



Digitourism project University of Pécs - Action plan

During the Phase 1 of the Digitourism project (June 2018 – May 2021), all partners identified interesting practices and initiatives which could be inspiring enough to lead to an improvement of public policy, or to the duplication of this experience in their territory.

Following these three years, a two years long second phase of the project is starting, when project partners will improve their policies and use the outcomes of the project. This document is the road map of this second phase.

1 GENERAL INFORMATION

Partner organisation:	University of Pécs
Other partner organisations involved (if relevant):	n.a.
Country:	Hungary
NUTS2 region:	South Transdanubia (HU23)
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2 IMPROVEMENT OF ECONOMIC DEVELOPMENT AND INNOVATION OPERATIONAL PROGRAMME PLUS

At the application stage of the project, all partners identified a public policy which needed improvement. University of Pécs targeted Economic Development and Innovation Operational Programme 2014-2020, but as its calls were all announced and closed, the University targeted the follow-up programme of the OP, which will run during the 2021-2027 programming period:

Name of the target policy: Economic Development and Innovation Operational Programme Plus
EDIOP Plus

- Nature of the target policy:**
- Investment for Growth and Jobs programme
 - European Territorial Cooperation programme
 - Other regional development policy instrument

Name of the managing authority of the target policy: Ministry of Finance

Improving the policy context by Digitourism experiences and suggestions:

Hungary's multi-fund operational programme for economic development and innovation supports the country's least developed regions to improve their economies. Digitourism project aimed to support EDIOP 2014-2020, but as all calls were closed during the first phase of the project, University of Pécs decided to follow the same logical approach but support the shaping of the follow-up programme of EDIOP, EDIOP Plus 2021-2027 (draft: <https://www.palyazat.gov.hu/gazdasagfejlesztési-es-innovációs-operatív-program-plusz>). This consideration was also encouraged by the Managing Authority, and in 2020 the Interreg Europe Programme's management made it possible to switch to influencing policies of the next programming period.

However, the focus of Digitourism was not changed in Hungary, as EDIOP Plus follows the structure of EDIOP in terms of priorities. University of Pécs undertook improve the second financing priority of the programme (Priority 2): Research, (technological) development and innovation. Important objectives of this priority are improvement of R&D activity of knowledge- and technology-intensive companies, development of an advantageous background for innovation, more effective use of knowledge, development of marketable products/technologies and services, as well as increasing number of strategic networks between R&D companies, SMEs and universities. Another priority of the OP aims at developing the tourism industry and supporting info-communication developments, therefore Digitourism assists the OP by also connecting these 3 thematic fields. It also considers that software development is covered by the digital Renewal Operational Programme Plus (draft: https://www.palyazat.gov.hu/digitalis_megujulas_operativ_program_plusz#).

EDIOP Plus was not approved yet by the European Commission, but its content was set in late 2020. Therefore policy influencing actions could be delivered in right time by Digitourism.

University of Pécs identified the challenge that under Priority 2, calls are not reflecting in a dedicated way to the innovation trends of virtual and augmented reality applications, although these immersive communication technologies are already widely applied in diverse economic sectors. Introducing this possibility would provide an efficient tool for the tourism facilities in improving their marketing, raising income and level of employment. On the other hand, research facilities and IT companies could join R&D co-operations, which aim is also defined in the OP. Moreover, by revealing the need of better highlighting the support of these technologies via the need assessment and good practice analysis implemented in the tourism sector, University of Pécs was able to formulate recommendations that might contribute to a technological switch not only in the target sector of the project, but in a wider spectrum of the economy.

Technological content and support needs of immersive technologies in Digitourism

To clearly formulate our recommendations, first we need to clarify the terms we are using in the action plan, and identify the differences between virtual reality, augmented reality, and mixed reality. Virtual

Reality can be used as an umbrella term to describe other technologies similar to, but different from an actual Virtual Reality (VR) experience.

VR is the most widely known of these technologies. It is fully immersive, which tricks the users' senses into thinking they are in a different environment or world apart from the real world. Using a head-mounted display (HMD) or VR headset, users experience a computer-generated world of imagery and sounds in which they can manipulate objects and move around using haptic controllers while tethered to a console or PC. It is important, that VR can be enjoyed only with the support of a VR headset, which limits its applicability. Also, this aspect needs to be considered during the formulation of suggestions for the eligible activities of EDIOP Plus calls, where the limits for procuring IT equipment needs to be examined. A VR headset (or VR goggles) is head-worn equipment that completely covers the eyes for an immersive 3D experience, and to exclude the sensation of the real environment. The headsets may be entirely self-contained such as the Oculus Rift or the HTC Vive. They are quite expensive for private use and must be tethered to a very robust computer to handle the animation. A cheaper, more simple solution is provided by that equipment, which require the user's smartphone to be strapped onto the device. Both solutions use some combination of different sensors such as accelerometers, gyroscopes, magnetometers and proximity sensors to detect the user's motion and harmonize it with the virtual environment projected in the headset.

Augmented reality developments under EDIOP are rather composed of different steps of software development. As such activities are rather funded by the Digital Renewal Operational Programme (DRO), a clear demarcation of EDIOP and DRO supported activities need to be delivered. Augmented reality integrates and displays virtual content of real-world scenes, as a growing area of interactive design. The term Augmented Reality (AR) is used to describe a combination of technologies that enable real-time mixing of computer-generated content with live video display. With the rise of personal mobile devices capable of producing interesting, augmented reality environments, the vast potential of AR has begun to be explored. The technology has seen unprecedented growth in 2020. Commercial use of the technology has exploded due to use by market leaders like Microsoft, Apple, Google, Facebook, and Amazon.

The term, Mixed Reality (MR) refers to the technology, which is a step beyond AR, where the virtual objects placed in the real world can be interacted with and respond as if they were real objects. MR brings together real world and digital elements. In mixed reality, users interact with and manipulate both physical and virtual items and environments, using next-generation sensing and imaging technologies. Mixed Reality allows to see and immerse ourselves in the world around us even as we interact with a virtual environment using your own hands. MR is the most advanced technology, which has a great potential in many sectors such as prototyping new products, implementing remote surgeries or assistance, or creating different games.

General experiences of the first phase of the project

The Hungarian team of the project was composed successful IT companies working with AR/VR, an IT cluster, some tourism experts, the representatives of the Managing Authority of EDIOP and the University of Pécs itself. The members of this team attended at all study trips and identified two good practices which could be matched with the development needs of the stakeholder group, representing other actors of the tourism and IT sectors. The first Action focuses on the integration of an AR/VR supported destination marketing solutions to the calls of the operational programme, while the second

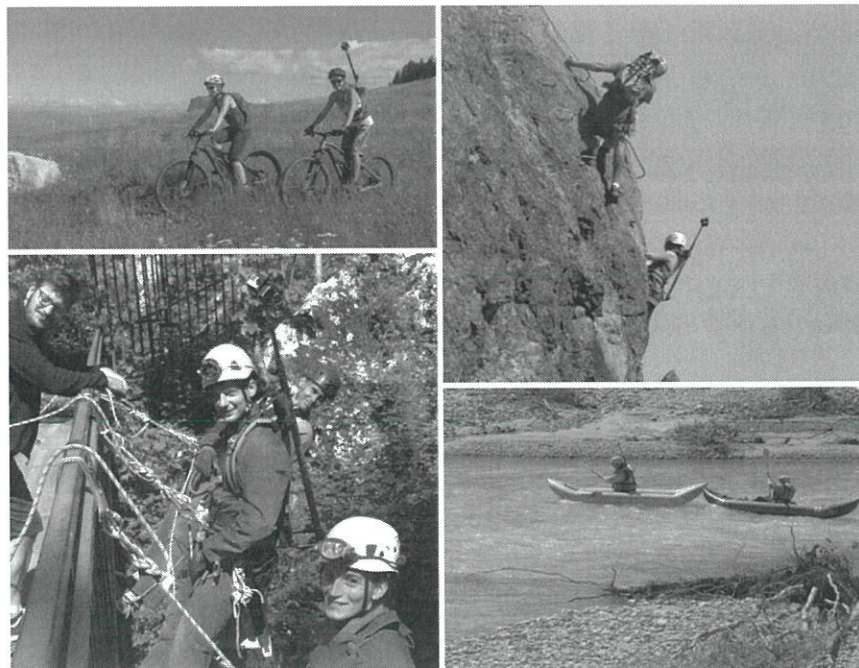
action reflects to the needs of local IT companies for sharing their capacities and establishing or further developing co-operations that enable them to undertake and deliver more complex orders.

2.1 Action 1 - Integrating of AR/VR tools into presenting special destinations for tourists

a. Relevance to the project

The Hungarian stakeholder group agreed at its 3rd meeting (30 March, 2021), that one of the desirable technical developments is the integration of AR/VR tools into presenting special destinations for tourists. These destinations they are difficult to visit because they are located in remote places, or they are protected and their visit is prohibited or limited, or because it is dangerous to visit them due to their physical or environmental conditions. Also, in some cases the activities and programs organised at these locations are not suggested for some target groups as silver age tourists or children, due to the required physical conditions or skills (e.g. mountain climbing, caving, extreme sports).

During the Digitourism study visit in Auvergne-Rhone-Alpes, France the Hungarian stakeholders had the possibility to examine and also try the good practice, called Isère Outdoor 360. This practice is focusing on the creation of 360° immersive videos to promote outdoor sports in schools and sport events. In a "sports health" approach, the Youth and Sports Service of the Isère Departmental Council wanted to encourage the general public to practice outdoor sports in an innovative way. Using a series of 360° videos of different disciplines (kayaking, caving, mountain biking, via ferrata, etc.), and equipped with a mobile virtual reality booth, the department offers immersive experiences at major sporting events in Isère as well as in schools. Virtual reality helps create genuine empathy, with a safe approach to certain sports that are sometimes unjustifiably considered extreme.



1. Figure: Creating 360o movies in Isère Outdoor 360 project [Source: <https://odexo.fr/en/projet-isere-outdoor-360-2/>]

During the COVID travel bans, in 2021 the partnership switched from organising physical study visits to online visits. In this period, University of Pécs collected further experiences, which also serve as inspiration for shaping Action 1. The following projects showed direct connection :

- Intelligent Tourist Destination / Puerto de la Cruz initiative / Turismo de Tenerife (P7)
- Visit Gran Paradiso app (P2)
- Nicolaus Copernicus House (virtual walk + AR and VR) (P8)
- Saint James Way virtual tours (P8)

b. Nature of the action

According to the characteristics of the tourism attractions (nature protection areas, caves, historic buildings with limited visiting possibilities) and the opinion of the Hungarian stakeholder group, the good practice should be adopted in the South Transdanubian region, as well as other regions of the country. South Transdanubia offers a wide range of outdoor, tourism related activities consequently a tool, which improves the marketing actions of these sites and activities may improve the region's tourism.

c. Stakeholders involved

- EDIOP MA – involved in negotiating the suggestions and integrating them to the relevant call;
- IT companies as developers – applying for the call. We cannot narrow the list of applicants as these are open calls;
- Tourism destination management organisations, other organisations that plan to exploit the possibility of introducing their attractions, operation, locations with VR support – applying for the call. We cannot narrow the list of applicants as these are open calls;

d. Timeframe

Estimated start date: 2021/Q1

Main milestones:

1. Sending suggestions for EDIOP MA
2. Identifying the relevant call, checking the relevance of call EDIOP Plus 2.1.1;
3. Opening the call
4. Submitting successful applications
5. Implementation of the projects (Software development, procurement of necessary VR equipment, management, testing, etc.)
6. Evaluating results

Estimated Approval / enforcement date: 2021/Q4 for the integration of the recommendations to the call

e. Indicative costs

Based on the project experiences of Isère Outdoor 360, the cost of creating 9 videos is € 100,000 + VAT, which means that in average ca. € 11,100 + VAT is needed to shoot a video. The exact cost depends on the location, length, special technical needs.

The procurement of the necessary equipment was estimated as € 50,000 + VAT for 12 VR helmets and the application.

Operational costs can be estimated also based on the good practice: The booth, accessible free of charge, is equipped with 12 helmets and requires an average of 3 permanent operators. Therefore, the maintenance fee of the technical equipment and the salaries of the operators need to be planned as operational costs. After the termination of the project, these costs will have to be covered by the income of the applicants, without any further support.

The overall estimated budget of a new project in EDIOP Plus is therefore around € 250,000 + VAT (27%).

f. Indicative funding sources:

Companies need to apply for the open calls of EDIOP Plus programme, priority 2, call 2.1.1

Each application will contain a concept description of Digital Reality tools or products created by tourist beneficiaries, which is a target indicator for the Hungarian project part of Digitourism. Achievement of at least 5 submitted proposals is targeted.

2.2 Action 2 - Supporting IT incubators, which gather and coordinate IT companies to develop more complex AR/VR tools

a. Relevance to the project

The second action that was identified to be adopted in Hungary by EDIOP Plus is providing support for IT companies in form of establishing/developing special incubator facilities.

Already in the Partnership Agreement of the 2014-2020 period, the Hungarian Government set the goal of strengthening research, technological development and innovation. The Government planned to achieve this goal by cooperating with the actors of the seeding phase of the innovation ecosystem under the conditions set out in the call 2.1.5 (EDIOP). In the framework of the cooperation, the organizations applying for call undertook to contribute to the achievement of the goal of increasing the intensity of R&D&I activity by implementing their project; in addition to the support received, they provide funding as own-contribution; the projects create new, innovative businesses with rapid growth potential and market their innovative products. These goals are still relevant for the stakeholder group in the 2021-2027 period, therefore the 'PARK Business and Entrepreneur House' good practice was selected for adaptation in Hungary.

During the study visit in Oppland, Norway the hosts presented “PARK Business and Entrepreneur House” good practice, which is an ecosystem across industries, a place for ideas and businesses to grow. The house is a collaboration between public authorities private investors and sponsors, VR/AR tech companies, R&D institutions, business clusters, media/film and design companies, and game development companies. The ecosystem creates new solutions, and help each other excel. It is a place where the brightest heads in gaming and digital realities meet, and by having this co-work space, it becomes a realm for innovation. The objective is simple: create new digital solutions for the advancement of the society as a whole. Examples of beneficiaries are the tourism industry in generating more sales, and the public school system, as VR can be a powerful pedagogical tool.



2. Figure: Green room offered for rent for companies at PARK Business and Entrepreneur House, Oppland [Source : Digitourism project]

Announcing calls under EDIOP Plus dedicated for supporting IT incubators, which gather and coordinate IT companies to develop more complex, more expensive AR/VR developments is a preferred action of the Hungarian stakeholders.

During the COVID travel bans, in 2021 the partnership switched form organising physical study visits to online visits. In this period, University of Pécs collected further experiences, which also serve as inspiration for shaping Action 2. The following projects showed direct connection:

- Public Private Partnership, the CIDIHUB, (P7)
- FIHUB and Tourism / DIH / FIWARE (P7)

b. Nature of the action

In recent years there were numerous initiatives to create a network, cluster for companies and organizations related to computer technologies in South Transdanubia. IT companies of the Hungarian stakeholder group were informed about the Norwegian good practice, moreover we had the possibility to invite one of the IT companies to the study trip, who studied the

operation of PARK Business and Entrepreneur House personally. Besides, the participants of the study trip could discuss financial aspects (operational costs, rental fees of rooms and technologies, organizing joint works for more complex orders, etc.) with the management of the facility.

During our 3rd stakeholder group meeting attendees all agreed that an IT incubator needs to be established, supported in the Hungarian region of Digitourism as well. The IT companies achieve remarkable successes on the international market as well, therefore the necessary skills and competencies, are already available to take part in complex orders with high quality standards. However, sometimes these developments need the involvement of expensive infrastructures, which is not needed after the given project, therefore renting such equipment or special rooms would be more favourable in some cases. Besides, an incubator, which might be managed by an IT cluster, may provide support in market research, building business connections, managing joint works. IT clusters provide a solid background for this development at Pécs, or other cities of the region or the country.

It is also proposed to include in the application an element to be paid to IT startups through the incubator to finance the incubation process.

Therefore, the announcement of a call, supporting the establishment or operation of IT incubators is needed under EDIOP Plus. This call may build on the structure and experiences of the former operational programme's (EDIOP) similar call, 2.1.5.

c. Stakeholders involved

- EDIOP MA – involved in negotiating the suggestions and integrating them to the relevant call;
- IT companies or clusters as operators – applying for the call. We cannot narrow the list of applicants as these are open calls;

d. Timeframe

Estimated start date: 2021/Q1

Main milestones:

1. Sending suggestions for EDIOP MA
 2. Identifying the relevant call, checking the relevance of call EDIOP Plus 2.1.5;
 3. Opening the call
 4. Submitting successful applications
 5. Implementation of the projects (Investments, procurement of necessary IT equipment, hiring staff, setting up services, marketing activities.)
 6. Evaluating results

Estimated Approval / enforcement date: 2021/Q4 for the integration of the recommendations to the call

e. Indicative costs

According to the budget of PARK Business and Entrepreneur House, annual operational cost of the incubator itself is estimated to €145.000. By calculating the necessary investments, procurement of IT equipment, operational costs of the first 3 years and the necessary amount to finance the start-ups, € 1.4 million is advised per incubator.

f. Indicative funding sources:

Organisations need to apply for the open calls of EDIOP Plus programme, priority 2, call 2.1.5

3 OTHER RESULTS OF THE PROJECT: USING AR IN AWARENESS RAISING


Based on the inspiration of Digitourism, University of Pécs has elaborated and submitted a project for the Interreg VA Hungary-Croatia Cross-border Co-operation Programme in May 2019, which was approved in Sept 2020. The project is uses AR to create and promote Living Labs in Hungary (Pécs) and Croatia (Koprivnica) involving actors of the quadruple helix in order to open the innovation of climate protection related researches for public. Partners will also create installations to present the energy efficient / water saving / climate friendly facilities of the involves cities and institutions. These exhibitions will use markers to visualise additional information on the visitors' mobile devices by AR techniques. The title of the project is Green AURA - Setting up cooperation of GREEN Communities with AUGmented Reality Assisted living labs. It's total budget for two Hungarian partners (University of Pécs, Pécs Urban Development Plc) and two Croatian partners (City of Koprivnica, Regional Energy Agency North) is 270.134,45 EUR (ERDF contribution: 229.614,28 EUR) – which was leveraged by Digitourism results.

Moreover, in Digitourism project many interesting practices, initiatives were observed, which were not selected as good practice or not channelled into the action plan. Even though, some of them offered inspiration for other policy instruments like the 7th (Tourism) priority of EDIOP Plus, or the Digital Renewable Plus Operational Programme. Also, they inspired the local stakeholders to embed practices into or local concepts like the establishment of an AR supported living lab approach at University of Pécs – mentioned above - that is used on one hand for the enrolment of students, and on the other hand for setting up R&D&I based business co-operations with enterprises of different sectors. However, as influencing other operational programmes or other priorities of the targeted OP was strictly excluded from the project by the guidelines of the Interreg Europe programme, therefore we haven't formulated any official recommendations for these policies.

Date: 12 Oct 2021

Name of the organisation(s) : University of Pécs

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