

Liviu-Marian DOBROTĂ - The Smart Village from perspective of sustainable development. Case study Chiscani Village, Brăila County

**IOSUD – „DUNĂREA DE JOS” UNIVERSITY OF GALAȚI**

**Doctoral School of Fundamental Sciences and Engineering**



## **PhD Thesis Summary**

# **THE SMART VILLAGE FROM PERSPECTIVE OF SUSTAINABLE DEVELOPMENT. CASE STUDY CHISCANI VILLAGE, BRĂILA COUNTY**

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## CONTENTS OF THE PhD SUMMARY THESIS

<b>CONTENTS OF THE PhD SUMMARY THESIS .....</b>	<b>3</b>
<b>INTRODUCTION .....</b>	<b>5</b>
<b>PRESENTATION OF THE CHAPTERS OF THE PhD THESIS .....</b>	<b>7</b>
<b>CHAPTER I. THE CURRENT STAGE OF APPLICATION OF RURAL DEVELOPMENT MEASURES (NRDP) IN THE PERIOD 2014 - 2020, PRECURSOR TO SMART VILLAGES</b>	<b>7</b>
<b>CHAPTER II. THE CURRENT EUROPEAN DIGITAL MARKET CONTEXT – ENGINE OF ECONOMIC GROWTH .....</b>	<b>9</b>
<b>CHAPTER III. DETERMINANTS OF SUCCESS IN RURAL DEVELOPMENT PROJECTS AT THE LOCAL LEVEL. CASE STUDY NEAR CHISCANI VILLAGE, BRĂILA COUNTY .....</b>	<b>14</b>
<b>CHAPTER IV. STUDY ON THE OPPORTUNITY OF THE APPEARANCE OF SMART VILLAGE CONCEPT FROM THE PERSPECTIVE OF DIGITAL TRANSFORMATION. CASE STUDY CHISCANI VILLAGE, BRĂILA COUNTY.....</b>	<b>18</b>
<b>FINAL CONCLUSIONS .....</b>	<b>24</b>
<b>SELECTIVE BIBLIOGRAPHY .....</b>	<b>25</b>
<b>DISSEMINATION OF RESEARCH RESULTS .....</b>	<b>26</b>
<b>ANNEXES .....</b>	<b>27</b>

## **A Few Words of Gratitude,**

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Author,

PhD. Liviu-Marian DOBROTĂ

## INTRODUCTION

The research included in the doctoral thesis entitled "The Smart Village from the perspective of sustainable development", strongly argues that geographical proximity is important for the close cooperation between businesses and partners, which is often necessary in the development of innovations and other factors of economic growth.

This circumstance favors urban areas with many partners with potential in research activity. For companies in less populated areas, this means that innovation systems risk becoming of weaker intensity. To counter this, companies in less populated regions often need to have more extensive connections to be competitive. The need for local knowledge and expertise will be a decisive factor for development. Companies with connections that extend beyond their own locality or region have greater access to new knowledge and therefore to better conditions for innovation.

It is possible that these relationships will vary at the level of industry profile, size and age of companies. However, smart rural growth also depends on the connectivity of firms in the region. The connectivity of firms and organizations in a region, in particular with regard to networking between complementary areas, is what allows for development in related technological areas and supports entrepreneurs in exploiting local facilities, creativity and resources in the territory.

The political approach highlights the belonging of the regions around the cities as an organising element in the territorial economies of the nations, especially in terms of creating partnerships between complementary areas, which allows specialization in related technological fields and supports entrepreneurs in exploiting local resources, creativity and resources based on their own territory. In the context of a region around a city, cities, sub-urban areas and surrounding rural areas are brought together as a whole so as to allow for more focused reflections on their interdependence, including trade flows, labour market flows and capital movements. However, when it comes to peripheral regions, connections are quite rare and companies in these regions depend on specialized links across metropolitan regions, for knowledge and learning, as well as for product development and marketing.

Rural areas do not have the same access to resources and markets and differ in socio-economic conditions and social structures. The general characteristics of peripheral and isolated regions are low accessibility, negative migratory balance and low levels of education. Pursuing the conceptual framework underpinning smart growth policies would imply that peripheral and isolated regions do not have their own potential for endogenous development. There is, however, a growing literature that recognizes the relevance of place-based planning services and the entrepreneurial context for the development of rural areas. The facilities are also highlighted as being particularly important for attracting and retaining creative individuals, who have been shown to contribute to the development of rural communities. As mentioned, the concepts of incorporation, relationship and connectivity are identified as key areas to achieve smart growth, which implies development based on knowledge, research and innovation.

Smart growth in itself is thus not specifically defined, with the consequence that it cannot be measured directly. Also, the role played by different types of facilities is not explicitly emphasized as a key engine for achieving rural growth, but rather is left unspecified and assembled into the broad concept of features based on the place. In addition, how intermediate and isolated regions are defined and whether there are categories between these two types is not discussed in the previous literature. It is therefore not yet clear whether smart growth policies are appropriate for many rural regions.

Thus, from the point of view of conceptual aspects and from the point of view of the potential indicators and measurements of smart growth and its determinants, there is a clear need

Liviu-Marian DOBROTĂ - The Smart Village from perspective of sustainable development. Case study Chiscani Village, Brăila County

for studies that analyses each of the factors that can influence the potential for growth in a diverse set of rural regions.

The purpose of this work is twofold. On the one hand, it is to conceptually discuss the title of the work: What is the smart village? On the other hand, it is to present a proposal for smart rural development and to analyse their relevance in future studies on issues related to rural development and the concept of smart growth. In order to achieve these objectives, we start by presenting an overview of the emergence of the concepts of smart growth and smart development from a European perspective. Here we discuss the associated concepts of smart, sustainable and inclusive growth, how they are mutually formulated to achieve the stated policy objectives, and how each of these concepts defines growth differently. The paperwork continues with an inquest study on the actors' perception of accepting a smart rural development model, and then the research compares smart development to the associated term sustainable development. The fourth section explicitly deals with solving the problem of rural areas and what the proposed smart development involves for the peripheral intermediate and rural regions. Finally, short-term conclusions and proposals are discussed and presented.

## **PRESENTATION OF THE CHAPTERS OF THE PhD THESIS**

PhD thesis entitled "The Smart Village from the Perspective of Sustainable Development. Case study Chiscani Village, Brăila County", coordinated by Mrs. Prof.dr. habil. Turek-Rahoveanu Maria Magdalena addresses one of the most important and current themes of the rural space in Brăila, where we have proposed to achieve an innovative solution of the future smart village of Chiscani.

In order to achieve the best results in the approach of this thesis from the research carried out, based on the study of the specialized literature in the field of sustainable development, the research axes are approached as follows:

1. the current state of implementation of rural development measures (NRDP) in the period 2014-2020, precursor to smart villages;
2. the current European digital market environment – an engine for economic growth;
3. determinants of success in rural development projects at local level, case study in the proximity of Chiscani village, Brăila County;

Sustainable development is a very dynamic concept with many dimensions and interpretations, seen as a process of permanent change, very related to the local context, local needs and priorities and with well-defined objectives.

The number of companies in Romania that have begun to report information on sustainable development, in addition to financial data, is increasing, and this is an advantage for all existing factors: company (employer), employees, society, environment, city, country.

Among the key factors identified, the research stressed that there are three of utmost importance for promoting territorial success in local projects:

1. defining clear common objectives and master plans;
2. promoting political transparency and commitment to decisions related to the project implemented, and
3. promoting connectivity and mobility between localities.

Keywords: sustainable development, indicators, community, evolution, quality of life, economic growth, potential, performance, company, institutional health, objectives, employer, employees, environment.

## **CHAPTER I. THE CURRENT STAGE OF APPLICATION OF RURAL DEVELOPMENT MEASURES (NRDP) IN THE PERIOD 2014 - 2020, PRECURSOR TO SMART VILLAGES**

This chapter presents examples of participatory social and digital initiatives that improve the delivery of rural services. The source of these innovative initiatives varies, but nevertheless, at the local level communities play a central role. The examples cover six key service areas: multi-service hubs, health, education, mobility, energy and the digitalization of the village itself. On their own, they can have a major impact on the quality of life in rural areas. Taken together, they can provide examples and inspiration for a broader concept of 'Smart Villages'.

The main purpose of this study is to highlight the need to reinterpret and reconceptualize the accepted notions of smart cities and villages by turning the focus from technology and technical solutions to communities and sustainability. In this way, we can support the shift from a development focused mainly on technology to a more life-centered development for rural and urban communities in the future. Such communities will consider "the needs of the present without compromising the ability of future generations to meet their own needs" [1].

A new concept of rural development proposed by the European Commission is entitled 'smart villages'. It is primarily aimed at villages that are in decline due to their remoteness from a developed area and depopulation [2] [3] [4].

The question is about its scale and nature. Does the concept of a smart village have chances? The decline in rural areas is characterized by the lowest level of socio-economic development, raising the following assumption: the lower the level of rural development, the lower the accessibility of the Internet. This makes it more difficult to implement the concept of the smart village.

The implementation of such an objective would be done in three stages:

- ✓ following changes in Europe's rural population in relation to the level of socio-economic development;
- ✓ identifying areas with a lack of infrastructure with internet access and verifying that they overlap geographically with the areas with the lowest level of development;
- ✓ determining what smart villages are or want to be and what resources rural areas need to support activities to promote such initiatives in the EU's future financial framework.

The promotion of social innovation is in line with one of the main challenges of innovation in the contemporary world, namely the need to move from innovation for growth to innovation for sustainable development [5].

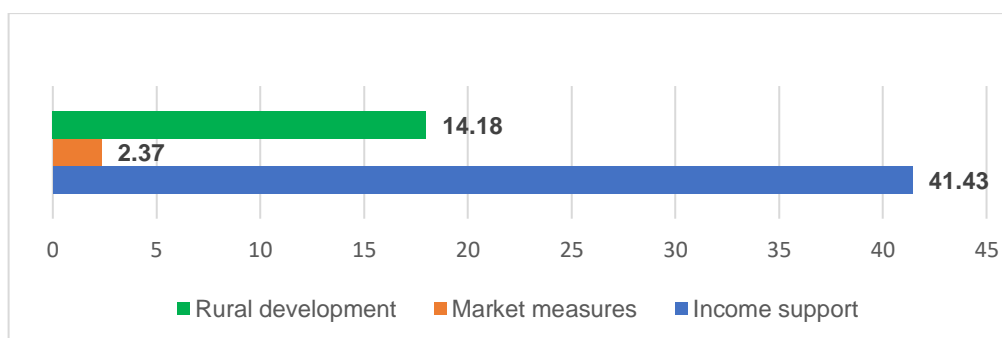
I believe that this problem represents a general challenge, not only for institutions planning sustainable rural development, but also for the scientific community, its task being to provide knowledge that describes reality.

Through the support and flexibility of the common agricultural policy, we can preserve traditions while facilitating business development. We can make rural areas more attractive to new talent while supporting young and old farmers. And we can meet citizens' expectations by ensuring the highest standards of safety, quality and well-being.

The Common Agricultural Policy intervenes by: *supporting incomes* through *direct payments* ensuring income stability and remunerating farmers for organic farming and the delivery of public goods that are not normally paid by markets, such as the protection of the rural environment; *market measures* to withstand the market, such as a sharp drop in demand due to health problems or a fall in prices due to seasonal oversupply; *rural development measures* with national and regional programs to address the specific needs and challenges facing rural areas (Figure 1.1).

Figure 1. 1

Share of financial allocations in the EU budget in 2014-2020



Source: [6]



The financial instruments co-financed by the EAFRD have contributed and will contribute to the development, diversification of the sector and to the necessary investments by supporting activities in areas where projects are commercially viable, which will open up market opportunities for as many partners.

The development of 'smart rural villages and towns' is also recommended by the Organisation for Economic Co-operation and Development (OECD) in its rural policy-making principles [7].

The important role of digital technologies is also highlighted by F. Bogovic and T. Szanyi [8], who consider that the development and practical application of the concept is a chance to ensure an easier and better life for rural residents, adding that it is necessary to respond to the problems created by the ageing of society and the lack of services.

Another important aspect of smart villages is the territorial sensitivity of the idea of a smart village, allowing any projects to adapt to local circumstances. The wide applicability of the concept can also be a disadvantage whenever we try to say what a smart village is (or could be).

Therefore, we intend in this chapter to come up with a description of what "sustainable development" means based on the specialized literature, to understand where this concept started, how important it is for the society in which we live and what are the objectives to be achieved.

## **CHAPTER II. THE CURRENT EUROPEAN DIGITAL MARKET CONTEXT – ENGINE OF ECONOMIC GROWTH**

This chapter analyzes some very recent issues regarding the access to ICT, the use of the Internet, but also some more special aspects, such as digital skills and electronic sales at European level and implicitly in Romania. Using Eurostat statistical data, the chapter aims to: analyse the profile of the digital society and of companies interested in how and for what purposes people and businesses enter online, on digital skills and ICT specialists. It includes, inter alia, information about mobile internet access, internet activities, the use of social networks, as well as the employment of ICT specialists. It also presents an analysis of e-commerce from two perspectives: people who order goods and services online and companies that sell e-commerce. At the end of the chapter, we aim to answer the question: Can we speak of a digital single market in the near future?

The methodology used in this study combines the analysis of bibliographic sources with the purpose of empirical research (identifying possible causes of the low level of digital skills among the Romanian population) with the statistical data existing at European level. The two main possible causes that can explain the low level of digital skills among the Romanian population would be a certain structure of the educational risk on the one hand, but also Romania's openness to the general educational strategy and the urban-rural gap in terms of competence of the and the level of use of digitalization. On the basis of these aspects, we will carry out an analysis of the results and statistics at European level.

The shift to digitalized services has once again widened the digital divide and clearly demonstrated that with the current developments in digital infrastructure and skills, there are still many disadvantaged members of society who cannot participate in the digital economy and society. More attention is therefore needed to empower them, both in the EU27 and in the Eastern Member States. UN has stated that digital technologies are capable of strengthening and even accelerating inequalities, risking excluding almost half of the world's population – most of whom are women who do not yet have access to the Internet.

DESI (digital economy and society index) shows that 4 out of 10 people in the EU lack basic digital skills. At the same time, more than 70% of companies say that the lack of staff with the right digital skills is an obstacle to investment. The same phenomenon is happening in the Eastern countries, and the level of digital knowledge on the basis of the population remains relatively low. For example, a survey conducted in Georgia in 2019 shows that 47% of the population of Georgia did not have the basic knowledge to use the computer, in Armenia, 34% of people did not have digital skills and in Ukraine 53% of the population had digital skills lower than basic ones, and 15.1% had no digital skills.

In order to ensure that all citizens can benefit from digitalization and have the right skills to participate in the digital society, the European Commission is expected to prepare min 80% of the EU population with basic digital skills.

The European Commission has proposed a solution to translate the digital ambitions for 2030. The main objectives were grouped as follows:

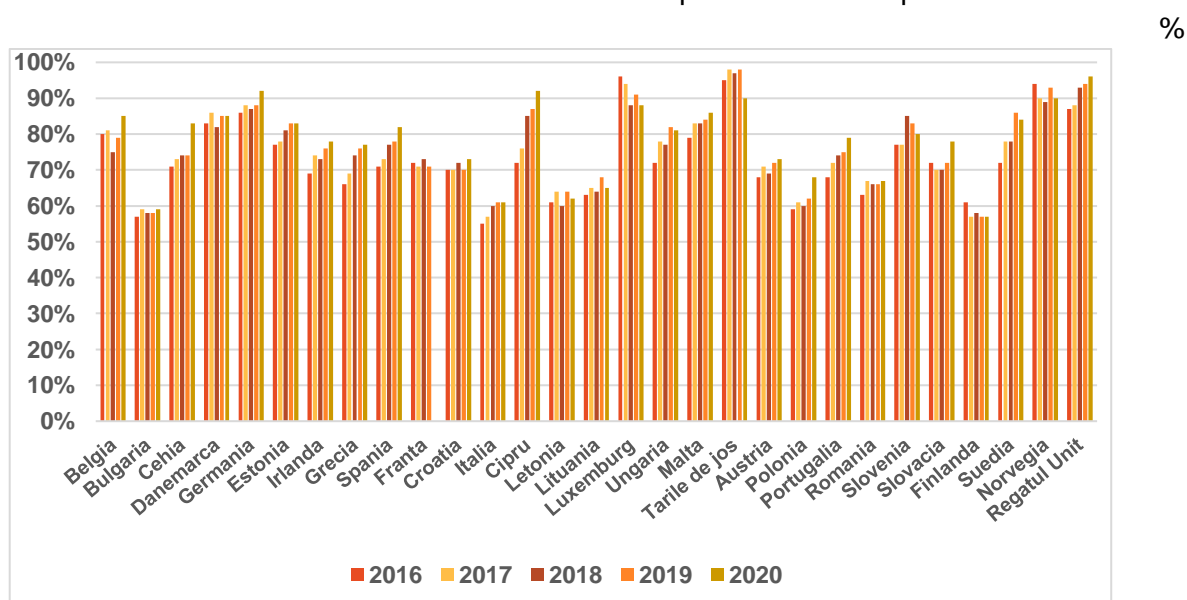
1. digital skills for all;
2. the existence of a digital, secure, high-performance, sustainable infrastructure;
3. digital transformation of companies;
4. digitalization of public services.

The European Commission will address this digital skills gap by promoting projects and strategies to improve their level across Europe. Most of these initiatives are strongly linked to EU4Digital's efforts in eastern partner countries, such as the establishment of national associations for digital skills and jobs and the development of a common methodology to measure and forecast digital skills in terms of alignment with DESI.

We set out to carry out an analysis of the digital performance of Member States in different areas and to try an assessment of the progress made and to highlight the need for further efforts to improve it. We believe that implementing the measurement of digital skills in parallel with the DESI would allow Member States to compare their progress, assess the effectiveness of investments and determine the development of digital skills in certain areas and the continuation of the potential support provided.

Figure 2.1

Households with fixed broadband connection at European level in the period 2016-2020



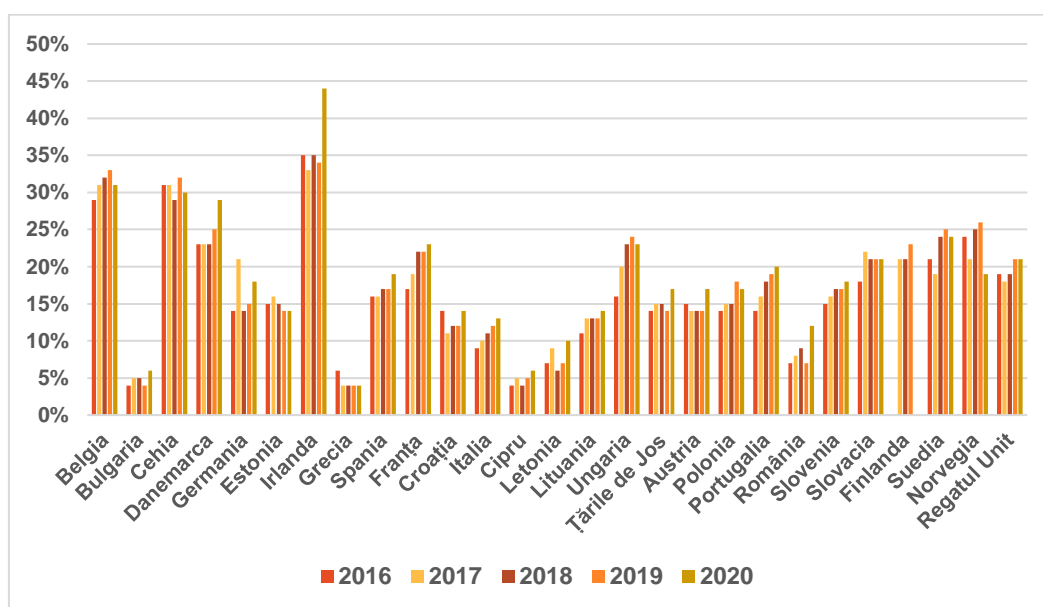
Source: Eurostat, accessed 2021

We are witnessing today a profile of their Internet users who have many options in terms of methods in which they can work online and often use more than one device to do so.

Our observation is that since 2016, *smart phones* are the most preferred and often used is devices, as shown by the trend at EU level, following some surveys, respectively out of the 87% of internet users, 44% answered that they use a tablet, 64% use a laptop or notebook and 54% a desktop computer.

Figure 2.2

The share of turnover from sales through electronic channels in total turnover %



Source: Eurostat, accessed 2021

If we follow the online activity of home Internet users in the European Union, we can see how the most common activities in 2019 were email exchanges, 86% of people have used the Internet in the last 3 months, also searching and finding information, 78%, going through on-line news, 72% and last but not least participating in social networks, 65%.

Companies use their website to provide different information and functionality to their customers or business partners. Most commonly, those companies that had a website in 2017 provided product catalogs or price lists (73%), while 26% offered options to order or book online, and 11% had website functionalities that provide for online order tracking.

Statistical data show that social networks are the most widely used networks of companies in the European Union. In addition to websites, companies can use social media channels to spread information or for marketing/promotional purposes.

Among the EU Member States, the largest share was among internet access companies that used social networks were in Malta (76%), while the largest share for multimedia content sharing sites was recorded in the Netherlands (29%) and for blogs or micro-blogs in the United Kingdom (44%).

There are a variety of reasons why businesses in the European Union can choose to use social media. The most popular uses included developing their business image or marketing their products (84% of companies that used at least one social media channel in 2017), getting or answering customers' opinions or answering their questions (56%), and recruiting employees (49%).

Figure 2.3

The share of companies participating in social networks in Romania, as a percentage of businesses with internet access



Source: Eurostat, accessed 2021

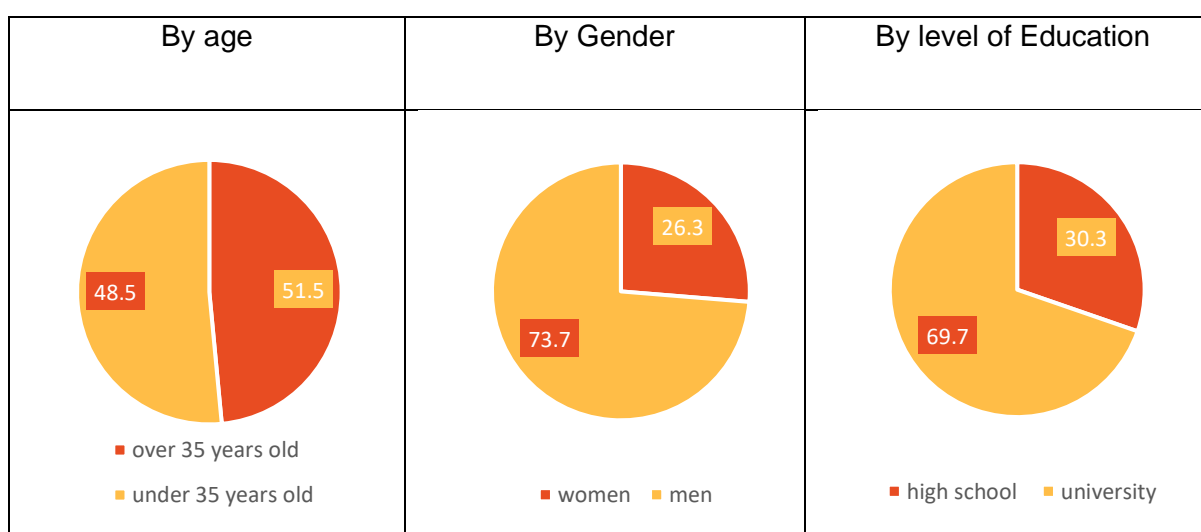
Information and communication technologies (ICT) has a considerable impact on living and working conditions. Nowadays, an increasing number of companies rely on ICT for their daily operations, and this often requires the development and maintenance of ICT systems by specialists.

The employment of ICT specialists has increased over the last ten years, so that in the European Union, 3.7% of the total number of people employed in 2019 were ICT specialists. This equates to 8.2 million people. The largest share of ICT specialists in total jobs was recorded in Finland (6.6%), Sweden (6.3%) and Estonia (5.3%).

Unlike most other professions, the evolution of the employment of ICT specialists has been largely unaffected by the financial and economic crisis. Over the past decade, the number of ICT specialists employed has increased by 33% across the European Union, compared to the 2% increase in the total number of jobs. During the same period, the share of businesses that recruited or tried to recruit ICT specialists remained relatively stable, around 8%.

Figure 2.4

The share of ICT specialists employed in Romania after 2017 – present %



Source: Eurostat 2020, accessed 2021

In Romania, ICT specialists are mainly highly educated men, aged under 35, and in the E-U. the category of over 35 years prevails. In 2016, a large majority of ICT specialists employed in the EU were men (83%), their share increasing from 78% in 2010. This gender distribution of

Liviu-Marian DOBROTĂ - The Smart Village from perspective of sustainable development. Case study Chiscani Village, Brăila County

ICT specialists was in contrast to the distribution for total employment, where the sexes were generally balanced (54% men and 46% women). Women specialized in ICT were under-represented in all EU Member States and the largest gender gaps were found in Slovakia (91% were men) and the Czech Republic (89%). The largest share of women specialized in ICT was recorded in Bulgaria (30%) and Romania (26%).

The European Union is working to make the Internet more accessible and has introduced activities such as:

- *more accessible ICT*: making ICT more accessible to all and encouraging the development of accessible technologies;
- *assistive technologies*: supporting the development of ICTs that assist people with disabilities in the digital world;
- *digital skills and competences*: empowering citizens to combat marginalization and social exclusion, including in their careers, and through ICT in education;
- *social inclusion*: increasing the participation rate of disadvantaged people in public, social and economic activities through social inclusion projects.

Digital technologies and, in particular, the internet is transforming our world, and the European Commission wants to make the EU's single market right for the digital age – moving from 27 national digital markets to one.

To date, citizens and businesses in the European Union have often faced barriers when using online tools and services. These barriers mean that beneficiaries have restricted access to some goods and services, businesses cannot reap all the benefits of digitalization, and governments and citizens cannot fully benefit from this digital transformation.

The Digital Single Market will open up new opportunities as it will close the key differences between online and offline worlds, removing barriers to cross-border online activity.

The Digital Single Market Strategy was adopted on 6 May 2015 and is one of the European Commission's 10 political priorities. The EU approach can be defined by 3 areas of action:

1. removing online barriers, allowing full access to goods and services across the EU;
2. abolishing unjustified cross-border barriers;
3. making shopping easier and safer wherever you are in the EU.

The European Union also provides funding, develops technical guidance and brings together experts to support public administrations and businesses working to improve network coverage and roll out 5G networks across Europe.

The focus now is on creating a European Community area with harmonized rules for connectivity services, so that we can enjoy the same benefits, wherever we are in the European Union. Its actions also help to bring more choice to consumers, reduce bills and set a higher standard of service.

The main connectivity target of the next decade is for every European household to have access to high-speed internet by 2025 and giga-bit connectivity by 2030.

Digitalization has been like a boon for the European economy. However, the Digital Single Market remains an aspiration rather than a reality, and the European institutions and Member State governments must redouble their efforts in the coming years to create a better and larger space for the digital economy to develop. Even though there is a big difference between the performance of the different economies of the European Union, it is lagging behind many different economies and could increase the economic outcome of digitalization.

### **CHAPTER III. DETERMINANTS OF SUCCESS IN RURAL DEVELOPMENT PROJECTS AT THE LOCAL LEVEL. CASE STUDY NEAR CHISCANI VILLAGE, BRĂILA COUNTY**

Rural development projects have reached an unprecedented level in recent decades, not only because of their territorial integration potential, but also in view of their role in local, regional investments such as infrastructure building and planning activities.

Identifying the factors influencing the success of projects in rural areas is considered to be decisive in order to achieve sustainable development through rural development strategies, which lead to a consistent improvement in the quality of life of the local population.

This study explores the attitudes and perceptions of people with responsibility in implementing local projects to identify a set of key factors for the success of projects. Throughout this research, 20 interviews have been evaluated, described and analyzed, allowing the identification of 14 key factors to successfully obtain development projects based on the principles of local cooperation. These factors have been briefly explained in light of the objectives of this research and their influence for success, described statistically and analyzed individually by both case study and by factors. Among the key factors identified, the research highlighted that there are 3 of the utmost importance for promoting territorial success in local projects: (i) defining clear common objectives and master plans; (ii) promoting political transparency and commitment to decisions related to the implemented project and (iii) promoting connectivity and mobility between localities.

In the new post-socialist European Union member states, the partnership-based approach has been implemented since the beginning of the 21st Century, especially after joining the European Community, perceived as an element of Europeanisation, largely determined by European Union policies.

Cross-sectoral territorial partnerships, called Local Action Groups (LAGs) in the context of the LEADER programme, are important institutions operating at local level, but structured and operating according to the rules of the Following E-Area. LAGs are concerned with cooperation and coordination between partnership stakeholders between local and public sector actors and beyond. They receive financial support for the preparation of Local Development Strategies (SDL) and their implementation. The LSDs are operationalized through the funding of local actions (referred to as 'operations' in the LEADER programme documents), on a co-target basis, with actions classified and selected by the LAGs.

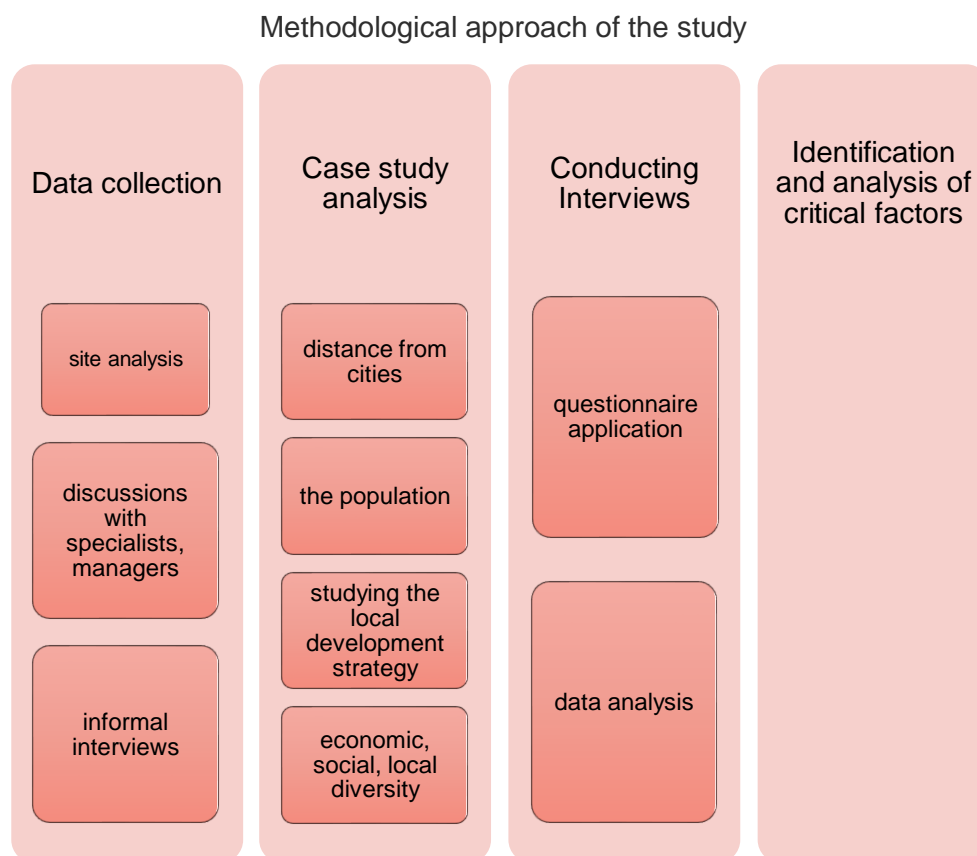
The focus of the analysis presented in this paper is making decisions on the financing of actions in rural Brăila. We focus on how formal external rules interact at the leader axis programme level (2014-2020) and informal local rules and priorities. In this paper we present evidence from the qualitative research undertaken on the decision-making processes of three LAGs in Brăila compared to the community of Chiscani.

In the first section of the paper, we analyze the theoretical foundations underlying local partnerships, paying attention to the differences between extra-local and local objectives and referring to the concepts of endogenous, exogenous and neo-endogenous development. Below, we present the methodological approach of qualitative research carried out in fifteen LAGs in Romania. We then present the results of our qualitative research, focusing firstly on formal approaches to evaluating actions for the selection of funded actions and, secondly, on the local dynamics influencing decision-making on project selection and funding. We end with a discussion and a conclusion.

Given the purpose of this research, for a careful year ours was dedicated to the development of the methodological framework, since the study required the use of several methods during the research, including indirect and direct research methods and tools. In this respect, the methodological approach has been divided into four main phases (Figure 3.1), which ends with the identification of critical factors for territorial success in the implemented LEADER projects and

the evaluation of the local development strategy, their relationship according to local planning specialists.

Figure 3.1



Source: own processing by consulting the literature

The data of the study were collected through the analysis of the local development strategies presented in the websites of the LAG's structures, the process of planning and evaluating each case study was different, given that Chiscani is not part of any LAG. Informal discussions and interviews with officials, specialists and main actors in the implementation of the projects were aimed at determining the interest in participating in such research, as well as identifying the most relevant issues to which the discussions should be addressed.

The review of the literature was intended to cover a wide range of issues, such as the state of the art on LEADER projects and experiences at the level of other communities and the identification of the main processes and schemes that frame the way communities cooperate.

As regards the analysis of local development strategies for each entity included in the study selected, other data sources were used to understand not only the main challenges and failures faced by each rural locality, but also the main benefits and benefits obtained through local development projects (LEADER).

The representative sample was made up of specialists and officials who acted and live in the territories covered by the LAGs and the municipality of Chiscani. The sample was composed of nineteen people, and the questionnaire was distributed and carried out by e-mail, using a specific form sent directly to members of local councils and specialists who were directly involved in the development and / or implementation of rural development projects in the period 2014 - 2020.

Liviu-Marian DOBROTĂ - The Smart Village from perspective of sustainable development. Case study Chiscani Village, Brăila County

Descriptive statistics were used to present the results of the univariate analysis, taking into account the objectives of the *Chi-squared* test analysis, in order to correlate the data between the factors chosen for territorial success.

Through the analysis of the case study, a considerable amount of data was collected in order to gain a deep understanding of the main problems that could somehow influence the success of rural development projects (Table 3.1).

Table 3.1.

Macroeconomic indicators of case studies in the period 2014-2020

Case Studies	Administrative Territorial Units (ATU)	Population (inhabitants)	Distance from Brăila / Galați (Km)	Value of implemented projects (LEADER) (euro)	GDP/head/inhabitant
Chiscani City Hall	Lacul Sărat, Vărsătura, Chiscani,	3.665	7/22	-	-
LAG Association "Terasa Brăilei"	Traian, Movila-Miresei, Gemenele, Tudor Vladimirescu, Romanu, Cazasu	16.037	10/32	783.288	48,8
LAG Association „Câmpia de Vest a Brăilei”	Orașul Făurei, comunele Cireșu, Galbenu, Grădiștea, Jirău, Mircea Vodă, Surdila-Găiseanca, Surdila-Greci, Șuțești, Ulmu, Vișani	35.777	50	1.478.398	41,3
LAG Association „Danubius Ialomița - Brăila”	Bărăganul, Berteștii de Jos, Bordușani, Bucu, Ciulnița, Coșambești, Făcăieni, Frecăței, Gheorghe-Lazăr, Giurgeni, Gropeni, Gura Ialomiței, Mărașu, Mărculești, Mihail Kogălniceanu, Movila, Ograda, Plătonești, Săveni, Scânteia, Stăncuța, Stelnică, Sudiți, Tichilești, Tufești, Valea Ciorii, Victoria, Vlădeni) și un oraș cu populație sub 20000 locuitori (Țândărei).	92.440	21/49	4.435.390	47,9

Source: processing in consultation with local development strategies, 2014 - 2020, accessed 2021

Due to the high territorial variability, the study focused on the area covered by the LAGs, which shows primarily agricultural economic development. Braila County currently comprises 20 of the 293 significantly disadvantaged ATUs in the country ranking. These are characterized by low agricultural productivity and specificities related to soil, climate, biodiversity, relief, etc. [9].

Taking into account all the data sources used during the present research (literature review, technical and scientific papers, implemented projects, redevelopment proposals, etc.) and informal (interviews with key participants, site visits, etc.), fourteen critical factors were identified



and briefly defined, in order to achieve territorial success in rural areas being organized according to their direct relationship with the analyzed case studies (Table 3.2.).

Table 3.2.

Critical factors defined by indirect research analysis

Question 1 (multiple answers)	Respondents		Percentage of the total
	No.	%	
Connectivity - Mobility between localities and cities	7	12.1	36.8
Avoid duplication of infrastructure investments	3	5.3	15.8
Diverse infrastructure offer	2	3.5	10.5
A stronger economy	8	14.0	42.1
Quality standards for a better life	6	10.5	31.6
Stronger political commitment	5	8.8	26.3
Political transparency and commitment	2	3.5	10.5
Strong local development strategy	1	1.8	5.3
Increasing the sense of belonging	2	3.5	10.5
Access to European funds	7	12.3	36.8
Attracting young entrepreneurs	4	7.0	21.1
Common objectives and general plans	3	5.3	15.8
Citizen engagement	4	7.0	21.1
Marketing and advertising	3	5.3	15.8
Total	57	100.0	300.0

Source: Survey-based processing informations

Through this research it has been possible to verify that, regardless of all the efforts made in recent years to strengthen local rural development, there is still a long way to go in order to achieve a sustainable methodology based on objective principles that could help support the creation of multiple economic and environmental benefits, sociocultural and political.

Even though the analysis carried out allowed to identify several problems in local development projects such as the duplication of equipment in nearby areas, the need to look for services and infrastructures outside the strategy's area of influence, the poor quality of data sharing on common planning options between cities, the low demand for public participation for access to strategy-related data and the reduced job opportunities created by the implementation of LEADER, among others, issues that should be reviewed and rethought in view of the negative results that it presents. Moreover, although there is an obvious duplication of equipment and infrastructures in the localities that cooperate with each other, there are still a lot of essential services and public infrastructure that none of the localities has.

However, the research carried out has allowed us to conclude that there is still a long way to go in terms of implementing leader projects and that most decision-makers do not consider that they respect the critical factors identified with regard to the chosen projects, aspects such as the exchange of data between localities, in connection with their use by the citizens of the respective Administrative Territories Units and as an increasing satisfaction of citizens with the benefits introduced by the link between the ATU and the social and economic movement between localities, are encouraging indicators, which show a positive trend [10][11].

Moreover, during the research it has been possible to determine that the main challenges that LAGs must take into account in LEADER projects are the definition of symbiotic development approaches, which will allow for the achievement of integrated growth and highlight a growing

Liviu-Marian DOBROTĂ - The Smart Village from perspective of sustainable development. Case study Chiscani Village, Brăila County

political will and commitment, while breaking the cultural barriers that, to some extent, you will contribute to the increase of the sense of belonging.

The study also established that the most relevant factors for territorial success in LEADER projects are:

1. Definition of common objectives and master plans;
2. Political transparency and involvement;
3. Connectivity - Movement between localities.

These factors, given the dependency relationships given by the *Chi-squared* test, carrying out the analysis, highlight the fact that, in addition to the aforementioned factors, there are six other principles that deserve attention both from the decision-makers and by the planners and designers involved in leader development projects, namely:

1. defining a strong and coherent territorial strategy;
2. diversification of the infrastructure offers between localities, covering as many citizens as possible;
3. increases the opportunity to access European funds and eligibility for different calls;
4. to attract young and talented people, increasing the cultural and economic potential of the locality;
5. promote citizen involvement and participation in the definition of leader project guidelines; and
6. increasing the quality of life for both residents and visitors, which is actually a critical factor for any city desired to grow, become competitive and be successful.

#### **CHAPTER IV. STUDY ON THE OPPORTUNITY OF THE APPEARANCE OF SMART VILLAGE CONCEPT FROM THE PERSPECTIVE OF DIGITAL TRANSFORMATION. CASE STUDY CHISCANI VILLAGE, BRĂILA COUNTY**

This chapter proposes a model for the development of the smart village as a structure, for a local economic growth using data from Chiscani Village, Brăila County. The model captures locally the specific comfort characteristics and quality of life built using the database as well as ad hoc descriptions of the facilities described in the previous chapter. In addition to the perspectives on the influence of local characteristics, the *SMART Chiscani app*, through its proposals, suggests that there are predictable relationships between facilities, quality of life and local economic performance.

*SMART Chiscani app* will contribute to connecting the Chiscani community in the global economic network, which over time will lead to the improvement of the villagers' livelihoods in terms of education, health care, agriculture, small and medium-sized enterprises (SMEs), etc. The operation of *SMART Chiscani app* integrates information technology in the village communities. Through the implementation of the application, there will be an improvement of the interconnection with the nearby cities, namely Brăila and Galați, and the digitalization of the activities will provide an efficient education through a global network, the establishment of a sustainable and circular economy and an ecological environment.

The application has the following functionalities:

- ❖ Possibility of authentication through one of the following providers:
  - Facebook
  - Google
  - Apple

### ➤ **Android**

Authentication is optional, so the user can skip this step. Authentication is only required for users who want to write a review for a goal.

- ❖ Viewing the objectives of Chiscani Village. Each lens contains a gallery of photos, real-time distance to the lens (in km), a text description and contact details (location, phone, website).

- ❖ Objective reviews with database storage

Logged-in users can provide a rating (1-5 stars) and write a text description to publish a review for a goal. They can also view the average rating for goals, along with all the reviews provided by all other users.

- ❖ Listing of events in Chiscani Village

Users can view the date, location and description for them.

- ❖ News and notifications listing from Chiscani

Users can view the date, title and description for them

- ❖ Map display (Google Maps API)

All objectives have a marker or route on the map, depending on their category. The application allows opening the objectives through Google Maps to reconfigure the route.

- ❖ Push Notification Service.

Users will receive real-time notifications containing the title and description set by the app administrator.

#### ***Application architecture***

The application was created using the Flutter Development Framework, which is based on the Dart programming language. This is a new technology that allows the development of Cross-platform mobile applications (Android + iOS) based on a single codebase. Thus, it is no longer necessary to develop two applications in parallel for the two platforms, and the solution benefits from a much shorter *time-to-market*.

The data in the database can be manipulated by just a few mouse clicks. They are updated in real time in the application, which simplifies the process of operation and administration of the database. Unlike a SQL database, the data is not structured and allows the addition of new nodes without further dependencies.

The application will store its data (e.g., reviews, events) from a Firebase database in the Cloud, which can be easily accessed and modified by administrators through the browser. The database will allow users to upload and access the data in real time through the graphical interface of the mobile application.

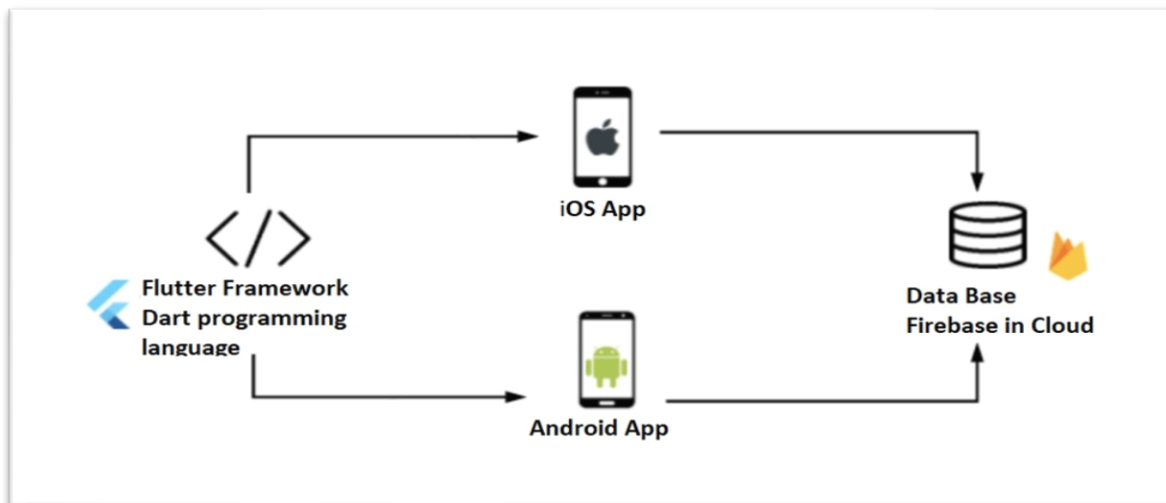
Push-notifications can be sent via firebase cloud messaging (FCM) service, also available in the Firebase web console at the touch of the buttons.

Therefore, the proposed architecture for the development of the solution consists of:

- Client application for phones running iOS and Android
- No-SQL SaaS database in the Firebase cloud

Figure 4.1

Application Architecture



Source: author processing, 2021

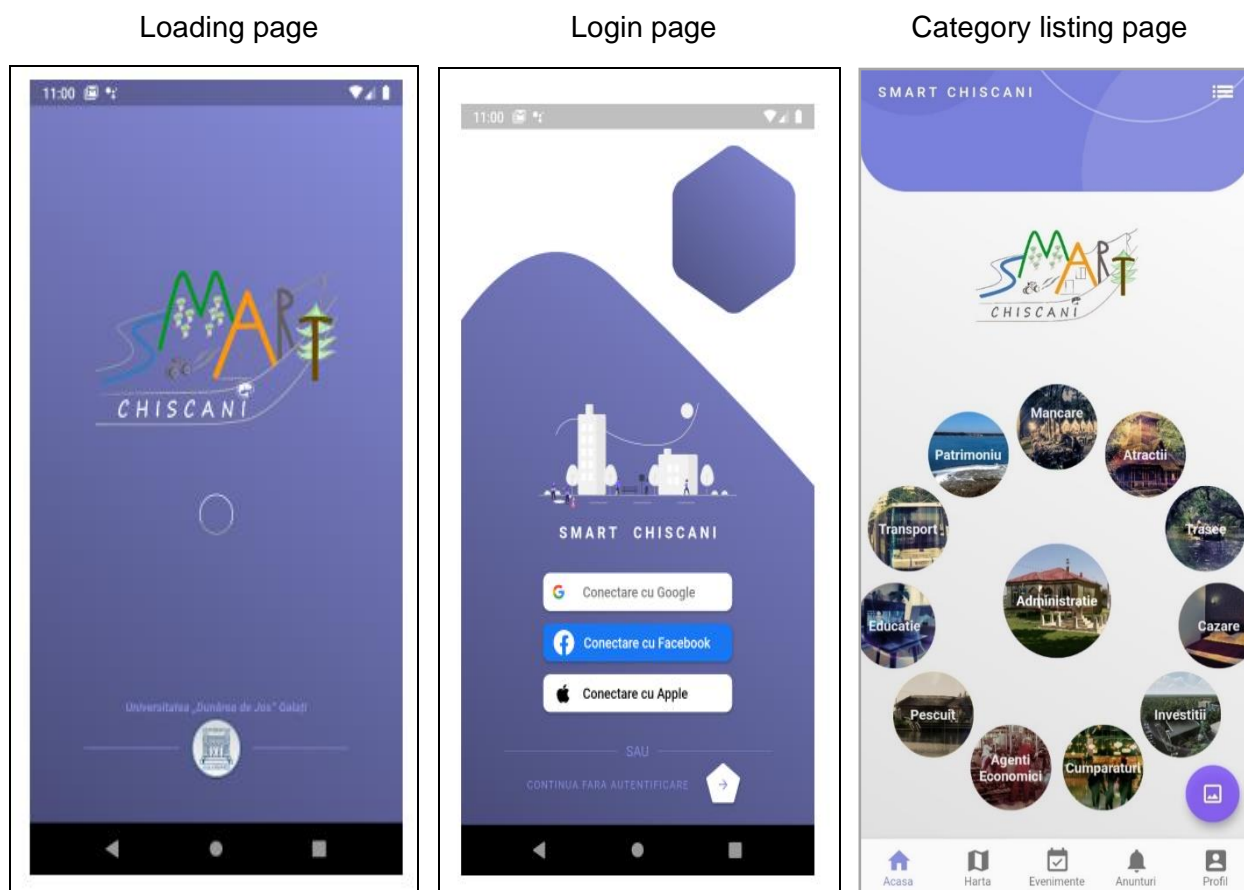
### The design

The application is *screen responsive*, in the sense that the elements in the graphical interface are resized according to the length and width of the screen.

Therefore, the application will run in the same way on any type of smartphone, even on the tablet.

Pages (selections):

Figure 4.2



Source: author processing data, 2021

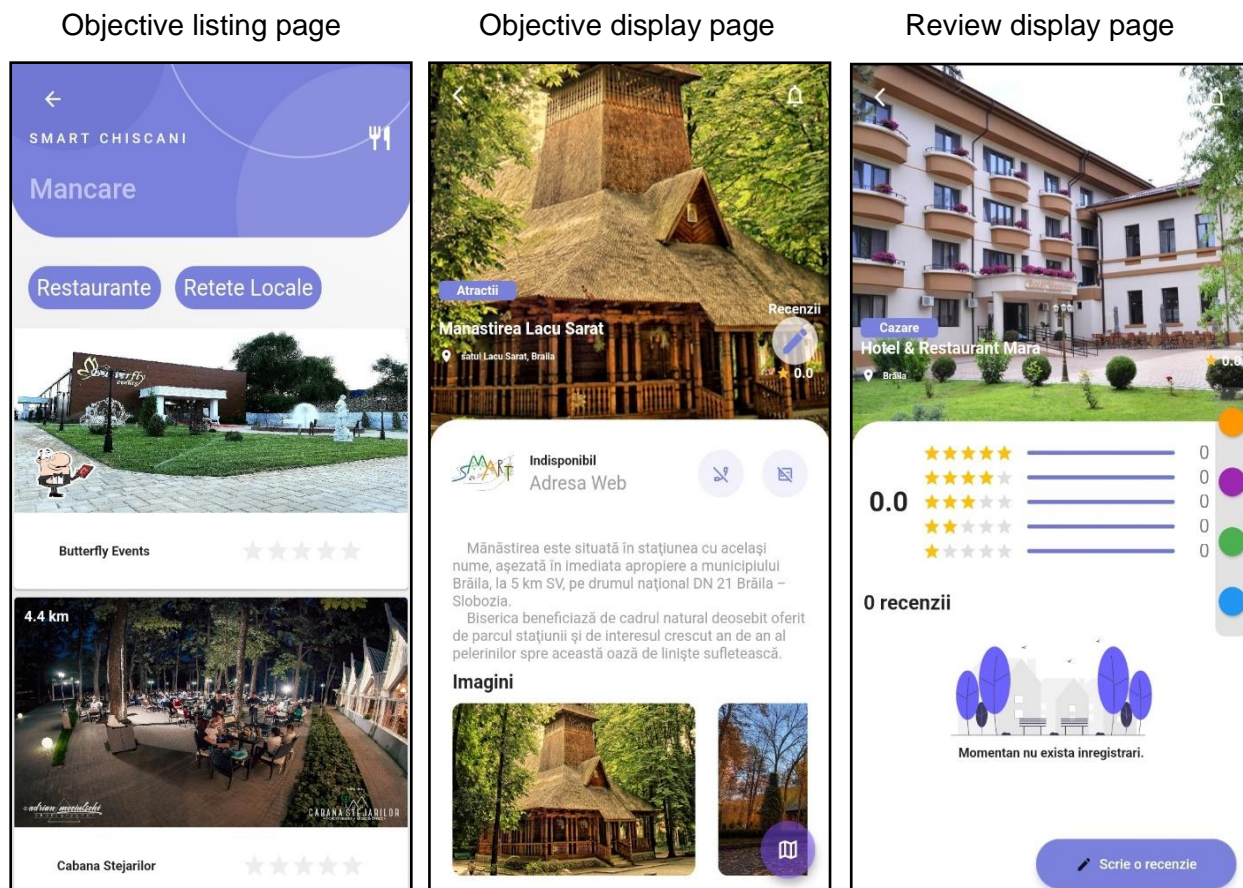
Liviu-Marian DOBROTĂ - The Smart Village from perspective of sustainable development. Case study Chiscani Village, Brăila County

**The loading page** It is the first page of the application and is displayed only for a few seconds, during which the data from the database and the interface elements are loaded.

**Login page** Allow user authentication page. One can skip this step through the "CONTINUE WITHOUT LOGIN" button.

**Category listing page** Allows the user to choose one of the objective categories. You can also change the display mode, from pictures (*masonry, grid-view*) to a radial *menu button* display.

Figure 4.3



Source: author processing, 2021

**Objective listing page** Is a list display, with the possibility of ordering depending on the type of lens. It allows the user to choose a goal once a category has been chosen.

**Objective display page** It allows the user to view the photos, description and information of a lens. It can also select buttons for map view, reference to Google Maps, view reviews, contact details (address, phone number-direct contact for reservations, website).

**The reviews page** Allows the user to view the reviews for a goal and write a review in turn.

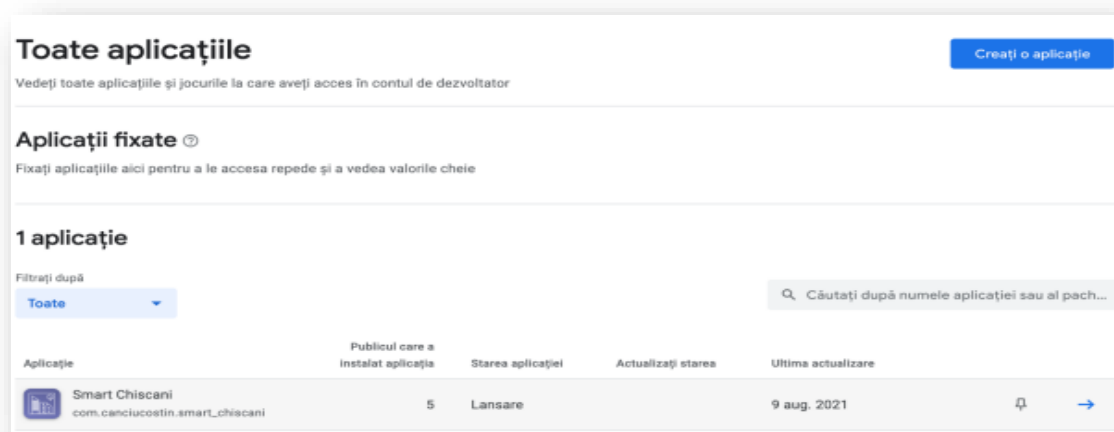
**Publishing to the Google Play Store for Android**

Step 1. Create a Developer Account in Google Play (<https://play.google.com/console/u/0/developers>)

Step 2. Create the app in the developer console.

Figure 4.4

### Google Developer Console



Source: author processing, 2021

Step 3. Filling in the information required for publication: Name, Description, Distribution Countries, Contact Details, etc.

Step 4. Upload the app to the developer console (app *bundle* file).

Step 5. Submitting your app to Review to Google.

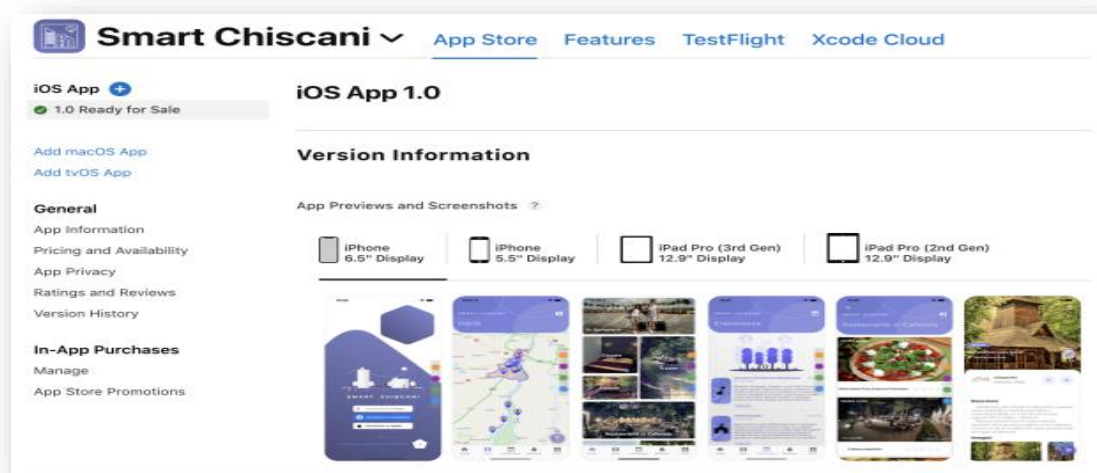
#### **Publishing to the Apple Store for iOS**

Step 1. Create an Apple Developer Account on <https://developer.apple.com/>

Step 2. Creating the app in the App Store Connect

Figure 4.5

### The app in Apple developer console



Source: author processing, 2021

Step 3. Filling in the information required for publication

Step 4. Upload the app to the Apple Developer console (signed.ipa file)

Step 5. Sending the app to apple's Review team for publication

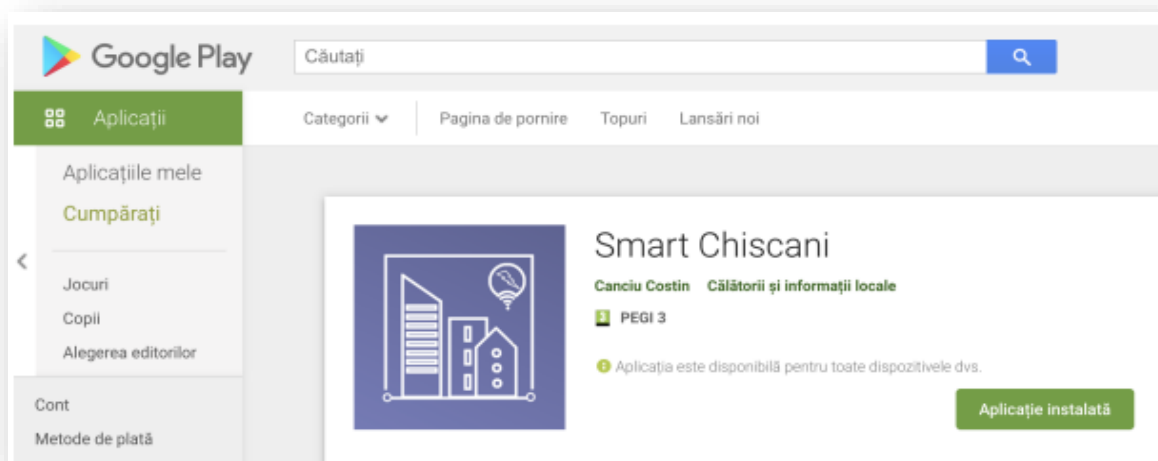
#### **Installation and use**

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Once published in the Google Play Store, users with an Android smartphone can install the app through a simple way:

Figure 4.6

Play Store

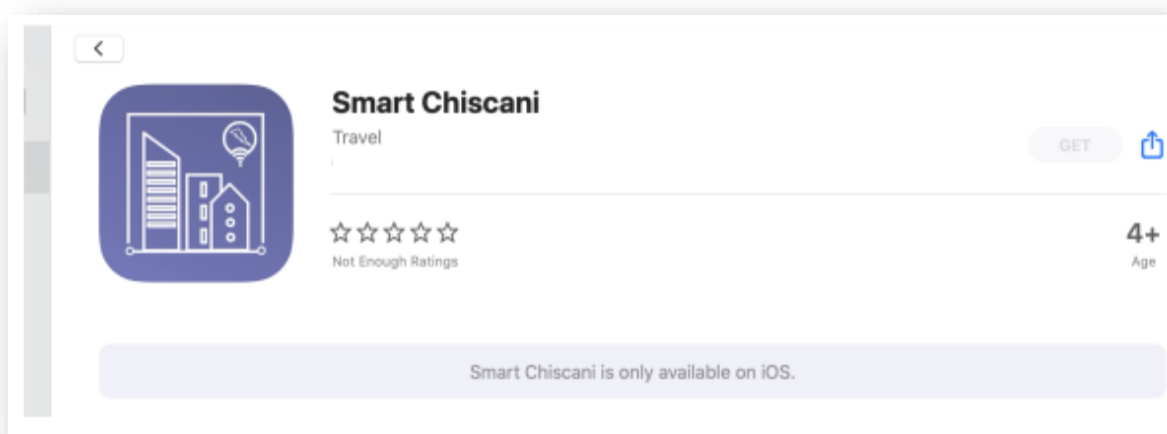


Source: author processing, 2021

The process is the same for the Apple Store, for smartphone users running the iOS operating system.

Figure 4.7

Apple AppStore



Source: author processing, 2021

We appreciate that the *SMART Chiscani application* can be a reference point for smart rural development approaches at the regional, county and local levels, and future approaches should join our initiative as a Proxy server that theoretically connects with the more detailed measures of smart growth and its determinants [12].

*SMART Chiscani App* can be a prime example of how the "bottom-up" (smart) approach is possible. In addition, it can be argued that while it is essential to improve collaboration, accountability should be encouraged through substantial contributions.

## FINAL CONCLUSIONS

The village is the term that has always brought the perception of a place devoid of necessities and close to nature. For substantial growth, we must consider accepting that the progress and development of villages are as crucial and important as that of cities.

In general, the stages of village development are classified into five high levels, namely: *excluded village*; *connected village*; *village with commitment*; *experienced village* and *village actor*, depending on factors such as their development status, available facilities, skills of residents, etc.

A village without internet connection, digital skills, services and digital inclusion falls into the category of excluded village, considered to be at the early stage of digital progress. Substantial and simplified growth can be observed in villages that fall below each higher sequential level in terms of available facilities, the level of inclusion of its people in the territorial transformation, etc.

Finally, a village in the actor category is considered the most advanced in all digital areas, from internet connectivity to self-conduct services, which is considered a vital step in the strategy towards smart villages. However, poverty and social isolation remain a problem in rural communities with high levels of energy poverty, limited access to health, recreational and educational centers and a small network of suffering rural transport partnerships.

At present, even in the XXI century, the penetration of technological advances in villages is commonplace. However, many villages do not have an adequate configuration of the communication network, or some do not have any central healthcare facility or some have no system for monitoring and sublimating energy supply and many others. All these sectors of improvement can be effectively achieved through the proper use of technologies such as IoT, WSN, AI, Blockchain, etc.

*SMART Chiscani* is an application with a large part of its work already reflected in the practices of current rural development programs. Thus, it is worth noting that funding through a European project would be particularly important, which could provide the answer to combating and relieving poverty and isolation in rural areas. Indeed, a local partnership could demonstrate that it would have the capacity, the funds and the willingness to improve the well-being and livelihoods of its rural population.

Our proposal *SMART Chiscani* we appreciate that it will succeed in achieving its main objective, its intelligent approach, which combines local knowledge with local policy objectives, to counteract the distance from urban areas or other most disadvantaged rural areas. Firstly, it will succeed in maximizing access to health, recreational and educational centers (local services), which is significant for both health and isolation, however, this largely depends on the rural transport network.

The village is vital for the development and growth of the country. Currently, rural villages are missing from urban cities in terms of the industrial revolution and socio-economic development. Advances in the latest technology make it possible to act as a source of automation and technical support for a common goal of improving people's livelihoods.

The research has a number of significant approaches for the efficient implementation of the smart village, for the improvement of rural livelihoods and the stimulation of socio-economic growth. We believe that entrepreneurship in the near future is an "innovation through newly formed independent companies".

The fact that villages are less attractive to non-local businesses makes the emergence and success of new local businesses a key aspect of smart rural development.



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## COMPLETE LIST OF WORKS DEVELOPED AND / OR PUBLISHED

### A. SCIENTIFIC ARTICLES

#### I. Articles published in ISI-listed journals \* / ISI indexed conference volumes

1. **DOBROTĂ Liviu-Marian**, FERȚU, C., TUREK-RAHOVEANU, M.M. - "Rural Digital Hubs: The "tool" for Revitalization of European Rural Areas through Digitization ", Proceedings of the 34th International Business Information Management Association Conference, Madrid, Spain, Nov. 13-14, 2019, ISBN: 978-0-9998551-3-3, WOS:000556337408062;
2. **DOBROTĂ Liviu-Marian**, FERȚU, C., TUREK-RAHOVEANU, M.M. - "The Importance of Social Farming in the Socio-Economic Development of Romania and of the EU States", Proceedings of The 35th International Business Information Management Association Conference, Seville, Spain, 1-2 April 2020, ISBN: 978-0-9998551-4-0, WOS:000661489800035;
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#### B. Member of research projects won through competition

- I. Project title: "**Smart, competitive and inclusive rural revitalization**", Grant value: 50,000 lei, UDJG Internal Grants - Competition 2022, NR.314 / 08.04.2022, Project period 05.2022-12.2022.

## ANNEXES

Anexa 1

Valoarea sumelor plătite prin accesarea submăsurii 7.2. în România în perioada 2015-2019

	2015	2016	2017
ALBA	7626531	3509984	1068082
ARAD	10305955	5094217	5358363
ARGES	1299921	6546344	1943592
BACAU	4336231	9908024	8284563
BIHOR	17801773	11912213	7930709
BISTRITA-NA-SAUD	19733531	12303540	12387070
BOTOSANI	4014795	1695249	9005409
BRAILA	0	0	0
BRASOV	2101383	2133733	2043957
BUZAU	11268602	615774	5446907
CALARASI	892746	2327580	6741549
CARAS-SEVERIN	1743481	7887035	5221269
CLUJ	9140219	20910636	2753486
CONSTANTA	3591064	4516385	8654264
COVASNA	0	5522363	7779312
DAMBOVITA	5206551	8420279	4544768
DOLJ	5841728	13443369	7955052
GALATI	9094725	2424398	4050556
GIURGIU	3838207	2563501	1214661
GORJ	9531875	5490426	4914262
HARGHITA	14634923	7715046	20405419
HUNEDOARA	4518656	14700791	6294098
IALOMITA	14548285	6131869	3222087
IASI	0	10730321	14656714
ILFOV	2873854	4650530	934126
MARAMURES	13581769	13727031	6817191
MEHEDINTI	11795248	13090206	0
MURES	7750344	9330757	13090880
NEAMT	18595784	5712989	9386538
OLT	3010437	5873018	11346073
PRAHOVA	1506183	670541	5448669
SALAJ	5298104	4448933	7151139
SATU-MARE	5870727	15004101	5138403
SIBIU	24735299	2639203	5712195
SUCEAVA	12106520	14591916	23503979
TELEORMAN	9692071	3519496	3899342
TIMIS	1189855	4892601	9931627
TULCEA	4302136	1575186	2199411
VALCEA	2777831	2081978	408082
VASLUI	6300834	268311564	4051554

Sursa: [95]

Valoarea sumelor plătite prin accesarea submăsurii 16.4. în România în perioada 2015-2019

	2016	2019
ALBA	0	0
ARAD	0	0
ARGES	0	0
BACAU	0	0
BIHOR	0	0
BISTRITA-NASAUD		14259.77
BOTOSANI	0	0
BRAILA	0	0
BRASOV	89343.14	18229.35
BUZAU	0	0
CALARASI	0	0
CARAS-SEVERIN		
CLUJ	458723.14	52751.39
CONSTANTA	0	0
COVASNA	139495.76	83534.7
DAMBOVITA	0	0
DOLJ	0	66535.08
GALATI	0	0
GIURGIU	0	0
GORJ	0	35241.76
HARGHITA	0	119004.26
HUNEDOARA	82634.25	59869.62
IALOMITA	0	0
IASI	0	0
ILFOV	0	0
MARAMURES	0	0
MEHEDINTI	0	0
MURES	5355	5355
NEAMT	0	0
OLT	0	0
PRAHOVA	0	0
SALAJ	0	0
SATU-MARE	0	0
SIBIU	0	0
SUCEAVA	0	0
TELEORMAN	0	0
TIMIS	0	0
TULCEA	76041.55	0
VALCEA	53727.8	0
VASLUI	0	0
VRANCEA	0	0

Sursa: [95]