RURAL
SERVICE-LEARNING
IN INFORMATION SCIENCES

SUMMARY

In the course Urban and Rural Service-Learning, 13 graduate students of information sciences from the University of Zagreb (Croatia) had the opportunity to apply academic knowledge and skills to meet the real needs of the rural community on the island of Korčula and Pelješac through the experience of service learning.

The rural community partner was LAG5, an NGO founded with the purpose to implement the LEADER approach in south Croatia.

The needs of the rural beneficiaries (i.e. local population) defined as: digital skills in rural tourism - adult education (web advertising and web development) and robotics for primary school children were met by university students.
In addition, students of museology and archival studies worked on service-learning (SL) projects at the cultural heritage institutions: City museum in Korcula and Archival collection center Korcula - Lastovo.

In total, there were 5 rural organizations that participated as beneficiaries in rural SL projects: LAG 5, 2 primary schools (from Korčula and Pelješac), City Museum in Korčula and Archival collection center Korcula - Lastovo. Students of information sciences have spent 5 days (40 hours on the implementation of their solutions on-site).

The number of school children who participated in 4 workshops on robotics was 36, while the number of adults who participated in workshops on web advertising and web development was 10.

Students have devised solutions that meet the above listed needs selected by a rural community, implemented them in the rural community on the island of Korcula and Peljesac, supplemented them with explanations and comments from rural partners and, as a result, compiled this manual with examples that are

PROJECT DATA

Country	
Croatia	
Name of the course of the academic module designed for RURAL 3.0 related to the activity	
Urban and Rural Service-Learning	
Name of the activity	
Rural service-learning in Information sciences	
Name of Higher Education Institution	
University of Zagreb, Croatia, Faculty of Humanities and Social Sciences, https://web2020.ffzg.unizg.hr	
Person responsible for the project at the Higher Education Institution and email address	
Nives Mikelić Preradović, full professor, nmikelic@ffzg.hr	
Name of rural organization	
LAG5, Croatia	
Person responsible for the project at the rural organization and email address	
Marijeta Čalić, razvoj@lag5.hr	
Number of participating Higher Education students	
13	

applicable to meet similar rural needs in other EU countries.

LINKS

Link of the course in the academic module designed for RURAL 3.0.
http://learn.rural.ffzg.hr:8080/course/view.php?id=6

Videos and testimonials:
https://youtu.be/Qiz03ogk5q0
https://youtu.be/OS0DhZU9M4U
https://youtu.be/AtPl_Zprj64

This project is part of the RURAL 3.0 Knowledge Alliances project (https://rural.ffzg.unizg.hr/) funded by the Erasmus+ Programme of the European Union.

Degrees of the participating Higher Education students and course (1st year, 2nd year,…)

1st and 2nd year of graduate study of Information Sciences, course: Urban and Rural Service-Learning

Number of beneficiaries of the service

Type of beneficiaries: children, adults.

Number of beneficiaries:
- children who participated in 4 robotic workshops: 36;
- adults who participated in computer workshops: 10.

PROJECT DESCRIPTION

Background of the project

Service-learning and robotics

According to Mikelic Preradovic (2019) [1], jobs in the natural sciences, technology, engineering and mathematics (STEM jobs) are paid 29% more than jobs in other fields. These statistics have been confirmed in both the US and EU countries. Also, in the last 10 years, job growth in the STEM area has been three times higher than the growth of other jobs, and it is expected that in the next decade the number of jobs in the STEM area will continue to grow faster than the number of other jobs.

Despite the demand for STEM graduates, it is difficult for companies to find qualified candidates for many jobs. Two main factors contribute to this problem: (1) insufficient student enrollment in STEM colleges and (2) lack of qualified teachers in the STEM field. In addition to the fact that many students never enter the STEM area due to inadequate school preparation and poor quality of teachers, many employees in the STEM area are approaching retirement, suggesting additional demand for this profile.

Service-learning (SL) as a teaching strategy has a strong link with job readiness and civic engagement. Teachers are increasingly working to encourage girls and minorities, groups traditionally neglected in STEM, to consider STEM as a future career. But there are three key factors for creating a STEM generation of students: engagement, motivation, and exposure to STEM subjects. Each of these factors can be addressed by implementing service-learning in STEM.

In research on engineering projects that integrate SL, Lemons et al. (2011) write that expanding the core competencies of engineering students and incorporating skills important to SL (collaboration, customer awareness, and ethics understanding) could result in a population of gender and ethnically diverse engineering professionals.

STEM industry groups and accreditation institutions have begun to place emphasis on key learning outcomes of academic courses, and it is SL that can help students achieve them. For example, accreditation bodies for engineering programs state that a desirable learning outcome in engineering courses is an understanding of the impact of engineering in a global and societal context. SL projects that connect students with the community enable such learning. Lemons et al. state that "the positive effects of SL activities are attributed to the processing of experiences through critical reflection, discussion, and interaction with other students and professors".

It is important to note that the problem is not only the lack of STEM competencies among pupils and students, but also the outstanding lack of interest in STEM among many students.

The objectives of introducing SL in STEM are: (1) to contribute to a knowledge society consisting of active, educated and engaged citizens / STEM professionals and (2) to encourage behavior that will create a sustainable future in terms of environmental integrity, economic sustainability, healthy community and a just society for present and future generations.

Intel and Change Equation survey from 2011 [2] showed that teenagers' interest in enrolling in one of the STEM colleges increases significantly when they hear in what ways their choice can be beneficial to the world.

According to the study, although 63% of teens have never considered a career in the STEM field, the social benefits of what engineers do (prevent disasters or create cleaner electricity) are of particular interest to them. Information about events such as rescuing Chilean miners, who were trapped for 69 days, motivated 52% of teenagers to think twice about their future careers.

SL enables students to understand how STEM competencies can benefit the community in which they live, as well as themselves.

Examples of the implementation of service learning in technology and engineering in the U.S. include mobile robots [3], the Internet of Things [4], gerontology [5],, rehabilitation engineering [6] and intergenerational computing [7].

In Croatia, the first example of the implementation of service learning in the field of technology and engineering is the project STEM revolution in the community (2018-2019), which enabled students to participate in the digital literacy education of primary school children, transferring STEM competencies to them.

The coordinator of this project is the Institute for Youth Development and Innovation (IRIM), a non-profit organization that organizes educational and competitive activities, in cooperation with educational institutions, and by donating the necessary equipment for the development of STEM and digital competencies. The students of Information Sciences from the University of Zagreb participated in the project STEM revolution in the community (2018-2019), implementing workshops related to robotics in elementary school, with the support of school teachers and their academic mentor. Students were in charge of material development, preparation and implementation of workshops.

Students were included in the program development of new digital educational materials that they published in the educational portal Create! (http://izradi.croatianmakers.hr/). These materials as used a basis for the implementation of workshops in robotics, the organization of the competition and for children who want to work on more complex tasks. Students have created materials in the form of presentations, tutorials, graphics, video instructions.

After the successful implementation of the STEM revolution in 2019 in the urban environment (City of Zagreb), information science students tried to implement workshops related to robotics in the rural environment in 2020 as part of the Rural 3.0 project in the course Urban and rural service learning.

Service-learning and adult education

Recent results of research on digital skills of adults in adult training and development programs in Croatia (Pavić, 2019) [8] from public open universities in seven Croatian cities show a relatively low level of digital skills.

According to statistics in the Curriculum for the Development of Basic Digital, Mathematical and Reading Skills of Adults (2019) [9], 20 to 25% of European adults between the ages of 16 and 65 have a low level of digital literacy (ability to solve problems in technology-rich environments). Furthermore, CEDEFOP (2019) [10] provides data that 37.4% of adults (25 - 64 years) in Croatia have a low level of digital literacy. Regarding the adoption of digital skills, the motivation to use lifestyle technologies is emphasized (social networks, watching videos, informal communication, etc.), while a low level of competence in workplace-related skills was observed (problem solving in a complex technological environment related primarily to work tasks, knowledge of technologies such as Excel, PowerPoint, web design, etc.). The computer is rarely used to run a personal website (Pavić, 2019).

Research recommendations (Pavić, 2019) are that training and development programs must contain elements of teaching digital skills at the level of contextualized problem solving related to a particular profession.

Two teams of students from the course Urban and Rural Service-Learning decided to develop workshops for adult education, more precisely the development of more advanced digital skills of adults that involve solving problems in a complex technological environment related primarily to work tasks.

In the workshop "Web for Rural Entrepreneurs", students had the task to teach participants what a website is, how it is maintained, what it consists of and finally how to create it and publish it. The platform they chose was Wix because it is very easy to use and requires no prior knowledge and is free of charge.

At the workshop "Online Advertising for Rural Entrepreneurs" students taught adult participants online advertising in tourism. Participants were taught to work with tools and platforms such as Facebook, Instagram, Google My Business, Airbnb and Booking.

The participants of the workshops were adult members of various associations in the rural area covered by LAG5, who still do not have a website of their association and who as small entrepreneurs are engaged in tourism and apartment rental and need to acquire knowledge and skills of advertising on various online platforms.

General social needs addressed by the project

The rural needs were defined as: digital skills in rural tourism - adult education, development of STEM competencies of primary school children and the promotion of rural cultural heritage.

Service and Learning objectives

Service objectives:

a) to provide conditions for the development of STEM competencies of primary school pupils in rural areas, using the principles of robotics as tools for entering the world of programming and STEM

b) to promote the development of more advanced digital skills of adults that involve solving problems in a complex technological environment

Learning objectives:

a) develop and implement software solutions for micro: bit and mBot robots;

b) develop and implement websites and solutions for advertising on the web and social networks;

c) develop extracurricular plan of robotics for elementary school students;

d) elaborate curriculum plan for the development of digital skills in adult education;

e) formulate and prove a hypothesis about how the approach and ability to work with technology affects education and;

f) effectively teach pupils and adult users of different cultural and educational backgrounds.

Linkage with the Sustainable Development Goals (SDGs) and its targets

4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.

Other organizations that participated in the project

2 primary schools (from Korčula and Pelješac), City Museum in Korčula and Archival collection center Korcula - Lastovo.

Dissemination activities of the project

All dissemination activities included: videos in YouTube, Facebook posts, students' radio interview (Radio Korčula).

Human resources and materials needed

Resources needed were: teachers, students, didactic resources: micro:bits and mBots (provided by the Institute for Youth Development and Innovation IRIM, personal computers / laptops, projector.

Celebration

The celebration of the project included the small party at the end of the project (limited due to specific covid-19 restrictions) and presentation of the projects' outcomes in Rural 3.0 Hackathon.

All Solutions given through the service to the identified rural needs

Service-learning (SL) workshops described in this document aimed to satisfy the need for the development of digital skills in rural tourism (which was part of the adult education) and development of STEM competencies of primary school children through robotics workshops. Service-learning (SL) projects that are not described in detail in this document are the ones realized at the cultural heritage institutions: City museum in Korcula and Archival collection center Korcula - Lastovo.

[1] Mikelić Preradović, N. (2019). *Implementacija društveno korisnog učenja u STEM području*. Institut za razvoj i inovativnost mladih. Zagreb: Hrvatska. https://croatianmakers.hr/wp-content/uploads/2020/09/Implementacija-dru%C5%A1tveno-korisnog-u%C4%8Denja-u-STEM-podrucju.pdf

[2] Exposure to Engineering Doubles Teens' Career Interest. 2011. https://newsroom.intel.com/news-releases/exposure-to-engineering-doubles-teens-career-interest/

[3] Bhounsule, P.A., Chaney, D., Claeys, L., Manteufel, R.D. (2017). *Robotics service learning for improving learning outcomes and increasing community engagement.* American Society of Engineering Education Gulf-South West Section, Dallas, Texas, USA.

[4] Watson, C. E. & Ogle, J. T. (2013). The Pedagogy of Things: Emerging Models of Experiential Learning. *Bulletin of the IEEE Technical Committee on Learning Technology, 15*, 3.

[5] https://eecs.wsu.edu/~cook/gt2/syllabus.pdf; https://eecs.wsu.edu/~cook/gt1/presentations/gtintro.pdf

[6] http://www.ece.neu.edu/ece/undergraduate-studies/capstone

[7] Wexler, S. S., Drury, L. J., Coppola, J. F., Tschinkel B. J., Thomas, B. A. (2011). Service-learning computing courses assist with technology needs in community based organizations serving older adults. *IEEE Long Island Systems, Applications and Technology Conference*, Farmingdale, NY, pp. 1-6.

[8] Pavić, D. Digitalne vještine polaznika obrazovanja odraslih. *7. Međunarodni andragoški simpozij* Biograd na moru, Hrvatska, 2019. Plenary lecture.

[9] MZO (2019). Kurikulum za razvoj temeljnih digitalnih, matematičkih i čitalačkih vještina odraslih: Temeljne vještine funkcionalne pismenosti. http://obrazovanjeodraslih.hr/wp-content/uploads/2019/11/MZOSKnjizzniBlokBros%CC%8CuraOO_WebOKr.pdf

[10] CEDEFOP (2019). Adult population in potential need of upskilling: Croatia. Cedefop country factsheet. Dostupno na: https://www.cedefop.europa.eu/files/factsheet_hr.pdf

ACTIVITIES CARRIED OUT TO ACHIEVE THE OBJECTIVES OF THE PROJECT

Students: Eva Trstenjak, Vanja Vukman

1. Workshop: BBC micro:bit

1. INTRODUCTION - GENERALLY ABOUT THE TOPIC AND NEEDS

The STEM field (*science, technology, engineering & mathematics*) has recently stood out as important for the development of the economy both in the world and in Croatia.

However, the interest of young people in the STEM field in Croatia is not sufficiently developed, as evidenced by the fact that the Ministry of Science and Education has awarded 3,400 direct state scholarships in recent years to encourage young people to enroll in studies in this field. In addition to such initiatives, interest in the STEM field needs to be encouraged by providing access to technology and education from an early school age. The school system in Croatia is currently in the curricular reform phase and progress is expected in this field, but there is still a lack of formal education in the STEM field. Robotics is a great way to raise pupils' interest in the STEM area because the informatics curriculum is often very theoretical, and the introduction of something so practical as micro: bit may induce the desired interest. It is important to introduce them to the micro: bit, and they will certainly continue to experiment on their own because it is a way of learning through play. Associations such as IRIM contribute greatly to improving the situation, such as the *Croatian Makers* movement, by donating equipment, organizing activities, training educators, developing teaching content and training websites. Educational robotics workshops for primary school children serve not only for the acquisition of knowledge in STEM areas, but also for the development of competencies such as cooperation in group work, communication, learning skills, creativity, curiosity and many others. It is extremely important to initiate trends in such education in rural areas as well, where access to equipment and extracurricular education is much more limited than in urban areas.

2. BBC MICRO: BIT

BBC micro: bit is an open source microcomputer. This is a microcomputer developed in the United Kingdom and specifically supplied to schools to raise interest of pupils for robotics

and increase the number of engineers in the technology sector. In addition to teaching computer science, BBC micro: bit can be used in other subjects (e.g. mathematics, technical culture, geography, nature and society, etc.).

Educational materials for various subjects are available on the website of the IRIM association: https://izradi.croatianmakers.hr/edukacija/ .
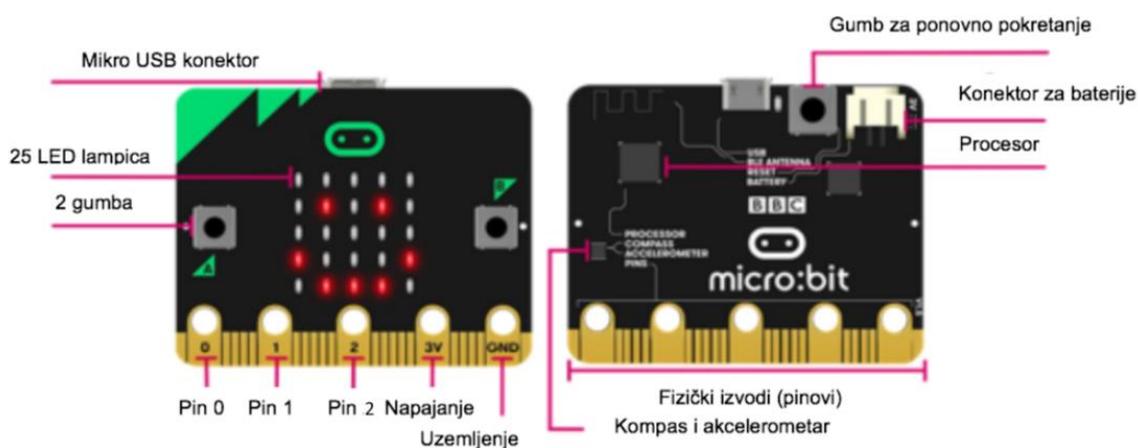

Figure 1: Parts of micro: bit

As can be seen in Figure 1, the BBC micro: bit has a processor that runs the programs we create, 25 LEDs that make up the 5x5 network, 2 input buttons (A and B) that can also be used in combination (A + B), a button R (*reset*) for restarting micro: bits, compass, accelerometer, input-output pins P0, P1 and P2, wireless connection (*Bluetooth*) that allows sending and receiving information via radio and micro - USB port for wired connection of micro: bits and computers. The micro - USB port is used to send programs from a computer to the micro: bit via a USB data connection.
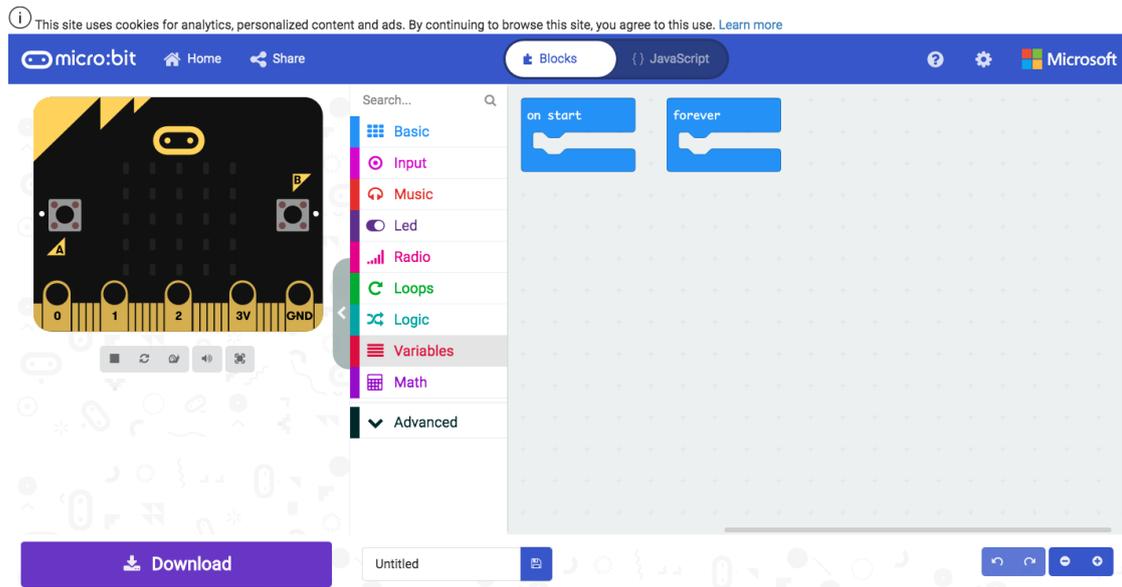
Figure 2: Makecode for micro:bit

The easiest way to bring programming closer to pupils is to use the *Makecode* page for micro: bit (Figure 2) : https://makecode.microbit.org/ . This page offers the possibility of programming with the help of blocks that are attached to each other, and a pupil can also see the JavaScript code. The site also offers guides for several micro: bit games.

3. SKILLS THAT STUDENTS NEED WHEN ENTERING THE SL PROJECT:

1. Basic computer skills
2. Basic knowledge of English
3. Knowledge of basic programming concepts
4. Basic pedagogical skills

4. SKILLS THAT PUPILS NEED WHEN ENTERING THE SL PROJECT::

1. Basic computer skills
2. Basic knowledge of English

5.1. WORKSHOP PREPARATION

No later than one week before the workshop, it is necessary to get acquainted with the micro: bit device and the *Makecode editor,* and to have ready assignments, *worksheets* and an introductory presentation. The day before the workshop, it is a good idea to go through the tasks again and practice explaining step by step. It is extremely important to be in contact with the community partner organization and to emphasize that it is important for pupils to bring their laptops with them, if they have them. However, in the event that pupils do not bring their laptops, you should be prepared to hold a workshop with the resources at your disposal and divide the pupils into groups (Figure 3).

Figure 3: Division of pupils into groups

At the beginning of the workshop it is necessary to:

- Ask pupils what prior knowledge they have and what their interests are
- Explain to pupils what micro: bit is
- Explain which parts make up micro: bit
- List some possibilities of micro: bits
- Distribute micro: bits, cables and batteries to pupils
- Provide pupils with worksheets
- Show pupils how to connect micro: bit to a computer and batteries

During the introductory presentation, it is a good idea to give pupils a few theoretical assignments on a worksheet that they can solve to make sure they pay attention to the workshop, but also to have some notes that they can bring home. For example, a fill-in-the-blank task with parts of micro: bit (Figure 3).

Ime i prezime: _____
Datum: _____

Radionica: BBC micro:bit

1. **Dopišite dijelove micro:bita!**
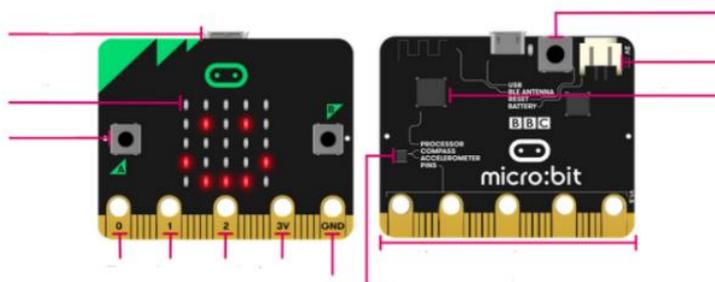
2. **Otvorite stranicu https://makecode.microbit.org/. Napravite novi projekt naziva "Projekt1".**
   a) Kojim naredbenim blokom se određuje što se događa kad se pokrene micro:bit?
      _____
   b) U kojoj kategoriji se nalaze naredbeni blokovi koji određuju što se događa kad pritisnemo određeni gumb ili potresemo micro:bit?
      _____
   c) IF THEN i IF THEN else blokovi su _____ i nalaze se u kategoriji _____.
   d) Kako se izrađuje varijabla u MakeCode editoru?
      _____

Figure 4: Theoretical tasks on the worksheet

Depending on the available time, pupils need to be given several tasks after a short theoretical introduction. Depending of age and level of prior knowledge, it is necessary to assess whether pupils can solve all tasks independently or it will be necessary to do a guided exercise (showing step by step on a projector). If pupils are encountering a micro: bit for the first time, they will probably need help switching the program from the computer to the micro bit itself. The following are a few exercises and tasks that are arranged from the simplest to the most demanding. In case the pupils do not have any prior knowledge, it is necessary to first do the exercise together with them, and then ask them to solve the following tasks independently. All tasks together with the steps must be written on the worksheet. This is important because it is likely that pupils will have different levels of prior knowledge and skills and will work at different paces.

Exercise 1. A heart that flickers

We will create a program called "heart". From the *Basic* group, we will select the *forever* command block. We will nest the *show icon* command block from the same category. Select the heart icon. Put another icon below that command block. Save the program to your micro: bit and watch your heart beat <3.

➞ Required command blocks: *forever, show icon*

Figure 5: A trembling heart

Display your name on the micro: bit screen by pressing the A button. Pressing the B button should display the icon you drew. Press both buttons to display your year of birth.

➔ Required command blocks: *on button _ pressed, show string, show leds, show number*
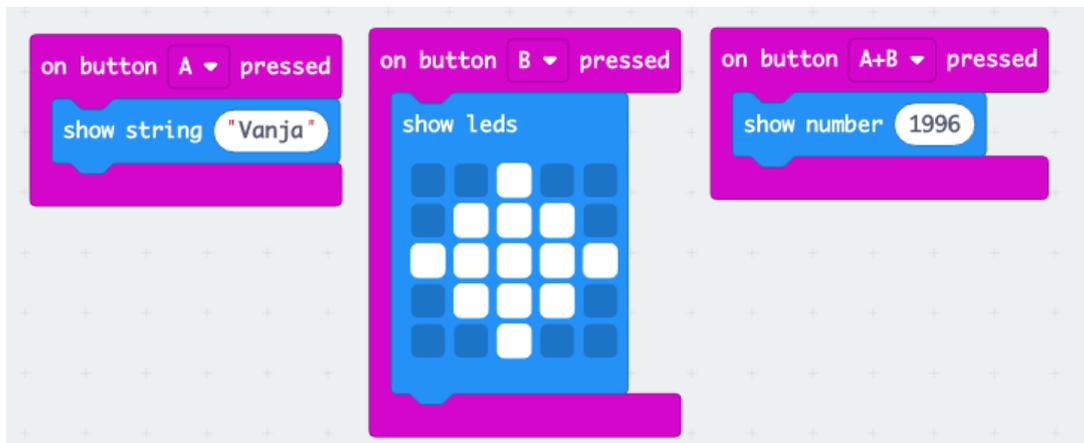
Figure 6: Identity card

Exercise 2. Stone-scissors-paper

From the *Input* group, select the *on shake* command. Let's create a variable "hand". Within the group *Variables* we now have the command block *set hand to 0.* Then from the group *Math* we select the command *pick random 0 to 10* and drag it to place 0 in the command block *set hand to 0.* Instead of 0 to 10 we enter 1 to 3 because our goal is for the micro: bit to randomly choose between three numbers - one representing a stone, the other scissors, and the third paper. From the *Logic* group, we select the IF THEN condition and place it inside the *on shake* block. Within the conditions we then insert a logical comparison 0 = 0 from the *Logic* group. In the place of the right 0 within the logical comparison, type 1. Then select the *show leds* command from the *Basic* group. Using this command, we will display stone, scissors or paper depending on the number that is randomly selected. By left-clicking on the field representing the LED light in the command with *how leds* we will draw the paper. By clicking on the plus within the IF THEN block we can add the ELSE condition. Within the ELSE conditions we add the *show leds* command and draw scissors. Within the ELSE conditions we insert the *show leds* command and draw a stone. Each time we shake the micro: bit, a stone, scissors or paper will randomly appear.

➔ Required command blocks: *on shake, set _ to _, pick random _ to _, IF THEN, _=_, show leds*
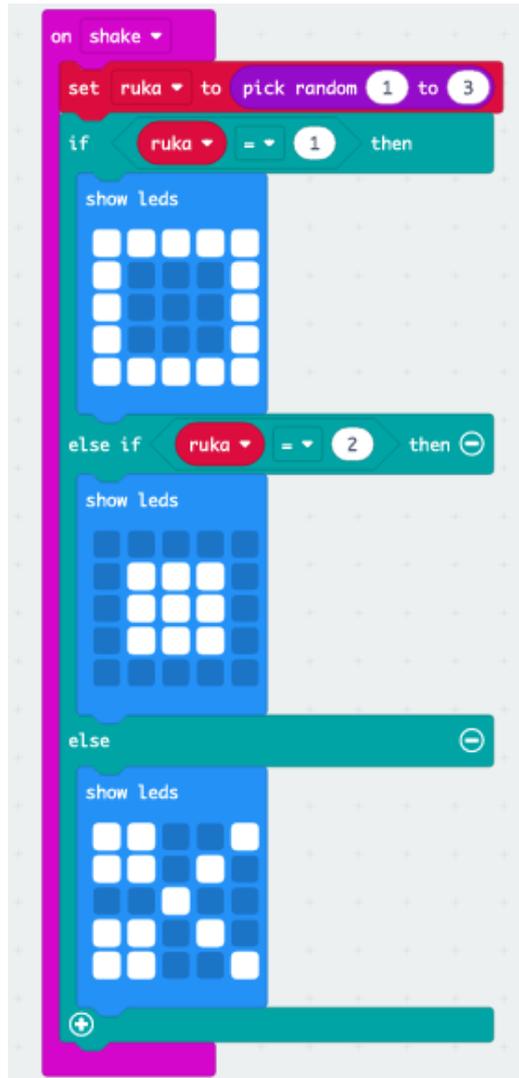
Figure 7: Stone-scissors-paper

Task 2. A bottle of truth

Let's play! We will sit in a circle and take turns asking the questions "Who will pass the class with the best grade next year?" It is up to you to create a program that will show the arrows in 8 directions on the micro: bit when the micro: bit shakes.

➔ Required command blocks: *on shake, show arrow, pick random _ to _*
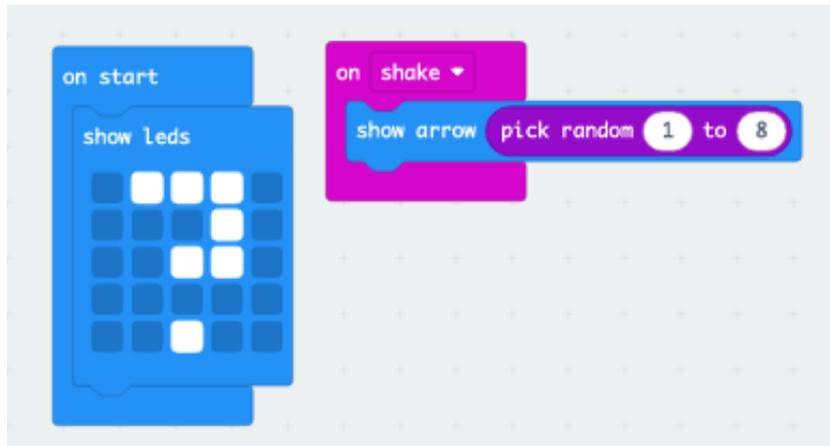
Figure 8: A bottle of truth

Exercise 3. Compass

Micro: bit can even serve us as a compass. We will create a new project called "compass". We will delete the command block *on start*, and we will use *forever*. The compass must be in function at all times, so the command block *forever* is our best solution. In the category *Logic*, we will take the IF THEN condition and place it inside the *forever* block. Then we will take the logical operator OR from the same Logic category. We will place this logical operator in the logical condition between IF and THEN. After that, we place the logical comparison 0 = 0 in the first place of the logical operator OR, and then we put the block compass heading (°) from the category *Input* in the first place of this comparison. We repeat the same for the second place of the OR operator. We extend the condition twice more by using the plus sign. We put logical comparisons into these new conditions. In addition, we will take the *show string* command block and place it under each condition. Under the first condition we will put "N" for North as a string. Under the second condition we will put "E" for East, under the third we put "S" for South, and under the last "W" for West. Now we have to set the compass heading (°) for "N", i.e. the north to be less than 45 (OR) the compass heading (°) to be greater than 315. We will take these two numbers because the north is roughly between these two degrees. For the next condition that will apply to our east we have to put that our compass heading (°) is less than 135. So, the east will be between 45 and 135 degrees. The next condition applies to the south and we will put the compass heading (°) less than 225 for it. And we will not put anything for the west because everything else will be covered by the ELSE condition - from 225 to 315 degrees.

➔ Required command blocks: *forever, IF THEN, _=_, _OR_, compass heading (°)*

Figure 9: Compass

Task 3. A more accurate compass

Now that we have made a relatively inaccurate compass, try to make a more precise one that will include the four intercardinal directions. We will assume that the cardinal directions are in the range of 60 degrees and the intercardinal directions are in the range of 30 degrees, e.g. the north will be between 330 and 30, and the northeast between 30 and 60.

➔ Required command blocks: *forever, IF THEN, _=_, _OR_, compass heading (°)*
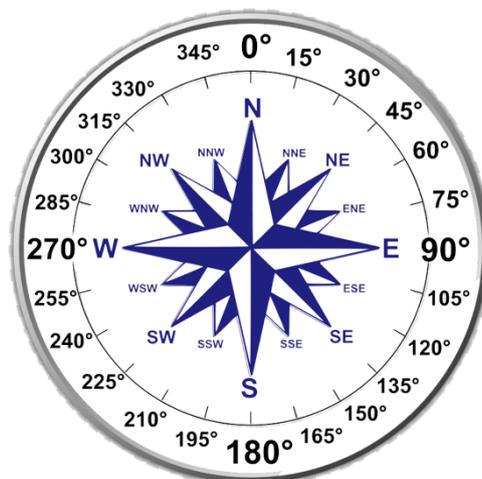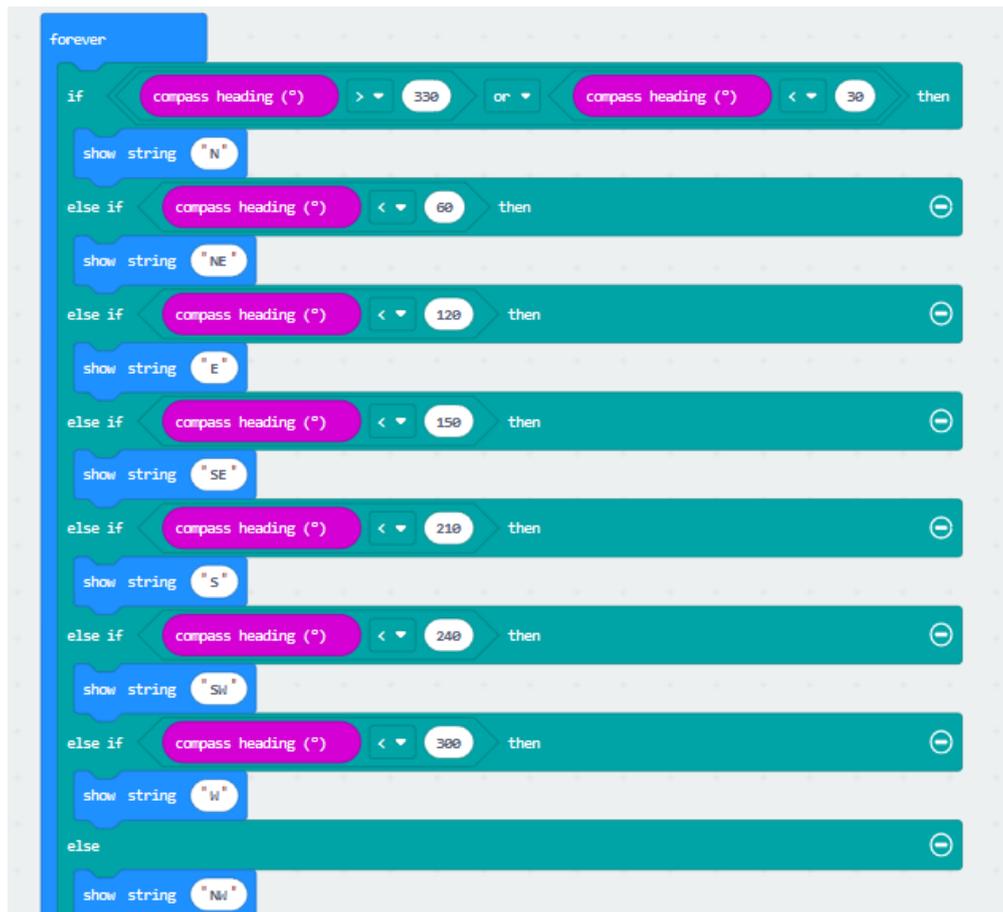
Figure 10: More accurate compass

Exercise 4. Simon Says

Simon Says is a game where you listen to Simon's instructions. The person playing the role of Simon will send instructions via micro: bit, and everyone else will listen. The one who completes the task last - falls out ☹.

First, in the workspace we will drag the command block *on start* from the *Basic* group, and then command block *radio set group* from the group *Radio*. We will all set the same group - 1. First, we will tell the micro: bit to send messages - so we will insert command block from group Radio - *radio send string* into the blocks from the group *Input - on button A pressed, on button B pressed, on button A + B pressed, on pin PO pressed and on shake.* In the blank space we will write commands that you can design yourself - e.g. "get up", "say A", "touch your nose". We will now enable the micro: bit to receive commands. From the *Radio* group we will drag the command block *on radio received_receivedString* to our workspace. We will now tell micro: bit to display the received message, so we will nest the *show string* command block from the *Basic* group inside that block and drag the *receivedString* variable to the empty space.

➔ Required command blocks: *on start, radio set group, on button A pressed, on button B pressed, on button A+B pressed, on pin PO pressed, on shake, radio send string, on radio recieved_receivedString, show string.*
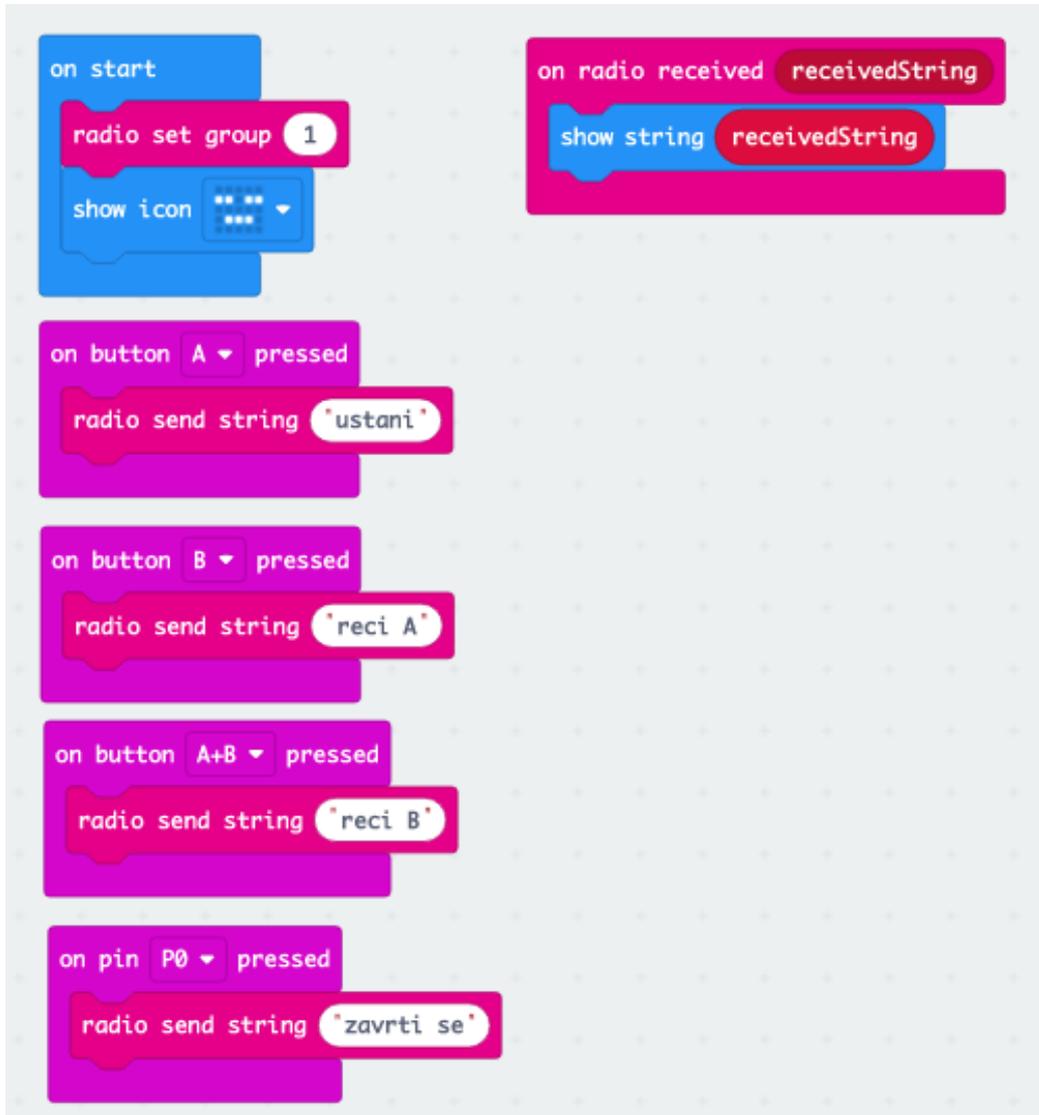
Figure 11: Simon Says

It is important to ask friends how they are doing. Divide yourself into pairs. Create a program that will allow you to ask a friend how he is doing, and he will answer it with a suitable smiley, and vice versa. e.g.:) :(: I

➔ Required command blocks: *on start, radio set group, on button A pressed, on button B pressed, on button A+B pressed, on pin PO pressed, on shake, radio send number, on radio recieved_receivedNumber, IF THEN, show icon.*
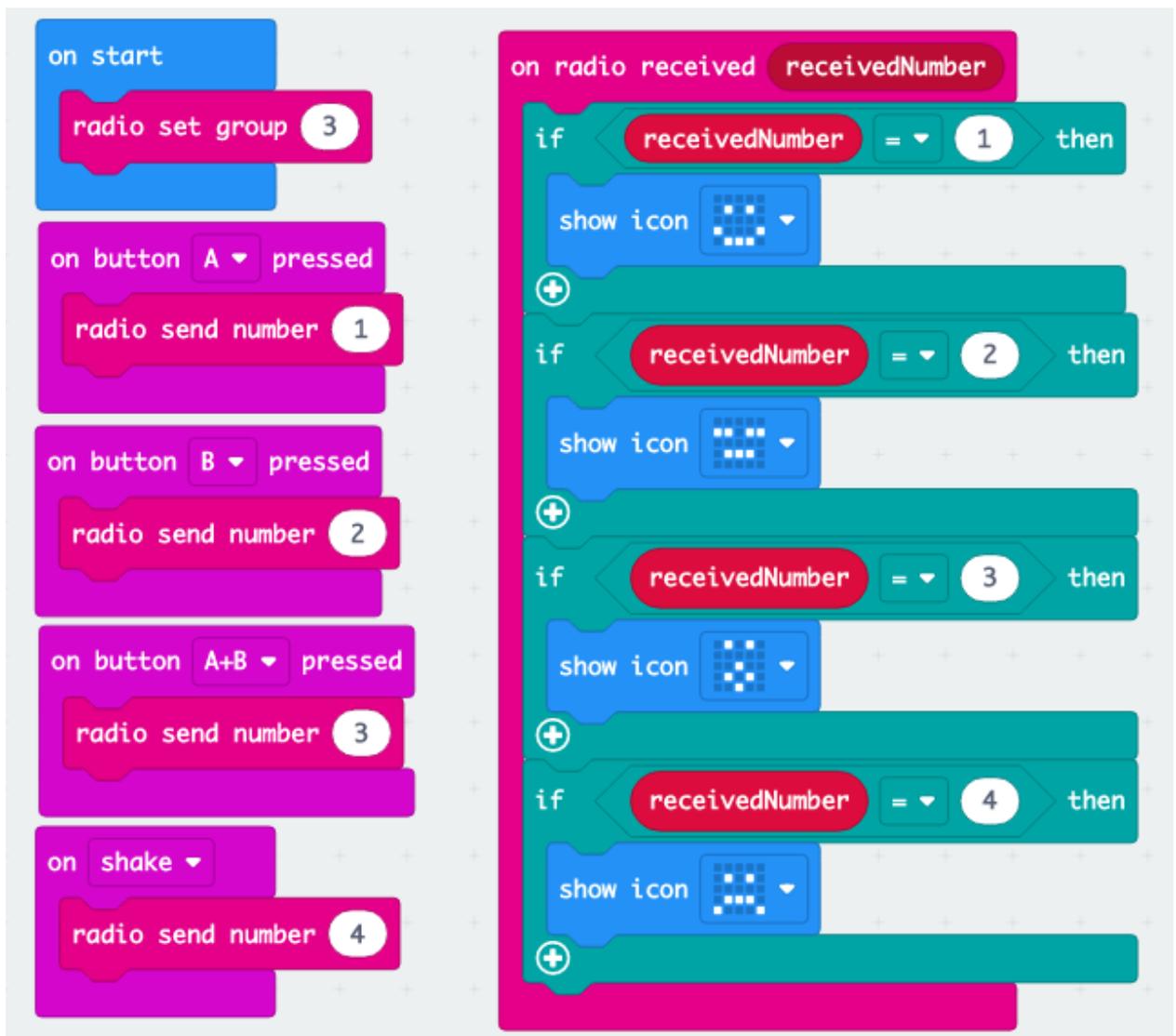

Figure 12: How are you?

5.4. EVALUATION

An evaluation can be very helpful at the end of the workshop, especially if you plan to hold the workshop more than once. In this way you can see if the workshop was interesting and useful for the pupils and if you could do better next time. It is possible to do this orally or with written evaluation questionnaires (Figure 12).

Datum: _____

Evaluacijski upitnik

Naziv radionice: _____

Molimo Vas da na skali od 1 do 5 ocijenite zadovoljstvo navedenim komponentama, pri čemu je: **1** - nedovoljno, **2** - dovoljno, **3** - dobro, **4** - vrlo dobro, **5** - izvrsno.

	1	2	3	4	5
Kako ocjenjujete zanimljivost teme radionice?	1	2	3	4	5
Omogućuje li radionica razvijanje vještina i primjenu znanja u praksi?	1	2	3	4	5
Ocijenite način izvedbe i pripremljenost radionice.	1	2	3	4	5
Kako ocjenjujete metodičke/predavačke sposobnosti predavača?	1	2	3	4	5
Ocijenite jasnoću i razumljivost prezentiranja predavača.	1	2	3	4	5
Konačna ocjena radionice u cjelini:	1	2	3	4	5

Ako imate neke dodatne komentare ili prijedloge kako bismo mogli napraviti ovu radionicu još boljom, molimo Vas da nam to napišete:

_____

_____

_____

Hvala!

Figure 13: Evaluation questionnaire

2. Workshop: Introduction to mBot

1. INTRODUCTION

The use of digital technologies is increasingly used in teaching. Since we live in a time that is evolving at a rapid pace, students are expected to know digital technologies, but also to know how to use them. The importance of acquiring digital skills is also shown by the increasingly frequent campaigns to promote the STEM area.

One of the important items of modern technology is certainly robotics. And apart from the fact that knowledge of robotics is something that is very useful for pupils, they show great interest in it (as the authors of this manual were convinced by holding workshops in primary schools). By dealing with robotics, pupils not only acquire the knowledge and skills necessary for life in the digital age, but are motivated for further development in the field of mathematics, informatics and other natural and technical sciences.

The idea of this part of the manual is to introduce teachers to mBot robots and their functions and to educate them on how to transfer their knowledge to pupils. Although the manual is primarily intended for teachers of upper primary school students, it can be used by other educators, even those who do not belong to the field of education.

Examples and tasks in the manual were used during workshops on Orebić and Korčula, held in cooperation with LAG 5.

2. A LITTLE ABOUT MBOT

mBot is a robot created by the Chinese company Makeblock as a learning tool. Its hardware is based on Arduino, while its software is based on Scratch 2.0. program that you can connect to an mBot device using Bluetooth or 2.4GHz wireless mode. Along with mBot, Makeblock has also become known for its micro: bit plates.

Since in addition to the basic parts, additional parts can be purchased, and even created, the robot has almost unlimited possibilities. It is assembled very quickly, and thanks to the mBlock application, it is very intuitive and easy to program. That is why it zealously fulfills its goal - to bring robotics, but also the entire STEM field (science, technology, engineering and mathematics) closer to children and young people.

mBots have become popular in Croatia thanks to Croatian Makers, a project of the Institute for Youth Development and Innovation (IRIM), as well as its founder, entrepreneur and innovator Nenad Bakić. IRIM focuses on the donation of robotics and automation equipment and new technologies in general to schools and other organizations working with young people, as well as on the development of knowledge related to new technologies (IRIM, 2020).

Thanks to IRIM, it is possible to find materials and ideas for working with pupils on the "Izradi" portal (https://izradi.croatianmakers.hr/).

3. PARTS AND FUNCTIONS OF MBOTS

The mBot educational robot consists of about 40 parts. The mBot can communicate with a computer via Bluetooth or using a wireless module. The mBot is driven by two wheels driven by electric motors. In addition, the robot has several sensors: a light sensor, an ultrasonic sensor, a line tracking sensor, etc.
Parts:
1. A board (mCore) represents the "brain" of an mBot. The plate is very similar to the Arduino Uno plate, and is designed specifically for mBot. The board has a buzzer, light sensor, button, RBG lamps, leads for mBot engines, etc.
2. Bluetooth module connects directly to the board. The module allows you to control an mBot computer or mobile device via Bluetooth.
3. Battery housing. In order for the mBot to work, it needs a power source. Four AA batteries are required for power, which are placed in the battery case.
4. Ultrasonic sensor - "eyes" of the robot. Using an ultrasonic sensor, the robot detects obstacles in front of it.
5. Line tracking sensor with which the robot can monitor the line.

The robot also consists of some physical parts that connect all the listed components. The mBot also consists of two motors that allow the robot to move. Apart from Bluetooth, it is possible to control the mBot using remote control, the Makeblock application on a mobile device or simply by storing the program on the board. We can create mBot programs using the mBlock program. Before programming the mBot itself, some of the programs stored on the mBot can be tested. The first program allows you to control the mBot using a remote control. The second program allows the robot to move so as to avoid obstacles and the third program allows the robot to follow the line drawn on the floor. Programs are changed by pressing a button on the plate.

The ultrasonic sensor on the front of the robot works by emitting sound which is then repelled by various obstacles and returned to the robot. Depending on how long it takes the sound to get back to the robot, it can deduce how far it is from the obstacle.

3. WORK ON EXAMPLES

Activity 1: Turning the mBot on and connecting it to the computer

Pupils should first be taught how to connect the mBot to a computer. This is done as follows:
We open the mBlock program.
Using a USB cable, we connect the mBot to the computer.
In the left pane of the window, in the 'Devices' category, we select *add*. In the popup window, we select *mBot*.
With the help of a switch on the mBot, we turn it on.
Then we select *Connect* in the mBlock interface.
If necessary, by selecting the option *Setting - Update Firmware - Firmware version - Factory firmware* it is possible to restore mBot to factory settings and thus delete the operations stored so far on *Mode - Upload*.

Activity 2: Using RGB diodes

Since mBot contains RGB diodes, which are the easiest to use, we will start programming using them. RGB diodes can create any color, which pupils choose in the mBlock menu, by combining basic colors. The color can be selected manually, but also by entering the RGB value.

Switching on the RGB diode
Events *when mBot starts up* ☐ Control *forever* ☐ Show *LED (all) shows color* ☐ Devices *Upload*
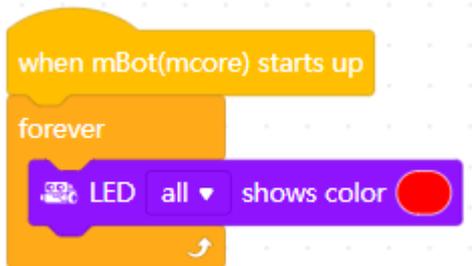
Changing the colors of RGB diodes

Events *when mBot starts up* ☐ Control *forever* ☐ Show *LED (all) shows color X* ☐ Control *Wait (1) seconds* ☐ Show *LED (all) shows color Y* ☐ Control *Wait (1) seconds* ☐ Devices *Upload*

Task 1: Set the mBot LEDs so that each of the diodes (both left and right) lights up in a different color and changes to a different color after two seconds.

Activity 3: Make mBot move by pressing the button

mBots move using the rear two wheels, and they turn using the wheels on the front. It is possible is to adjust the speed of their movement.
Events *when mBot starts up* ☐ Control *forever* ☐ Control *wait until* ☐ Sensing *when on-board button (pressed)* ☐ Action *move forward at power (50%) for (1) secs* ☐ Devices *Upload*
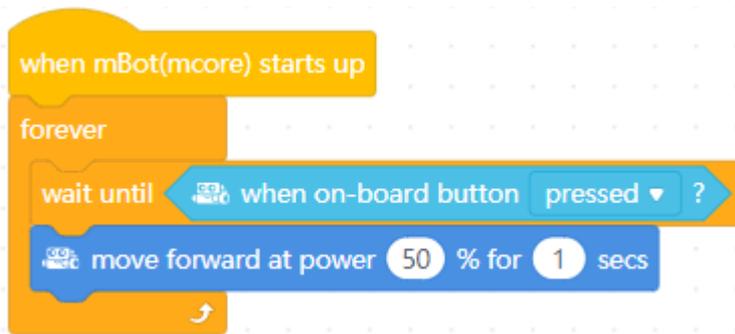
Task 2: Write a code that will cause your mBot to move forward at the push of a button for 3 seconds at the speed you specify, turn 180° and continue to move backwards for 3 seconds at a speed slower than moving forward.

Activity 4: Black line tracking

The robots follow (trace) the black line using two sensors located on the front. These sensors tell mBot if there is a black or white background above each sensor. Looking for differences between them, the robot recognizes whether it is following the line or if it is off the line. Black is defined by the binary number zero, and white by one.

Since it has two sensors, they can show four combinations. When both sensors are in black, we have a binary record of 00, which is 0 in the decimal system. The robot is following the line and the command we give it in this case is: 'go forward'.

If the left sensor is black and the right is white, the combination in binary notation is 01, which is also binary number one. As the robot fell off the line on the right side, it can be concluded that the line turns left, so the command we give is: 'drive left'.

In the reverse situation, the sensor combination gives a binary number of 10, which is 2 in the decimal system (when converting from binary to decimal we add the powers of number two at the places where there are ones in the binary notation, while omitting zeros).

As the robot has now jumped off the line on its left side, we can conclude that the line turns to the right, so the command we give is: 'drive to the right'.

In the latter case, the sensors show 11 which means that the robot is on a white background. Binary record 11 in the decimal system is 3. In order for the robot to return to the line, we give it the command to drive back.

As soon as mBot returns to the line, it will come to one of the remaining three positions and thus drive in a circle.

Let's write a program.

Events *when mBot starts up* ☐ Control *wait until* ☐ Sensing *when on-board button (pressed)* ☐ Control *forever* ☐ Control 4x *if-then* ☐ Operators *equality operator* ☐ left side of the equation: Sensing *line follower sensor (the port to which the mBot line sensors are physically connected)*

1. *if-then* loop – right side of equality value 0 – the left and right line sensors are located above the black background ☐ Action *Move forward*
2. *if-then* loop – right side of equality value 1 – the left line sensor is above the black background, the right above the white background ☐ Action *Move left*
3. *if-then* loop – right side of equality value 2 – the left line sensor is located above the white background, the right above the black ☐ Action *Move right*
4. *if-then* loop – right side of equality value 3 – the left and right line sensors are located above the white background ☐ Action *Move backward* Devices *Upload*
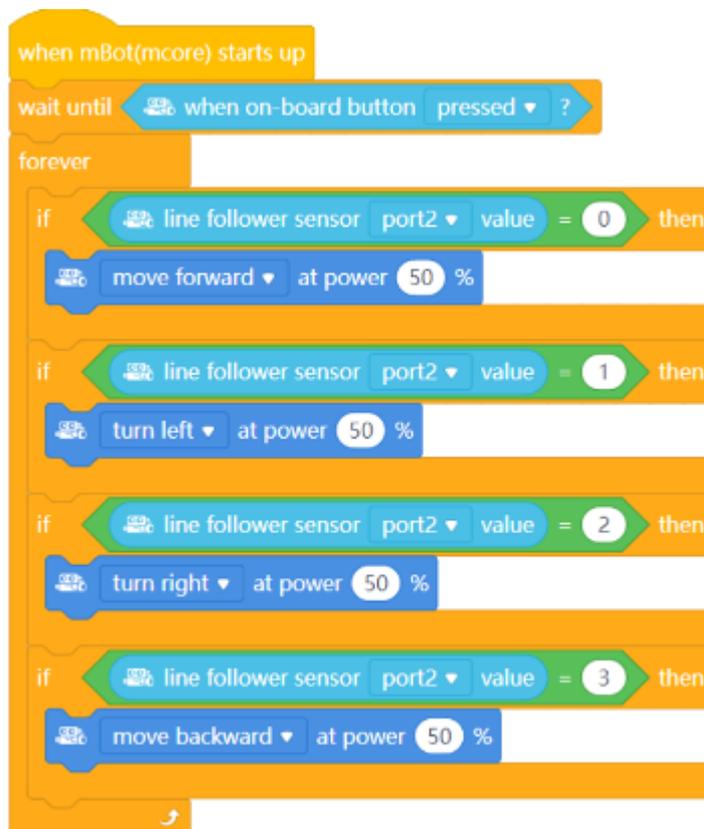
Task 3: While tracing a black line on a white background, let the mBot respond by signaling with the right LED. If its direction of movement changes - to the right, or the left LED if its direction of movement changes to the left. Let it give a green signal with both LEDs when moving forward.

Activity 5: Object detection and avoidance

With the help of ultrasonic sensors, the robot can recognize an obstacle at some distance in front of it. We can define what to do in case it is recognized. If we want to avoid it, we will set

it to turn a certain (short) number of seconds to the left or right at the moment of recognizing the obstacle. This will redirect it after which mBot will continue to drive straight (first command) until it recognizes the obstacle.

Detection

Events *when mBot starts up* ☐ Control *wait until* – Sensing *when on-board button (pressed)* ☐ Control *forever* ☐ Control *if-then-else* ☐ Operators *operator greater than* ☐ left part of the operator: Sensing *Ultrasonic sensor (the port by which the mBot is physically connected to the ultrasonic sensors)* ☐ right part of the operator: the final distance of the object, e.g. 10 cm ☐ if: Show *LED all shows color (green)* ☐ else: Show *LED all shows color (red)*
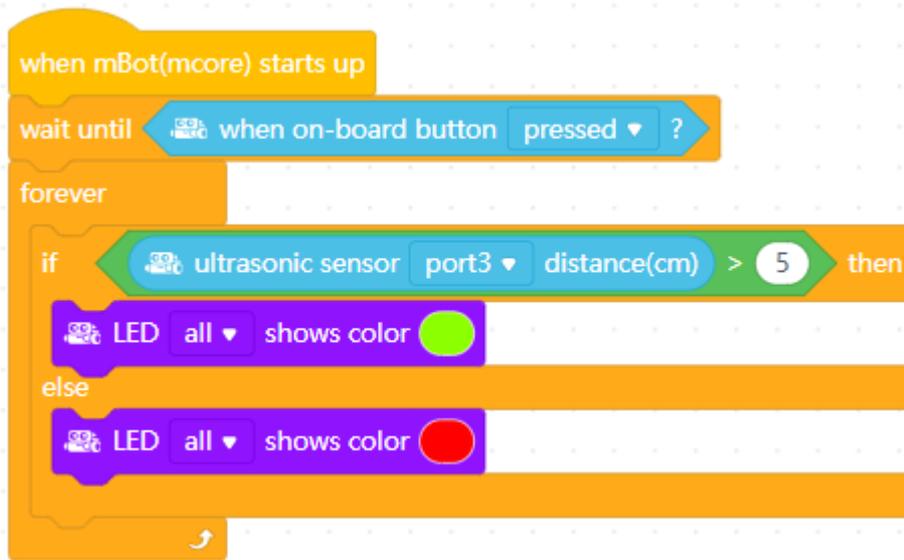
Avoidance

Events *when mBot starts up* ☐ Control *wait until* – Sensing *when on-board button (pressed)* ☐ Control *forever* ☐ Control *if-then-else* ☐ Operators *operator greater than* ☐ left part of the operator: Sensing *Ultrasonic sensor ((the port by which the mBot is physically connected to the ultrasonic sensors)* ☐ right part of the operator: the final distance of the object, e.g. 10 cm ☐ if: Action *Move forward (50%)* ☐ else: Action *Stop moving*

```
when mBot(mcore) starts up
wait until    when on-board button   pressed ▾   ?
forever
    if    ultrasonic sensor   port3 ▾   distance(cm)   >   5   then
        move forward ▾   at power   50   %
    else
        stop moving
```

Task 4: Detect an object that is in the path of your mBot. After detection, have the mBot change direction to avoid it and at the same time give a light signal to change direction.

Task solutions

Task 1.

```
when mBot(mcore) starts up
forever
    LED   left ▾   shows color  ⬤
    LED   right ▾   shows color ⬤
    wait   2   seconds
    LED   left ▾   shows color  ⬤
    LED   right ▾   shows color ⬤
    wait   2   seconds
```

Task 2.

```
when mBot(mcore) starts up
forever
    wait until    when on-board button   pressed ▾   ?
    move forward at power   50   % for   3   secs
    turn left at power   40   % for   1   secs
    move backward at power   30   % for   3   secs
```

Task 3.

```
when mBot(mcore) starts up
wait until < when on-board button pressed ▼ ? >
forever
    if < line follower sensor port2 ▼ value = 0 > then
        move forward ▼ at power 50 %
        LED all ▼ shows color (blue)

    if < line follower sensor port2 ▼ value = 1 > then
        turn left ▼ at power 50 %
        LED left ▼ shows color (red)

    if < line follower sensor port2 ▼ value = 2 > then
        turn right ▼ at power 50 %
        LED right ▼ shows color (red)

    if < line follower sensor port2 ▼ value = 3 > then
        move backward ▼ at power 50 %
```

Task 4.

```
when mBot(mcore) starts up
wait until < when on-board button pressed ▼ ? >
forever
    if < ultrasonic sensor port3 ▼ distance cm > 10 > then
        move forward ▼ at power 50 %
    else
        turn right ▼ at power 50 %
        LED right ▼ shows color (red)
```

4. FINAL TIPS

For pupils under the age of 13, binary numbers are too abstract and therefore incomprehensible, so it is important to pay attention to how line tracing is explained to them.

Also, not all pupils are the same and some have prior knowledge, while some even intuitively get along better with robots. We therefore advise you to try to come up with additional tasks on the go for those who are more advanced so that with the next lesson the whole group can start again at the same time.

Many pupils accept very well when you praise them in their work, so they put in more effort and thus motivate themselves to do more work. Some of them will prefer if you direct them to show their knowledge by explaining and helping their colleagues. That way, they build self-confidence, learn team spirit, and practice social and communication skills, which is why we can conclude that in addition to robotics, we do not necessarily have to develop only STEM, but also other soft skills of school pupils.

3. Workshop: Website design

1. WEBSITE DESIGN - THE THEORETICAL PART

Websites today are a powerful marketing tool. You can use them to promote yourself or your business, to improve your business, or to show your hobby to the whole world. Absolutely every reason is a good reason, and, more importantly, to successfully breathe life into your site. For those a little less skilled in programming and computer skills, there are platforms where you can very easily get the desired website. The only knowledge that workshop participants and all those who want knowledge need is the most basic related to the use of computer technology. They will learn everything else with the help of manuals and workshop leaders.

Students who enter such a project should have developed IT knowledge, and above all the desire and motivation to lecture.

In order to better and more easily focus attention on important parts, the content is organized into the following content units:

1. Basic elements of a website
2. Website maintenance
3. What problems occur when you neglect maintenance
4. Wix - main features
5. 8 steps to successfully create a page
6. Tips for making a website
7. What to avoid
8. Elements to be processed in a workshop or for practice

1.1. BASIC ELEMENTS OF A WEBSITE

Speaking of websites in general, it is important to know what prerequisites need to be met for a site to exist. These are the three elements that every website you have ever opened has: domain, hosting, platform.

DOMAIN

A domain is a nicer and simpler name for an internet address. Each internet address is unique and consists of a series of numbers ranging from 0 to 255. Just as we have streets names so that we do not have to remember their coordinates, we have a domain instead of an internet address. A domain is what we need to type in a web browser to visit a page.

The domain consists of the whole name together with the part that comes after the dot - some of the better known domains are .eu, .com, .net. The

domain needs to be purchased and renewed annually. The price varies depending on its popularity.

HOSTING

Hosting denotes the place where the website is actually located. Web hosting is a server (or computer) on which the website is stored and from there it is displayed to users, visitors. These servers are physical devices and usually one server contains several hundred smaller web pages. There are also large websites that require several devices to function properly. One such site is the famous Facebook which requires a lot of processing power and a lot of memory which is why several hundred servers work just for it and are located in the Arctic.

Hosting is also paid for, and it is recommended to choose hosting in the country for which the website market is intended.

PLATFORM

A platform is a place where you can create your website, if you don't want to or don't know how to make it yourself and program it from scratch. One of the better known and more popular platforms is Wordpress, as well as Wix which was chosen to work with in our case. Although you don't have to have a platform, you do need to have a domain and hosting. Without hosting there would be no place for a website, and without a domain you would not be able to find it.

1.2. WEBSITE MAINTENANCE

Once you have created a website, it needs to be maintained. What does that mean?

- adding new products

- adding services

- updating images

- updating information

- design refreshing

Think of your website as your company's digital ID. In order to meet the expectations for which you made it, you need to take care of it. This means almost daily care of existing and new products and services that need to be harmonized. It is important to replace existing images when you change some services, your own space or anything else that would be interesting to your visitors and potential customers. It is also important to make major or minor design changes from time to time. It is important to pay attention to the design when creating the page itself because you do not want a page made in 2020 to look like it was made 5, 6 or more years ago. It is certainly a long-term process, but important for business. Maintenance needs to be carried out in order for the site to remain functional, but also well positioned on search engines, which is the ultimate goal for the business to grow.

1.3. WHAT PROBLEMS OCCUR WHEN YOU NEGLECT MAINTENANCE?

If you neglect your website, numerous disasters may occur. It takes a long time to load it, and we all know that if we have to look at a spinning circle for a while and never loads the page - we will give up visiting it and look for another site with the information we need. The next consequence is a lower position on the search engine. If the page is not high among the search results, it is not visible and it is the same as if you are not available on the market. We all know that we rarely clicked on the second, let alone the third page in search results when we were looking for something. And your page may only be on page nine. As a result, there is less traffic, less sharing and you become invisible, which has negative consequences for your business.

1.4. WIX – MAIN FEATURES

Wix is one of the leading web development platforms chosen for its simplicity and intuitive design. Storing data on the cloud is a great advantage because there is less chance of disappearing of stored information. On Wix it is possible to create a website for any purpose; for personal entertainment, for showing portfolios, for advertising jobs of any kind and the like.

One of the specifics is the ability to use a blog which means you can write articles according to your own interests. You can personalize the Wix page and most importantly - it's free. However, because it is free, you can only partially influence the appearance or domain name. The domain in the name has a *wixsite*, and if you develop a serious and successful business through the site, it is possible to buy a domain in which it is always worth investing. Also, the free version, as tempting as it sounds, is limited, i.e. you don't have access

to all the options. There are 7 different plans for a wide range of prices and you will surely find one that will suit your needs.

When a page is created on Wix, it also makes it easier to maintain it. All aspects of the platform and updates are controlled, and if you get stuck somewhere, there is a support team with organized video guides available to you.

It is also possible to use a number of apps and add-ons that Wix itself contains that they claim are regularly monitored with their functionality regularly tested.

DESIGN

SIMPLICITY

APPLICATIONS AND ADD-ONS

WIX

BLOG

MAINTENANCE AND SUPPORT

PRICE

1.5. EIGHT STEPS TO SUCCESSFULLY CREATE A WEBSITE

To make a website as easily as possible, there are some guidelines to follow.

Step # 1: Discover the purpose of your website

Think about why and for whom or for what you are creating a website, what its purpose is. When you crystallize your goal, you'll find it easier to focus on the important parts during the design so you don't get stuck halfway and wonder what you wanted to achieve.

Step # 2: Identify end users. Decide what kind of audience you want to attract to your site because you will create content and design accordingly. The site will certainly not look the same if it is intended for the younger population, business people, parents with children or the elderly.

Step # 3: Sketch the layout of the page. With the old-fashioned approach, take a pen and paper and really draw or sketch how you envisioned at least one part of your page. Sketch the position of a menu, where the pictures, titles, descriptions, toolbars and navigation bars and the like will appear. Once it's on paper, it's a lot easier to implement an idea into a platform.

Step # 4: Create keywords. Every aspect of an action or a text can be reduced to a few keywords that are at the center. Think about what your keywords are, what makes up your page, and when you create them, use them when you create content. Keywords help to better link your content and make the page more searchable.

Step # 5: Collect your own material. Depending on the purpose of the page, make sure you have as much copyrighted, authentic material as possible to put on the page: from your own photos, texts to links to your own social media profiles.

Step # 6: Meet the prerequisites listed at the beginning of these instructions: get a domain, hosting and platform. if you work on Wix, you've already done that.

Step # 7: Start designing the page. Introduce all the ideas from the beginning to the real page and design it at your own discretion and style.

Step # 8: Pay attention to SEO. Wix has the option (paid) to make SEO of your site, or to link it to Google and thus increase the visibility and searchability of your site, which is always in your interest if it is a business page. An opportunity worth exploring and investing in.

1.6. TIPS FOR CREATING A SPECIFIC WEBPAGE

It is important to keep a few things in mind when creating a webpage. One of them is the mobile version: Wix offers you the possibility to open your page and see how it looks like on your mobile phone. It is important to check that version at the end of the production or sporadically during it. It is very likely that most users will get to your site right through their smartphone because they remembered to book accommodation for their vacation while riding the tram. You want the webpage to look good on all devices.

The next importan item is a clickable object. Once you have attracted someone to your site, you want them to stay on it for as long as possible and, if possible, subscribe to receive news or perform any action, ideally

one that will benefit you. So right next to the top, at eye level, a noticeable button should be placed that says "click me and buy / view / book / subscribe".

The website should also have a key information about you or your company, depending on who is in the spotlight. It must contain a section that contains basic information such as a description of the company, name, location. A user is always interested in who is behind a project or idea, especially when it is good.

Similar to a clickable object is the output pop-up. We are all annoyed when this window pops up when leaving a page, forcing us to read it, because if we choose the wrong button, we will have to repeat the whole process of clicking X to exit. At that point, we promise ourselves that we will never open that page again - as easily as possible and true, but research has shown that pop-ups bring in significantly more clients. The thing is, the one who has strayed to your site or isn't really interested in it, won't visit it again anyway, but there's a relatively large group of those who are interested in something but are hesitant and leave. This is where a pop-up pops up and gives them a small incentive to stay on the page and you get one more user. This pop-up can be a persuasion to sign up for a mailing list thus agreeing to receive promotional emails from your site or some offers which is a win-win situation.

When you visit a website, you want to be clear about what is happening on it and where all important parts are. You may have come for specific information that is not immediately visible. Make sure you organize good, meaningful, logical and visible navigation.

Connect with your own social networks, connect with those social networks you collaborate with, highlight them and thus promote both yourself and them. Write a blog, put links and make collaborations. This makes you noticeable and visible, which means - better retrievable.

Be specific and recognizable; if the page is for a company that has a logo - put it on the page, make it visible. If you don't have it, you can always make it. A logo is a visual accessory that means a lot in the world of marketing.

1.7. WHAT TO AVOID?

After all the advice on what would be good to do for your website to strive, sometimes even more important are those advices that tell us what to avoid.

Avoid:

• inconsistency in design and fonts

• music that starts when the page loads

• links that do not work

You don't want a visitor to get a seizure when he opens your webpage just because you couldn't decide between 7 fonts and 12 colors and you took advantage of them all. Do not do that. The golden rule is "less is more". According to the same rule, do not set music that starts automatically when the page opens. There are people who have 20 windows opened in the same browser at once. Once they discover where the melody is coming from, whatever it is, they will remember that they are no longer visiting that page.

And last from these general tips - make sure all the links that exist on the site work and lead exactly where you planned. It is a reminder regarding the maintenance of the website mentioned at the beginning. If you

neglect the posted links, a horror can happen. Imagine that some of these sites have been sold in the meantime and have now become the headquarters of sexual services or something absolutely inappropriate and you have directed your users there. Embarrassing, isn't it? So check the content of your site regularly. 😊

1. Design selection
2. Simultaneous moderation of the mobile version
3. Selecting and adjusting the background
4. Inserting subtitle, job description
5. Adding a clickable button
6. Uploading your own photos
7. Editing sections about yourself, contact information, location
8. Setting up navigation
9. Setting up internal links
10. Connecting with social networks
11. SEO settings
12. Blog
13. Publishing the site

2. WEBSITE DESIGN – THE PRACTICAL PART

2.1. CHOOSE THE THEME OF THE WEBSITE

After registration and *log in* on the Wix platform, it is necessary to select the type or theme of the website (Figure 1). Some of the offered are Blog, Music, Fitness…
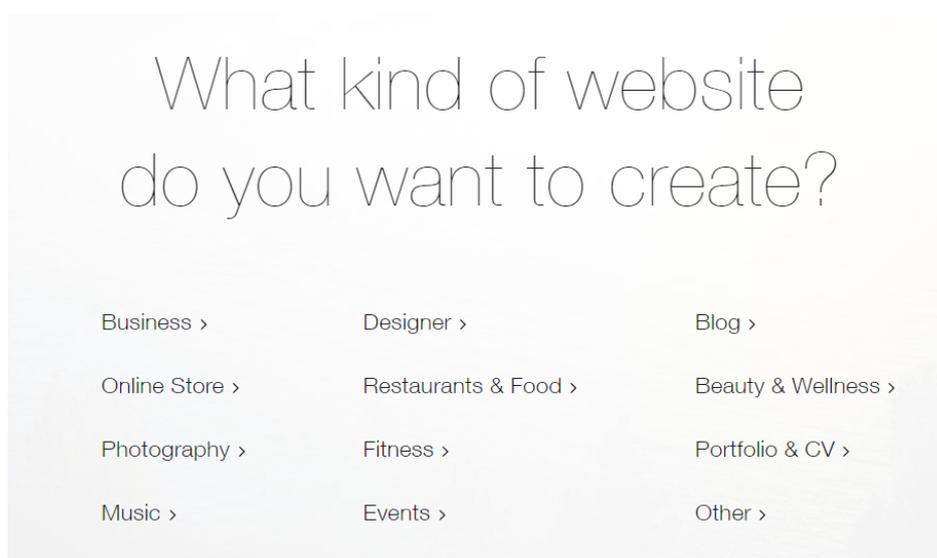
Figure 1

2.2. CHOOSE HOW TO CREATE A WEBSITE

Wix offers two options here (Figure 2). The first option is for Wix to automatically create a web page after you answer a few questions, while the second option is to select a template and continue working on it. For a better understanding of the Wix platform, the second option is recommended.
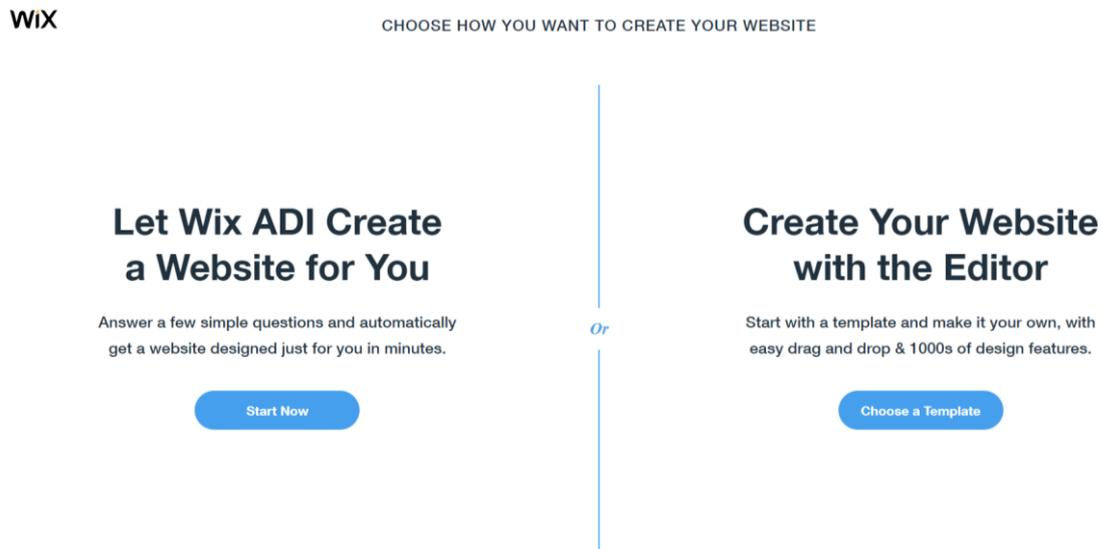

Figure 2

2.3. SELECT A TEMPLATE

The next task is to choose a template, and the options are many. Wix offers over 150 different templates and it is up to you to choose the one that best suits the idea of your website so that you can modify it as easily as possible later.

2.4. TOOLBARS

After selecting a template you need to become familiar with the toolbars, which are the horizontal and the vertical toolbar (Figure 3).
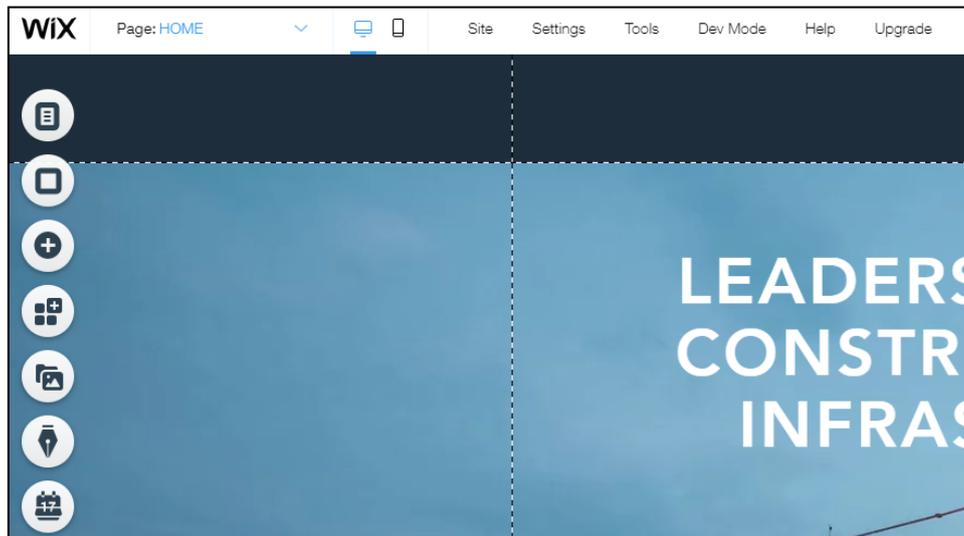
Figure 3

The horizontal toolbar makes it easy for you to navigate between your pages and view the web page on your mobile device. With the 'Site' button you can save your page, view what it looks like, publish it and the like. With the 'Settings' button you can connect to your domain if you have one and you can improve your Wix page (this option involves payment). With the 'Tools' button you can select the tools you want to use in creating your website (Toolbar, Layers, Rulers, Gridlines, Snap to Objects). You can create a professional web application by clicking on the 'Dev Mode' button. The 'Help' button is used to help create the website, while the 'Upgrade' button provides the option to improve the Wix page (a paid option). The vertical toolbar is used to manage the content of the website.
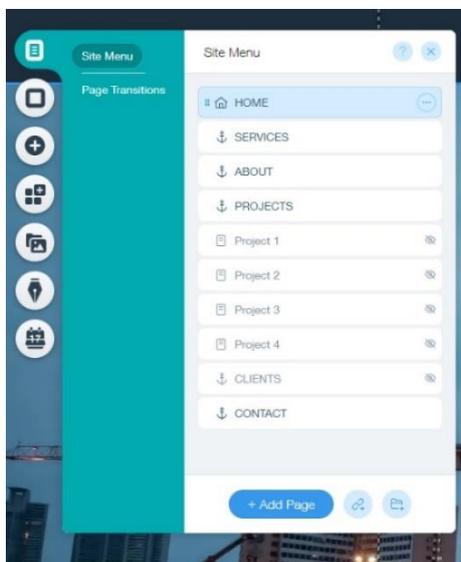

Figure 4

The first item of the vertical toolbar (Figure 4) is used to view, delete or add new pages to your website.
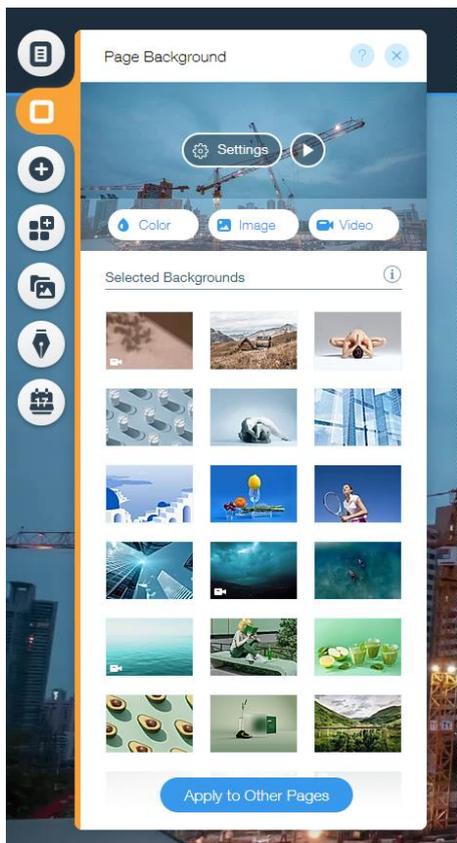
Figure 5

With the next item (Figure 5) on the vertical toolbar you can change the background image of your website. You can add a color or video instead of an image.
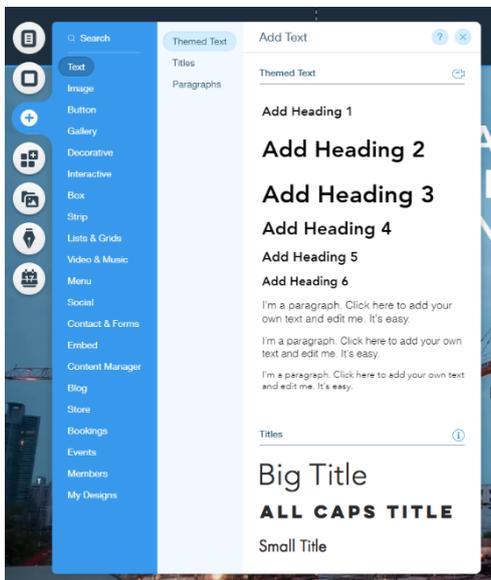
FIgure 6

Using this item (Figure 6) you can add content to your page. The text option offers to add text such as a title or paragraph. This item also allows you to add photos. In addition to photos, you can add buttons that can serve as a link to another page, a link to download some content, to return to the top of the page and the like. These are just some of the options this item offers. The next item (Add apps) is used to add web applications

to the page. The item after that (Media) is used to add content from social networks. The last two items are used to start a blog and bookings (an easy-to-use scheduling system that lets customers book services online).

2.5. WEBSITE DESIGN

Once you are familiar with all the options that Wix offers, take the time to create a quality website for yourself and your business. Once you have finished creating the website, it is important to check what its mobile version looks like, and you can do this using the vertical toolbar (Figure 7).
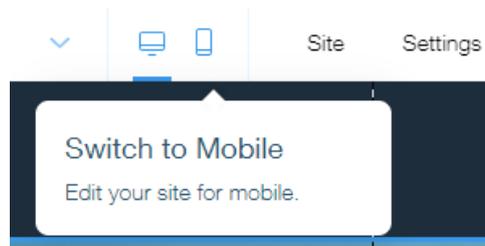
Figure 7

While you are viewing the mobile version of your website the goal is to arrange all the content in the most appropriate way. If you are happy with the look, you can publish the page. Publishing a website can be done by clicking Site -> Publish on the vertical toolbar. Once published, the URL of your website will contain the email you used to sign up for Wix in case you did not connect to your domain or do not have one. If you do not plan to pay for the domain, keep in mind the name of the e-mail with which you registered on the Wix platform.

3. TIPS

Before you implement this workshop, make at least one detailed webpage in Wix to try out all its possibilities, especially the ones you plan to use during the hands-on part of the workshop. Organize a guided exercise and keep in mind that participants will be of different ages, different skills, and different abilities. It is therefore necessary to present the content clearly, meaningfully and logically connected. Be prepared to answer even those questions to which you do not know the answer!

4. Workshop: Advertising in tourism

1. INTRODUCTION - GENERALLY ABOUT THE TOPIC AND NEEDS

In tourism, advertising is the basic way of communication and mediation between products (i.e. individual entrepreneurs, tourist attractions, events ...) and tourists, i.e. potential clients. Older methods such as the use of physical leaflets or newspaper advertisements today are simply not adequate for the modern and technologically supported world that is popularly called "the global village". The world of Web 2.0 has enabled a variety of advertising methods that are widely used today and are used to make people from different parts of the world hear and visit all the existing corners of the world. From such a perspective, it is important to note that not all people from all parts of the world posses a high level of information skills or are familiar with all possible ways of advertising. The use of these new ways of advertising has become one of the crucial factors for making money in the field of tourism. The above statement remains the main reason for teaching people from rural areas about all the new existing ways of advertising because they must get the opportunity to promote their own business (but also its successful continuation). The way in which this can be achieved are short-term educational programs (e.g. workshops) on possible advertising techniques in tourism.

2. SKILLS THAT STUDENTS NEED WHEN ENTERING A PROJECT

Students should have the following:
- information and information education,
- awareness of the change and fluidity of this field,
- knowledge of the most current methods of advertising in order to avoid obsolescence of the material being taught, and
- developed interpersonal and public communication - the purpose of this project is to further develop and improve them.

3. SKILLS THAT WORKSHOP PARTICIPANTS NEED WHEN ENTERING A PROJECT

Participants should have the following:

- intrinsic motivation to acquire new skills and

- basic knowledge of the use of computer technology.

4. TEACHING MATERIALS – WHAT AND HOW?

We first determine the appropriate advertising tools according to the needs and desires of the participants by asking these questions:

- What population or group of people are they targeting? → Will it be foreign or domestic tourists, younger or older, families with children or pets, etc.?

- How much money do they (not) want to use for advertising?

- What exactly do they want to advertise? → Will they rent an apartment / room / house?

- What are their needs?

- What advertising techniques have they (not) used before? Which ones do they know best? How often and what was their performance with them? How satisfied were they with them?

Specific goals (i.e. what we want the participants to learn after our workshops; general goals that should be flexible enough with regard to the specific needs of different participants):

- knowledge of modern advertising opportunities

- selection of appropriate tools depending on individual needs

- successful independent advertising in tourism using computer technology

The best known and most effective types of advertising with key features:

- https://ads.google.com/home/ - charged, but large number of users can be retrieved

- https://www.facebook.com/business/ads - charged, effective for retrieving specific users (target group)

- https://www.instagram.com/ - similar to Facebook, the creation of the profile itself is free, but the promotion of the created profile is charged. Useful for reaching a younger population

- http://booking.hr - this not an advertising service such as Google Ads, but a website where users search for apartments, rooms, hotel rooms, etc. It is very easy to use and provides contact with potential guests.

- https://hr.airbnb.com - Airbnb works on a similar principle as booking.hr, except that in the Republic of Croatia booking.hr is better known

- Further advertising sites: Tripadvisor, Trivago, Yahoo Local, Google Local, Yelp, etc.

FACEBOOK - (https://www.facebook.com/business/ads)

Tips for using Facebook:

1. PAGE, NOT Profile!

2. Use vanity URL - pin that new, simpler, more memorable, more accessible URL on your web, Booking.com, poster, any other way of communication.

3. Share relevant information with your followers 2-3 times a week to stay interesting and worth following.

4. Use Facebook Places - a location can be set up on Facebook so that people can search for you there as well http://www.facebook.com/help/?topic=places

5. Create a database of followers who may be interested in your apartment - take into account the age of previous visitors, their data - send a Facebook page invitation to people who have already been to your apartment.

6. Create QUALITY photos and interesting descriptions.

7. Describe what is offered near your apartment and why people should choose yours! (close to the sea, WiFi, close to the airport, close to popular places, shops ...)

8. Create cover photo - it would be best to represent the whole picture of what you are offering.

9. Fill in all information about your apartment - address, website, phone, description, parking ...

10. Use videos

11. Post when most people are online.

12. Use emoticons in posts to get closer to the audience.

13. Use humor in posts!

The above tips for effective use of the Facebook page can also be applied to the Instagram platform. Next you can read detailed instructions and examples of tasks for using the Facebook page to promote the desired objects, and immediately after that the tips for the Instagram page.

Facebook
USEFUL FOR:
- reaching a large number of guests from all countries and from all age groups,
- the most used social network and thus the largest number of potential guests,
- promoting accommodation through paid advertisements and sharing the accommodation business page,
- targeting the age groups in which your ads will appear
- frequent publication of photos and videos and text - various types of documents can be published at any time and in any issue.

Basic steps for setting up a renter account:

1. on the Facebook page there is an option "Create" - "Page",

2. the page of the apartment / room is connected to the personal profile of the person creating the page so that it is not necessary to remember new passwords or names,

3. it is necessary to state the name and category of the site (e.g. Rose apartments) - the categories must be somehow related to the theme of the site (e.g. hotel, hotel and accommodation…) and there can be a maximum of 3,

4. in the "Description" part the person describes the accommodation (e.g. two bedroom apartment near the beach),

5. it is better to write in English or at least in one foreign language in addition to Croatian in order to attract as many guests as possible,

6. after the step 5, the page is edited in the "Set up your page" section where images are added (optional but highly desirable). Without pictures, a potential guest cannot create a visual impression of the accommodation, so the rule is to publish as many pictures as possible - especially profile and cover pictures,

7. now it is necessary to publish as many pictures of apartments and rooms and if possible arrange them in folders with the name of each room / apartment - the more pictures the better (they must be high quality - have in mind that those taken with a mobile phone are rarely high quality),

8. It is always good to publish various information to potential guests - e.g. indicate if you have refrubished something in the house (painted the rooms a different color, tiled the parking lot ...) and accompany each post with a picture,

9. Every post can be promoted, but it is always better to promote the whole page,

10. it is necessary to add as much information about the apartment / room (e.g. working hours, location, name of the owner, number of rooms / apartments…) - this can be done on "Edit information about the page",

11. it is always good to link the site to other accommodation websites (e.g. Booking or Airbnb),

12. Ads related to the site may be published in the "Ad Center",

13. first determine what is being promoted - it is best to promote your own site,

14. and then the conditions for the ad are set - e.g. duration of advertising, how detailed the ad should be, what the target audience is, how much you want to pay, etc.,

15. It is also important to stay in touch with potential guests and answer all possible questions. There is a "Messages" option for this,

16. on that page you can follow all inquiries and messages, but also all comments from the Facebook page, as well as from the Instagram page,

17. Instagram can be linked to a Facebook page so you can promote both pages at the same time, to attract as many guests as possible.

INSTAGRAM

USEFUL FOR:
- promoting accommodation mostly to younger generations as mostly young people and teenagers use Instagram,
- visual presentation of the accommodation (on Instagram the focus is mostly on photos and videos, and less on the text),
- allowing guests to tag your accommodations in their posts and thus you can attract other guests for free (but this can also go in the wrong direction, if guests post negative photos or if people who were

not your guests take the opportunity and negatively promote your accommodation - which rarely happens).

Basic steps for setting up a renter account:

1. the easiest way to connect Instagram and Facebook is through creating a new Instagram profile. This can be done with a personal profile (so you don't have to come up with a new password), but you can also create a separate account with a special password,

2. to create a new Instagram account next to the existing account, you need to go to the personal account settings and then click on "Add account" and then click on "Create a new account",

3. after that, as with all other pages, personal data such as the name, location and description of the page are added, and finally,

4. If you connect to Facebook, there is an automatic option "Create a new Facebook page" so you do not have to create a separate page on Facebook.

GOOGLE MY BUSINESS (https://www.google.com/intl/hr_hr/business/)

- Google My Business is a great way to increase your presence in Google search results and make it easier for users searching for accommodation to find what's best for their needs. When a user searches for services on Google, Google My Business results are in the first place in the list of search results.

Tips for using Google My Business:

- Once an advertiser already has a profile set up on Google My Business, reviews are paramount! To begin with, reviews of people who have already been guests of the accommodation can be requested and in that way you can collect good points, i.e. excellent reviews.

- Advertisers need to constantly respond to reviews because they show a willingness to improve their service and that they care about the opinions of guests, which contributes to the development of trust.

- The renter must add the location of the accommodation on Google Maps and link it to the Google My Business ad.

- On average, 42% more visitors visit and search Google Maps for locations on images, so posting photos and descriptions is recommended.

- The renter is encouraged to create their own website and link it to a Google My Business ad.

- Renters receive monthly information on the analysis of user behavior via e-mail: data on the number of people who saw their business and the number of people who clicked on the company's website and requested instructions for the location of the business.

- Advertisers can also use Google Posts, a service on Google My Business to promote special events, promotions and benefits.

Basic steps for setting up a renter account:

1. Login and verify your account.

2. Set the business name and location of accommodation.

3. Add contact and working hours.

4. Select the category of activity that describes the business (e.g. renting an apartment).

5. Add a panoramic photo or a short virtual walk through the apartment (video) - to make the guest feel the atmosphere of the place in the best possible way even before he gets there.

6. Verify business via e-mail.

BOOKING.COM - (https://join.booking.com/?lang=hr)

- Booking.com is a website that connects millions of travelers each year with a variety of accommodation facilities, from holiday homes to hotels and more. During the creation of the ad on the Booking, the user provides a variety of information about their accommodation, and allows potential guests to access this information. This reduces the need for direct contact with potential guests, as they see everything that might interest them in the ad of the accommodation facility. As one of the world's largest markets for accommodation, Booking.com allows them to reach potential customers around the world, thus developing their business. Booking.com is available in 43 languages and offers more than 28 million accommodation units, of which 6.2 million are just holiday homes, apartments and other unique accommodation.

Tips for using Booking.com:

1. Guests can use the messaging system and contact the host before booking to make sure all expectations are met.

2. When you are ready, open your facility for bookings (in some cases you will need to confirm your location before you can receive guests);

3. Describe in your own words what makes your facility and your neighborhood unique and add a welcome message to all future guests;

4. 'About the object' - here you can describe what makes your object unique. You can add information about the design, facilities, equipment and history of your facility;

5. 'About the host' / 'About the company' - compose a short message about yourself or your company and allow your future guests to get to know you or your brand;

6. 'About the neighborhood' - add some tips on touring the area and local attractions;

7. Add a photo of the host or company logo;

8. You have support from 0-24 and the possibility of reporting in case guests violate the rules;

9. Set conditions and criteria that guests must meet;

10. You can make a deposit in case of damage and provide yourself with greater security.

11. Upload as high quality images and as many images as possible so that the user can have a visual impression of your object;

12. You can update your calendar and prices and confirm that the information about the facility is correct. Keep track of your booking calendar. You can use it to display the time slots in which your object is occupied or free.

USEFUL FOR:

- performing the entire process of renting accommodation in one place

- it is possible to reach a very large number of potential guests through a very detailed filtering option by which potential guests determine what they are looking for in accommodation

- editing the entire accommodation occupancy schedule and linking it to other calendars

- preparation of special promotions and discounts for, for example, the off-season period

- talk to guests and Booking.com employees

- secure payment process - money is paid directly to your account, and there is no cash exchange

- leaving feedback and guest reviews

- Booking.com offers a very detailed and extensive way of filtering that allows tourists to very easily find exactly what they are looking for.

AIRBNB.COM - (https://hr.airbnb.com/host/homes)

Today, Airbnb has over 800,000 private accommodations and activities in 33,000 cities and 192 states. The platform is designed to encourage communication between the renter and the guest as much as possible. Airbnb is therefore also called a social network for renting accommodation. The renter can connect his profile with profiles on other social networks, again with the same goal - to build the trust of the guest in the accommodation of the renter, but also to strengthen the trust in the service itself. No matter what kind of space or room it is, Airbnb is promoted as a simple and safe rental tool. The renter decides when his accommodation is available, what his price is, what the house rules are and how he makes contact with guests. In addition to accommodation, the hosts can offer special activities that are an opportunity for tourists to feel like a local population at any destination.

Tips for using AIRBNB:

1. Please note that the process of advertising on Airbnb is free, i.e. there is no registration fee.
2. The renter can specify his calendar, prices and conditions for guests.
3. Airbnb offers global customer support 0 - 24.
4. When the guest arrives at the accommodation, the money is paid via Paypal, direct payment to the account or in some other way.
5. The calendar on Airbnb may be linked to other calendars to avoid receiving bookings for periods when it is not possible to receive guests or when renters already have pre-arranged bookings on other advertising platforms.
6. The renter can enter the house rules that guests must accept before booking accommodation.
7. Airbnb charges 3% of the total price the guest pays to the renter.
8. The host can add the accommodation cleaning fee to the price of accommodation by dividing the fee by the number of days and adding that amount to the official price of the night.
9. Hosts (renters) should encourage guests to leave reviews and try to respond to all guest comments. On each profile of the host, you can see what his previous response rate is. The frequency of responses to guest comments can increase, but also decrease the popularity of renters.
10. Airbnb offers free accommodation photography by a professional photographer if such a person exists in the local area. Photography must be ordered in advance.

Basic steps for setting up a renter account::

1. registration by e-mail, Facebook or G+ profile,
2. selection of type of accommodation,
3. setting up a calendar of accommodation availability,
4. determining the price of the offered accommodation,
5. uploading photos,
6. editing the address of the accommodation that the guest finds out only after booking the accommodation,
7. defining the payment method.

5. FINAL REMARKS

It is the intention of the authors of these guidelines to facilitate future workshops dealing with this or a similar topic. To facilitate such a process, the work is redirected to specific tools and examples with instructions for their processing. Also, it is worth referring to the year of writing these instructions and that due to their fragile nature, as Internet platforms, they are subject to possible changes. It is the duty to check the operability of these tools before conducting specific workshops. Changes can occur by changing the way platforms operate (both rules and existing services), binding laws, platform activities and the like.