

Summary:

Applicant: Univerzitet U Beogradu, Tehnički fakultet u Boru/University of Belgrade, Technical faculty in Bor

Seat: Bor, RS

Project ID #/Title: **22110036**, Possibilities and barriers for Industry 4.0 implementation in SMEs in V4 countries and Serbia

I. APPLICANT

Univerzitet U Beogradu, Tehnički fakultet u Boru

Organization name (English):	University of Belgrade, Technical faculty in Bor Tehnički fakultet u Boru
Address:	Vojske Jugoslavije 12, Bor, 19210, Serbia
Statutory representative:	Nada Štrbac
ID No. of organization:	07130210
Registered VAT Payer:	no
VAT Compensation:	no
Phone:	+38130424555
E-mail:	imilosevic@tfbor.bg.ac.rs
URL:	https://www.tfbor.bg.ac.rs/
Coordinator of the project:	Ivan Mihajlović
Coordinator's e-mail:	imihajlovic@tfbor.bg.ac.rs
Coordinator's phone:	+381642273621
Applicant heard about the current call from:	About the current call of the Visegrad+, we were informed from the website of the Visegrad Fund
Consultation:	no
Previous projects:	, 11410011,11540386 ,21820267

II. PROJECT PARTNERS

Partner No. 1

Name of the organization in its native language: Univerzita sv. Cyrila a Metoda v Trnave	
Name of the organization in English: The University of Ss. Cyril and Methodius	
Address: Nám. J. Herdu 2, Trnava, 91701, Slovakia	Slovakia
Statutory representative: prof. Ing. Jozef Lehotay, DrSc. – acting rector	Organization ID No.: 6078913
Registered VAT payer: yes	VAT Compensation: no
Phone: +421335565128	
E-mail: rector@ucm.sk	Website: http://www.ucm.sk
Justification of involvement: Previous cooperation with project partner: Yes, we have cooperated in the past on two projects financed by the International Visegrad Fund	

Partner No. 2

Name of the organization in its native language: Univerzita Tomáše Bati ve Zlíně	
Name of the organization in English: Tomas Bata University in Zlin	
Address: Náměstí T.G.Masaryka 5555, Zlín, 760 01, Czech Republic	Czech Republic
Statutory representative: RNDr. prof. Ing. Vladimír Sedlářík, Ph.D.	Organization ID No.: 999880172
Registered VAT payer: yes	VAT Compensation: no
Phone: +420 576032235	
E-mail: pnovak@utb.cz	Website: www.utb.cz
Justification of involvement: Yes, we have cooperated in the past on two projects financed by the International Visegrad Fund	

Partner No. 3

Name of the organization in its native language: Óbudai Egyetem	
Name of the organization in English: Obuda University	
Address: Bécsi st 96/b, Budapest, 1034, Hungary	Hungary
Statutory representative: Prof. Dr. Levente Kovács	Organization ID No.: IBAN: HU25 1003 2000 0029 1350 0000 0000
Registered VAT payer: yes	VAT Compensation: no
Phone: +3616665202	
E-mail: lazanyi.kornelia@kgk.uni-obuda.hu	Website: uni-obuda.hu
Justification of involvement: Yes, we have cooperated in the past on three projects financed by the International Visegrad Fund	

Partner No. 4

Name of the organization in its native language: Uniwersytet Ekonomiczny w Katowicach	
Name of the organization in English: University of Economics in Katowice	
Address: 1 Maja 50, Katowice, 40-287, Poland	Poland
Statutory representative: Prof. Dr hab., inż Celina Olszak, Rector	Organization ID No.: IBAN PL 70 1050 1214 1000 0023 3448 5238
Registered VAT payer: yes	VAT Compensation: yes
Phone: +48322577000	
E-mail: kancelaria@ue.katowice.pl	Website: www.ue.katowice.pl
Justification of involvement: Yes, we have cooperated in the past on the International May Conference of Strategic Management and the joint Cost action project.	

III. PROJECT

1. PROJECT SUMMARY

1.1 Project title: Possibilities and barriers for Industry 4.0 implementation in SMEs in V4 countries and Serbia

1.2 Focus area/objective: Innovation, R&D, Entrepreneurship, Development of regional networks/clusters of SMEs, academia, and research institutions with a long-lasting impact

Is the project CBC? Cross-border filter

IMPLEMENTATION PERIOD: 01/06/2021–31/03/2022

Short description of the project:

Modern technologies based on Industry4.0 change the business environment, especially in SMEs. This opens a new field in research and possibilities for continuing and strengthening academic collaboration among partner institutions in Visegrad countries (V4) and Serbia which the focus would be on acceptance of Industry4.0 concepts in SMEs. The aim of this project is to develop small however practical software application, adaptable to the needs of decision-makers in SMEs'. It will be intended for SMEs that want to embrace and utilize digital transformation in their business operation.

2. PROJECT RELEVANCE AND CONTEXT

2.1 What is the main issue that your project would like to focus on? What is the current situation that you wish to change?

In the previous project cycle, funded by the Visegrad fund, the research was completed, focusing on the factors influencing SME failure and possibility of their recovery in Visegrad countries (V4) and Serbia. Based on the obtained results, it was concluded that one of the most significant factor that cause SME failure is the lack of knowledge and experience in the process of implementation of technologies based on the Industry4.0 in business. Considering the fact that contemporary concepts and technologies dramatically change the circumstances. The aim is to develop small scale, practical, software solution which can adapted to the needs of decision-makers in SMEs'. The application will use the data base created during our previous research project, and will allow decision makers to assess their present business process, based on the most influential factors. This will enable the management of SMEs in V4 and Serbia to recognize the opportunities and overcome threats by the support of user friendly ICT tool, developed on the concept of open sources available in frame of the Industry4.0. framework. Continuing and strengthening academic collaboration in V4 and Serbia, an international and interdisciplinary research network will be created, aimed to explore possibilities for using an implementation of the Industry4.0 concept in entrepreneurship. The project will be focused on adopting best available practices from Visegrad countries, whereby Serbian lecturers will further transfer this knowledge to the students as future managers of SMEs and to the current entrepreneurs.

2.2 What should be done to address this issue/problem? How does your project contribute to the solution?

Digitalization and concepts of Industry4.0 are still insufficiently known in the business environment, especially in the SMEs sector in Serbia. Experiences in applying the advanced technologies in the frame of Industry4.0 from V4 countries will be a good example to SMEs in Serbia, for their future development and better competitiveness in the EU market. The willingness of SMEs to accept the Industry4.0 concept depends on the levels of understanding of the benefits among entrepreneurs, scientists, and practitioners. The overall objective of the project is to contribute to the economic and technological development of Serbia through the advancement of academic and entrepreneurial cooperation, transfer of knowledge, expertise, and best practice by V4 countries in the field of Industry4.0 in business. The specific goals are: identifying the needs, possibilities, and barriers for digitalization and Industry4.0 implementation in SMEs in V4 and Serbia; Creating specific concepts and strategies for intelligent and flexible SMEs business model based on Industry 4.0; Developing the methodological approach which will be applied in practice; Designing a business software tool for strategic decision-making in accordance with the concepts of available open sources of Industry4.0, which will be customized to the needs of managers, SME owners, entrepreneurs, and academic institutions for students needs; Introducing a special field of Industry4.0 applications within the existing courses in the curriculum of TFB, EMD.

2.3. What added value does your project bring to the already existing practices? What is the innovative element in your proposal?

The most important added value of the project will be development of small scale software application, that will assist decision makers in SMEs operations. The software will be developed in Python and will represent the platform that will allow decision makers to assess the database with the most important factors affecting the SMEs operations, developed during our previous project supported by the Visegrad fund. The database is already stored in the cloud storage, using the open sources of the Google forms, that were developed during our previous project. Then, the user of the application, will be able to access this data base and compare the level on which are the operations in his/her organisation, similar to the situations of the SMEs stored in the base. Based on this comparison, potential solutions for further business process will be offered. The software will be developed based on big data analysis, cognitive computing and AI modules available in the Python programming environment, as the most important segments of the I4.0 concept. On the other hand, the application will be completely user friendly and the SMEs decision makers will have no need to know any of the analytical - software development issue. The plain elementary knowledge of PC usage, will be adequate for them to use the software. During and after the project implementation phase, the training on installation and usage will be provided. The preliminary modules of this software application are already being developed, based on the knowledge base from our previous project.

2.4 What is the regional relevance of your proposal?

A powerful collaboration between the V4 countries and Serbia can be seen as a precondition for regional stability but also as a necessary component of the stronger regional market, higher competitiveness, and enhanced capabilities. Knowledge acquisition and transfer are enabled through different business levels and activities. Educational organisations, SMEs, local authorities, and population, as well as the entire region to which the project activities refer, will have benefits. Exchange of knowledge and experience among the partner's institution will improve and empower the regional academic cooperation through the research network aimed to explore possibilities for using an implementation of digitalisation and I4.0 concept in entrepreneurship. Project participants will get in touch with SMEs from their regions and investigate their level of knowledge on the digitalization and Industry 4.0 concept, and the use of ICT tools in their business. The software solution, that will result from this project, will be offered to SMEs owners in regions of all project partner institutions. The decision makers will have chance to test the software and to send their feed backs to us, so the researchers from all partner institutions will be able to do the fine turning and finalization of the app. The application of this app will help SME owners to make more efficient and effective strategic decisions. Therefore, they will improve their business and achieve a better competitive position in the market. This will ensure the economic and technological progress of V4 and Serbian regions.

2.5. How would you describe your organization's experience in dealing with the proposed topic? Have you previously implemented similar projects?

The offered optimisation of existing business model and strategic decision making software application are direct result from our previous research activities on the Visegrad project: "How to prevent SMEs failure (Actions based on comparative analysis in Visegrad countries and Serbia)" (ID 21820267). This project be directed in creating the tangible output that will be offered to SMEs from V4 and Serbia. We have the necessary experience gained during the implementation of the international projects. Starting with 2007, EMD was included in the Hewlett Packard GET-IT (Graduate Entrepreneurship Training Through Information Technologies) program. During 2011, the GET IT program has grown to a higher level - the LIFE program for the application of ICT tools in entrepreneurship. Significant international cooperation experience was achieved by participating in an international network: "Resita Network - Entrepreneurship and Innovation", sponsored by the DAAD Foundation from Germany. In 2014, 2016, and 2018 three projects were financed by Visegrad Fund: ID 1141001; ID 11540386 and ID 21820267. During 2018, the project „P.O.W.E.R.- Providing Opportunities for Women Empowerment and Rights “, funded by the Australian Embassy, was conducted. During 2019, the projects "B.O.S.S.-Be Owner of Successful SME", financed by the EU PRO, and "SET-SAP (Students Entrepreneurship Training through SAP)", financed by the Ministry of Education and Technological Science of Serbia, were realized. In 2020, the project "Modular strategic decision support system "PLEXUS II", financed by Innovation fund RS.

3. TARGET GROUPS

Target group	Method of selection	No. of people
Teaching staff and researches	Project partner representatives whose lectures and research courses are connected with the application of advanced methods in the SMEs sector and/or in the frame of digitalization and Industry 4.0.	20 participants (4 members from each partners country)
Entrepreneurs and owners of SMEs	Entrepreneurs will be selected and invited by phone and e-mail contact from the Register of small and medium-sized enterprises in the region and the Chamber of commerce and industry. The criteria of selection will be their willingness to learn and implement advanced digital tools in their business processes.	100 entrepreneurs (20 members from each partner country)
Students	The beneficiaries who will have benefits of project activities are students of Bachelor, Master, and Ph.D. level from Technical Faculty in Bor, Serbia and from all V4 partner universities.	150

4. SPECIFIC RESULTS

Specific result	Contribution to the project's overall goal
Identifying the needs, possibilities, and barriers for digitalization and Industry 4.0 concepts implementation in the SMEs in V4 and Serbia.	Based on the analysis of the desk and field research results, partners will propose adapted models to ensure the potentials for the business process digitalization and transfer of the Industry 4.0 concepts to SMEs.
Creating specific conditions, concepts, and strategies for the future intelligent and flexible SMEs based on Industry 4.0.	Support for the transfer of digitalization and the Industry 4.0 into practice by developing the strategies for improving the competitive level of SMEs in V4 and Serbia.
Introducing a special field of Industry 4.0 applications within the existing accredited courses in the curriculum of the Technical Faculty in Bor, Department of Management.	Implementing innovative chapters in existing adequate courses in the curriculum at the BSc level, based on the application of modern Industry 4.0 technologies. Encouraging the greater application of ICT and contemporary concepts in the teaching process will speed up prosperity in Serbia and secure a new job creation.
Developing the integrated methodological approach that will be applied in practice.	Developing an original integrated methodological framework, based on our previous research, that will be used as a good basis for designing a business software solution for strategic decisions in business operations by applying the concepts of Industry 4.0. The results of this integrated methodological framework can serve to the researchers and scientists to write scientific articles so that the academic community can benefit from it.
Designing a business software solution for strategic decision-making in accordance with the available open source concepts of Industry 4.0.	Based on the database of the most important factors affecting the business operations and potential failure, a business software solution for strategic decision-making will be developed. The software application will be coded in Python programming environment, using the AI, cognitive computing and big data modelling of the cloud stored data. The final product will be user friendly and with potential to be further adapted to end user needs.

5. DISSEMINATION AND FOLLOW-UP

5.1 What activities will you carry out to share the results of the project outside your organization and partners?

All project activities will be focused on spreading the project vision, objectives, and results to all relevant stakeholders. The dissemination activities will be realized during the project and some of them will continue after the project ends. The information about the V4 and Serbian partnership, objectives, approaches, achievements of the project, main research findings related to Industry 4.0 will be disseminated via a range of digital channels. For the promotion of the Project partnership and activities, Visegrad project page will be created in the frame of the official web page of the TFB, EMD, and social media (Facebook, Instagram, Linked In) will be used. Also scientific networks (ResearchGate and Academia). During the project realization, these web pages will serve for publishing all relevant information about the project in a timely manner. Project members from Serbia will organize presentations of digitalisation and I4.0 benefit in SMEs, for students, and the public. Posters, brochures, and leaflets in a concise and visually appealing way will be, also, created and distributed during the project realization. All printed, promotional and events supporting materials will have a clearly highlighted Visegrad logo. Local media and portals will be invited to report to the public on all activities undertaken within the project, especially during the round table. The academic and scientific public will be familiar with the results of the studies through the research papers published in the Monograph and a special issue in the Serbian Journal of Management.

5.2 Do you plan any activities in the future which will build on the results of this project?

The main accent in future activities will be on promoting the developed business software solution for strategic decision-making among SME owners. This innovative software solution will be offered to SMEs owners and entrepreneurs from V4 and Serbia for free in order to collect data to assess the software's efficiency and user-friendliness. During testing of the final software solution by SME owners and entrepreneurs, the software developers will evaluate if the initial software solution is in accordance with the expressed needs of the users. If necessary, the software solution will be updated and re-tested. During the instalment and usage of the software solution ,by the SME owners and entrepreneurs, the participants of the project from V4 and Serbia will take the role of consultants. In this way, it will be possible to make the implementation of this software solution easier and enable its wider application in large number of SMEs. The developed Python code will also be offered to other developers, through adequate support pages and blogging. Finally, the results of the project in the form of an integrated methodological concept and software solution will be utilized for educational purposes that will allow students to better understand the concept of strategic management by application of advanced IT tools on the basis of I4.0 concept. Also, as the result of this project, From the results of this project, few scientific papers will be prepared and published in international scientific journals. This will be open science source available to all potential researches.

IV. DELIVERABLES

1 Initial online meeting (Event–Private), Bor, RS

01/06/2021–01/06/2021

The applicant institution from Serbia will arrange an online meeting with partner institutions from Visegrad countries using the Zoom meeting application. This meeting will be the inception step and the result will be a detailed implementation plan for project activities. The distribution of the project tasks and activities among the project consortium members will be carried out on the meeting. During the online meeting, ways for collecting additional data, required for the project activities will be also addressed. Based on which all partner institutions will conduct the desk and field research in order to determine the possibilities and barriers of SMEs processes digitalization and potential to use Industry 4.0 concepts in Visegrad countries and Serbia. Also, the activities for development of the methodological framework and further design of the software solution will be discussed at this meeting.

Direct target groups:

The representatives of academic institutions - 4 teachers from all partner countries (V4 countries and Serbia) will be attending the meeting.: 20

Selection/outreach: Participants from all partner institutions.

Dissemination/promotion

Report from the meeting will be presented on the project web pages with a list of attendances and their roles. The information will be available for all partners of the project. Local media and portals will be invited to report to the public, on all future activities that will be undertaken within the project, based on the agreement achieved during the initial meeting.

Role of the applicant and project partners

The applicant will prepare of introductory lecture and presentation for V4 partners (video conference) including project description, project management members, description of partner institutions, timetable of activities, plan of outputs, and financial budget. Representatives of V4 partners will be active participants during the meeting. All participates will generate the final research issue and topics, considering the peculiarities of the business environment and economy, and technological development level in their countries.

Budget category	Budget subcategory	Budget description	Sum
Copyright, licenses, fees		Zoom license fees for 5 institutions from all project countries per month. The Zoom license will be used for the purpose of conducting all online meetings and communications during the project, for each partner institution.	80.00
Total			80.00

2 Conducting the survey (Product)

07/06/2021–31/08/2021

Based on research, carried out about the factors influencing SME failure, and the possibility of their enhanced recovery in Visegrad countries (V4) and Serbia, the obtained results indicated that the most significant factors influencing SME failure are the inability and inexperience of the application in the field of ICT usage in their everyday business activities. This gives the opportunity to this project, to demonstrate the abilities of available open sources tools, that are based on contemporary concepts of digitalization, and the potentials for SMEs operations optimization, to the SMEs owners and employees. Hence, research stage will encompass the scientific literature review, creating an online questionnaire, defining the target groups, distributing the questionnaire, collecting the data, updating the database from the previous project research, and based on this the statistical data processing will be carried out. Targeting SMEs will be done through the register of small and medium-sized enterprises in the region and the Chamber of commerce and industry from V4 countries and Serbia. Entrepreneurs will be selected and interviewed about their experience and intention using digitalization and digital available open source technologies for their business operations.

Direct target groups:

Entrepreneurs from all partner countries (V4 and Serbia) : 500

Selection/outreach: Entrepreneurs from all partner countries (V4 and Serbia) will be involved in research about the current state of using the available ICT open sources and their familiarity with the concept of digitalization . Entrepreneurs will be selected and interviewed about their experience and intention towards using the digital technologies in optimization of their business operation.

Participants of academic institutions from all partner countries (V4 countries and Serbia): 20

Selection/outreach: All participants from the Visegrad countries and Serbia

Dissemination/promotion

The information about the research will be available on the web page of the project (including social media sites such as Facebook, Instagram, LinkedIn) in Serbian and English languages. These web pages and promotions will serve for publishing of the available information on this project activity, and will be opened to all interested SMEs to provide participation in this research.

Role of the applicant and project partners

The applicant from Serbia, together with the partners from all V4 institutions, will generate the research questions and topics about the level of ICT use and digitalization in SMEs. The main task of the applicant and the partners, will be defining the target groups in Serbia and V4 countries, creating an online questionnaire, conducting research, and statistical data processing for all countries. Participants from all V4 countries will conduct research among SMEs in their countries.

Budget category	Budget subcategory	Budget description	Sum
Expert fees/Fees authors or artists	for In-person services	Honoraria for an expert who will generate the research questions and conduct research in Serbia (40 working days/10 euro), and who will perform statistical data processing for all partner countries, after conducting the survey (10 working days/20euro).	600.00
Expert fees/Fees authors or artists	for In-person services	Honoraria for an expert who will conduct research in Hungary (20 working days/10 euro)	200.00
Expert fees/Fees authors or artists	for In-person services	Honoraria for an expert who will conduct research in Slovakia (20 working days/10 euro).	200.00
Expert fees/Fees authors or artists	for In-person services	Honoraria for an expert who will conduct research in the Czech Republic (20 working days/10 euro)	200.00
Expert fees/Fees authors or artists	for In-person services	Honoraria for an expert who will conduct research in Poland (20 working days/10 euro).	200.00
Total			1,400.00

3 Report on the results of the conducted research (Product)

01/09/2021–17/09/2021

The report will be based on the obtained results of the conducted research. The report will be prepared in English by the project leader according to the project-defined criteria. All summarized data from the research carried out, including statistical data analysis, will be provided in the form of a report. The key findings from this report, project manager will present at the meeting, organized during the visit to the Innovative entrepreneurial centre in Budapest in Hungary.

Direct target groups:

Applicant institution from Serbia: 1

Selection/outreach: The project manager from Serbia will prepare the report.

Dissemination/promotion

All results of this activity will be publicly available on the projects' Web platform and social media sites.

Role of the applicant and project partners

The applicant institution from Serbia will be directly included in creating this report. All partner institutions from Visegrad countries (Hungary, Slovakia, Czech Republic, and Poland) will be indirectly involved in this project activity. All partners will send collected data from their conducted research in the project's planned time, using the predefined report templates.

Budget category	Budget subcategory	Budget description	Sum
Office supplies/consumption material		The project manager from Serbia will prepare the report.	1.00
Total			1.00



4 Visit to the Innovative Entrepreneurial Center in Hungary (Event–Private), Budapest, HU

20/09/2021–23/09/2021

Participants from Serbia and all V4 partners will visit the Innovative entrepreneurial centre in Budapest in Hungary. This city is a vibrant start-up hub with a huge appeal for tech entrepreneurs. Also, in present days in this region, there are contemporary SMEs with new operational concepts, as well as Entrepreneurship development incubators, which can be used as the best available practice (BAT) examples for our project. During the visit to the Innovative entrepreneurial centre in Budapest, the representatives of the Innovative entrepreneurial centre in Budapest will introduce the visitors with business operating of Canter and exchange their experience and expertise. Additionally, a meeting with all project participants will be held, where the project manager will present the results of the research carried out in the previous project stage. After the visit and meeting with representatives from the Innovative entrepreneurial centre in Budapest in Hungary and representatives of the Obuda University in Hungary, and other Visegrad partners from Slovakia, Czech Republic, and Poland, participants from all institutions will generate newly acquired knowledge about potentials for SMEs operations digitalization, which will be implemented within the next project activities, e.g. during further development of the integrated methodological framework. Also, Serbian participants will transfer newly acquired knowledge from the Innovative entrepreneurial centre in Hungary to their students as the future managers of SMEs, as well as to existing entrepreneurs, which will provide an opportunity to introduce a special field of Industry 4.0 applications within the existing Entrepreneurship courses in the curriculum of the Engineering Management Department, at Technical faculty in Bor in Serbia. This will also be opportunity to other partners from academic institutions, from V4 countries, to do the same if they plan to conduct the curriculum development in their entrepreneurship courses.

Direct target groups:

Participants from all partner institutions (V4 countries and Serbia). : 20

Selection/outreach: Participants on the project

Dissemination/promotion

This activity will be described and publicly available on the project's Web platform and social media sites.

Role of the applicant and project partners

Participants from Serbia and all V4 partners will visit the Innovative entrepreneurial center and Obuda University in Budapest in Hungary. The participants of the project from Hungary will be the host and present their region which is a start-up hub with a special emphasis on tech entrepreneurs. After the visit and meeting with representatives from Obuda University in Budapest, participants from Serbia, and other V4 partner countries will exchange experience about tech entrepreneurship and successful SMEs from Hungary in their countries. Serbian participants will transfer of newly acquired knowledge from the Innovative entrepreneurial centre in Hungary to their students as future managers of SMEs, as well as existing entrepreneurs in Serbia.

Budget category	Budget subcategory	Budget description	Sum
Accommodation board	and Board and catering	Participants from Serbia and all Visegrad countries will spend 3 days at the Innovative Centre in Budapest, Hungary. Cost of boards and refreshments, for 25 participants (20 project participants + 5 guests from the Innovative entrepreneurial centre in Budapest).	650.00
Accommodation board	and Accommodation	Accommodation in Budapest for project participants from V4 and Serbia (2 nights/20 persons/40 euro per night)	1,600.00
Transportation and postage	Personal travel costs	Transportation of Polish partner (50 euro/ 4 persons) Poland - Hungary - Poland	200.00
Transportation and postage	Personal travel costs	Transportation of Slovakia partner (50 euro/ 4 persons) Slovakia - Hungary – Slovakia	200.00
Transportation and postage	Personal travel costs	Transportation of Czech Republic partner (50 euro/ 4 persons) Czech Republic - Hungary – Czech Republic	200.00
Transportation and postage	Personal travel costs	Transportation of Serbian partner (80 euro/ 4 persons) Serbia - Hungary – Serbia	320.00
Total			3,170.00

5 Development of the original integrated methodological approach (Product)

27/09/2021–08/10/2021

Based on the analysis of the research results obtained on the previous project stage, and also the results from our previous project, the applicant from Serbia will develop an original integrated methodological approach to ensure the potentials for the transfer of the Industry 4.0 concepts to SMEs, in the aspects of digitalization of their business activities, using the available open source tools. This integrated methodological approach will be based on upgrading the SWOT analysis with multi-criteria decision-making methods, to be available to decision makers in the SMEs. Namely, based on the already existing database, generated during our previous project, with collected factors influencing potential SMEs failure or success, as well as on the data collected on this project - revealing the potentials to optimize business operations by digitalization, the operational methodological framework will be developed. The original integrated methodological framework, developed at this stage, will be used as a good basis for design of the business software solution for strategic decision making in the business operations by applying the available open source concepts of Industry 4.0.

Direct target groups:

Researcher from Serbia: 1

Selection/outreach: Project manager, a person who is competent to develop such a methodological approach due to many years of experience in such things.

Dissemination/promotion

Innovative integrated methodological approach, developed in this project stage, will be available for all entrepreneurs and SMEs who will be involved in project research. Also, this project activity will be described and presented at the project web pages of the project's Web platform and social media sites.

Role of the applicant and project partners

The applicant institution will develop an innovative integrated methodological approach that will be used as a good basis for designing a business software solution for strategic decision making in the next project activity. This innovative integrated methodological approach will also be available to the students in the teaching courses, that will complement the existing curriculums with the Industry 4.0 concepts. Also, this methodological approach will be provided to partners from V4 countries, which can be used in their practical lectures.

Budget category	Budget subcategory	Budget description	Sum
Expert fees/Fees authors or artists	for In-person services	Fee for the project manager who will develop the methodological approach (10 working days/15 euro).	150.00
Expert fees/Fees authors or artists	for In-person services	Fee for the project coordinator from the partner institution TBU (Zlin, Czech Republic), who will organize the cooperation and work on methodological approach with the partners from Serbia (10 working days/15 euro).	150.00
Total			300.00



6 Designing the business software application for strategic decision-making (Product)

11/10/2021–27/11/2021

An additional result and practical application of this project will be reflected in the design and development of the business software application for strategic decision-making, based on available open source tools for digitalization and utilization of the available Industry 4.0 potentials. Based on the already available databased, stored in the Google cloud, during our previous project research, on the project that was dealing with influential factors that can lead to SMEs failure or success; with integration with new database collected during this project research, the software application will be developed. The application will be developed in the Python programming environment and will be designed as the graphical user interface (GUI), for entrepreneurs. Using this GUI, entrepreneurs would be able to assess the generated data from available database, in the user friendly manner, that will enable them to reach their own decision in everyday business process. The process of decision-making using this software will be conducted through the following phases: planning procedures through situational analysis of the internal and external business environment; formulation of potential strategic approach; implementation of strategies through available actions; performance evaluation. Namely, based on the assessment of the important factors from their everyday business activity, the SMEs will be compared with available data in our database. Based on results of this comparison, the entrepreneur will be offered with potential threats and opportunities for their business optimization. This will result in offering potential direction in the SMEs operations optimization. This innovative software solution will be customized to the needs of managers, SME owners and entrepreneurs, in the user friendly environment. The designed software solution will be a potential step forward in optimization of the SMEs practices, as a SaaS solution (software as a service) which will adapt to different end-user needs, based on the available open source tools. Taking into account that existing similar software solutions are too expensive, complicated for use, and available only for the big companies, this software solution will facilitate the support for the decision-making process in SMEs, and get them familiar with the modern concepts of Industry4.0 in their business environment. This software solution in a form of a designed draft application (beta version) will be offered to SMEs that want to embrace and utilize digital transformation in their business operation. After some period of use, during which support and consultancy will be offered from our side, fine tuning and finalization of the software application will be done. The final software application will be useful for decision-makers in SMEs if they decide to apply available open source digital tools, in their future operations, within the frame of Industry 4.0.

Direct target groups:

Direct target group will be project applicant institution from Serbia: 2

Selection/outreach: Project manager, a person who has experience in development of similar software solutions.

Indirect target groups will be the entrepreneurs from all partners countries (V4 and Serbia) : 100

Selection/outreach: Selection of SMEs that want to embrace and utilize the designed application in their business operation.

Indirect target groups will be representatives from partner institutions in Serbia, Czech Republic, Poland: 2

Selection/outreach: One person each from partner institutions from the Czech Republic, and Poland, which will provide support with their knowledge and suggestions to the main developer, during development of the software solution. Each person from these partner institutions will be suggested by the representatives of these project partner institution.


Dissemination/promotion

The news about the developed software solution will be available on project web pages on the project's Web platform and social media sites with a clearly highlighted Visegrad logo.

Role of the applicant and project partners

The applicant institution will design a business software solution for strategic decision-making in accordance with the concepts of Industry 4.0, and based on available open source tools and resources. This software solution, in the form of a designed draft application, will be presented to partners from V4 countries which will support the work on the development of this application with their knowledge and suggestions.

Budget category	Budget subcategory	Budget description	Sum
Expert fees/Fees authors or artists	for In-person services	Fees for the person who will be the designer and developer of business software solution for strategic decision-making (20 working days/ 25 euro)	500.00
Expert fees/Fees authors or artists	for In-person services	The person from Serbia who will assist the developer in strategic decision-making procedures and technical support (10 working days/20 euro).	200.00
Expert fees/Fees authors or artists	for In-person services	The person from the Czech Republic who will assist the developer in business process consultancy and in the technical support. It particularly means trying the software from a management perspective,	200.00

		communication with SMEs managers or employees about their opinion of applicability of the software in their everyday business activities, handing over obtained information to developers for further processing and software optimisation (10 working days/20 euro).		
Expert fees/Fees authors or artists	for In-person services	The person from Poland who will assist the developer in the business operations optimization procedures and in the technical support (10 working days/20 euro).		200.00
Total				1,100.00

7 Round table (Event–Private), Bor, RS

30/11/2021–30/11/2021

The round table with a topic "INDUSTRY 4.0 - IN YOUR BUSINESS NOW" will be organized in Serbia in the form of a combination of the face-to-face and the webinar meeting. The round table will be led by the project coordinator with the assistance of other project participants from Serbia. The entrepreneurs and students from Serbia will be physically present on the round table, while the participants from Visegrad countries will be engaged through the online attendances. This webinar will be organized in order to establish potential framework for future international cooperation between the representatives of academia and entrepreneurs from Serbia and Visegrad countries. The aim of this project activity is to share knowledge about entrepreneurial experience with digital technologies and digitalization. In this way, entrepreneurs will raise awareness about the benefits of the innovative concept of SME based on digitalization and available Industry 4.0 concepts, which can be applied in their business for obtaining the competitive advantages and long-term sustainability. Also, the software solution developed during the project, will be presented on the round table.

Direct target groups:

Entrepreneurs: 15

Selection/outreach: The entrepreneurs from Serbia will be invited to be physically present on the round table

Partners from Visegrad countries.: 16

Selection/outreach: The participants from Visegrad countries will be online participants.

Students: 5

Selection/outreach: The students from Technical faculty in Bor in Serbia will be physically present on the round table.

Participants from Serbia : 4

Selection/outreach: Partners from Serbia will generate the meeting reports and collect the research questions and topics discussed during the round table.

Dissemination/promotion

This project activity will be disseminated and promoted via the Visegrad webpage and social media. All information about the round table activities will be available on these web pages. Local media and portals will be invited to prepare media reports, to inform the public about all project activities, especially during the round table with clearly highlighted Visegrad logo.

Role of the applicant and project partners

The applicant from Serbia will generate the reports about the discussed questions and topics of the round table. The project manager will be the moderator on the round table, while other project members will be in charge of inviting and selecting entrepreneurs and perform technical support. Representatives of SMEs will present their experiences from practical business activities in the field of digitalization and Industry 4.0 concepts application in their business. Participants from V4, will give examples of good business practices from their countries, which will be useful for Serbian entrepreneurs to understand the importance and specificity of the application of digital advanced tools in their business.

Budget category	Budget subcategory	Budget description	Sum
Expert fees/Fees authors or artists	for In-person services	The project manager will be in the role of the moderator of the Round table.	150.00
Expert fees/Fees authors or artists	for In-person services	The person from Serbia who will be the technical support at the round table.	100.00
Expert fees/Fees authors or artists	for In-person services	The person from Serbia who will be technical support at the round table, involved in development of the promotional material and working material.	100.00
Rent and related technical services	Related technical services	Rent of premises and representation expenses (1-day conference room)	150.00
Office supplies/consumption material		Promo and working material such as posters, flyers, notebooks, pens.	100.00
Copyright, licenses, fees		Zoom license fees for 5 institutions, from all partner countries, per month. The Zoom license will be used for participation in the online meeting, for each partner institution that will participate in the meeting.	80.00
Total			680.00

8 Recommendation for the implementation of the Industry 4.0 concepts into curriculums at the Engineering Management Department, TFB in Serbia (Product)

10/01/2022–04/03/2022

Innovating and improving the curriculums of the Technical faculty in Bor, Engineering Management Department, with the concepts of the Industry 4.0, and their practical application generated during this project. Following the trends of higher education development and the need for the application of digitalization, open science and Industry 4.0, certain courses at the TFB EMD will be improved. The modified curriculum should enable students to acquire knowledge and competencies which will be focused on the application of modern tools based on the available Industry 4.0 tools, in the business process. In addition to students, partner institutions will benefit from this project, being able to potentially further develop their curriculums, by offering contemporary content of study programs, based on connection between business and IT concepts, within the Industry 4.0 practice in Visegrad countries.

Direct target groups:

Participants from applicant institution.: 4

Selection/outreach: Experts from Technical faculty in Bor, in Serbia who will conduct lecture and study courses connected with the potential application of advanced digital tools in the frame of Industry 4.0, in entrepreneurship and business.

The students of Bachelor, Master and PhD level from Technical Faculty in Bor, Serbia.: 150

Selection/outreach: All students who study in the Engineering Management Department

Dissemination/promotion

The recommendations for the potential implementation of Industry 4.0 concepts into curriculums of the Engineering Management Department, Technical faculty in Bor in Serbia, will be presented in the form of a report which will be available on the webpage of the Visegrad project.

Role of the applicant and project partners

The applicant institution from Serbia will collect and summarize all conclusions derived from the round table and create guidelines with recommendations for innovation of curriculums, and its' adaptation to the new technological trends.

Budget category	Budget subcategory	Budget description	Sum
Office supplies/consumption material		The applicant institution from Serbia will collect and summarize all conclusions derived from the round table.	1.00
Total			1.00

9 Preparing and publishing the Monograph and the special issue of the Serbian Journal of Management (Product)

01/12/2021–07/03/2022

The obtained results of the conducted research on Industry 4.0 in entrepreneurship will be presented in the form of the Monograph and one special issue of the Serbian Journal of Management (SJM)(<http://www.sjm06.com/>). The monograph will be consisted of a theoretical approach to the concept of Industry 4.0 and its implementation in entrepreneurship. Also, developed innovative integrated methodological concept, will be presented. The results obtained by the project research will be summarized in the form of scientific articles and published in the special issue in the SJM, dedicated to the Industry 4.0 concepts and applications. The authors of the articles will be participants from all Visegrad countries (Czech Republic, Slovak, Polish, and Hungary) and Serbia, and the wider academic community.

Direct target groups:

Participants from Serbia, Hungary, and Slovakia: 3

Selection/outreach: One person each from partner institutions from Serbia, Hungary, and Slovakia who will be editing, preparing and publishing the Monograph and the Serbian Journal of Management. Each person from these partner institutions will be chosen by the representatives of the partner institutions who participate in this project.

Researchers: 30

Selection/outreach: Researchers who will publish scientific papers in the Monograph and the Serbian Journal of Management.

Dissemination/promotion

The Monograph and the Serbian Journal of Management will be available on the web page of the project in English language, as well as on the web site of the Serbian Journal of Management. Printed form will be distributed to all participants on projects. All scientific papers published as the result of the project will have a note that the project is supported by Visegrad fund.

Role of the applicant and project partners

The project members will initiate the publication of joint research papers about the integration of Industry 4.0 with SMEs in the V4 countries and Serbia to keep scientific interest over the topic on a high level. Participants will write scientific articles that will be published in these publications.

Budget category	Budget subcategory	Budget description	Sum
Expert fees/Fees authors or artists	for In-person services	The person who will be in charge for the graphic design and main technical editor of the Monograph and the Serbian Journal of Management (40 working days/ 15 euro).	600.00
Expert fees/Fees authors or artists	for In-person services	The person who will perform the technical review in the final round of the text editing before the Monograph and the Serbian Journal of Management final publication. For this purpose, a project member from Hungary will be engaged (20 working days/ 15 euro).	300.00
Expert fees/Fees authors or artists	for In-person services	The person who will translate the text and grammar editor for the Monograph and the Serbian Journal of Management (40 working days/ 15 euro).	600.00
Expert fees/Fees authors or artists	for In-person services	The person who will perform the grammar review in the final step of the text editing before Monograph and the Serbian Journal of Management publication. For this purpose, a project member from Slovakia will be engaged (20 working days/ 15 euro).	300.00
Printing/publishing costs	Printing/publishing costs	Printing the Monograph and the special issue of the Serbian Journal of Management.	500.00
Total			2,300.00

10 Final Report (Product)

07/03/2022–31/03/2022

A Final Report will be prepared by the project manager in the cooperation of other project members from Serbia. The final report will consist of the summary results of the whole project, the final budget, and different aspects of the implementation, and the role of the partners in the cooperation.

Direct target groups:

Participants from applicant institution of the project.: 4

Selection/outreach: Participants from Serbia who are the applicant of the project will prepare the report.

Dissemination/promotion

The final report will be disseminated on the available project websites and distributed to the representatives of the Visegrad Fund. Local media and portals will be invited to report to the public after the realization of all project activities.

Role of the applicant and project partners

The final report will be prepared by the applicant of the project.

Budget category	Budget subcategory	Budget description	Sum
Office supplies/consumption material		The project manager will create a final report.	1.00
Total			1.00

List of experts/artists:

Experts/artist		
Name, institution	Role and tasks	Justification of selection
Sanela Arsic, University of Belgrade, Technical faculty in Bor, Serbia	Graphic designer and technical editor i	Ph.D. Assistant Professor
Andrea Tick, Obuda University in Budapest, Keleti Faculty of Business and Management, Hungary	Technical reviewer	Ph.D. Associate Professor
Danijela Voza, University of Belgrade, Technical faculty in Bor, Serbia	Translator of the text and grammar editor	Ph.D. Assistant Professor
Alena Hrušková , The University of St. Cyril and Methodius, Slovakia	Grammar reviewer	Ph.D.
Ivan Mihajlovic, University of Belgrade, Technical faculty in Bor, Serbia	Project manager and developer	Ph.D. Full Professor
Petr Novák, Ph.D, Tomas Bata University in Zlin, The Czech Republic	Project coordinator from partner institution	Ph.D. ass. Prof.
Ivan Mihajlovic, University of Belgrade, Technical faculty in Bor, Serbia	Project manager in the role of the moderator	Ph.D. Full Professor
Danijela Voza, University of Belgrade, Technical faculty in Bor, Serbia	Technical support	Ph.D. Assistant Professor
Sanela Arsic, University of Belgrade, Technical faculty in Bor, Serbia	Technical support	Ph.D. Assistant Professor
Ivan Mihajlovic, University of Belgrade, Technical faculty in Bor, Serbia	Project manager and developer	Ph.D. Full professor
Isidora Milosevic, University of Belgrade, Technical faculty in Bor, Serbia	Technical support	Ph.D. Associate Professor
Michael A. Kwarteng, Tomas Bata University in Zlin, The Czech Republic	Technical support	Ing., Ph.D
Aleksandra Szewieczek , University of Economics in Katowice, Poland	Technical support	Ph.D. Assistant Professor
Isidora Milosevic, University of Belgrade, Technical faculty in Bor, Serbia	Researcher	Ph.D. Associate Professor
Andrea Tick, Obuda University, Keleti Faculty of Business and Management, Hungary	Researcher	Ph.D. Associate Professor
Alena Hrušková , The University of St. Cyril and Methodius, Slovakia	Researcher	Ph.D.

Experts/artist		
Name, institution	Role and tasks	Justification of selection
Michal Kolář, Tomas Bata University in Zlin, The Czech Republic	Researcher	Ing., Ph.D.
Aleksandra Szewieczek , University of Economics in Katowice, Poland	Researcher	Ph.D. Assistant Professor

V. BUDGET

Own contributions:

	Sum in (€)
Total	0.00

Total expected: **€9,933.00**

Expected grant budget:

Accommodation and board	2,250.00
Copyright, licenses, fees	160.00
Expert fees/Fees for authors or artists	4,950.00
Office supplies/consumption material	103.00
Printing/publishing costs	500.00
Rent and related technical services	150.00
Transportation and postage	920.00
Project overhead costs	900.00
Total	9,933.00

...

Note: This is a print preview of application #22110036 for reference purposes only.

To apply please submit the electronic version on-line.

PLEASE DO NOT PRINT OR SEND ANY HARD-COPY VERSIONS OR PRINTOUTS!