Social Mining & Big Data Analytics

SoBigData

RESEARCH INFRASTRUCTURE ++

Deliverable D5.2

Innovation Report and Planning for the next period 1

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EXECUTIVE SUMMARY

This deliverable provides the overview of activities that have been undertaken by SoBigData partners towards the spreading of entrepreneurial skills and mind-set among students, researchers and professors.

All activities aimed at training future entrepreneurs were divided into three groups. The first one is devoted to specific programs which have been tailored to participants with background in management or in computer or data science. The second group is devoted to multidisciplinary courses and various events organized by the partner in order to spread entrepreneurial mind-set. The third group contains information about support activities provided by partners' incubators and acceleration programs for projects and start-ups created by students and researchers.

Moreover, it provides a brief description of the Challenge Us program.

DISCLAIMER

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SoBigData++ strives to deliver a distributed, Pan-European, multi-disciplinary research infrastructure for big social data analytics, coupled with the consolidation of a cross-disciplinary European research community, aimed at using social mining and big data to understand the complexity of our contemporary, globally-interconnected society. SoBigData++ is set to advance on such ambitious tasks thanks to SoBigData, the predecessor project that started this construction in 2015. Becoming an advanced community, SoBigData++ will strengthen its tools and services to empower researchers and innovators through a platform for the design and execution of large-scale social mining experiments.

This document contains information on SoBigData++ core activities, findings and outcomes and it may also contain contributions from distinguished experts who contribute as SoBigData++ Board members. Any reference to content in this document should clearly indicate the authors, source, organisation and publication date.

The content of this publication is the sole responsibility of the SoBigData++ Consortium and its experts, and it cannot be considered to reflect the views of the European Commission. The authors of this document have taken any available measure in order for its content to be accurate, consistent and lawful. However, neither the project consortium as a whole nor the individual partners that implicitly or explicitly participated the creation and publication of this document hold any sort of responsibility that might occur as a result of using its content.

GLOSSARY

EU	European Union
EC	European Commission
H2020	Horizon 2020 EU Framework Programme for Research and Innovation

TABLE OF CONTENTS

1   Relevance to SoBigData++

SoBigData is a research infrastructure (RI) for ethic-sensitive scientific discoveries and advanced applications of social data mining to the various dimensions of social life, as recorded by "big data". Although SoBigData is primarily aimed at serving the needs of researchers, the openly available datasets and open-source methods and services provided by the new research infrastructure will also impact industrial and other stakeholders. To widen the project impact beyond the scientific communities, various training activities were organized for students, researchers and professors of the SoBigData partners. This set of activities helps to reach other researchers and students of partner organisations and universities and widen the impact of Task 5.3 "Entrepreneurial skills for big data entrepreneurs" beyond the SoBigData project.

The Challenge Us program, in addiction, provide free consultancy services to firms interested in exploiting the potential of their own data, thus helping the interaction of the consortium with the industrial world. The implementation of the Challenge Us - 2021 program was re-scheduled and the results from the first call for applications are expected to be announced by mid-July 2021. For that reason, the current document does not include the Challenge Us statistics and results, as initially foreseen in the original description.

1.1   Purpose of this document

The purpose of this document is to demonstrate the contribution of each SoBigData partner in the development of entrepreneurial skills and mind-set among students and researchers. Moreover, this report provides information on partners' support activities that help participants to develop entrepreneurial ideas into start-ups. In addiction it highlights how the Challenge Us program has been organized.

1.2   Relevance to project objectives

Task 5.3 contributes to the creation of an inter-disciplinary community of social data scientists by leveraging entrepreneurial training courses and materials, offered by partners to spur the entrepreneurial mindset among students and researchers. The Challenge Us program serves as a hotspot which facilitate the interaction with external industrial world.

1.3   Relation to other work packages

Task 5.3 interacts with three tasks within the WP4 NA3 - Training, and namely tasks *T4.1 - Online Training Modules*, *T4.2 - Summer schools*, *T4.3 - Datathons*.

1.4   Structure of the document

This report is divided into four different sections:

- Section 1 consists of an introduction and highlights the main purpose of this document and its relevance to the SoBigData project.
- Section 2 is fully devoted to training activities, courses and events organised in order to spread entrepreneurial skills and facilitate the creation and development of start-ups.
- Section 3 describes the Challenge Us - 2021 Challenge Us program.
- Section 4 provides final thoughts and conclusion.

2   Entrepreneurial skills for big data entrepreneurs

2.1   Entrepreneurial and data science related courses

In this section, programs related to entrepreneurship for master, bachelor and PhD students as well as entrepreneurial courses available for students with background in management or computer and data science will be described. Moreover, data science related courses for students with background in management were included in this section because those courses help students with entrepreneurial mind-set better understand the phenomenon of Big Data.

2.1.1   King's College London

Business and Management and International Management programmes for bachelor students offer a range of entrepreneurial topics such as International Business, Technology & Innovation, Psychology of Entrepreneurship & Innovation, Entrepreneurial Family Firms, Crafting Entrepreneurial Opportunities, Business and Entrepreneurship in Contemporary China, Introduction to Entrepreneurship & Venture Capital. Those programs also include basic data science courses such as Quantitative Data Analytics and Statistics for Economists. The Digital Culture program for bachelor and master students provides courses such as Management for the Digital Domain and Digital Entrepreneurship. Computer Science Master program provides a variety of data science-related courses. Moreover, this master program offers some basic management courses such as Introduction to Management and Principles of Marketing.

2.1.2   TU Delft

Master in Management of Technology offers entrepreneurial courses such as Technology, Strategy and Entrepreneurship and Leadership and Technology Management. Minors Management of Technology offers courses such as Introduction to Technology-Based Entrepreneurship, Finance for Entrepreneurs.

2.1.3   Rovira i Vigili University

University offers various master programmes related to entrepreneurship such as Master in Entrepreneurship, Master in Business Management, Master in Business Administration. Entrepreneurial courses that are part of those programs are Entrepreneurialism and Business Plans, Management Skills, Business Cases and Experiences, Financial Management of an Entrepreneurial Project, Entrepreneurial Competencies, Strategy and Marketing for the Entrepreneur, Strategic Diagnosis and Entrepreneurial Management. Moreover, the course Tools for Entrepreneurship is offered in every bachelor of the Engineering Faculty. Data science-related courses are offered by several master programs such as Computational Engineering and Mathematics, Computer Security Engineering and Artificial Intelligence and Master in Artificial Intelligence.

2.1.4 University of Tartu

University offers various master programmes related to entrepreneurship such as The Business Administration, The Innovation and Technology Management. Entrepreneurial courses that are part of those programs are Business Communication, Principles of Entrepreneurship, Project Management, Business Environment in the Baltic Sea Region, Basics of Innovation, Strategic Management, Business Analysis, Business Process Management, Software Product Management, Innovation Management, Innovative Organisation and intrapreneurship, Business Growth Strategies. Moreover, entrepreneurial courses like

Digital Product Management Industry Project, Introduction to Software Entrepreneurship, Software Entrepreneurship Project, Principles of Entrepreneurship are offered for students in IT, data science and computer science. Data science related courses are offered by programs such as Computer Science, Conversion Master in IT, Data Science, Software Engineering. There are several data science related courses available for management students: Business Data Analytics, Introduction to Programming, Machine Learning.

2.1.5 ETH Zurich

University offers various programmes related to entrepreneurship such as Entrepreneurial Leadership in Technology Ventures, Management, Technology and Economics Master. Entrepreneurial courses that are part of those programs are Entrepreneurial Strategies & Lean Innovation, Entrepreneurial Leadership, Entrepreneurial Marketing & Sales, Business Development of Technology Ventures, Advanced Studies in Entrepreneurship, Innovation in Digital Space, Open- and User Innovation, Alliance Advantage - Exploring the Value Creation Potential of Collaborations, Corporate Strategy, Digital Health Project, Mastering Digital Business Models, Leading the Technology-Driven Enterprise. Moreover, entrepreneurial courses like Technology and Innovation Management, Discovering Management are offered by programs such as Electrical Engineering and Information Technology, Computer Science. There are several data science related courses available for management students: Bayesian Data Science, Hacking for Social Sciences - An Applied Guide to Programming with Data.

2.1.6 University of Sheffield

University offers various courses related to entrepreneurship as part of the Business Management program. Among those courses, students can find courses about International Business, Creativity and Innovation, New Venture Creation, Enterprise and Entrepreneurship, Business Management in Context, Business Strategy, Business Intelligence, Business Statistics. Moreover, plenty of entrepreneurial courses are offered for students with engineering and computer science background. Among them courses like Software Hut, Managing Engineering Projects and Teams, Genesys, AI Group Project. Those courses give students an opportunity to experience the processes of engineering a real software system for a real client in a competitive environment.

2.1.7 Sapienza School of Advanced Studies

University offers various programmes related to entrepreneurship such as Business Administration, Business Management, Management of Technologies, Innovation and Sustainability. Entrepreneurial courses that are part of those programs are Business Strategies, Business Plan, Strategic Analysis for Business Decisions, Business Crisis and Recovery, Strategic and Innovation Management, Entrepreneurship and New Ventures Finance, Business Negotiation and Contracts, Strategic Management, Business Intelligence, Start-up and Business Creation, The Technological Innovation of products and processes, Planning and Strategic Management, Project Management, Technologies for 4.0 Industries. Moreover, there are entrepreneurial courses that are offered for students with data science and computer science background. Among them courses like Digital Entrepreneurship, Data Driven Economics, Business and Computer Science. There are also some data science related courses provided for students with background in management, such as Statistics for Business Decisions, Statistics for Management, Quantitative portfolio selection for management, Business Data Science, Data Analysis and Data Mining.

2.1.8 University of Amsterdam

University offers various programmes related to entrepreneurship, such as Business Administration, Entrepreneurship, Business Administration with specialisation in Big Data & Business Analytics. Entrepreneurial courses that are part of those programs are Strategy and Organisation, Business Operations and Processes, Innovation Management, Company Assignment, International Business, Business Law and Ethics, Digital Innovation and Entrepreneurship, Management and Leadership in the Digital Age, Introduction to Social Entrepreneurship, Digital Business Models, Entrepreneurship and Business in China, Venture Challenge, Entrepreneurship in Science & Technology, Start-up Psychology, Big Data Strategy & Implementation, Digital Transformations, Law & Ethics for Big Data, The Entrepreneurial Venture, The Startup Project, Creative Entrepreneurship. Moreover, there are entrepreneurial courses that are offered for students with data science and computer science background. Among them courses like Principles of Management, Business Law & Ethics, Entrepreneurship Hackathon, Data-Driven Business Innovation and Entrepreneurship, Data Systems Project, Dynamics in Business and IT, Data-Driven Business Innovation and Entrepreneurship. There are also some data science related courses provided for students with background in management, such as Deep Learning, System Optimisation, Quantitative Marketing, Language Technology, Machine Learning, Big Data Infrastructures & Technology, Coding Lab, Data Stewardship, Statistics, Introduction to Python, Business Analytics, Information and Data Management, Project Qualitative Research Methods and Analysis, Quantitative Data Analysis.

2.1.9 Central European University

Central European University offers a master program in Technology management and innovation. This program covers different topics related to entrepreneurship, such as Introduction to Entrepreneurship, Technology Based Entrepreneurship, Best Practices in IT Service Management, Boardroom Global Challenge, Digital Transformations, Innovation Imperatives, Challenges and opportunities of connected business models, Introduction to Agile Project Management.

There are also some data science related courses provided for students with background in management, such as Data Management and Analysis with Python, Web Scraping with R, Data Management and Analysis with R, Opportunities and challenges of IoT, Quantitative Decision Making.

2.1.10 Aalto University

Department of Management Studies offers various entrepreneurial courses, such as Designing Business Models for Shared Value (in Industry 4.0), Global Brand Management - Real-life case competition, Doing Business in Emerging Markets, International Business in the Era of Disruptions, Business Negotiations, Entrepreneurship and Innovation Management, Energy Business and Innovation, Entrepreneurship and Innovation Management, Sustainable Entrepreneurship, Venture Formation, Entrepreneurship and Society, Business Model Design, Business Communication Skills, Design and Creativity in Business, Data-Driven Business, How to change the world: Innovating toward sustainability, Introduction to business, Corporate Entrepreneurship and Innovation, Doing Business in Russia, Global Online Collaboration and Team Management, Business Decisions, Strategic Information Technology Management, Business Analytics, Digital Business. Moreover, there are entrepreneurial courses that are offered for students with data science and computer science background. Among them courses like Blockchain Business Applications, ICT Enabled Service Business and Innovation, Global Business in the Digital Age, Introduction to Digital Business and Venturing, Digital Business Management, Data Science project.

There are also some data science related courses provided for students with background in management, such as Data-Driven Decision Making, MySQL for Data Analytics, Data Science for Business, Quantitative Methods for Management Studies.

2.1.11 KTH Royal Institute of Technology

Entrepreneurship and Innovation Management master program offers various entrepreneurial courses, such as Entrepreneurship, Management of Technology Innovation and Creativity, Project in Entrepreneurship and Innovation Management. Moreover, there are entrepreneurial courses that are offered for students with ICT and Engineering background. Among them courses like Entrepreneurship for Engineers, ICT Innovation Study Project, e-Business Strategies, Technology-based Entrepreneurship, Business Development Lab of Entrepreneurship Engineers, Industrial Development and Entrepreneurship, Entrepreneurship in Technology and Health, Entrepreneurship, Entrepreneurship in Developing Countries, Business Economics and Entrepreneurship, Entrepreneurship and Management, Business Calculation and Entrepreneurship, Social Entrepreneurship.

2.1.12 Scuola Superiore Sant' Anna

The Scuola Superiore Sant'Anna *(Sant'Anna School of Advanced Studies)* offers a few programs related to entrepreneurship, such as Management and Innovation Design, Innovation Management, Management Innovation, Sustainability and Healthcare. There are various entrepreneurial courses, like High-Tech Entrepreneurship, Managing Innovation Lab, Open Innovation Modelling and R&D, Start-Up Lab, Strategy

and Innovation Management, Introduction to International Business, Design Thinking & Entrepreneurship. For Data science PhD students there is a special course about Data Driven Innovations.

2.1.13 University of Pisa

The University of Pisa offers various entrepreneurial courses, such as Economics and commercial business management, strategies and governance in the family business, small and medium enterprise organization, Strategy and entrepreneurship, Business Organization, Business Management. Moreover, there are entrepreneurial courses that are offered for students with a data science background. Among them courses like Innovation Management, Business and project management, Management of Innovations, Information Technology for Business Management, Design of smart products and services and data-driven strategic analysis, Business organization, Business management. There are also some data science related courses provided for students with background in management, such as Optimization for decision support systems, Data analysis for energy management and sustainability, Data Mining and Intelligent Systems, Big Data and information systems, Elements of Data Processing for the economy and for business, Business statistics, Business information system and data management, statistics.

2.1.14 Scuola IMT Alti Studi Lucca

Scuola IMT Alti Studi Lucca offers various entrepreneurial courses for students with a background in Computer science. Those courses cover topics, such as Behavioural Strategy and Business Behaviour, Project Management, Management of Complex Systems: Approaches to Problem Solving, Firms, Business Analytics and Managerial Behavior, Decision-Making in Economics and Management, Critical Thinking, Business Model for Emerging Markets, Industrial Organization.

2.2 Multidisciplinary courses and other events

In this section, we described other entrepreneurial training activities and events that have been undertaken by SoBigData partners in order to spread the entrepreneurial skills, spirit and mind-set for big data entrepreneurs among students and researchers with different background of the Universities and Organizations that constitute the SoBigData partners. Those activities engage students in a multidisciplinary collaboration to tackle real world problems and develop their entrepreneurial ideas.

2.2.1 King's College London

King's Experience Enterprise Award
The King's Experience Enterprise Award helps to develop the 7 Skills of an Entrepreneurial Mindset. The Enterprise Award is made up of a variety of learning experiences and opportunities. The award is open to all undergraduate and postgraduate students and staff from any faculty.
https://www.kcl.ac.uk/entrepreneurship/learn-entrepreneurial-skills/kings-enterprise-award

Entrepreneurship: From Business Idea to Action

On the course Entrepreneurship: From Business Idea to Action, participants will enhance understanding of business and improve skills in entrepreneurship. Participants will learn how to approach key stages of entrepreneurship, from coming up with a business idea to writing a business plan. Using case studies of local businesses and entrepreneurship in the MENA region, participants will learn how to apply business concepts and ideas to different contexts. Participants will also practice pitching their business ideas and learn about developing their enterprise within an entrepreneurship ecosystem.

https://www.kcl.ac.uk/short-courses/entrepreneurship-idea-action-future-learn

Introduction to Business Management

On this course, participants will develop a range of business management skills and learn how to use and apply useful business concepts, tools and terminology whilst exploring four key aspects of business management: managing money, managing people, managing information, and self-management.

Business & Management online summer school

This course explores a wide range of essential business concepts and principles, encompassing strategy, marketing, entrepreneurship, innovation, organisation and more, with topics chosen in order to best prepare participants for a successful international career in business or management. Essential theories and concepts will be illustrated with case studies in order to demonstrate how to put learning into practice and successfully deal with modern business dilemmas.

https://www.kcl.ac.uk/short-courses/business-management-summer-online

2.2.2 TU Delft

Technology Entrepreneurship and Innovation

This course offers theoretical fundamentals of entrepreneurship and technology innovation. Students create a case study of an existing start-up analysing its entrepreneurial journey and how it fits the broad technology development process and how it navigates the relevant entrepreneurial ecosystem.

https://www.tudelft.nl/tbm/over-de-faculteit/afdelingen/stafafdelingen/delft-centre-for-entrepreneurship/education/master-courses/technology-entrepreneurship-and-innovation

Technology Entrepreneurship and Health

Students will learn the theoretical fundamentals of entrepreneurship and technology within the context of health and life science. Using a case study of an existing health start-up, students will analyse its entrepreneurial journey, how it fits the broad technology development process and how it navigates the health system to find a way to deliver its services to healthcare institutes in a sustainable manner.

https://www.tudelft.nl/tbm/over-de-faculteit/afdelingen/stafafdelingen/delft-centre-for-entrepreneurship/education/master-courses/technology-entrepreneurship-and-health

Technology Entrepreneurship and Sustainability

This course has a focus on innovation and entrepreneurship related to the circular economy and new sustainable energy technologies. Using methods and theories to analyse entrepreneurial opportunities, students will gain a deep understanding of circular business models.

https://www.tudelft.nl/tbm/over-de-faculteit/afdelingen/stafafdelingen/delft-centre-for-entrepreneurship/education/master-courses/technology-entrepreneurship-and-sustainability

Idea to Start Up: Health & Life Sciences, IT & AI, Energy & Sustainability, Deep Tech

In this course participants do not study entrepreneurship, they become entrepreneurs. Working in a team, participants identify a business opportunity, validate it, and build a viable business model – a roadmap from an idea to a sustainable innovation-driven company.

https://www.tudelft.nl/en/tpm/about-the-faculty/departments/staff-departments/delft-centre-for-entrepreneurship/education/master-courses/idea-to-startup-health-life-sciences

https://www.tudelft.nl/en/tpm/about-the-faculty/departments/staff-departments/delft-centre-for-entrepreneurship/education/master-courses/idea-to-startup-it-ai

https://www.tudelft.nl/en/tpm/about-the-faculty/departments/staff-departments/delft-centre-for-entrepreneurship/education/master-courses/idea-to-startup-energy-sustainability

https://www.tudelft.nl/en/tpm/about-the-faculty/departments/staff-departments/delft-centre-for-entrepreneurship/education/master-courses/idea-to-startup-deep-technology

Turning Technology into Business

Turning Technology into Business aims to equip participants with a strong conceptual foundation to actively understand the dynamic process of technology-based entrepreneurship. Participants learn how business strategies are best formulated and how (through entrepreneurship) technology can create value. A patent project is the focal point of the curriculum. Each group of 4-5 students will be assigned an original patent, and is expected to evaluate the commercial potential of this technology.

https://www.tudelft.nl/en/tpm/about-the-faculty/departments/staff-departments/delft-centre-for-entrepreneurship/education/master-courses/turning-technology-into-business

Ready to Start-up

Ready to start-up is a highly interactive course in which participants will gain all knowledge and receive the tools needed to build their business successfully and – most importantly – apply the concepts to their own business. Experienced professional business experts, entrepreneurs and coaches guide participants through e.g., customer validation, marketing, finance and team composition. This course focuses predominantly on Business Strategy: gaining market traction, prototyping, growing the team, devising a financial plan and fundraising strategy, protecting IP, and foundational activities (setting up a company, sharing ownership, etc.) The course has the prerequisite that teams should be formed and have business ideas that are analysed and validated. It is meant for students who plan to start a company.

https://www.tudelft.nl/en/tpm/about-the-faculty/departments/staff-departments/delft-centre-for-entrepreneurship/education/master-courses/start-dce-advanced-course

2.2.3 University of Tartu

STARTER
STARTER provides knowledge and skills for student start-up projects and helps teams to shape their ideas into tested business models. Semester-long STARTER programme consists of workshops that guide teams from ideation to business model. Teams receive individual mentoring from start-up founders or entrepreneurs and regular performance evaluations from instructors.
https://www.startuplab.ut.ee/projects/starter

Smart-Up Lab
Smart-Up Lab is supporting learners to address real healthcare issues that can encourage an innovative mindset. Smart-Up Lab uses this approach to spread a culture of innovation and entrepreneurship.
https://startuplab.ut.ee/projects/smart-up-lab

Big Data Management
Students will learn about Big Data Phenomena, Big Data Storage Systems, Batch Processing Systems for Big Data, Case studies and projects in big data processing.
https://ois2.ut.ee/#/courses/LTAT.02.003/details

Databases
Students will learn about basic concepts of relational databases, the structure and syntax of SQL, Data description and modification languages.
https://ois2.ut.ee/#/courses/LTAT.03.004/details

2.2.4 ETH Zurich

Design Thinking: Human-Centred Solutions to Real World Challenges
The goal of this course is to engage students in a multidisciplinary collaboration to tackle real world problems. Following a design thinking approach, students will work in teams to solve a set of design challenges that are organized as a one-week, a three-week, and a final six-week project in collaboration with an external project partner.
https://www.sparklabs.ch/ethz

Enabling Entrepreneurship: From Science to Startup
This course is for students who have developed a technology and are keen to evaluate the steps in starting a startup. This is also relevant for students who would like to start a startup but do not have a technology, but are clear on a specific market and the impact they would like to create. The students will have exposure to investors and entrepreneurs through the course, to gain insight to commercialise their idea.
http://www.vvz.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?semkez=2020W&ansicht=ALLE&lerneinheitId=140459&lang=en

Technology Entrepreneurship

This course aims to equip future leaders with strategies, frameworks and tools for understanding, analyzing and building technology ventures. In so doing, this course lays particular emphasis on providing an overview of various technology-related dimensions of the entrepreneurial journey, including founding, financing and growing a venture.

http://www.vvz.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?semkez=2020W&ansicht=ALLE&lerneinheitId=140588&lang=en

2.2.5 The University of Sheffield

Enterprise and Entrepreneurship

Participants will learn how to evaluate ideas and determine their commercial potential. The objective of the course is to help participants understand how companies are formed and operated.

https://www.sheffield.ac.uk/acse/news/2020-enterprise-and-entrepreneurship-course

CLEAR IDEAS

CLEAR IDEAS is an innovation development model. The course is designed to help participants develop the skills to analyse challenges, generate and assess creative solutions and plan for the implementation of those solutions. A key part of the course is also its collaborative group working.

http://clearideas.sheffield.ac.uk/

Introduction to Predictive Analytics for Business

This course has been designed for anyone who wants to improve the quality of decision making in their business function through the power of predictive analytics. Most organisations have multiple streams of internal and external data yet they do very little to harvest the value from them. After this course participants will be able to take advantage of your business data and transform it to profitable insights.

https://www.sheffield.ac.uk/management/executive-education/short-courses

Engineering - You're Hired!

Working in multi-disciplinary groups, students will work in interdisciplinary teams on a real world problem over an intensive week-long project. The projects are based on problems provided by industrial partners, and students will come up with ideas to solve them and proposals for a project to develop these ideas further.

https://www.sheffield.ac.uk/engineering/study/youre-hired

Global Engineering Challenge Week

The annual Global Engineering Challenge is a cross-faculty event aimed at developing our students' ability to take on real-life engineering projects. Working in multi-disciplinary, all students choose a project with scenarios set in a developing country and design creative solutions for real problems.

https://www.sheffield.ac.uk/engineering/study/global-engineering-challenge

2.2.6 University of Amsterdam

Webinar: Entrepreneurship in science
In this workshop, participants receive an introduction to the world of entrepreneurship with practical examples. They will learn how to start their company with scientific ideas and results.
https://grant-support.uva.nl/content/events/workshops/2021/05/webinar-entrepreneurship-in-science.html

Sefa Entrepreneurship Day
Sefa Entrepreneurship Day is an event for ambitious students who are eager to become an entrepreneur or simply are interested in the entrepreneurial and business world. The main goal of Sefa Entrepreneurship Day is to inspire, motivate, and inform these students on their future possibilities in the entrepreneurial world and beyond, as well as support existing start-ups and scale-ups.
https://sefa.nl/product/events/sefa-entrepreneurship-day/

INSPIRE: Entrepreneurship course
This course offers a unique opportunity to learn the basics of venture creation and pick your brains on potential business idea in the fields of science & technology.
https://grant-support.uva.nl/content/events/events/2020/09/inspire-entrepreneurship-course.html

2.2.7 Central European University

Finance for Start-ups
This course aims to help entrepreneurs and non-business students raise their awareness of finance and to use financial information to appraise business performance and improve business decision making.
https://courses.ceu.edu/sites/courses.ceu.hu/files/attachment/course/5114/financeforstartupschanfall2020-21.pdf

2.2.8 Aalto University

IDBM Capstone: Industry Project
The IDBM Industry Project course follows challenge-based learning approach where students participate in real-life business projects and practice working in multi-disciplinary teams. Field experts offer mentoring for each project team.
https://mycourses.aalto.fi/course/info.php?id=28993

Capstone: Digitalism Challenge
Participants will be able to apply the knowledge and skills they have accumulated during their studies for solving real-life problems. they will learn how to collaborate with people with different backgrounds (students, customers, coaches) and present and sell their ideas and solutions in compelling ways.
https://mycourses.aalto.fi/course/info.php?id=23816

2.2.9 Universitat Pompeu Fabra

Explorer
Explorer helps participants to experiment entrepreneurship as a career option. During 12 weeks participants will be working on their idea and turning it into a solution that contributes to achieving the Sustainable Development Goals 2030. With a practical focus and based on social learning dynamics, Explorer is designed so that participants become actors of change through the building of economically sustainable projects in different industries, sectors and types of organisations.
https://en.explorerbyx.org/

From science to the market
Science-based entrepreneurship program offers different entrepreneurial trainings and individual tutoring.
https://www.cienciamercat.cat/ca/

Start-UP Flama
This course offers training activities for entrepreneurs with a business idea. Participants will learn how to use a simple tool Business Model Canvas that will help them to improve their business ideas.
https://nanomoocs.cat/courses/course-v1:UPF+Flama+2021_Flama/about

2.2.10 Scuola Superiore Sant' Anna

Industry 4.0 Innovation Boot-Camp
The Course is designed for policy-makers, public officers, entrepreneurs, investors, businessmen, lawyers, practitioners, consultants, engineers and other professionals interested either in bringing robotics and AI products onto the market or in making use of robotics and AI solutions or industrial processes in their businesses.
https://www.santannapisa.it/en/formazione/industry-40-innovation-boot-camp

Advanced Course "High Tech Entrepreneurship"
The objectives of the course are to provide participants with an appropriate knowledge of the tools necessary for the analysis of business planning processes that lead to the creation of a new business.
https://www.santannapisa.it/it/formazione/advanced-course-high-tech-entrepreneurship

Winter School "The Regulation of Robotics & Ai In Europe: Legal, Ethical And Economic Implications"
The Winter School is designed for international students coming from different backgrounds at an advanced stage of their university-career (graduate students), young researchers in the field of law, social sciences, engineering, economics and management, who are interested in understanding the legal, ethical, social and economic issues raised by robotics and AI and young professionals working for policy makers or industries investing in or developing robotic and AI products.
https://www.santannapisa.it/it/formazione/corso-di-alta-formazione-winter-school-regulation-robotics-ai-europe-legal-ethical-and

2.3 Incubators | Accelerators

In this section, we described activities that have been paved to support and develop potentially interesting entrepreneurial ideas. Moreover, Big Data spin-offs that spurred from those training activities were described.

2.3.1 King's College London

Women Entrepreneurs Programme
The programme is open to all female-identifying and non-binary students, staff and alumni at King's and increases your exposure to entrepreneurial skills, knowledge sharing and community building.
https://www.kcl.ac.uk/entrepreneurship/develop-your-idea/women-entrepreneurs-programme

King's20 Accelerator programme
A tonne of ambition, a fun, supportive community and a team of experts-in-residence makes the King's20 accelerator a unique 12-month experience for the best and brightest ventures coming out of King's. King's20 Accelerator is the Entrepreneurship Institute's flagship programme supporting the 20 brightest and highest potential ventures from across the King's to take their ideas and ventures the next level.
https://www.kcl.ac.uk/entrepreneurship/scale-your-venture/kings20-accelerator

Idea Factory
Idea Factory is King's College London's flagship idea generation competition. The competition aims to nurture the biggest and best ideas from across the university that have the potential to grow into ventures, taking participants through the 'factory' process from light bulb moment to viable business proposition. It's a fantastic chance to develop skills and win amazing prizes and mentorship.
https://www.kcl.ac.uk/entrepreneurship/develop-your-idea/idea-factory

King's Entrepreneurship Institute
The Entrepreneurship Institute is the dedicated entrepreneurship hub within King's College London. We work collaboratively with faculties, student societies and external partners.
https://www.kcl.ac.uk/entrepreneurship

2.3.2 TU Delft

YES! Delft
Tech incubator turns promising ideas and teams into solid start-ups and help them grow into successful companies. Experts, mentors, corporate partners, and investors help to build tomorrow's leading firms.
https://www.yesdelft.com/

Delft Enterprises

Delft Enterprises participates in innovative, early stage and technology-based spin off companies of Delft University of Technology. The aim is to empower and speed up the development of these start-ups, as part of the ambition of the university to turn scientific knowledge into economic and social value.
https://www.delftenterprises.nl/

RoboValley

RoboValley organise events and initiatives to connect entrepreneurs, investors, researchers and other professionals working on robotics and AI innovations.
https://robovalley.com/

Those supporting activities facilitated the creation of several start-ups based on big data, which are reported in Table 1.

Company	About the company	Website	Year
UbiOps	UbiOps is an easy-to-use deployment and serving layer for your data science code. Software allows to run Python & R models and scripts live and use them from anywhere at any time.	https://ubiops.com/	2017
Envision	Envision App offers a range of visual recognition features that enables blind and visually impaired users to independently access visual information around them. It excels in all kinds of text recognition, with ability to read in over 60 languages.	https://www.letsenvision.com/	2018
Ocean Protocol	Ocean Protocol is governed by a Singapore based non-profit foundation, whose mandate is to ensure open access to the protocol and platform, provide data governance, encourage the network ecosystem growth, and take measures to ensure that the platform becomes ever more decentralized with time.	https://oceanprotocol.com/	2019
Medvice	Medvice is a flexible, ambitious and innovative digital healthcare start-up founded by doctors, developers and scientists. Very outdated software hinders the provision of responsible care. Medvice is changing this by deploying the smartest, technical innovations such as digital medical assistant.	https://www.medvice.io/	2019
LexIQ	LexIQ's machine learning software unlocks the databases of companies, making data accessible for analysis, aggregating and predicting purposes. LexIQ visualizes data on any desired level.	https://www.lexiq.nl/	2019
Flux Medical Systems	HEalth Management System that brings together everything that is necessary to exchange healthcare data and setup and run a healthcare practice or clinic from anywhere.	https://www.joinflux.nl/	2020

Table 1: Start-ups based on big data @ RoboValley

2.3.3 Rovira I Virgili University

URV-emprén provides mentoring, training and networking activities to promote entrepreneurship and innovation.Those activities facilitated the creation of several start-ups, one of them is related to big data (Table 2).

Company	About the company	Website	Year
UP2Smart	UP2Smart provides solutions and predictions for real-world problems in a wide variety of industrial and business domains. It aims to transfer innovation using artificial intelligence techniques, artificial vision and deep learning strategies by developing complete solutions, selecting both the most appropriate technologies and imaginary sensors for the customer-defined problem.	https://www.up2smart.com/	2019

Table 2: Start-ups based on big data @ URV-emprén

2.3.4 Tartu Ulikool

Start-up Lab
Start-up Lab provides hands-on entrepreneurship training and pre-incubation services for all students across disciplines. It is the place where students can turn their ideas into reality by testing the viability of their solutions, improve teamwork skills, and broaden their networks. Startup Lab provides workshops and webinars supervised by entrepreneurs, field experts, and mentors.
https://www.startuplab.ut.ee/en

E-Boat
E-Boat is start-up Accelerator for e-solutions in health in the Baltic region 6-weeks distance learning + 2-weeks cruise hackathon formula on the cruise ship. E-boat accelerator is for early-stage start-up teams with innovative health solutions in the healthcare sector in the Baltic region.
https://www.startuplab.ut.ee/projects/e-boat

Those activities facilitated the creation of several start-ups (Table 3):

Company	About the company	Website	Year
Neuroactive AI	Neuroactive AI is a software system which dramatically improves the ease and speed with which companies can create and deploy predictive machine learning models. The system automatically tests many machine learning algorithms, settings, and configuration options to find the model which works best.	https://neuroactive.ai/	2016
HumanITcare	HumanITcare is a Remote Patient Monitoring and Telemedicine Platform that integrates communication standards for the unification of different medical systems and devices. In this customizable platform, clients can choose	https://humanitcare.com/	2018

	which data they want to collect and process patient data remotely from different devices.		

<center>Table 3: Start-ups based on big data @ E-Boat</center>

EstLat - Accelerate

The main aim of EstLat-Accelerate is to prepare and carry out three pre-acceleration programmes that are jointly organized in Tartu and Riga. Each round of the pre-acceleration programme has four distinct phases – involvement, hackathons, mentoring and graduation.

https://www.startuplab.ut.ee/projects/estlat-accelerate

2.3.5 EGI

EGI Digitial Innovation Hub

The EGI Digital Innovation Hub is a virtual space where companies and technical service providers meet to test solutions before investing. EGI DIH offers different services on advanced computing to help companies in the digitalization improving their productivity.

https://www.egi.eu/business/

EOSC Digital Innoviation hub

Digital Innovation hub is an international and multi-partner cooperation that supports companies in easily accessing the digital technologies and services offered by the EOSC. It combines 4 main pillars to help companies become more competitive: Pilot design and co-design, Technical Access, Training & Support and Visibility.

https://eosc-dih.eu/

Company	About the company	Website	Year
Axyon AI	Financial time series analysis with Machine Learning algorithms	https://axyon.ai/	2016
Kings Distributed Systems	A web platform aggregating excess computing power with dynamic accounting	https://distributed.computer/	2018

<center>Table 4: Start-ups based on big data @ EOSC Digital Innoviation hub</center>

2.3.6 ETH Zurich

ETH Innovation & Entrepreneurship Lab

The ieLab is ETH Zurich's deep technology accelerator and home to Pioneer Fellows and ETH spin-offs alike. It offers office- and lab- space, individual coaching, entrepreneurship education and access to its wide start-up network of coaches, entrepreneurs, and investors.

https://ethz.ch/en/industry/entrepreneurs/ielab.html

Company	About the company	Website	Year
UrbanDataLab	The cloud platform for individualized location analytics and business intelligence	https://urbandatalab.ch/	2016

Table 5: Start-ups based on big data @ ETH Innovation & Entrepreneurship Lab

ETH Pioneer Fellowships

The programme provides mentoring and training activities for innovative thinkers and creators to to support them on their journey towards becoming successful entrepreneurs.

https://ethz.ch/en/industry/entrepreneurs/entrepreneurship/pioneer-fellowships.html

ETH AI Center

ETH's central hub for artificial intelligence brings together researchers of AI foundations, applications, and implications across all departments. AI Center fosters research excellence, industry innovation, and AI entrepreneurship to promote trustworthy, accessible, and inclusive AI systems.

https://ai.ethz.ch/

ETH Entrepreneur Club

The ETH Entrepreneur Club's goal is to encourage ETH students to start their own businesses and support them in pursuing their dreams.

https://entrepreneur-club.org/

2.3.7 The University of Sheffield

Pre-Accelerator Programme

The programme focuses on developing ideas and early-stage start-ups. Facilitators and expert mentors guide teams and individuals through building blocks of the start-up journey.

https://www.sheffield.ac.uk/pre/entrepreneurship/pre-accelerator

Innovation Centre

Innovation Centre provides lab space with dedicated facilities for start-ups including support and guidance.

https://www.sheffield.ac.uk/pre/innovation-centre

2.3.8 Central European University

CEU iLab

CEU iLab makes entrepreneurship more accessible by providing mentoring, know-how, network and a community for high-impact teams.

https://www.ilab.ceu.edu/incubation

Company	About the company	Website	Year
Goalbusters	Early goal alert system for traders, using algorithms by our sports betting experts and Machine Learning Intelligence.	https://www.betalertpro.com/	2021
PhaseGrowth	Software tool that helps logistics providers ensure tracking of goods in real time using a mix of satellite data	http://www.phasegrowth.com/	2020
Risk Cyber	Risk Cyber is a project of securing personal identity theft by continuous monitoring, analysing and reporting to corresponding social media platforms.	https://riskcyber.net/	
Talk-A-Bot	Talk-A-Bot is Hungary created tailor made integrated chatbots for enterprises like banks, insurance companies, realtors, retailers, utility providers, leading international brands, etc.	https://talkabot.net/about-us/	2016
Brokerchooser	Brokerchooser helps people invest by matching them to the best investment services. The company is transforming how people invest by making investment services Pan-European. Brokerchooser quickly became the leading European broker comparison site.	https://brokerchooser.com/	2016

Table 6: Start-ups based on big data @ CEU iLab

2.3.9 Universitat Pompeu Fabra

En Residència Àrea Tallers

Training sessions, personalized mentoring and free co-working space are offered for the participants to develop innovative projects.

https://www.upf.edu/web/area-tallers/en-residencia

Espais d'Incubació UPF Business Shuttle

Start-up Incubator that aims to contribute to the development of new technology-based companies and innovations.

https://www.upf.edu/web/innovacio/espais-d-incubacio

EIT Urban Mobility Accelerator

A unique 6-months programme including tailored coaching/mentoring, workshops with several stakeholders including industry leaders and city representatives, access to co-working space.

https://www.eiturbanmobility.eu/business-creation/accelerator/hub-south/

Company	About the company	Website	Year
ArtificIO	Creation of art like images or text throug AI	https://www.gusano.org/video/artificio/	2019
ExpAI	Analysis of BIAS to AI algorithms with an AI. **EXPAI** transforms algorithms in fully	https://expai.io/	2021

	transparent processes. **It improves user trust and AI adoption in companies.**		
Vianova	Vianova uses connected vehicles data to help cities and mobility operators build more efficient and sustainable transport systems for people and goods	https://es.vianova.io/	2018

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Table 7: Start-ups based on big data @ EIT Urban Mobility Accelerator

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2.3.10 KTH Royal Institute of Technology

KTH Innovation

KTH Innovation is providing world-class support for new ideas from students, researchers and employees. KTH Innovation work closely with regional and international partners, with the mission of enabling more technology and knowledge from KTH to create impact in society.

https://www.kth.se/en/om/innovation/om/innovationskraft-pa-kth-1.504834

2.3.11 Barcelona Supercomputing Center

Innovation Journey

Barcelona Supercomputing Center promotes the exchange of knowledge and expertise between academia and private enterprise to maximize research potential by transforming academic potential into practical applications. The Innovation Journey program exposed entrepreneurial researchers to new opportunities that existed for their projects with the overarching goal of broadening the impact of the new technologies into the market.

https://www.bsc.es/tech-transfer/entrepreneurship/innovation-journey

Company	About the company	Website
Nextmol	Nextmol develops tools for atomistic simulation and data analysis to accelerate the design of new chemicals.	https://www.nextmol.com/
QBEAST	Qbeast focuses on the analysis of Big Data with Data Leverage, providing great insights while accessing only the minimum quantity of raw data.	https://qbeast.io/about-us/

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Table 8: Start-ups based on big data @ BSC Innovation Journey

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2.3.12 Sapienza School of Advanced Studies

Sapienza TalentLab

The incubation process aims to transform projects and business ideas into a Minimum Viable Product. Participants will take part in different activities to validate their innovative ideas and projects.

https://web.uniroma1.it/saperi_co/sapienza-talentlab

3   Challenge Us - 2021 program

Aim of Challenge Us initiative is to help small and medium-sized companies to manage their (big) data problems and provides companies with opportunities to further benefit from the data they bring for analysis. The program, organized by SoBigData++ consortium, will run for the next three years, and will help companies by providing free of charge service in accomplishing the POC for their proposals.

It is a widespread opinion that companies must be able to exploit this data to continue to remain competitive on the global market through the offer of new products / services or make their processes more efficient. The use and analysis of this large amount of data can in fact be crucial to understand and predict the behaviour of its customers, predict when a machine will need maintenance, or add new services to improve its offer.

In the first stage of the Challenge Us, we invite proposals to be submitted about a problem or a potential idea of exploitation of data. In the next stage, selected proposals will be assisted in the resolution of the "challenge" by expert researchers in the field of big data belonging to the European consortium SoBigData++, to which the European institutions mentioned above adhere.

The first Challenge Us program is organized by Scuola Superiore Sant'Anna with the support of the SOBigData++ management team. All the information about the program and how to participate can be found at the following link: http://www.sobigdata.eu/challenge-us-2021

At the deadline of 30 June 2021, SoBigData received 6 applications. As reported below, we can state that the implementation of the Challenge Us - 2021 program was re-scheduled, also considering the pandemic situation. Unfortunately, the restrictions imposed by COVID crisis have also influenced the capillary dissemination of the Challenge Us initiative. The results from the first call for applications are expected to be announced by mid-July 2021. For that reason, the current document does not include the Challenge Us statistics and results, as initially foreseen in the original description.

Figure 1: Screenshot of the webpage of the Challenge Us - 2021

4   Conclusions

This report reports a variety of activities that have been undertaken by SoBigData partners in order to spread entrepreneurial skills and mind-set among students, researchers and professors. Theoretical and practical entrepreneurial courses, different events and courses related to data science help students to improve entrepreneurial skills and develop their entrepreneurial ideas. Those ideas can be developed further with help of incubators and accelerators and training activities provided.

We can already see the emerging of Big Data spin-offs and hopefully stimulating activities provided by partners of SoBigData will lead to the creation of more new businesses.

Finally, we reported the actions undertaken to conduct the Challenge Us program, which is actually on going and which will be exploited in the next month. In November 2021 the results of the first Challenge Us - 2021 program will be presented during and event organized by Scuola Superiore Sant' Anna.