Introducing "Veleri – OI IoT school" project

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Content

- Higher education in Croatia: quality and international cooperation
- Call for proposal
- The need for skills in the IoT field
- Project overview
- Project activities
- Future plans

International cooperation and HE in Croatia

- Low number of studies in foreign languages
  - especially of those performed in cooperation of Croatian and foreign HE institutions
  - improve the quality of HE through internationalization
- European HE institutions accepted internationalization
  - better quality and research development
- The need for internationalization was recognized in the STEM field
  - Expecting more investments, more competitive economy and “smart growth” based on innovations

Call for proposals and fundings

- Croatia aims to raise the quality of HE:
  - develop studies and educational programmes, modules and courses in foreign languages in the STEM field,
  - to be more attractive for foreign students and teachers
- December 2017 – March 2018 – open call to support these activities
- European structural and investment funds, European social fund
  - supports employment-related projects throughout Europe and invests in Europe's human capital – its workers, its young people and all those seeking a job
- Projects 12-36 months, 400.000 – 1.800.000 HRK (53.000 – 240.000 EUR)

- Opportunity to develop our institutions and teachers, and to offer something new to our students and to support incoming mobility

The aim of our project

- To help raise the number of people with competencies in STEM needed in international labour market
- To enable students to gain practical and enterprenurial competencies
  - better opportunities for their employability and self-employability
- To offer a combination of online and offline project-based education and gaining competencies applicable in business and economy
  - which will promote STEM and ICT field

The IoT field

- We recognized the IoT field as important
- World economic forum:
  - IoT is with 14% ranked 4th in the list of technological causes of significant changes in the labour market
  - it is expected from the IoT to make a positive impact to employment in 2015-2020
- European Centre for the Development of Vocational Training, CEDEFOP:
  - in EU it is expected to have 500.000 work places by 2025 in the ICT sector
  - to fullfill these needs, CEDEFOP recommends educational programmes in the STEM field

Internet of Things

- The IoT is the extension of Internet connectivity into physical devices
- Embedded with electronics, Internet connectivity, and other forms of hardware (such as sensors), these devices can communicate and interact and can be remotely monitored and controlled
- IoT brings connectivity to another level by connecting multiple devices at a time, facilitating man to machine and machine to machine interactions.

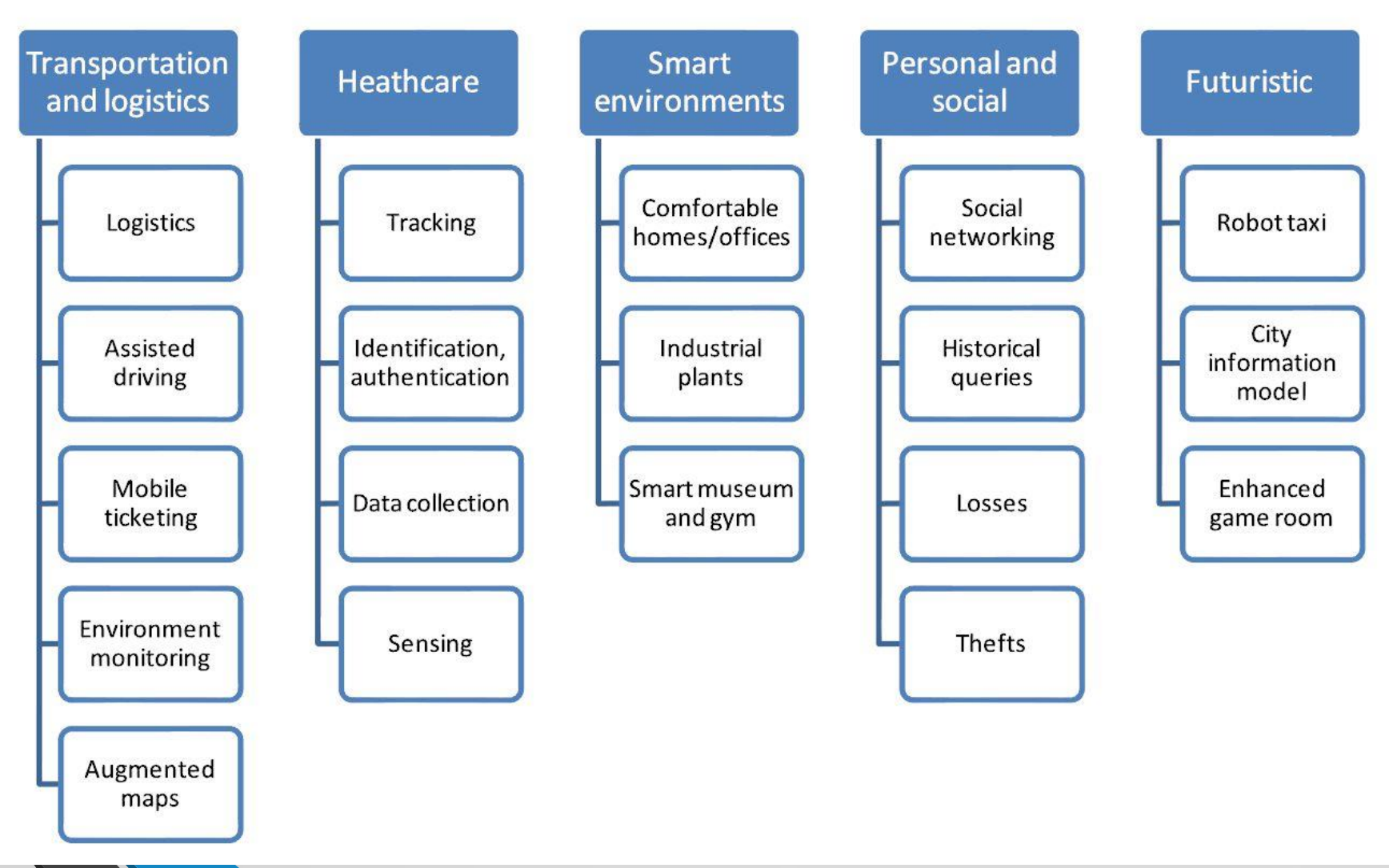
IoT for consumer use

- Connected vehicles, home automation, wearable technology, connected health, and appliances with remote monitoring capabilities.
- Smart homes, covering devices and appliances (lighting fixtures, thermostats, home security systems and cameras) which can be controlled via associated devices (smartphones, smart speakers)
- Assistive technology in home systems to accommodate owner's specific disabilities and elderly individuals.

IoT in business and industry

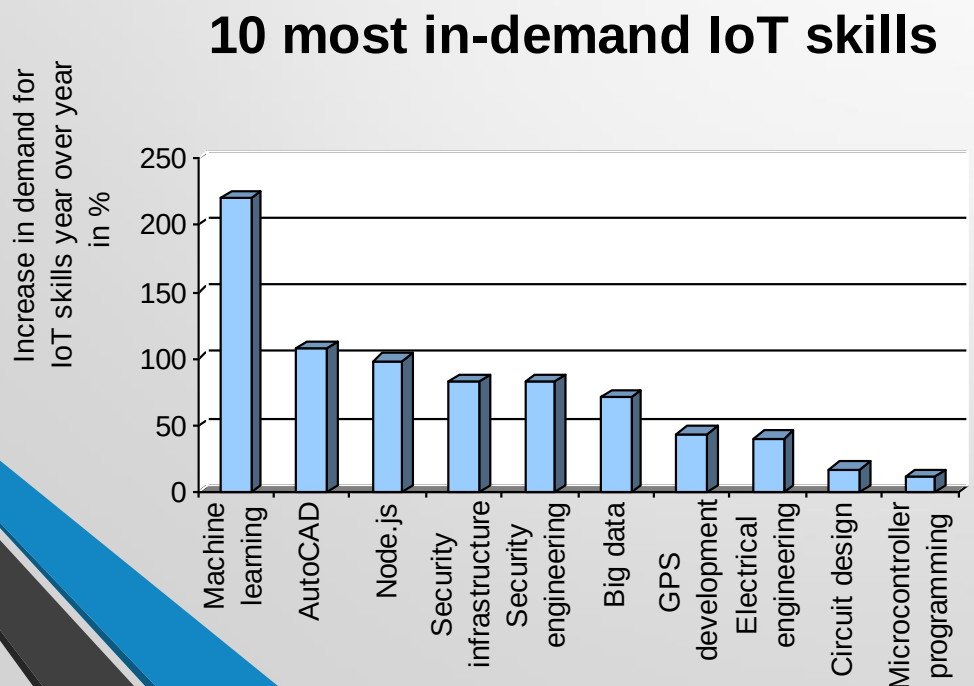
- To monitor and control the mechanical, electrical and electronic systems used in various types of buildings, energy efficient and smart buildings
- In healthcare: remote health monitoring, emergency notification systems
- In agriculture: collecting different data helps automate farming techniques, take informed decisions to improve quality and quantity, minimize risk and waste, and reduce effort required to manage crops
- In transportation systems: smart traffic control, smart parking, electronic toll collection systems, logistics and fleet management, vehicle control, safety, and road assistance

IoT in different application domains



IoT demand for skills

- The IoT creates a new demand for certain technology skills and hybrid job roles – IoT is a new IT job boom
- Many companies are beginning to plan their IoT strategies - need for skill sets to support IoT projects



- Gartner points out that a three quarters of the IoT projects will be a twice as long because of insufficient skills in key areas
- The need to develop these skills

IoT top skills

- Sensors
- Communicative chips
- Communication gateways
- Cloud management
- Security solutions that cut across the IoT stack
- Mobile development
- UI/UX design
- Big data
- Machine learning
- Embedded system
- Programming skills

IoT most paying and demanding job titles

- IoT product manager
- IoT architect
- IoT developer
- Data scientist
- IoT cloud engineer
- Industrial engineer
- Industrial UI/UX designer

Our application

- Polytechnic in Rijeka – the study of telematics (since 2010/2011)
- Department of informatics – the study of informatics (undergraduate since 2005/2006, but almost 40 years of tradition)
- Combine the knowledge, educate more through the process, and cooperate to create an educational programme

- Applied for the call
- Positive results
- Based on our IoT Vision
  - project “Veleri-OI IoT School” - development of a new international education programme in the field of "Internet of Things" (IoT)
  - in October 2018

Basic project information

- Name: Veleri-OI IoT School
- Project coordinator: Polytechnic of Rijeka
- Project partner: University of Rijeka, Department of informatics
- web: https://iot-school.veleri.hr
- Project amount: 1.769.698,00 HRK (cca. 240.000 EUR)
- EU financing: in full
- Implementation period: 12/10/2018 – 12/10/2021

Project elements

- The project team consists of 14 members (in 17 roles):
  - 10 from the Polytechnic of Rijeka
  - 4 from the University of Rijeka, Department of Informatics

- 94 basic project activities (within 5 project elements)
  - 1. Development of a new international educational programme in English
  - 2. Design of a business plan
  - 3. Implementation of the pilot project
  - 4. Project management
  - 5. Visibility

Main project goals

- to develop a new international education programme in the field of “Internet of Things” (IoT) (STEM) in Croatian and in English
- to include a modern approach to teaching and developing individual projects
- to ensure achievement of competencies which positively influence employment and self-employment
- to conduct a pilot project for the first class of educational programme attendees
- to create a business plan which will ensure sustainability of this programme even after the project has finished

Some of the finished activities

- Analysis of existing training programmes in the field
- Teachers' training (improvement of teaching competencies)
- Survey for companies about their needs and the needs of the labour market
- Core competencies for the Programmer of the IoT system / IoT programmer identified
- Learning outcomes grouped by modules
- Correlations of competencies and modules defined
- ECTS workload for each module defined
- Marketing activities: visual identity designed, other marketing elements designed, conference for media and interested parties organized, the project advertized in the media (published acticles)

Core competencies for the IoT programmer

- IoT programmer is able to:
  - create a business plan and present a business idea.
  - choose and apply mechatronic elements in the realization of the IoT system.
  - create an embedded system on the Arduino platform.
  - set up a work and development environment for developing, versioning and testing web and hybrid mobile applications.
  - use the NoSQL database.
  - document and present user requirements.
  - create a responsive web application.
  - create a hybrid mobile application.

Work in progress

- Modules and ECTS points
- Modules description and design of the curriculum
- Design of teaching and learning content (project-based learning)
- Knowledge assessment tests
- To define previous knowledge needed for each module
- To create previous knowledge assessment test
- To procure equipment for teaching and learning (next slide)

- Continous activities:
  - Reporting to the Agency for VET and Adult Education
  - Project documentation
  - Tracking costs and expenses
  - Visibility activities (web and media)

Project equipment

- Equipment for the pilot project implementation: 257.500,00 HRK (34.000 EUR)
  - ten laptop computers
  - two 3D printers
  - one milling machine
  - one color laser printer
  - 85 microcomputers and microcontrollers
  - sensors, actuators, passive electrical elements and electronic equipment
  - electronic circuit boards

Future activities

- To plan a procedure for periodical assessment of compliance of the educational programmme with the international labour maket needs
- To plan changes in the programme based on these results

- To create a business plan for activities in the next 5 years after finishing the project
- To ensure sustainability of this programme
- To plan marketing activities to attract future attendees

What we expect from our project

- To perform education for the first class of 30 students
- To prepare educational content suitable for distance learning
- To ensure self-sustainability of this educational programme for the future:
  - Different target groups (students in high schools and adults)
  - New opportunities for co-financing it by local, national and EU funds intended to support learning, and by employers for their employees
  - Customize the period for education of different target groups (summer holidays, weekends, etc.)
  - Offer the education as a part of Erasmus exchange and/or practical education
- Inquiries from some companies about the programme

Thank you!
Questions?

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