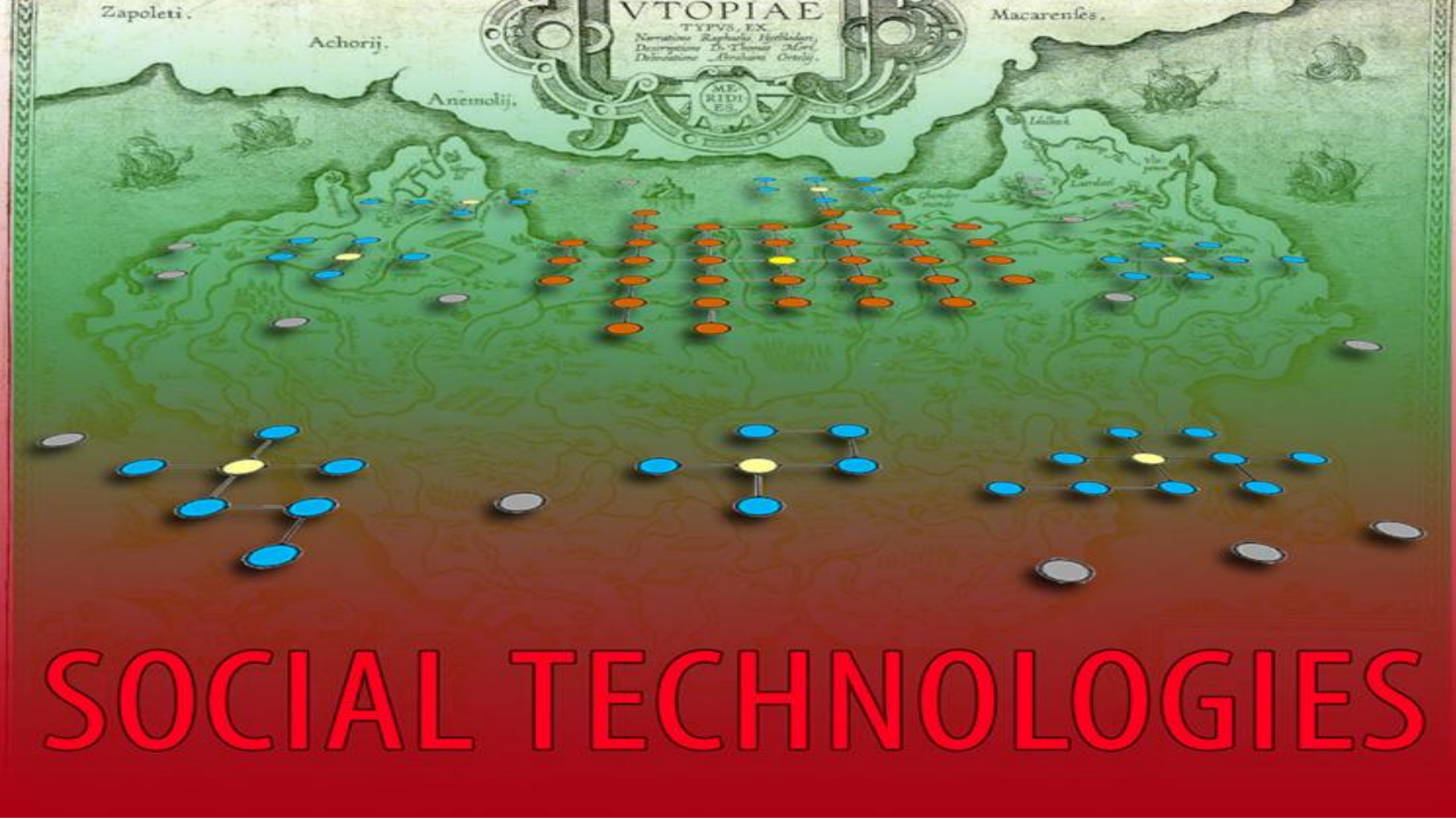
Social Technologies for Developing Collective Intelligence

Prof. Aelita Skarzauskiene



SOCIAL TECHNOLOGIES

Collective intelligence (CI) is the general ability of a group to perform a wide variety of tasks

Collective intelligence of the community:
new knowledge, ideas, decisions
suggested problem solving methods and solutions
shaped up or structured opinions
developed innovations, prototypes,
generated added value, etc.

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The Free Encyclopedia

INNOCENTIVE®

IDEO

frogMob™

Difference between *swarm* intelligence and collective intelligence

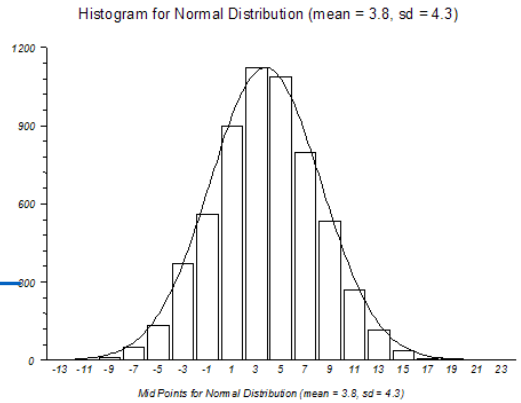
- Intelligent systems – humans are capable to generate knowledge and think
- Synergy based on knowledge, not on genetic interaction

The Wisdom of Crowds Idea

Guess the weight of the ox?

Market place

Predictions in total – 787



The weight of the ox— **1198** pounds

The average of the guesses – **1197** pounds

Wisdom of crowd

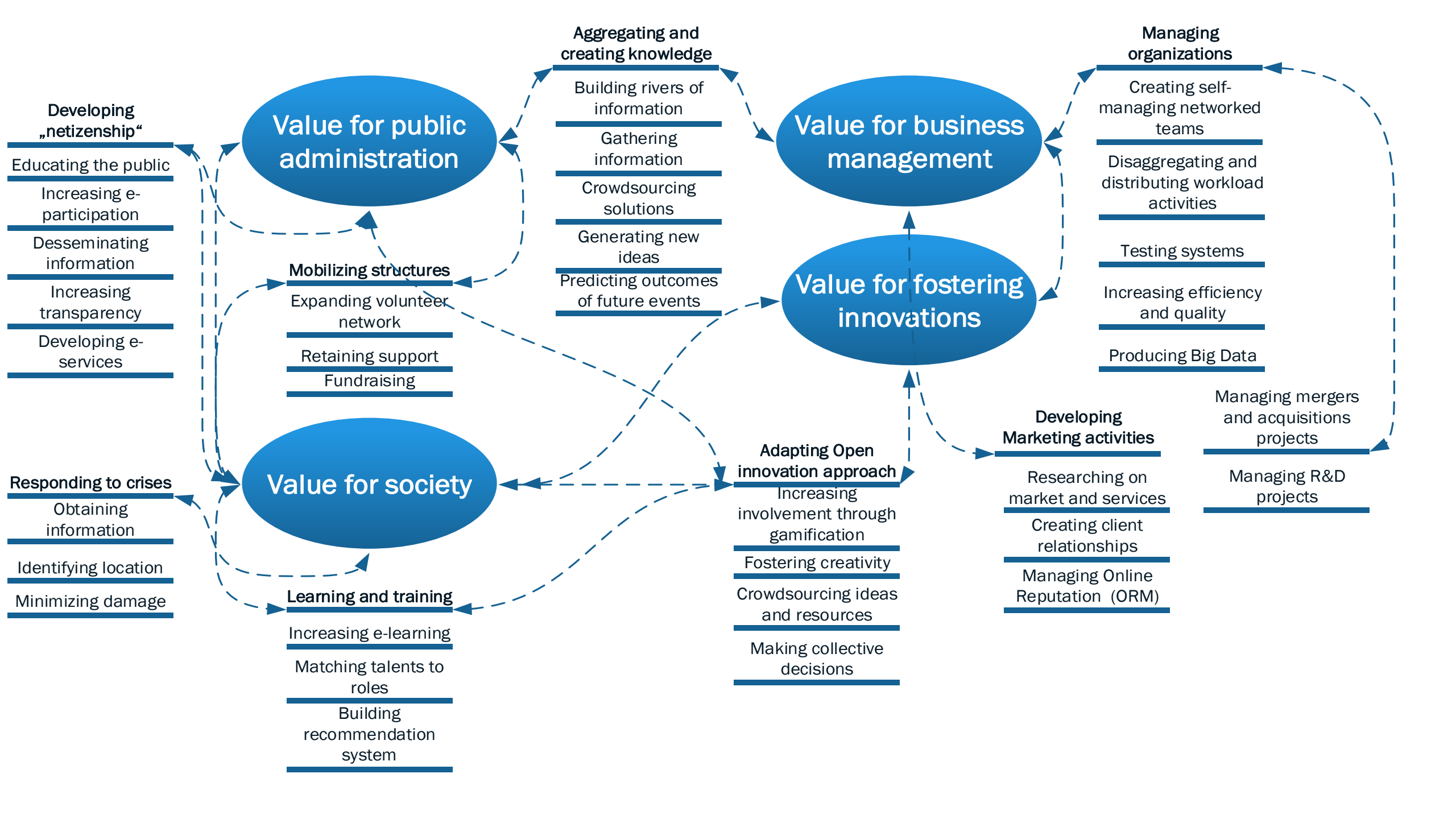
Surowiecki (2004):

"under the right preconditions the groups are more intelligent than the smartest people in them"

What are these conditions?

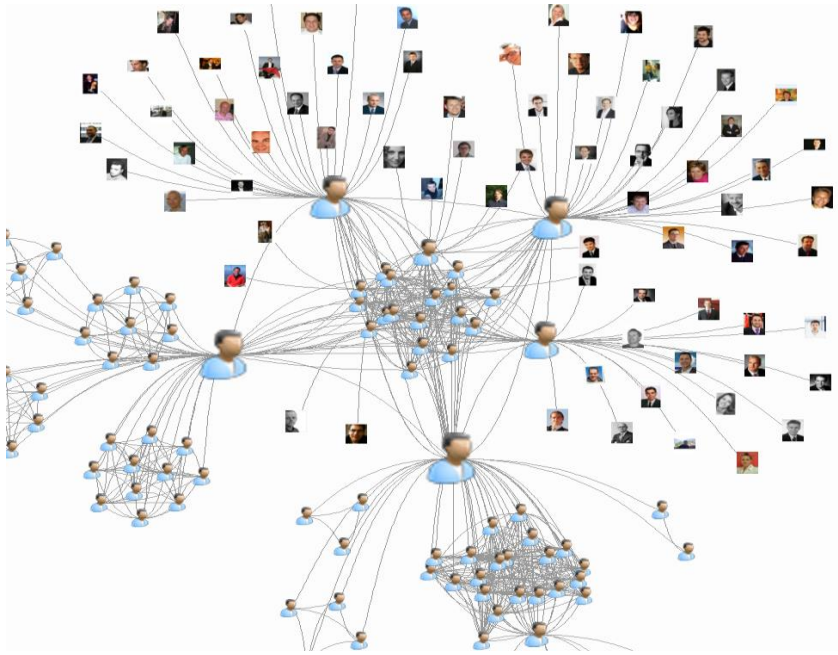
DIVERSITY, DECENTRALISATION, INDEPENDENCE

SWARM EFFECT


Value for public administration
Value for business management
Value for fostering innovations
Value for society
Developing „netizenship“
Educating the public
Increasing e-participation
Desseminating information
Increasing transparency
Developing e-services
Aggregating and creating knowledge
Building rivers of information
Gathering information
Crowdsourcing solutions
Generating new ideas
Predicting outcomes of future events
Managing organizations
Creating self-managing networked teams
Disaggregating and distributing workload activities
Testing systems
Increasing efficiency and quality
Producing Big Data
Mobilizing structures
Expanding volunteer network
Retaining support
Fundraising
Responding to crises
Obtaining information
Identifying location
Minimizing damage
Learning and training
Increasing e-learning
Matching talents to roles
Building recommendation system
Adapting Open innovation approach
Increasing involvement through gamification
Fostering creativity
Crowdsourcing ideas and resources
Making collective decisions
Developing Marketing activities
Researching on market and services
Creating client relationships
Managing Online Reputation (ORM)
Managing mergers and acquisitions projects
Managing R&D projects

Today, more than 80% of the world`s online population is interacting via social networks on a regular basis, but 65% of the world population – 4,6 billion people – still lacks internet access

McKinsey research, 2017



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MIT CENTER FOR COLLECTIVE INTELLIGENCE

The MIT Center for Collective Intelligence explores how people and computers can be connected so that – collectively – they act more intelligently than any person, group, or computer has ever done before.

ABOUT →

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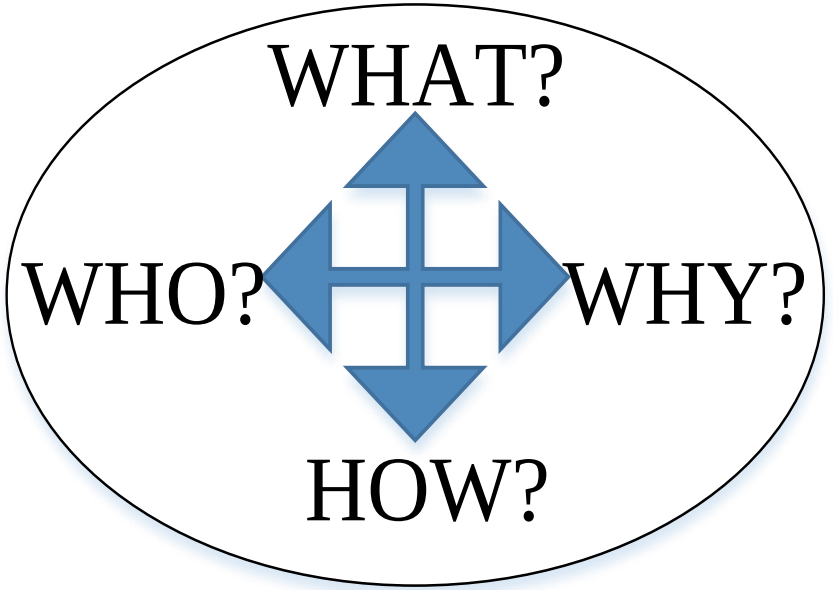
The Structural Model of CI System

(Luo *et al,* 2009)

- **technological network** or media network that supports information and knowledge transfer
- **human network of community members**
- **content network of knowledge** and information, which is hosted in humans and computer systems

WHAT is being accomplished?
GOAL

STAFFING
WHO is performing the task?
Hierarchy/ Crowd



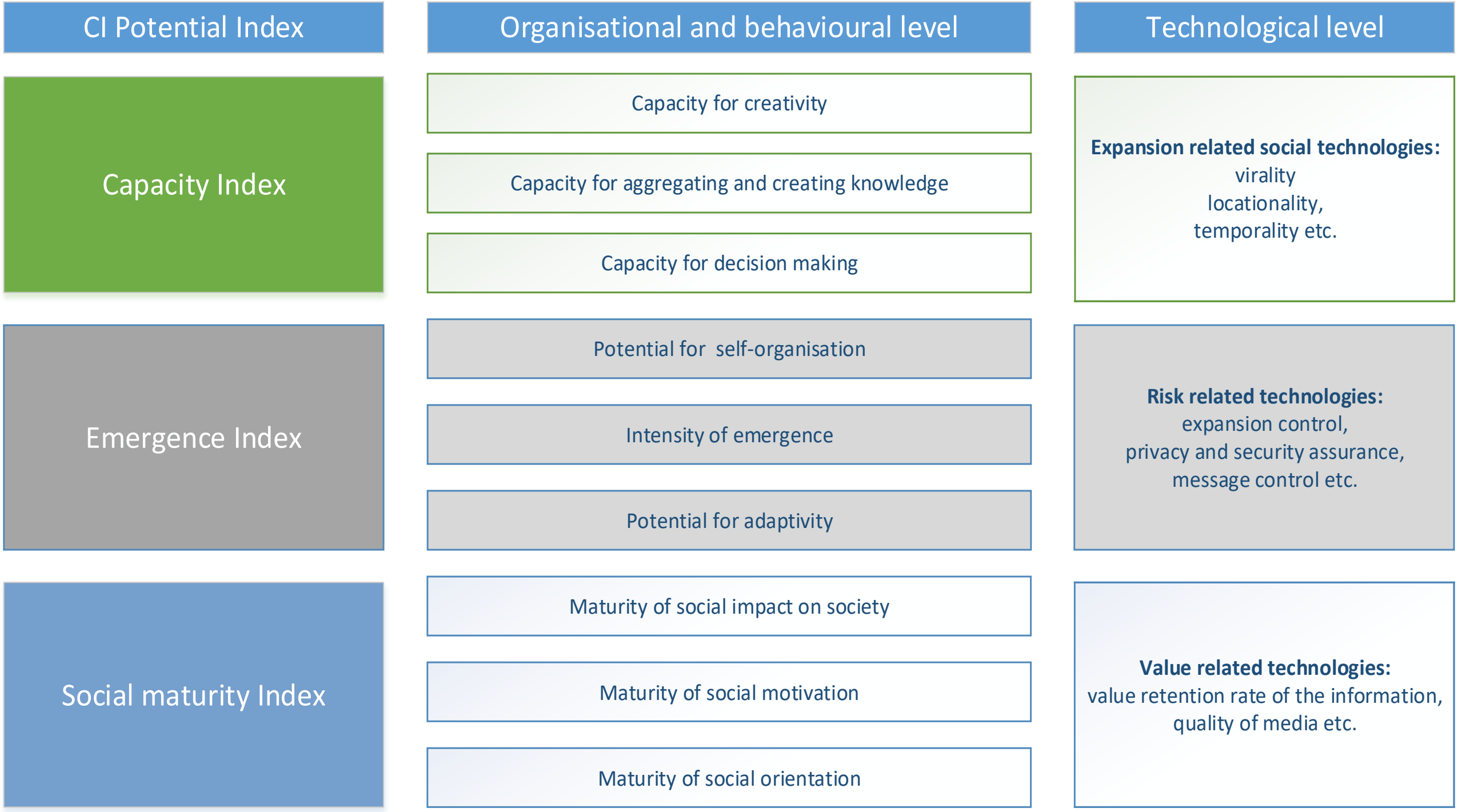
INCENTIVES
WHY are they doing it?
Money/Love/Glory

STRUCTURE/PROCESS
HOW it is being done?

	INDEPENDENT	**DEPENDENT**
CREATE	COLLECTION	COLLABORATION
DECIDE	INDIVIDUAL DECISION	GROUP DECISION

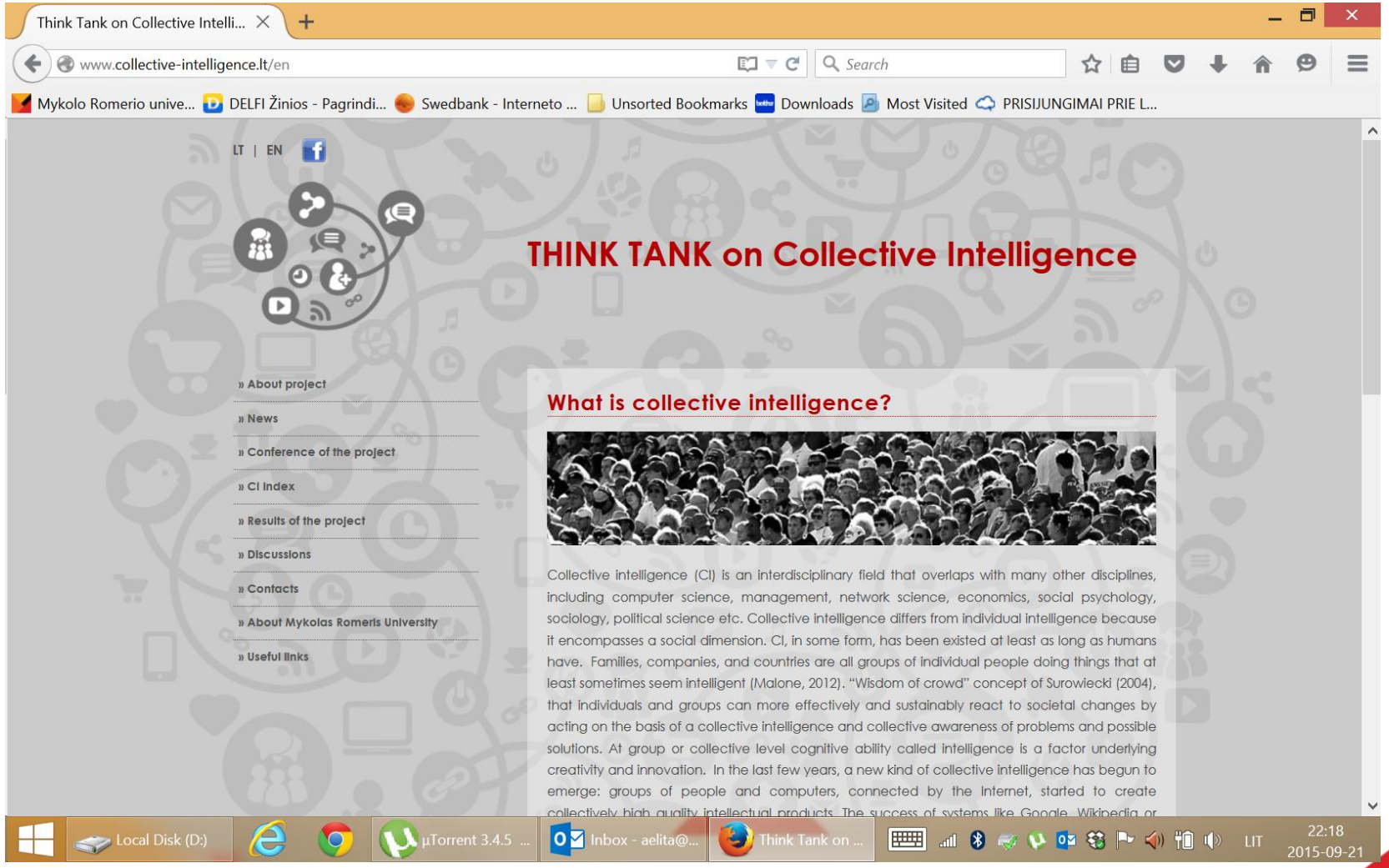
CI Potential Index

is a relational conception that defines capacity of networked structure for aggregating and creating knowledge, creativity and decision-making, the ability of community for self-organization, transparency, adaptivity and generation of “wisdom of crowd” effect


CI Potential Index
Organisational and behavioural level
Technological level
Capacity Index
Capacity for creativity
Capacity for aggregating and creating knowledge
Capacity for decision making
Expansion related social technologies:
virality
locationality,
temporality etc.
Emergence Index
Potential for self-organisation
Intensity of emergence
Potential for adaptivity
Risk related technologies:
expansion control,
privacy and security assurance,
message control etc.
Social maturity Index
Maturity of social impact on society
Maturity of social motivation
Maturity of social orientation
Value related technologies:
value retention rate of the information,
quality of media etc.

Dimension	Indicators	Value
$CAI = 0{,}6\frac{DS + DF + PS}{3} + 0{,}4\frac{CM + DD + DI}{3}$,		
Capacity for creativity	DS Degree of diversity in source of ideas	52
	DF Degree of diversity in engagement forms	36
Capacity for aggregating and creating knowledge	DI Degree of interdependence	47
	CM Degree of adequate supply of "Critical mass"	43
Capacity for decision making and problem solving	DD Degree of decentralization and independence	20
	PS Degree of efficiency of problem solving	25
		37.25

www.collective-intelligence.lt



KIPI

KOLEKTYVINIO INTELEKTO POTENCIALO INDEKSO SKAIČIAVIMAS

1

REGISTRACIJA PLATFORMOJE

2

INDEKSO DEDAMŲJŲ VERTINIMAS

3

SUVESTŲ DUOMENŲ APDOROJIMAS

KI GALIOS INDEKSAS	$CAI = 0{,}6\frac{DS + DF + PS}{3} + 0{,}4\frac{CM + DD + DI}{3}$
KI ATSIRADIMO INDEKSAS	$EI = 0{,}6\frac{DQ + AL}{2} + 0{,}4\frac{DC + AT + DM}{3}$
SOCIALINIŲ TECHNOLOGIJŲ INDEKSAS	$STI = 0{,}4MD + 0{,}6\frac{EI + PS + DM + DA + SC}{5}$

4

KOEFICIENTO PASKAIČIAVIMAS IR PAAIŠKINIMAS

5

REZULTATŲ LYGINIMAS SU KITŲ ORGANIZACIJŲ REZULTATAIS

Bendras

KI GALIOS INDEKSAS	KI ATSIRADIMO INDEKSAS	SOCIALINIŲ TECHNOLOGIJŲ INDEKSAS		KIPI
24	45	43	=	37

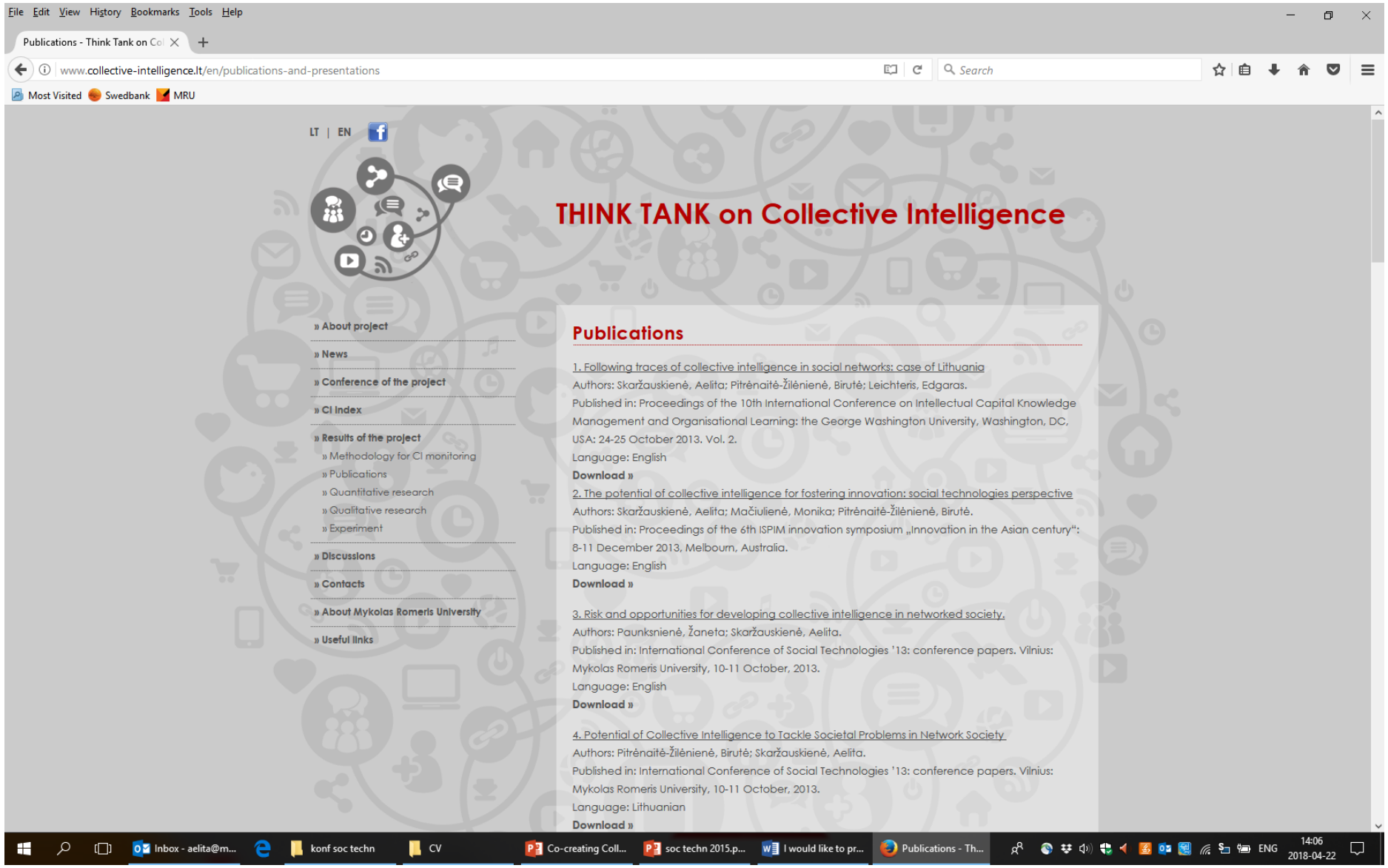
Individualūs

1

KI GALIOS INDEKSAS	KI ATSIRADIMO INDEKSAS	SOCIALINIŲ TECHNOLOGIJŲ INDEKSAS		KIPI
18	56	28	=	34

2

KI GALIOS INDEKSAS	KI ATSIRADIMO INDEKSAS	SOCIALINIŲ TECHNOLOGIJŲ INDEKSAS		KIPI
15	29	30	=	25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Publications
1. Following traces of collective intelligence in social networks: case of Lithuania
Authors: Skaržauskienė, Aelita; Pitrėnaitė-Žilėnienė, Birutė; Leichteris, Edgaras.
Published in: Proceedings of the 10th International Conference on Intellectual Capital Knowledge Management and Organisational Learning: the George Washington University, Washington, DC, USA: 24-25 October 2013. Vol. 2.
Language: English
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2. The potential of collective intelligence for fostering innovation: social technologies perspective
Authors: Skaržauskienė, Aelita; Mačiulienė, Monika; Pitrėnaitė-Žilėnienė, Birutė.
Published in: Proceedings of the 6th ISPIM innovation symposium „Innovation in the Asian century": 8-11 December 2013, Melbourn, Australia.
Language: English
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3. Risk and opportunities for developing collective intelligence in networked society.
Authors: Paunksnienė, Žaneta; Skaržauskienė, Aelita.
Published in: International Conference of Social Technologies '13: conference papers. Vilnius: Mykolas Romeris University, 10-11 October, 2013.
Language: English
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4. Potential of Collective Intelligence to Tackle Societal Problems in Network Society
Authors: Pitrėnaitė-Žilėnienė, Birutė; Skaržauskienė, Aelita.
Published in: International Conference of Social Technologies '13: conference papers. Vilnius: Mykolas Romeris University, 10-11 October, 2013.
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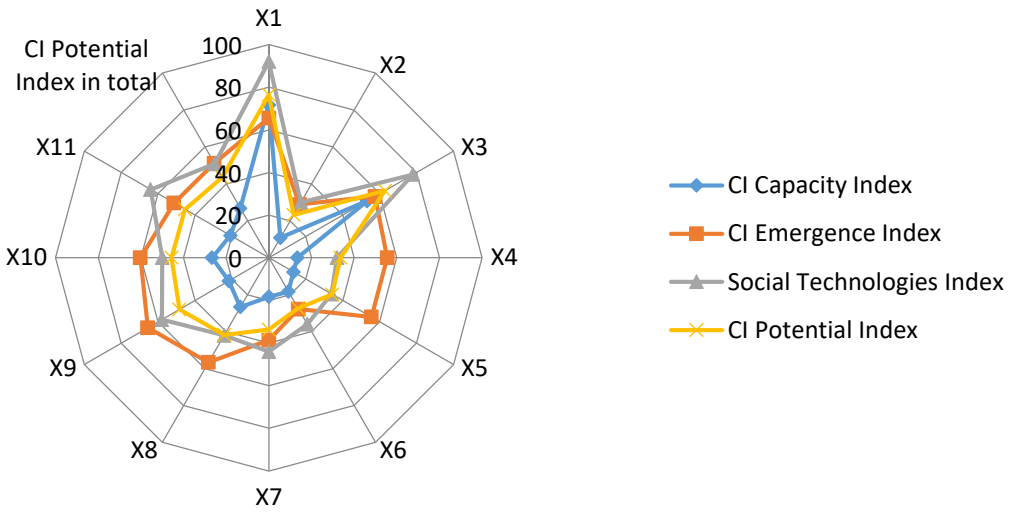
Graphical comparative analysis of 50 online communities according to Capacity Index, Emergence Index, Social Technology Index and Collective Intelligence Potential Index



The research is funded by European Social Fund under the measure „Support to Research Activities of Scientists and Other Researcher“(Global Grant) administrated by Lithuanian Research Council (Grant No. VP1-3.1-ŠMM-07-K-03-030)

Capacity for creativity	32,95
Capacity for aggregating knowledge	40,91
Capacity for decision making and problem solving	22,73
Potential for self-organisation	53,41
Emergence of collective intelligence	38,26
Potential for adaptivity	68,18
Networking and collaboration technologies	54,54
Privacy and security enabling technologies	45,45
Collective decision making technologies	36,36

CIPI Evaluation results

- When measuring the *Degree of diversity in source of ideas* (value of 52) and *Engagement forms* (36), in the majority of monitored projects the demographic, gender and geographic diversity was evaluated as high. However, the national diversity was defined as relatively low. Almost all civic projects lack the advanced competition elements, game based approach, and the adoption for the different age groups.

- *Degree of decentralization and efficiency of problem solving* was identified as rather low. In the majority of the platforms only the registered users are able to propose an idea on already posted issues, and there are only few projects allowing an anonymous participation.

- The diversity in the ways to express opinions (such as voting, ranking, structuring, mass deliberation, etc.) is low in the majority of the observed communities as they lack the technological solutions for it.

CIPI Evaluation results

- The possibilities for the users to initiate a new topic, aggregate or create knowledge are very limited in many cases, because of the clear leadership of platforms` initiators or managers.

- The level of diversity in the addressed problems, insights and proposed ideas varies from low to medium. With the rare exceptions, the exchanges of information in the civic projects are dominant.

- The Lithuania`s Civic Tech demonstrate a high *Speed of reaction to social issues* (68) and a high *Level of social sensitivity* (52). However, the platforms lack sustainability, visibility and support from cooperating partners and stakeholders.

What are the socio-technological conditions that led the communities to become more intelligent?

- Have to be clearly introduced and easily mastered.
- Have to be designed to pursue specific goals and clearly represent the goals in their design.
- Have to encourage diversity of opinions by providing privacy, anonymity and personal data protection
- Have to allow knowledge accumulation and exchange of information between the participants and outside world with the possibility to reuse the collected data.
- Have to offer solutions for collective decision making, collective problem solving, virtual brainstorming, voting, ranking, etc.
- Special attention has to be paid to gamification technologies and adaption for different age/nationality/digital maturity groups

Which community is collectively intelligent?

- **Continual flow-in of new ideas and knowledge - DIVERSITY**
- Guarantee **anonymity** of participants - **INDEPENDENCE**
- **DECENTRALIZED structure and governance**
- **Synergy based on SWARM EFFECT** (critical mass of usrs)

Which community is collectively intelligent?

- Should contain a **memory system** **that stores information and knowledge‘**
- **Should have the capability of ‘intelligent’ problem-solving**
- Should commonly **exhibit higher-level intelligent capability** than any community member

Threads for digital participation

- Privileged access to community resources, closing up within community
- Increased gap between participating and left-behind
- Discrimination for age, gender, sexual orientation or cultural background, disabilities
- Exclusion because of income, educational level, urban/geographical location, digital competencies level
- Maturity of created content
- Security, privacy, data protection and other legal issues

One of the main risks … in citizen engagement is the danger of engaging only those people who are already engaged in an issue, thereby deepening the gap between those already participating and those left-behind…

The biggest problems

- Not structured opinions
- Not clear problem/advice/ technology
- Maturity of created content (short–form content)
- „Fake news“, spam
- Technological determinism

http://www.youtube.com/v/eakKfY5aHmY?version=3