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„Innovative ICT Solutions for the Societal Challenges (INNOSOC)“

Innovation in and with ICT: A Croatian Industry Perspective

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I dream about:

- ▶ DISCOVERY
- ▶ INVENTION
- ▶ INNOVATION

Discovery

- ▶ *Discovery*. A new increment to knowledge.
 - Theoretical knowledge is increasingly expressed as a mathematical model
 - Empirical knowledge is obtained from observations of new phenomenon or observations deliberately taken to test a theoretical hypothesis
 - Last, but not least, is practical knowledge. An important economic example is the practical knowledge acquired by a workforce to make a new manufacturing plant operate efficiently. This knowledge is intuitive and frequently very difficult to express as equations

Invention

- ▶ *Invention*: A new device or process.
 - To qualify for a patent an invention must pass a test of originality--that is, be sufficiently different from previous inventions
 - Most inventions are minor improvements on existing inventions which do not qualify for patents
 - Only a small percent of patented inventions have any economic value

Innovation

- ▶ *Innovation*: A better way of doing things.
 - Innovations can occur in all goal-directed behavior such as profit maximization, reelection politics and personal lifestyles
 - Thus an innovation improves performance in goal directed behavior as measured by a criterion
 - An example of a criterion would be profit maximization in business

Relation model

- ▶ a. **Invention** is promoted by discoveries in the natural sciences and more recently the biological sciences; whereas, **innovation** is promoted by discoveries in the industrial engineering, the social sciences and the business disciplines.

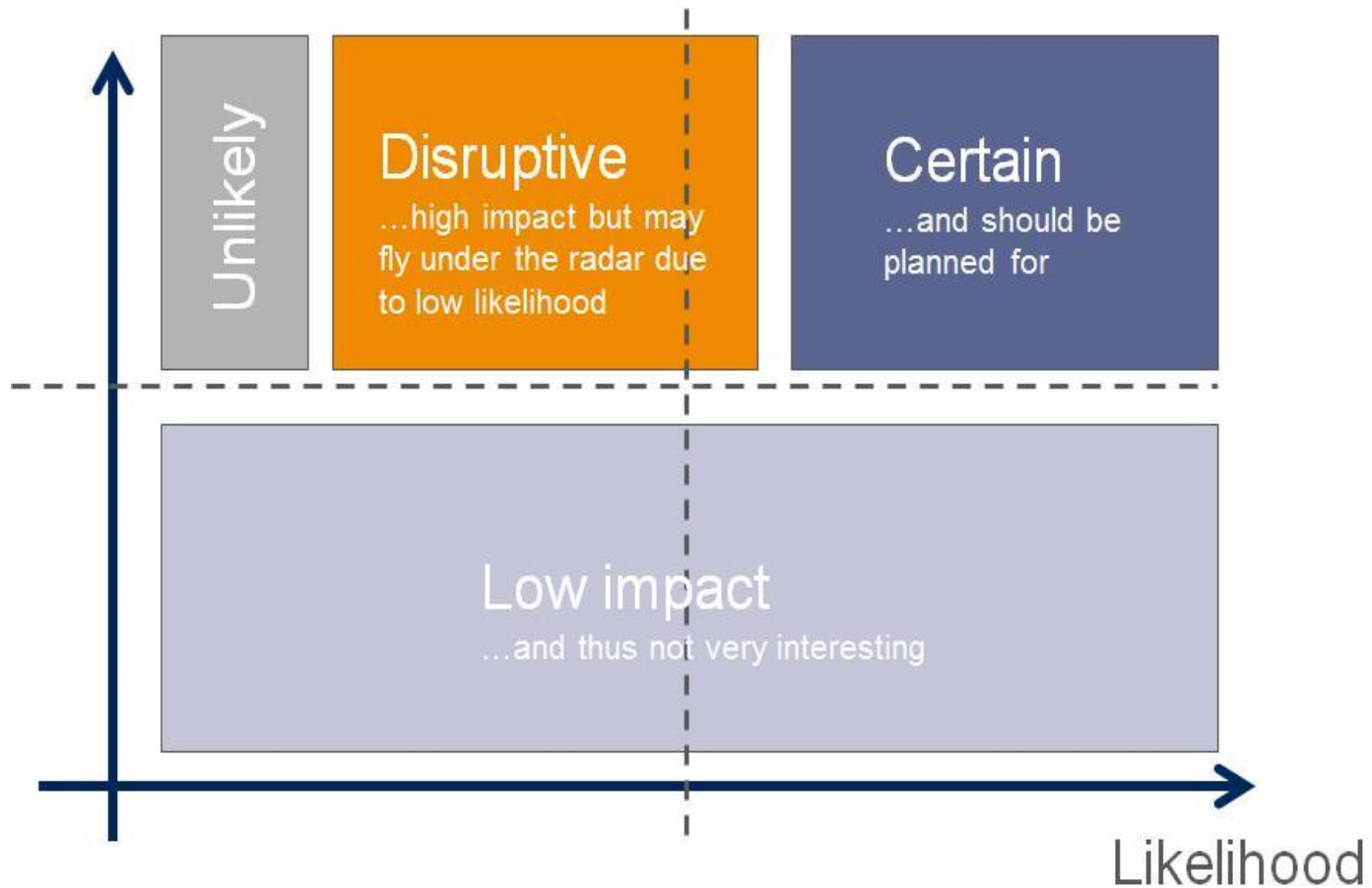
- b. The interaction between discovery and invention is a **two-way street**. Obviously, as science advances, it produces opportunities to create new inventions. However, the development of the full economic value of an invention requires massive discoveries for many inventions. For example, the modern airplane required the scientific development of aerodynamics. The economic development of superconductivity will require the physicists to develop a theory of superconductivity.

- c. Similarly the interaction between discovery and innovation and between invention and innovation is two-way.

Bussines expectations

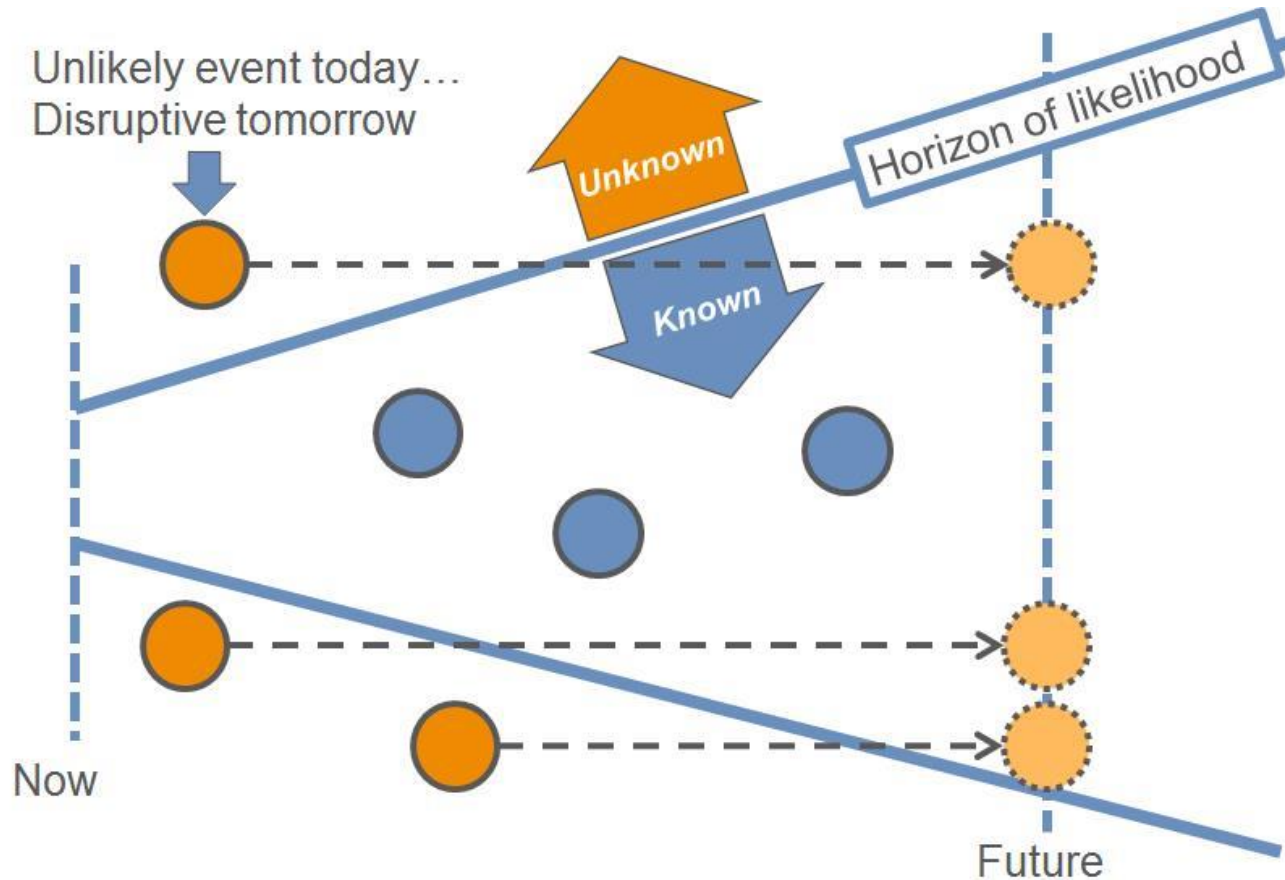
- ▶ Disruptive innovations are:
 - **Cheaper** (from a customer perspective)
 - **More accessible** (from a usability or distribution perspective)
 - **And use a business model with structural cost advantages** (relative to existing solutions)

Innovation impact



Know your numbers!

Innovation prospect



Define the process with relaxed business feeling.

Innovation challenge

▶ **Economics:**

- Move into the Networked Society
- Collaborative consumption, or sharing economies, signals the shift in consumption from ownership to access
- Use of network technologies creates the ability to do more with less by renting, lending, swapping, gifting and sharing products, instead of increasing consumption and production

Innovation challenge

▶ Themes to the extreme:

- The cloud trends points to a concentration of computing power to a few global players while at the same time network endpoints, like devices, are becoming increasingly powerful and being able to do increasingly advanced computations (voice/image recognition, AI etc.)
- Every company will be a technology company; it is just where in the stack it competes. We are in for a major reshuffling of the industry landscape.

Innovation challenge

▶ **Products / Offerings:**

- It's getting increasingly difficult to sell a consumer device that does not have an app that enhances the customer experience over time
- The goal is recurring revenues and a relationship with the customer, continuously filled with new value e.g. by adding new features or by connecting and combining offers from other service providers

Innovation challenge

▶ Go to market:

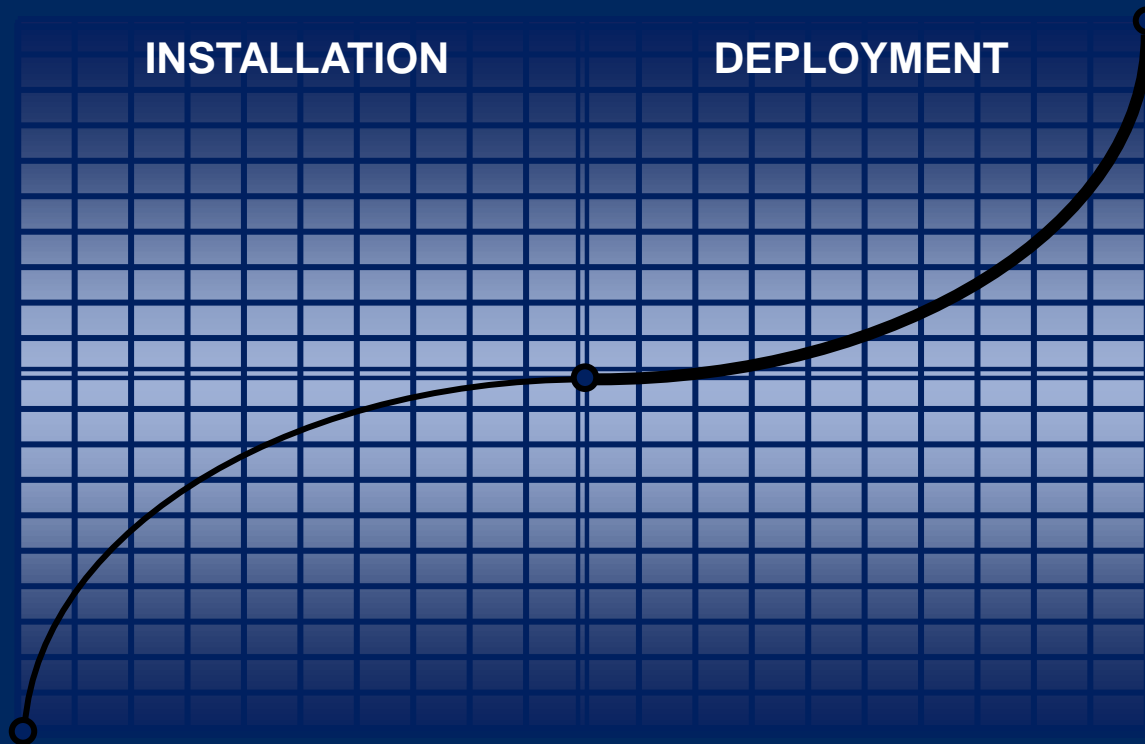
- Ecosystems are replacing employee rich corporations
- Cloud, connectivity and collaboration allows for much more efficient GTM models than traditional channels
- Transactions costs (incl. trust) can be drastically lowered with technologies, something that was impossible in the past and justified to keep disparate functions under one (legal) roof

Innovation challenge

▶ Operations:

- Technology advancements are changing operations turning what used to be mainly a cost to a competitive advantage
- The big public cloud providers today, Amazon, Google, etc., excel in their operations, not their CAPEX spend
- Automation that over time has evolved with big data analytics and deep learning (AI) will evolve their offering further

THE NETWORKED SOCIETY



MOBILITY

–

BROADBAND

–

CLOUD

Innovations in ICT

Spectrum comes scarce resource

1 – expectation from above 6 GHz

Networks enabled to handle a plethora of use cases

2 – 5G and IoT

Increased need for indoor wireless access

3 – wireless to the home

New IP network where everything aaS is emerging

4 – industry verticals requires small simple SW solutions

Adoption of distributed cloud

5 – everything is elastic and scale on-demand
– mobile edge computing (fog computing)

Automated management - tackle system complexity

6 – integration of cross-industry domains

Innovations in ICT

E2E delivery optimization

7 – protocols efficiency

New security challenges

8 – 5G and IoT and cloud

Identity management for entire IoT ecosystem

9 – identity management generic for any connected device

Automotive & Transport usage of IoT

10 – coordinated way to fastest move forward

Energy efficiency

11 – lower energy consumption in any communication/processing

Innovations with ICT

Continuing wave of digitalization

- any kind of ICT especially IoT

New technologies creation

- 3D printing, nanotechnology

New platform economics emerge

- digitalization, liberation of information and cloud – new opport.

From product to service

- digital tools – new value to customer

Information architecture before mechanical architecture

- software updates instead hardware

Innovations with ICT

Changing industrial structure

- Industry 4.0 (ICT)

New competencies and new jobs

- applying new technologies in old fashioned production

Computational capacity

- competitive advantage

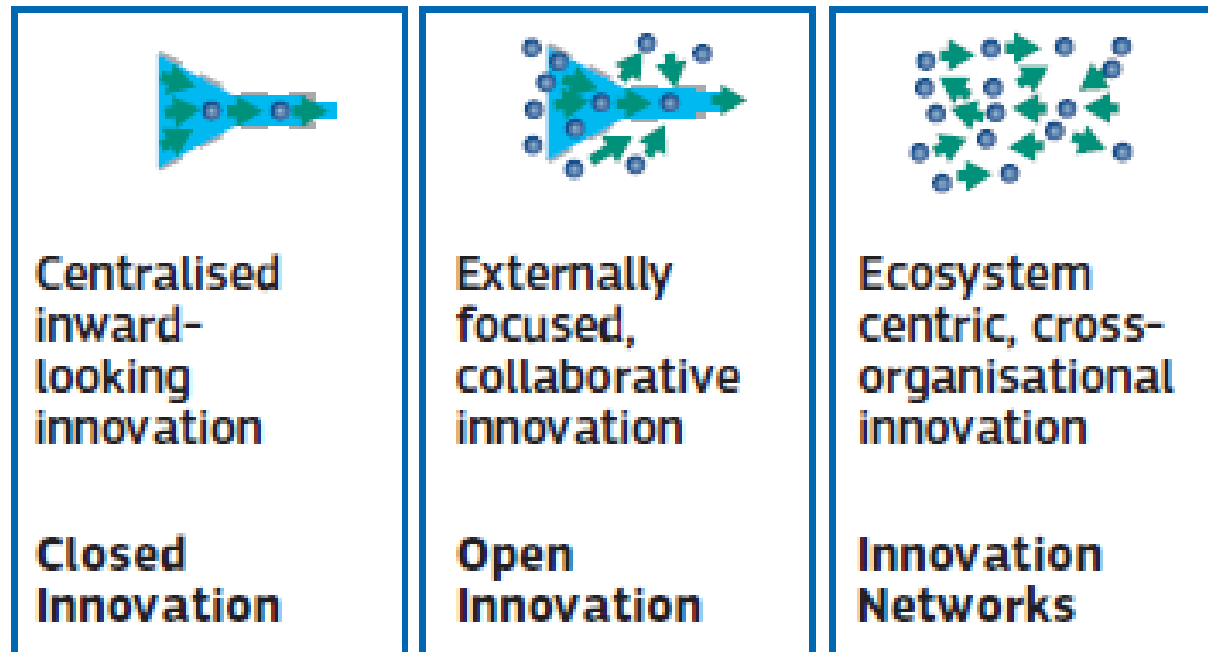
Unconventional convergence

- telecom and car industry – connected car

Economics of aggregation

- digital technologies – new way of collaboration

Open innovation



VALUE PROPOSITION – cross industry competence



Citizen Experience Management



Utilities



Transport



Public Safety



Other Industries

Analysis, Security & Information Management

Device Management (IOT, Sensors, equipment etc.)

Connectivity Management : Industry differentiated performance

Network Infrastructure: Private & Public.

InNOVATIVE SOLUTIONS FOR A LOW-CARBON ECONOMY



Smart grid – enables renewables and saves energy



The connected car



Managing traffic



Brightest Connection



Emergency response

This is us!



9 %

Doctors of Science and Masters of Science

> 1800

Employees in Zagreb and Split

73% : 27 %

Gender ratio (Male vs. Female)

588

Employees younger than 32

22 %

Female managers

87%

Highly educated experts

12 years

Average employment duration

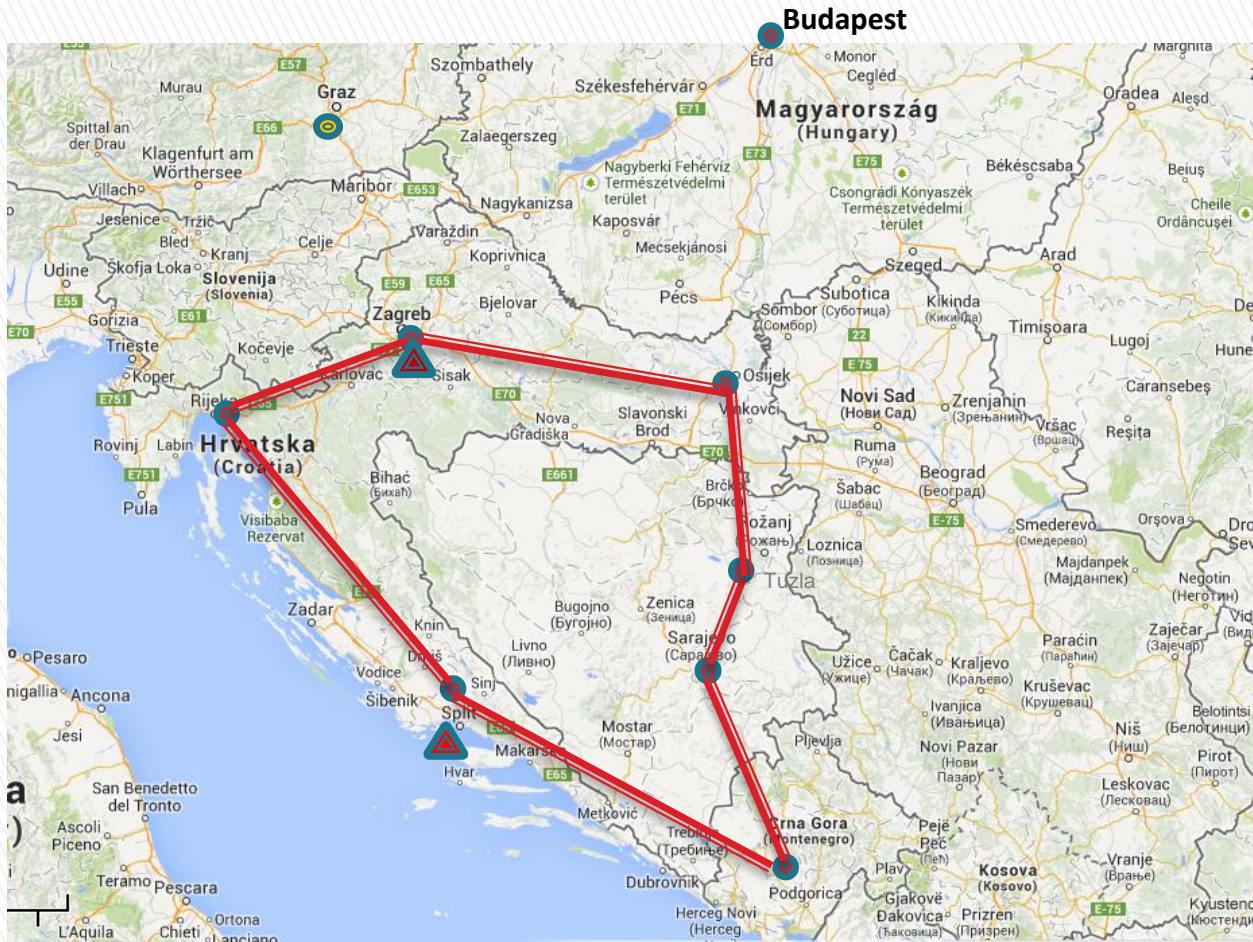
38 years

Average employee age

19 %

Employees with up to 2 years of work experience

Ericsson Nikola Tesla Summer Camp



- ▶ 15 years
- ▶ 5 weeks
- ▶ > 600 students
- ▶ > 160 mentors
- ▶ > 300 projects
- ▶ > 60 articles
- ▶ > 100 prototypes
- ▶ master, doctoral thesis
- ▶ Diploma thesis
- ▶ > 300 employees
 - Zagreb, Split

Conclusion

- ▶ Innovations are essence of sustainable business surveillance
- ▶ Expectations on you:
 - CREATIVE
 - INNOVATIVE
 - PRODUCTIVE
 - COLLABORATIVE



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