough coherent and integrated on the ATM axis.
- In the ATM axis ethnic diversity represented by the presence of Romanian, Hungarian, German, Gypsy and other minority ethnic groups, respectively the presence of orthodox (the majority), Romano-catholic, reformed, Unitarian and other confessions may be highlight by the approach to European projects that encourage agro tourism and cultural diversity (traditions, customs), but also biologic diversity and environmental conservation, with afferent technologies adapted to climate changes.
- The *agri-forest-pastoral* space represents an attractive and relatively intact landscape with different objectives of the cultural heritage and living traditions. The renewal policy has, as a priority on the ATM axis, as a great need, the protection and conservation of cultural, architectural, archeological and natural patrimony, the development of local infrastructure which could be the bases of the development of standard tourism or of responsible tourism directly applicable by agro-rural tourism, farm tourism or ecotourism.
- These developments would favor the growth of attractiveness of the zones specific to the ATM axis, the creation of jobs (the main objective of the renewal policy strategy) and therefore would support the slowing down of youth migration from zone towards urban environment or abroad.
- Civil society from the ATM axis is relatively rich in ONG type organizations axed om social groups such as young people or those needing social assistance, but who function in most cases on a voluntary basis, with very reduced human, material or non-material resources, so that in the renewal policy there is an urgent need to support

civic sphere in order to develop it (local communities being the target).

- Demographically, the ATM axis is very affected as population tends to grow old, which has as an effect a phenomenon that may affect the zone medium and long term attractiveness, at the same time altering consumption habits of the population and its incomes. The number reduction of young population, as a major disharmony factor of the ATM axis reduces the potential for the respective area development and may become an irreversible disturbing factor of the development (see fragile zones: mountainous or wet ones), which imposes punctual public policies of bioharmonization.
- In economic terms, the main activities on the ATM axis are: agriculture, animal breeding, food processing, valorization of agro-alimentary production by tourism, forest exploitation and different types of services and non-agricultural production, but that are in a limited number, non-competitive, using outdated technology, which imposes a special attention in the renewal policy.

Conclusions

(1) RENEWAL POLICY is a policy of *mentality changing*, at the level of society and especially of politicians who may do a policy *centered on citizen*, but guided by an ideological and doctrinaire framework specific to the 21st century evolved society, respectively application of the principles of the bioharmonist theory and ideology for a new policy that aims a *Centre-right moderate* attitude, that may be a „seed” for *a new policy*, but also a „vehicle” that has the fulfilment of the Knowledge Society as target.

(2) Now that the world as economically, sanitarilly, demographically, racially etc. confused, it is more than ever necessary to have new political concepts, new alternative variants, and THE RENEWAL POLICY certainly is a feasible alternative, provided that it is well understood and correctly applied.

(3) The principles of the bioharmonist ideology applied to integrated programs of renewal policy find their coherence and realism in the potentiality to visibly improve people's life and their relation with the resource offer and to establish new notions, principles and directions of action, with the declared intention to broaden

the standard political paradigm towards a distinct innovating policy.

(4) As a framework idea for the *Renewal policy* we may think of the syntagma: „*Bioharmony, Honesty and Political common sense*”.

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A COMPUTER ASSISTED GRAPHICAL USER INTERFACE FOR ASSESING THE CUSTOMERS DEVICES PREFERENCES FOR BOOKING ONLINE TOURISM SERVICES

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Abstract: The paper presents the tourists behavior in choosing devices to access the Romanian online tourism services using websites. A computer assisted graphical user interface named Google Analytics was used and the website monitored with this tool was www.eurocars.ro. Also in the paper are revealed several aspects about working with Google Analytics.

Keywords: Google, analytic, cars, rent, tourists

1. Introduction

Tourism is beyond all doubts one of the most important activities the modern person carries out, in a world that is developing faster and faster and that is generating more stress to individuals. MB Development processes in information and communications technology and the Internet, in particular, have revolutionized the industry of tourism, creating new business models, changing the structure of its distribution channels and changing all processes related to the industry and, not least, influencing suppliers of package holidays, destinations and stakeholders.

Information technology facilitates the speed and efficiency with which information is handled, the handling of information reduces costs, increases transfer speed and the extraction of information and transactions involving customers in control. Information transmitted in real time enables companies to anticipate the needs of their customers and global market developments, to face increased competition [2].

In any economical activity and also in tourism the measurement is very important. Without systems in place to measure the profile and the interest of tourists in specific services it's tough to improve performance and to adjust to the ever changing market conditions [1]. As measuring systems, websites have a major role in study the site visitors . In the past we used to talk about "hits" to a website. The problem... this meant practically nothing. Fast forward to today and it's

amazing what you can from a good web analytic system.

Web traffic analysis tools cost hundreds of dollars, but provide valuable strategic information and web design that justify the investment, if the information collected is used to continually adjust web content and marketing campaigns. In-depth web traffic analysis is not offered as part of a traditional web hosting service. As the Internet evolves, web analysis reports provide more and more advanced to help web operators to market strategies becoming more targeted. Counter-cost tools that provide traffic information include Geomatics, Click Tracks Analyzer and other remote tracking services.

Assessing the success of web development strategies helps to make adjustments in the site design stage and in marketing tactics, by using time and money more effectively to increase the number of visitors to a web site. Determining the costs is very important for a company and in the online case the company must be able to determine the cost per visitor, the cost per potential client, the cost for each web marketing campaign and the return on investments.

Sometimes, the classic means of web analysis are inconclusive. For example, in the case of an online store a number of new unique visitors of 1000 people per week can give the impression of a very good activity. If an insignificant number of visitors actually buy products, the situation changes. One of the best in-depth traffic monitoring and analysis services is Google

Analytics. This service, although very complex, is offered free of charge. This tool is useful for analyzing complex reports of the quality elements (loyalty, efficiency of the Ad Words campaign - if enabled, the most visited pages, etc.). For all the data provided, "Cross Segment" analysis can be performed, by isolating the reports on certain segments: traffic sources, keywords, visitor, country, city, new visitors and many more.

2. Google analytics as a tourists behavior measuring tool

Unlike many other website traffic analysis tools, Google Analytics (GA) is positioned as a resource for marketers instead of webmasters. Google Analytics tracks visitor information from all referrers including search engines, advertisements, email marketing and other websites. Website owners can use Google Analytics' integration with Google Ad Words to review online advertising campaigns by tracking entrance pages and goals. User-defined goals include views of specific pages or downloading

particular files. With over 80 available reports, Google Analytics provides marketers with information about how to optimize campaigns including which advertisements are performing well and which are not [5].

Google Analytics is a reporting tool that provides a powerful tracking solution for websites, videos, rich media content, mobile apps, etc. The information concerning visitors origin and what activities do they do on a site are available with Google Analytics. Another information given by Google Analytics are about turning visitors into customers from a website or the effect of keywords on potential customers. In the same time with this measuring tool can give an answer about which online ad or advertisement is the most effective. Another answer important for the web developers is about the reason visitors leave the site without taking the desired action. Are the website design elements that keep visitors away? What is the content of the site that visitors are most interested in? Google Analytics can answer to all this questions [5].



Fig. 1. The real time sections [5]

In figure 1 are presented the real time sections from Google Analytics. The real time sections contains six reports: Overview, Locations, Traffic Sources, Content (or Screens, for Mobile App

properties), Events, and Conversions [5]. All reports display (from left to right): the number of active users, the number of hits during each of the most recent 30 minutes, the number of hits during each of the most recent 60 seconds.

Audiences allows users segment in the ways that are important to the business. The segmentation can be made by event (e.g., session start or level up) and by user property (e.g., Age, Gender, Language), and combine events, parameters, and properties to include practically any subset of users. The audiences can be used to filter reports so the different user segments engage with the app can be analyzed. As Firebase gets new data about users, their audience memberships are reevaluated to ensure they still meet the audience criteria. If the latest data indicate they no longer meet the criteria, they are removed from those audiences.

The user lists in Ads that correspond to the website audiences are pre-populated with up to 30 days of data when that data is available. Before targeting an audience in Cloud Messaging or Remote Config, is important to check the number of users in audience to see if it meets expectations.

The audience size will typically be different from remarketing-list size. This is usually because tracking IDs can't be sent to Google

Ads remarketing lists until Google Ads accounts are linked.

In the *mobile devices* section are presented which mobile devices are being used to interact with the website content. User agents from iOS devices usually don't provide enough information for Analytics to identify the specific device model[5]. As a result, Analytics usually classifies iOS devices as simply "iPhone", "iPod", or iPad", without specifying the device model. However, hits from InApp Safari (Web View inside apps) contain additional information that can be used to identify the specific device model. As of late 2015, Analytics shows the specific device model when that information is present in the user agent string. InApp Safari hits typically account for less than 10% of a property's traffic, so most hits still result in only a general device classification (iPhone, iPad or iPod). In the figure 2 is presented the mobile devices usage on www.eurocars.ro.

		Acquisition		
		Users ? ↓	New Users ?	
<input type="checkbox"/>	Mobile Device Info ?	3,324 % of Total: 74.70% (4,450)	2,943 % of Total: 74.68% (3,941)	
<input type="checkbox"/>	1. Apple iPhone	933 (28.07%)	852 (28.95%)	1
<input type="checkbox"/>	2. Samsung SM-G950F Galaxy S8	107 (3.22%)	95 (3.23%)	
<input type="checkbox"/>	3. Samsung SM-G960F Galaxy S9	84 (2.53%)	76 (2.58%)	
<input type="checkbox"/>	4. Samsung SM-G965F Galaxy S9+	83 (2.50%)	64 (2.17%)	
<input type="checkbox"/>	5. Samsung SM-G975F Galaxy S10+	73 (2.20%)	63 (2.14%)	
<input type="checkbox"/>	6. Huawei ANE-LX1 P20 Lite	66 (1.99%)	59 (2.00%)	
<input type="checkbox"/>	7. Samsung SM-G935F Galaxy S7 Edge	64 (1.93%)	59 (2.00%)	

Fig.2. The Mobile devices usage [5]

3. Assessing the customer devices preferences in online tourism services

A study conducted by Google in partnership with TNS, which focused on Romanians' travel habits, revealed that Romanians prefer to travel in the summer and that their main source of information for vacation planning is friends and colleagues. The study puts together data from Google searches and public personal data, targeting users over the age of 18 who have had at least one vacation in the last 12 months. The study shows that young audiences prefer shorter, but more frequent, getaways, while older people travel for longer, but less frequent periods.

As for the seasonality of travel, most Romanians travel in the summer, spring being the second place in terms of travel preferences. Despite other studies, the Google study reveals that family and friends are the most important sources of travel information, and then search engines and review sites are preferred.

Regarding the duration of the decision, when we talk about escapades, more than half of the Romanians reserve in less than a week local destinations, and between 1-4 weeks external destinations. About the same percentage is maintained for long trips.

Romanians who prefer online bookings are influenced by the possibility of making reservations at any time of the day or night, as they believe they can benefit from lower rates than at the agency, but also from the fact that

they have the possibility to compare services on several sources. On the opposite side, the potential security issues, the multitude of information provided, the relationship with a classic travel agency and the lack of a credit / debit card keep Romanians away from online reservations.

In terms of devices used to document travel, although PCs and laptops are still the most widely used, smart phones are increasingly being used to make online reservations, especially to book accommodation and buy bus tickets and by train. 39% of Romanians spend more than half of their time dedicated to documenting the journey on their mobile phones. This is also reflected in the behavior of users on different OTA platforms in Romania, such as vola.ro, where searches on mobile devices reached over 47%, with a significant increase in mobile accesses: over 38% preferred to make plans from the mobile phone, while 9% use the tablet. In the case of Tripsta.ro, 33% of users prefer mobile bookings (16% smart phone, 17% tablet), while in 2014 paravion.ro recorded mobile bookings, from the application, as a percentage of 12% of the total reservations.

For the rent a car tourist service, a comparative analysis with Google Analytics. was made of the clients who accessed the website www.eurocars.ro in Romania. Figure 3 shows the preference of customers to use more mobile phones to access the website www.eurocars.ro than tablets or desktop.

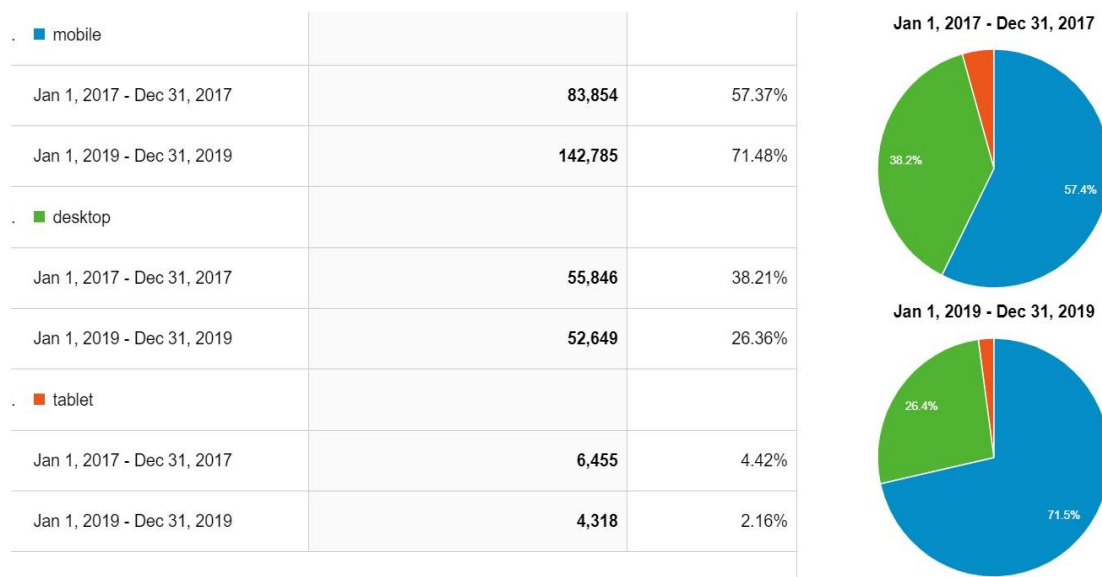


Fig. 3. The preference of customers to use electronic devices for online reservations from www.eurocars.ro

As seen in the previous graph in 2017, the first place in the preferences of potential customers was the mobile phones, 57.37% of them preferred to use mobile phones. In the second position with a percentage of 38.21%, the desktop users are found, and the third place is occupied by the tablets users with a percentage of 4.42%. In the 2019 year, the same trend of using mainly mobile phones is maintained, with a percentage of 71.48%, followed by those who use desktops at 26.36%. The number of tablet users decreased to a value of 2.16%. An interesting situation can be seen when comparing 2017 with 2019. It is found that after two years, the number of visitors to the website www.eurocars.ro that used mobile phones increased from 57.27% to 71.48%. In the same time frame, the number of desktop users decreased from 38.21% to 26.36% and that of tablet users from 4.42% to 2.16%. The Global Statss website presents an interesting situation of the users of the three categories of devices used by customers to access the online services in Romania [4]. The figure 4 shows the situation at the level of 2017. Unlike the preference of the users www.eurocars.ro, in the year 2017, the first position is taken by the the users of desktop computers with a percentage of 62.78%, followed by the users of mobile phones with a percentage

of 34.25%, and in the last place re the users of tablets with a percentage of 2.97 %. After 2 years in the 2019 year, the same website shows the same tendency of increasing the users of mobile phones to make online reservations and decrease the users of desktops and tablets. In the figure 5 it is observed that within 2 years there has been a reversal of positions [4]. Thus, in the first place mobile users increased with a two-year increase from 34.25% to 49.38%. In the next position are the users of desktop computers with a decrease from 62.78% to 49.28%, while the percentage of tablet users decreased from 2.97% to 1.48%. As shown by the comparative graphs In recent years, the number of mobile devices has grown exponentially, and users have begun to use them more to make online reservations. The online service providers in Romania did not understand this phenomenon and did not adapted their websites with mobile interfaces which is a big disadvantage for companies because it is often difficult to keep track of the details of a reservation on the most adapted websites. many desktop devices. Some sites do not even have systems for monitoring online activities, number of clients, etc.

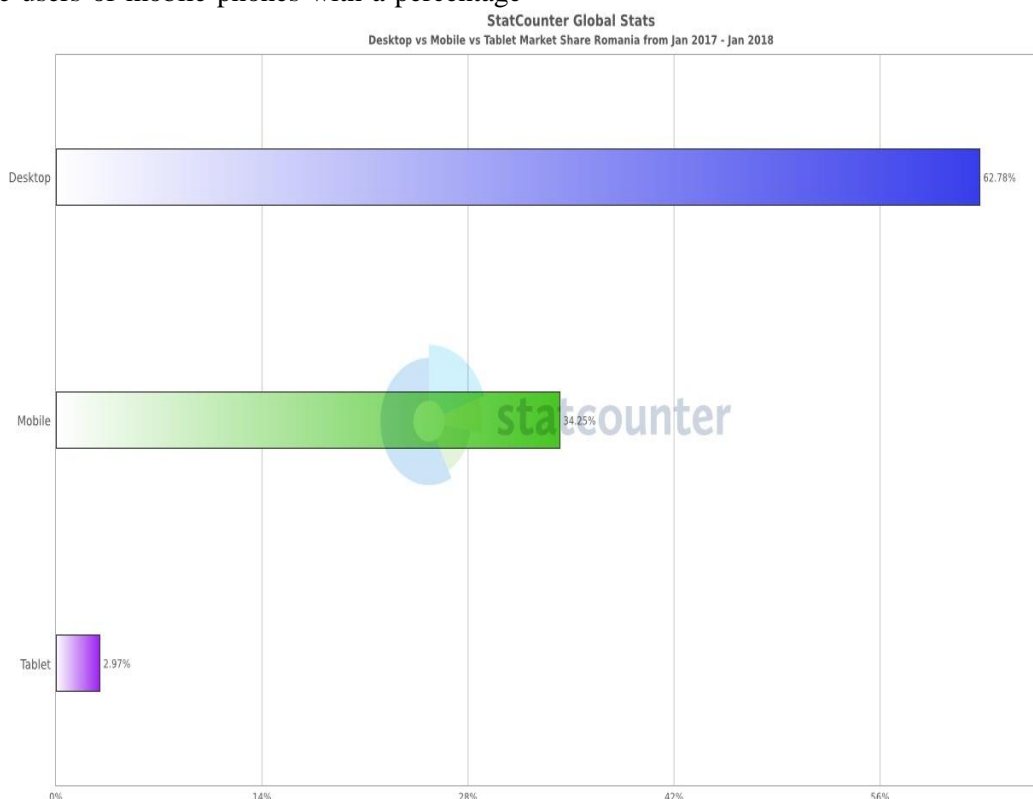


Fig. 4. The customers devices preferences for the year 2017 [4]

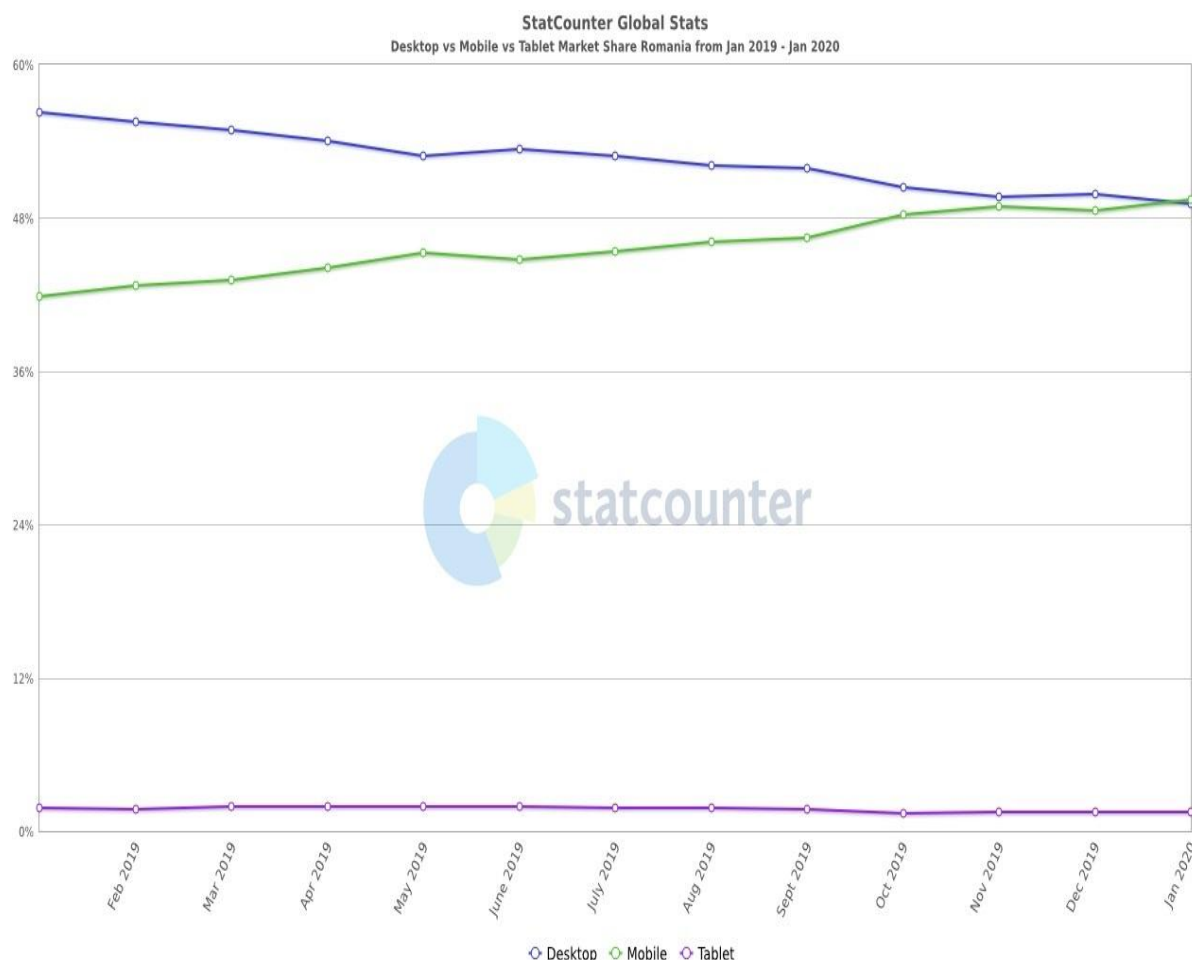


Fig. 5. The customers devices preferences for the year 2019

4. Conclusions

Such a system as Google Analytics that has an area dedicated to tracking the devices that visitors use to enter the site would give them a picture of their preferences to use their smart phone in particular to make online purchases.

The Google Analytics monitoring tool has proven to be a very useful tool for monitoring customer preferences to first use mobile phones for online bookings. This information is very important for tourism companies because it can create graphical interfaces for mobile phones, which make it easier for customers to access the website and increase the number of reservations.

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FACTORS AFFECTING ACCEPTANCE OF GOVERNMENT: USING EXTENDED UTAUT2

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Abstract: Governments around the world are seeking to provide services to their citizens easily and quickly, so many governments have taken advantage of the tremendous development in the means of technology and communication and launched their services electronically and move from "traditional government" to "electronic government". However, many governments still have challenges especially in the level of citizens' acceptance of these services, particularly in developing countries. Understanding of user's acceptance of electronic government services is still scarce. Added to this, previous studies in literature concerning e-government acceptance have primarily been done in developed nations. This study primarily aimed to provide a theoretical discussion on Electronic government the factors that may affect the level of acceptance in Jordan and Hungary by extended UTAUT2 Model and identify the variables that affect the acceptance level.

Keywords: E-government, UTAUT2, Trust, Acceptance model, Jordan, Hungary.

1. Introduction

The revolution in means of Information and communication technology (ICT) has found new ways for governments to enhance the service for their citizens and businesses. This technological revolution that started in the eighties and nineties not only made changes in daily life aspects but also changed all life aspects, including the way of interaction between governments and citizens, and the direct communication and interaction became a new revolution (Nations, 2014).

Since the beginning of the ICT revolution, the private sector has been more advanced and Initiative than the public sector in adopting technology and moving to transform the way of interaction and providing services from the traditional way to the electronic way using the means of ICT. On the other hand, the public sector was more cautious and reluctant to move towards technology adoption.

Jaeger, (2003) pointed out that this cautious and hesitations in the public sector began to dissipate and decline at the beginning of the twenty-first century, and many governments began to adopt technological means more, and many governments launched "e-government"

initiatives, where the United Nations report indicates (United Nations, 2002) that the case of "e-government in 2003 around the world is promising and surprising.

Rahim & Athmay, (2013) defines "e-government" as "an application of information and communication technology to improve, transform and redefine any form of exchange of resources and information (dealing and contracting) between relevant actors such as companies and government organizations and their customers and suppliers or other partners, by developing And maintenance of inter-organizational systems, virtual organizational arrangements and national institutional arrangements." Additionally, Lin, Fofanah, & Liang, (2011) refers e-government as "an administrative system in which government offices usefully modern technologies, including information, network technology, and automation Offices to deal with official affairs and provide public services to the community.

There are many definitions of "e-government" in the previous references, but most of the definitions revolve around the concept of using ICT in the public sector to provide services and communicate and interact with stakeholders

(citizens, companies and the government body) and provide services electronically, and this definition that this study will adopt.

Despite the tendency of most governments around the world to adopt the transition to "electronic government", the level of citizens' acceptance and use of these electronic services is still very low, and many previous studies have attempted to identify the major factors that play a fundamental role in the level of users' acceptance of any new technological system.

In this paper, we will review the most prominent theories that explain the users' acceptance for any new system, and then explore the factors that may affect the acceptance level in two countries (Jordan and Hungary) by extending Unified Theory of Acceptance and Use Technology Model 2 (UTAUT2).

1.1 E-government in Jordan and Hungary

Both countries are similar in many characteristics, such as area (Jordan 89000 km², Hungary 93000 km²), population (around 10 million), and even the application of the electronic government program, which launched in both countries in 2001.

Likewise, the two countries share several challenges facing their program in the electronic government. Among these challenges, the two countries share the challenge of raising citizens' acceptance of the electronic government program, in Jordan was reported that more than 85% of the Jordanian people never logged in to the e-government website or did not find any information. (Al-Hujran, Al-dalahmeh and Aloudat, 2011).

On the other hand, Hungary also faces the same problem accepting e-government.

2. Technology acceptance model variations

The successful adoption of any e-system requires the individual's acceptance to use Information Technology (IT). Acceptance is a stage that precedes adoption. More specifically, it is the initial decision that an individual makes before interacting with technology. The adoption stage comes; therefore, after the direct experience with the technology and after the individual's decision to accept technology (Venkatesh *et al.*, 2003).

There is a considerable number of studies about technology acceptance that has studied the

adoption of e-government services in developed countries. Using standard and amended acceptance models, they attempted to investigate the citizens' perception of technology in the governments (Alshehri *et al.*, 2012; Elsheikh, 2012; Alsaif, 2014)

There are many models in the literature such as: Theory of Reasoned Action (TRA), Theory of Planning Behavior (TPB), Technology Acceptance Model (TAM), an extension of TAM or what is known as TAM 2, Diffusion of Innovation Theory (DOI), Motivational Model (MM), Unified Theory of Acceptance and Use Technology Model (UTAUT), and next we will discuss the most recent ones (UTAUT) and (UTAUT2)

2.1 Unified Theory of Acceptance and Use of Technology (UTAUT)

The UTAUT model is a model that offers an explanation to the acceptance level for new users of any new system or application and explains user's behaviors to accept a new system, especially in the field of information systems (Venkatesh *et al.*, 2003).

The UTAUT model merges 8 previous theories to explain the level of user acceptance of any system: Technology Acceptance Models (TAM), Logical Procedure Theory (TRA), Planned Behavior Theory (TPB), Motivational Model (MM), Innovation Diffusion Theory (IDT), Model Computer use (MPCU), social cognitive theory (SCT), and a model that combines TAM and TPB (C-TAM-TPB).

The model includes four main variables related to the acceptance of the new system:

-Expecting performance: This variable measures the user's belief that the new system will help in performing its function. In the other models, the variables that relate to performance expectancy are shown in other names as job fit (in MPCU), extrinsic motivation (in MM), outcome expectancy (in SCT), relative advantage (in DOI) and perceived usefulness (in TAM and combined TAM-TPB) (Hung *et al.*, no date).

-Expecting effort (EE): This variable measures the user's belief that the system is easy to use. the variables that have the same concept in other models are complexity (in DOI and MPCU) and perceived ease of use (in TAM)(Venkatesh and Davis, 2000).

- **Social Impact (SI):** This variable measures the impact of the user's belief that people who are important to him think that using the new system is important and better. Similar constructs are identified in existing models, such as social factors (in MPCU), image (in DOI) and subjective norms (in TRA, TAM2, TPB/DTPB, and combined TAM-TPB) (Venkatesh *et al.*, 2003).
- **Facilitating Conditions (FC):** This variable measures the system users' belief that the technical or organizational infrastructure can provide support for them to use the new system. where such a definition captures three individual constructs in previous frameworks: facilitating conditions (in MPCU), compatibility (in DOI) and perceived behavioral control (in TPB/DTPB and combined TAM-TPB).

In 2012 Venkatesh et al (2012) expanded the previous model (UTAUT) and named it (UTAUT2) by adding three new variables (Figure.1):

- **Hedonic Motivation:** This indicator measures the enjoyment the users achieve when they use the system or new technology and thus affects the extent of their acceptance of this technology
- **Habits:** This indicator is similar to another variable "experience", which is the user's frequent use of the system and the passage of a period of time from the first use, but "habit" is the degree to which the user can use the system automatically and naturally.
- **Price value:** This indicator measures the impact of the costs that can be handle by users when they use the new system and the effect on acceptance.

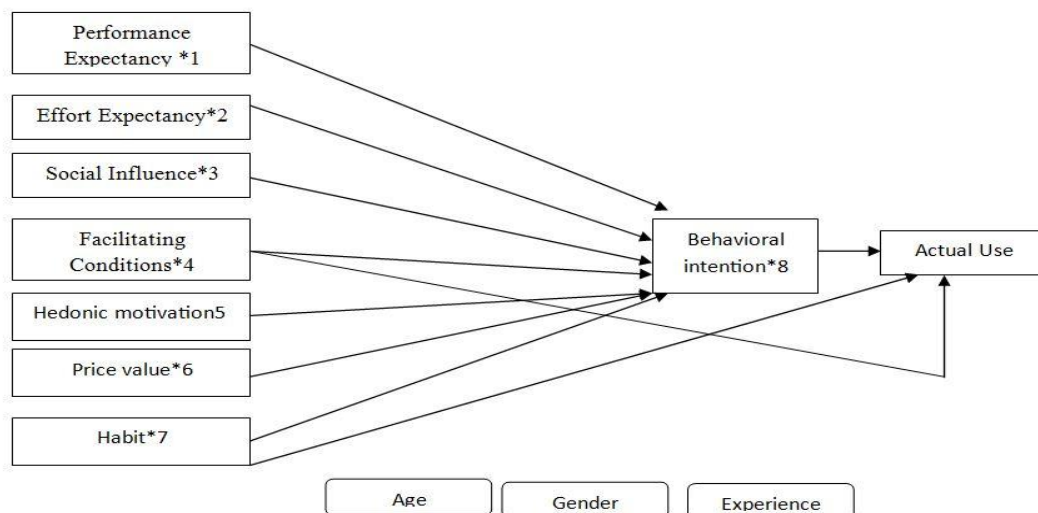


Fig. 1. Extending the Unified Theory of Acceptance and Use of Technology (UTAUT2) (Venkatesh, Thong and Xu, 2012)

2.3 Conclusion of model selection

It is obvious how technology acceptance models usually focus on the general factors that influence the end users to adopt new technology in general. These models can apply to any emerging technology and provide a general overview of the factors that affect its adoption. This paper aims to adopt UTAUT2 for Venkatesh et al. (2012) for the following reasons:

- UTAUT2 has been developed out of eight previous theoretical models and theories, therefore, UTAUT2 is a comprehensive model that is highly underpinned by the theories in the literature.

- UTAUT2 is more flexible than the other theoretical models in measuring the acceptance of technology use and behavior. Furthermore, UTAUT2 is relatively precise

and can predict 70% of the cases of adoption in information technology, compared to the other user's adoption models (TRA, TAM, TPB) which can only predict about 40 % of the cases (Venkatesh et al., 2003).

- UTAUT2 can apply to different countries, different age groups, and different technologies. It can identify other relevant factors that may help increase the

applicability of UTAUT to a wider range of consumer technology use contexts.

- UTAUT2 has been proven to be a reliable model used across a numerous number of studies in technology adoption (Yahya et al., 2011; Abdul Rahman et al., 2011; Shafi & Weerakkody, 2009).
- UTAUT2 has been mainly tested in developed countries, but not very much in the developing countries. Therefore, this paper aims to adopt UTAUT2 framework to investigate the acceptance of e-government services among the Jordanian and Hungarian citizens.
- Finally, UTAUT2 has been used many times to examine the effective factors that influence the acceptance and use of technology intention (Alazzam et al., 2015).

3. Proposed Research Framework

The proposed framework incorporates the attitude towards IS, the individual attention, and the willingness to use new technology in the public sectors (e-government system). the user behavior factors are centered on the UTAUT2 constructs that measure effort expectancy (EE) (similar to ease of use), performance expectancy (similar to usefulness), influence (SI), habit (H), and facilitating conditions (FC).

UTAUT2 has also been employed by numerous IS studies that investigated the antecedents that influence the adoption and implementation of new technology by individuals (Oliveira and Martins, 2011). In short, UTAUT has been employed by an extensive number of studies and it demonstrated a high explanatory power of variance.

The proposed framework is supposed to be tested on public sector system, so the model excludes two variables from the original model: Hedonic Motivation: "the fun or pleasure derived from using a technology" (Brown et al., 2008); since the current study will apply in a public system and it is a free of fun so it is not expected to have any significant effect for this variable on the acceptance.

Price value: "users are responsible for the costs, and such costs, beside to being important, can dominate consumer adoption decisions" (Brown et al., 2008); since e-government services in both countries(Jordan and Hungary) are provided free of charge this variable was excluded.

Moreover, the adopted model excludes two moderator variables, age, and gender. The gender variable was excluded in the present framework as the services provided by government are equally available for males and females. The age variable as well as the voluntariness variable were similarly eliminated as everyone has access to the technologies, and the usage of e-government is optional and completely voluntary. The gender and age are found insignificant in moderating the user intentions toward using e-government services in Qatar (Al-Shafi and Weerakkody, 2010) .in addition, the proposed framework has also employed experience as a moderating variable. Venkatesh et al. (2003) suggested that the increased experience can lower the influence of EE, SI, as well as Habit (H) on the adoption of the system. Relatedly, this study assumes that there could be some moderating effects for the experience on the citizens' adoption of e-government in both countries (Table.1).

Table 1. Studies of The Research Model's Constructs (Own process)

Factor	Previous Studies
Performance expectancy	(Venkatesh <i>et al.</i> , 2003; Jong and Wang, 2009; Venkatesh, Thong and Xu, 2012)
Effort expectancy	(Venkatesh <i>et al.</i> , 2003; Venkatesh, Thong and Xu, 2012)
Behavior Intention (BI)	Friedrich and Hron, (2010), Elaiza and Geri, (2008), Marchewka et al., (2007) and Suma et al. (2010)
Facilitating Conditions (FC)	(Venkatesh <i>et al.</i> , 2003; Venkatesh, Thong and Xu, 2012)
Social influence	(Naor-Elaiza and Geri, 2008; Jong and Wang, 2009)
Actual use	(Jong and Wang, 2009; Venkatesh, Thong and Xu, 2012)
Habit (HT)	(Venkatesh, Thong and Xu, 2012)
Trust	(Alshehri <i>et al.</i> , 2012; Omar Al Hujran, Anas Aloudat, 2013; Lian, 2015)

3.1 Trust

The constructs in UTAUT2 are assumed to influence the behavioral intention to adopt e-government services. However, UTAUT2 does

not address the issues relevant to trust. It does not also provide an explanation for why the same application system can be adopted in different ways in various settings (Tsiknakis and Kouroubali, 2009). Hence, it has been posited that combining all these independent factors could better represent the factors that determine the behavioral intention of using e-government.

For the current study context (e-government in Hungary and Jordan) trust (in government and in system) is important variable and many researchers mentioned trust in their research.

In Hungarian environment, Spacek et al., 2020 examined the core administrative services in the Czech Republic, Hungary, and Romania. Almost all three countries are at the same level of e-government development, but their strategies and the levels of centralisation are different. The digitalisation of core administrative services is still rather low in Hungary, usually not exceeding simple e-transactions. The Good State Public Administration Opinion Survey (GSPAO) carried out in Hungary 2017 (Aranyosy, 2018). The survey questions were tested on a representative sample (n=2.506) for the adult (age 18+) Hungarian population. They examined the following different factors of e-government adoption: Perceived ease of use, Trust of internet, Trust of government, Facilitating conditions, Experience, Habit, Age, Gender. The higher level of government trust leads to more online transactions. Trust in the internet in Hungarian e-government adoption has an important role (Aranyosy, 2018). Aranyosy, 2018 highlights the key factors differentiating e-government users are habit, trust in the internet, and facilitating conditions. In Hungary Trust in the government seemed not to be a significant influencer (Nemeslaki, Aranyosy and Sasvári, 2016). Welch et al., 2005 suggest that increasing usage of government websites improves people's trust on government. Csótó, 2019 also used the Hungarian GSPAO 2017 survey data. He focuses the knowledge gap, which clearly exists in public administration-related knowledge, and affects the choice of channels for managing administrative issues. Also, clearly visible, the more educated people have the less difficulties dealing with their public administration-related tasks, while the lesser educated people need more help.

On other hand in Jordan, Mofleh et al. (2008a), using their own adoption model, examined the factors that affect citizens' adoption of e-government services in Jordan. They collected data from a sample of 660 people who were

recruited from an online survey. The findings pointed out that the compatibility with e-government, trust in the Internet, and trust in the government are significant variables that are likely to increase the citizens' demand on e-government services. Alhujran and Chatfield (2008) also made a similar attempt to uncover the factors that influence the adoption of e-government services, using the TAM model. More specifically, the study examined the effect of cultural, trustworthiness, and perceived public value on citizens' adoption of e-government services in Jordan. The data was collected from 65 university students. The authors reported that the culture, trust, and nation value are very important predictors for the successful adoption of e-government in Jordan.

Al-Hujran *et al.*, 2015 integrated the TAM constructs with other new constructs; such as citizen satisfaction, service quality and trustworthiness, in order to develop a model of factors that are thought to influence the citizens' adoption of e-government services in Jordan. The findings demonstrated that PU, PEOU, citizen satisfaction, and trustworthiness are significant predictors of usage intention, and they together account for 54.6% of the variance in citizens' intention to use e-government services. Additionally, the citizens' intention to use e-government services is predominantly influenced by their satisfaction.

Alryalat et al. 2013 investigated UTAUT constructs, together with trust and security, to determine the influences that affect the behavioral intention of Jordanian citizens to use the e-government systems. According to the results, it seemed that each of the trust, the perceived security, the facilitating conditions and social influence has a positive and significant effect on the behavioral intention of citizens to use the e-government system.

There is another similar study that attempted to examine the factors that could affect citizens' intention to adopt and use e-government services in Jordan (Khattab *et al.*, 2015) this study used a model that was developed from the Technology Acceptance Model (TAM) and other additional constructs; namely, web trust and perceived risk. It also employed a self-administered questionnaire. The findings reported that there are four main factors that are likely to affect citizens' intention to engage in electronic government services. They are the perceived ease of use, perceived usefulness, perceived risk, and trust in electronic channels.

To conclude, it seems that, according to the evidence explained above, very little research on e-government services has been made in Jordan and Hungary. Particularly, there is a lack of focus on e-government adoption from the demand-side. Furthermore, it is obvious that most of the previous studies that investigated the adoption of e-government services in both countries have

adopted the UTAUT model and more researches are needed especially taking in account Trust as an independent factor may effect the level of acceptance, hence, the proposed framework created to offer better understanding of the previous factors on the level of acceptance (Figure 2.).

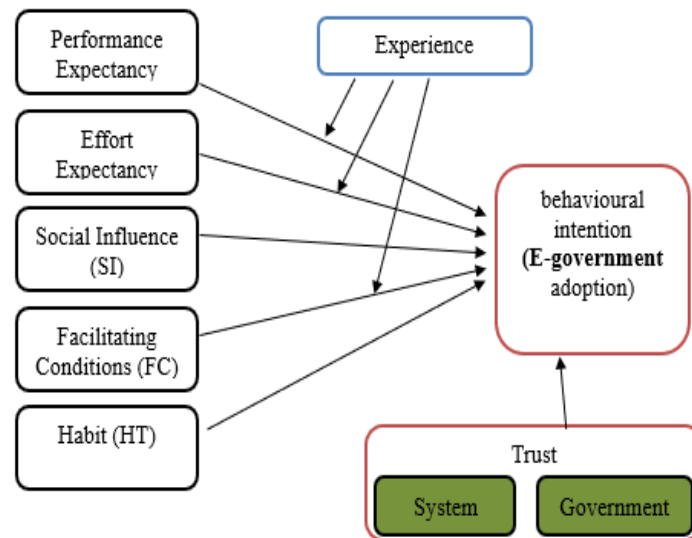


Fig. 2. The proposed research framework

Conclusions

UTAUT2 is more flexible than the other theoretical models in measuring the acceptance of technology use and behavior. It has been proven to be a reliable model used across a numerous number of studies in technology. It has been mainly tested in developed countries, but not very much in the developing countries. Therefore, this study aims to adopt UTAUT2 framework to investigate the acceptance of e-government services among the Jordanian and Hungarian citizens. Several previous studies showed weakness in the use of this model, especially in the contexts of government applications and electronic government. The original model ignored trust as a primary variable affecting the level of acceptance of the new system, and for better understanding for acceptance more broadly, the old model has been extended by two main variables related to trust, trust in the government itself And trust in the system used for e-government.

As many previous studies in the two countries (Jordan and Hungary) showed the importance of trust as a variable and these studies encouraged

for more applied research in this area with examination of the trust factor, this study provided a new theoretical framework for understanding the influences of all UTAUT factors and trust on the level of acceptance in e-government context.

Future studies can apply this model to gain a greater understanding of the nature of the interaction of all elements and their impact on the level of acceptance, and looking at new variables that can have an impact such as (safety, privacy, and technological elements).

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EXPERIMENTAL RESEARCH ON THE ANTIMICROBIAL ACTION OF ESSENTIAL OILS OBTAINED FROM PLANTS ON STAPHYLOCOCCUS BACTERIA

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Abstract: For testing the antibacterial action, essential oils extracted from the following plants were used: *Thymus vulgaris*, *Ocimum basilicum* L., *Melaleuca alternifolia*, *Hippophae rhamnoides*, *Eucalyptus*, *Mentha piperita*. The antimicrobial action of essential oils was tested after isolation and confirmation of bacterial strains from food following expertise by laboratory examinations: *Staphylococcus aureus* and *Staphylococcus saprophyticus* - unpasteurized milk cheeses. the standard SR EN ISO 6888-1 / June 2002, ISO 6887 -1, depending on the diameter of the inhibition zone.

It has been observed that the essential oil of *Thymus vulgaris*, *Ocimum basilicum* L., *Melaleuca alternifolia*, *Mentha piperita* are the most active, showing sensitivity to *Staphylococcus aureus*. *Staphylococcus saprophyticus* did not show sensitivity to any of the plant extracts listed above.

Keywords: antimicrobial, essential oils, *Staphylococcus* bacteria.

1. Introduction

Consumption of food contaminated with pathogenic microorganisms poses a risk to human health. The phenomenon of bacterial resistance to antimicrobial agents can become a global problem, as a consequence of their intensive and irrational use. The consequences that appear on the health of the human body are represented by the appearance of resistant pathogenic microorganisms isolated from food. In order to avoid the use of antibiotics in the fight against the destruction of pathogens, it is possible to resort to a less harmful option, by using some essential oils from plants that have an intense bactericidal activity.

In recent years, there has been a growing interest in research and development of new antimicrobial agents from various sources to combat microbial resistance. Therefore, increased attention has been paid to methods for detecting and evaluating antimicrobial activity.

Compared to the research carried out so far, it was wanted to test plant extracts: thyme oil (*Thymus vulgaris*), basil oil (*Ocimum basilicum* L.), mint oil (*Mentha piperita*), tea tree oil (*Melaleuca alternifolia*), eucalyptus oil (*Eucalyptus*), white sea buckthorn oil

(*Hippophae rhamnoides*), on several bacterial strains and make a comparison between them in order to incorporate oils into foods that have a high predisposition to infection with certain bacterial strains, which do not affect the health of consumers, through which to improve the sensory quality, nutritional value of food, to create new products, functional food supplements to replace synthetic drugs [11].

After antimicrobial testing, it was desired to find a way to incorporate them into food. The species of microorganisms whose sensitivity were tested and the foods from which they were isolated were: *Staphylococcus aureus* and *Staphylococcus saprophyticus* - unpasteurized milk cheeses.

2. Materials and Methods

For testing the antibacterial action, essential oils extracted from the following plants were used: *Thymus vulgaris*, *Ocimum basilicum*, *Mentha piperita*, *Melaleuca alternifolia*, *Eucalyptus*, *Hippophae rhamnoides*.

The antibacterial action of essential oils was tested after isolation and confirmation of various bacterial strains from food following expertise by laboratory tests. The species of microorganisms

whose susceptibility was tested and the foods from which they were isolated are presented in the following table.

Table 1. *Tested microorganisms*

No. crt.	Name of the microorganism	The food from which it was isolated
1.	<i>Staphylococcus aureus</i>	Unpasteurized milk cheeses
2.	<i>Staphylococcus saprophyticus</i>	Unpasteurized milk cheeses

For the isolation of bacteria of the genus *Staphylococcus*, the standardized working methodology was used, according to SR EN ISO 6888-1 / June 2002, ISO 68887-1 [12,13].

The principle of the method consists in the isolation of bacteria from food and their identification based on cultural, microscopic, biochemical, serological characteristics, the diagnostic methodology requiring four successive phases:

- Inoculation on Baird - Parker agar medium;
- Incubate for 24 ± 2 hours, then re-incubate again for 24 ± 2 hours in an incubator at 35°C and 37°C ;

- Identification and confirmation: Atypical colonies may have one of the morphological characteristics:

- Bright black colonies with or without a narrow white border; the clear area is absent or poorly visible and the opalescent ring is absent or difficult to see.
- Atypical colonies are mainly formed by coagulase-positive staphylococcal strains. They are much less common in coagulase-positive staphylococcal strains that contaminate other products. Bacteria belonging to this genus, other than *staphylococcus*, can give colonies that look similar to *staphylococcus*. Microscopic examination by Gram staining, before confirmation, makes it possible to distinguish it from other genera of *staphylococcus*. From cultures obtained by inoculation of Baird-Parker agar, it is transferred to a test tube or bottle with a brain-heart infusion for confirmation. The coagulase test is considered positive if the clot volume takes up more than half of the initial fluid volume [14].



a.



b.

Fig. 1. The obtained test: a. *Staphylococcus saprophyticus*, b. *Staphylococcus aureus*

Staphylococcus saprophyticus and *Staphylococcus aureus* that were isolated from unpasteurized milk cheeses were tested for the action of essential oils.



Fig.2. Used essential oils

For this, the diffusimetric method was used, the principle of which is based on inhibiting the development of a microbial culture put in contact with different essential oils, on suitable culture media [11,15]. As a culture medium, the special Müller - Hinton medium was used (fig.3.), which allows the development of most pathogenic bacteria, having no antagonistic effects to antibiotics or components of essential oils. The pH of the medium was 7.3 ± 0.1 .

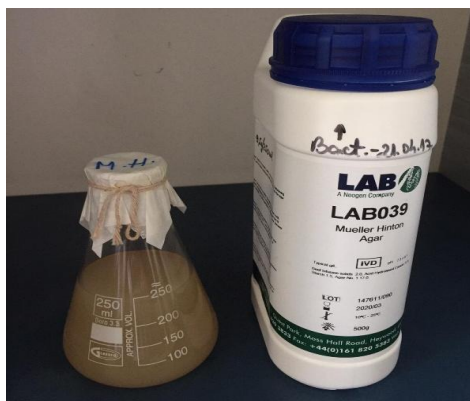


Fig. 3. *Mueller – Hinton medium*

Prior to inoculation of the Müller - Hinton medium, the pure culture of the microorganism to be tested was transplanted (fig.4.) into a nutritious broth, after previously making serial decimal dilutions of 10⁻¹ to 10⁻³ in sterile saline.

Dilution was performed to obtain dense but not confluent colonies. Transplantation was performed on the surface of selective culture media, used to isolate bacteria.

The strain to be tested was transferred from the Petri dish (fig. 1) to the nutrient broth (fig. 4).

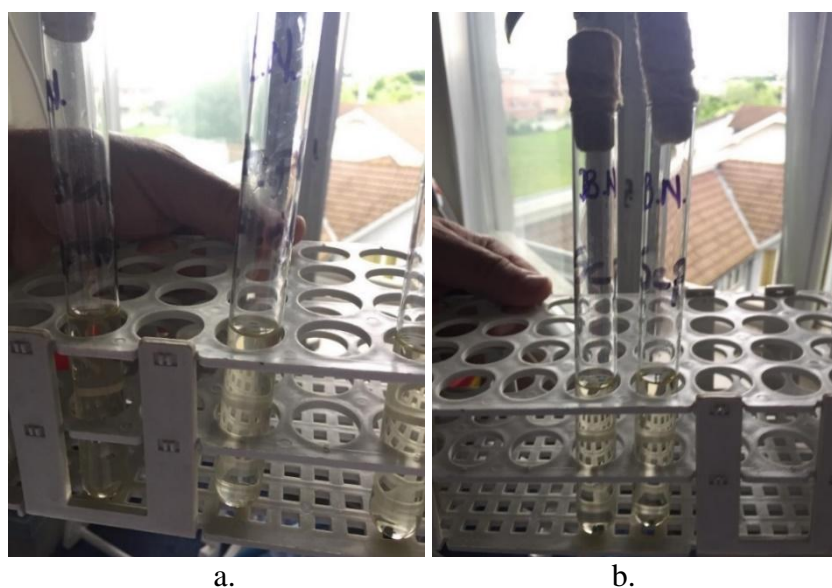


Fig. 4. *Nourishing broth at transplantation:*

- a. *Staphylococcus saprophyticus* and
- b. *Staphylococcus aureus*

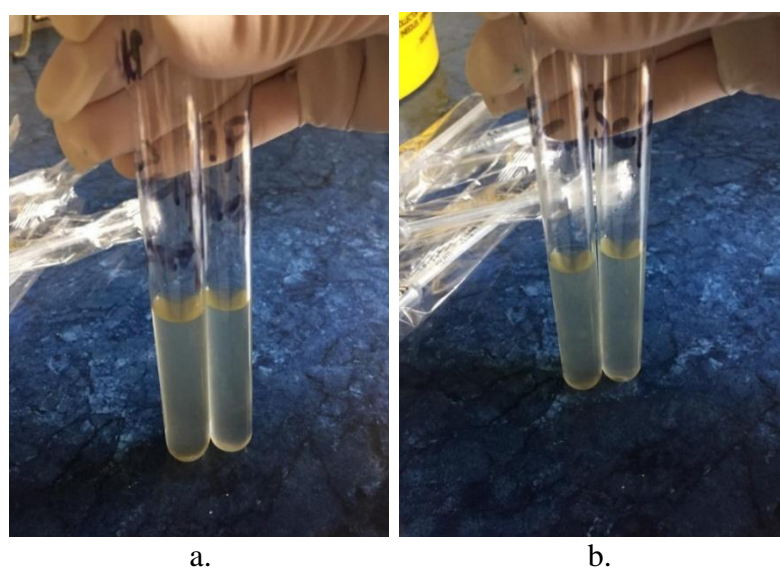


Fig. 5. *Nutritional broth with Staphylococcus saprophyticus (a.) and Staphylococcus aureus (b.), 24 hours after transplantation*

For seeding the Müller-Hinton medium, the method of flooding the medium with 1 - 1.2 ml dilution was used (dilution of 10⁻³ was generally used from nutritional broth 24 hours after transplantation – fig. 5), with a Pasteur pipette, after which by repeated tilting the suspension was dispersed over the whole surface.

The inoculated medium was introduced into the thermostat with the lid of the semi-open plate, for drying for 20-30 minutes, after which with the help of a pre-flamed tweezers the micro-compresses/ discs impregnated with essential oils were distributed, taking care that they are at about 15 mm from the periphery of the environment and approximately 30 mm apart. The plates were covered with a lid, the plates with symbols for each oil were noted, after which they were left on the work table for 15-20

minutes for pre-diffusion so that the essential oils diffuse into the medium. The symbols used were: “MH” - Müller – Hinton medium, “Ci”-thyme, “E”-eucalyptus, “CA”- white sea buckthorn, “B”- basil, “M”- mint, “T”- tea tree.

The plates were then placed on the thermostat for a period of 24 hours, after which the results were interpreted.

5. Results

After the plates stood for a period of 24 hours on the thermostat, they were removed and the results were noticed depending on the area of inhibition developed around the discs impregnated with essential oils (fig.6).

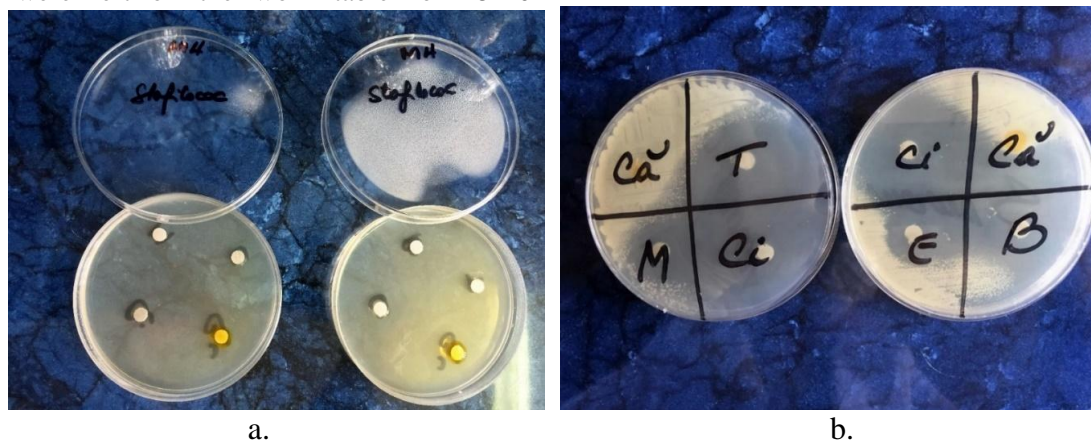


Fig.6. Plates seeded with *Staphylococcus saprophyticus* (a) and *Staphylococcus aureus* (b) on which the microcompresses impregnated with essential oils were distributed after 24 h of incubation

The reading consisted in assessing the size of the areas of inhibition induced by essential oils. Their diameter is directly proportional to the sensitivity of the germ, in the sense that the more active the essential oil, the wider the area of inhibition. According to the McFarland scale, microorganisms in which the inhibition zone was

greater than 6 mm were considered sensitive, microorganisms in which the inhibition zone was 2-5 mm were considered moderately sensitive and microorganisms in which the inhibition zone was ≤ 2 mm or even absent were resistant. The table below (table 2) shows the sensitivity of bacteria to the action of tested oils.

Table 2. Sensitivity of *Staphylococcus saprophyticus* and *Staphylococcus aureus* to the action of tested essential oils

Essential oils	Used microorganisms					
	<i>Staphylococcus saprophyticus</i>			<i>Staphylococcus aureus</i>		
	S	MS	R	S	MS	R
<i>Thymus vulgaris</i>			X	X		
<i>Ocimum basilicum L.</i>			X	X		
<i>Melaleuca alternifolia</i>			X	X		
<i>Hippophae rhamnoides</i>			X			X
<i>Eucalyptus</i>			X		X	
<i>Mentha piperita</i>			X	X		

S- sensitive, MS – moderately sensitive, R- reduce sensitive (McFarland scale)

Staphylococcus aureus showed high sensitivity to the action of thyme, basil, mint and tea tree extracts with impressive inhibition sizes in the range of 15-35 mm (thyme-35 mm, tea tree-25 mm, mint-15 mm, basil- 25 mm), moderate sensitivity for eucalyptus oil with an area of 1 mm and resistance for sea buckthorn oil that has no antibacterial activity at all.

Staphylococcus saprophyticus did not show sensitivity to any of the plant extracts listed above. Although the way of working was exactly the same, which was applied in the case of all examined microorganisms, and the bacterium is not part of the species of positive coagulates, this bacterial strain has resistance to the action of all extracts tested. Detailed analysis of this micro-organism for several types of vegetable oil will be considered.

Conclusions

Due to the active components contained in the tested essential oils, they exert an obvious bactericidal action, with variations, depending on the microorganisms used for sensitivity testing.

The diffusimetric method may be recommended for use in testing the activity of essential oils that can be used in the food industry, providing relevant results depending on the area of inhibition developed around the micro-competent.

The use of essential oils can prevent food poisoning. The tested essential oils can be used for incorporation in various foods, in order to prevent the development of microorganisms, helping to increase shelf life and increase food safety. It is also considering the creation of new foods with functional potential that would bring benefits to human health.

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