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Interactivity for e-Health stakeholder empowerment

by mean of expert judgement technique

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E-health

- e-Health instruments have opened more channels for both patient and healthcare professionals in pursuit of common goals of improving patient quality of life.
- However, gained benefits have created a number of problems which are fundamental by their nature and are widely reported internationally.
  - Budgeting issues,
  - legal regulation,
  - data protection,
  - cooperation between stakeholders
  - wider social-economic impact
- These issues could be grounded in social context within society, which may be represented through stakeholder needs and awareness

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e.Health in Lithuania

- The second largest investment into IT in Lithuania
- E-health creation, development and operation is painful
  - Resistance to changes and innovation
- Patients do not feel changes (new quality of improved health services).
- New abilities are required
  - Computer literacy
  - New approach to process management inside health care organization
  - New standards of patient treatment and new standards for time management

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E-health services in Lithuania

- Currently operates 14 e.health services at different level of development completeness:
  - Electronic health records
    - Electronic health records of pregnancy
    - New born baby EHR
  - The on-line sick leave certificate
  - E-testing
  - Image exchange (The *sharing* of medical *images* and clinical data)
  - E-registration
  - E – prescription
  - And others

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Stakeholders needs

- Success of developing new technology-based systems, such as e-Health, largely depends on implementation of fourfold tasks
  - 1) to recognise a diverse pool of stakeholders;
  - 2) to make efforts to unfold their interest and needs;
  - 3) to disclose differences in understanding and accessibility of IT solutions; and
  - 4) to reach the common understanding about added value proposed by e-Health.

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Awareness and readiness to use it

- Willingness of e-health players to contribute to the development process depends, to some extent, on their awareness of functioning processes and understanding that such contributions might be meaningful.
  - Particular service of on-line sick leave certificate is known across 42.8 percent (N = 428) of respondents and used by 44.6 percent (N = 191) of those.
- Such results indicate that despite good availability and penetration of the e-health service, the awareness is still limited.
- This means that data sharing is complicated.

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To make stakeholder voice **readable** for policy makers

- is a long standing goal,
- which could not be solved by hierarchical linear call for stakeholder opinion.

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Research question

- How to approach all diverse stakeholders
  - in the cheapest and quickest possible way
  - with the purpose to empowered them

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Tools for e-cooperation

- Development of various e-cooperation platforms is based on the three access patterns:

discussion forums and the possibility to provide comments.

- provide the space for reading and participation when information and contribution of the user are set out in a chronological manner where information is not otherwise sorted or processed.

search systems

- which by the algorithms **provide relevant information** via software systems. Here the tree principle is applied when information is sorted by the conceptual significance and is presented to the user (Google search).

ideation tools.

- This platform is often used in the collective intelligence systems and is called the Idea Management System.

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Shortages of available tools

- “Flat” discussions are insufficient
  - to reach collective intelligence and generate knowledge.
    - It is attractive for quick exchange of views or information.
    - Unfortunately this doesn’t provide additional information about logical meanings of arguments and significance of ideas.
- The idea management systems are close to the emergence of new knowledge and intelligence,
  - The main shortcoming of the above systems is the need for a manager or intermediary.

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Needs of new mechanisms

- e.g. reflective deliberation tools.
-
- Some attempts:
  - to establish virtual platforms based on the personalised decision support systems.
    - provide additional access to health resources and information sources,
    - give the possibility to users to create health scenarios
    - make individual decisions on disease prevention.

Collective Awareness Platforms (CAPs)

- "Collective" means that the instrument is open for everyone, i.e. is inclusive, and encourages to act together.
  - "Awareness" refers to knowledge management starting from access to information, then approaching different attitudes, assessing expert opinions, creating new ways of thinking and sharing collective understanding.
  - A word "platform" is used as a web-based library of components that can be assembled to generate a design at a particular level of abstraction.

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Collective Awareness Platforms (CAPs)

- CAP is based on the following paradigms:
  - Collective Intelligence (MIT, 2012),
  - Knowledge Management (King, 2009),
  - Stakeholder Theory (Freeman, 1984; Friedman & Miles, 2002),
  - Health Policy Management (WHO, 2007),
  - Behaviour Changes (Franks et al, 2012)
  - Deliberation Analytics (Buckingham et al, 2014)

Collective intelligence

- Collective intelligence (CI) or group/shared intelligence emerges from the collaboration and competition of many individuals.
- The emergence of the collective intelligence is associated with the idea that on certain conditions team decisions might be far more effective and creative than an individual person's decisions.
  - *Diversity*
  - *Formal/informal organisational structure*
  - *Modularization of tasks*
  - *Dense communication structure*
  - *Engagement incentives*
  - *Shared vocabulary and other infrastructure*.
  - *Awareness*
  - *The power of edges*
  - *The power of an ecosystem*

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New attributes for CAP

Visualisations: facilitated by images, photographs, films and other graphical tools.

- shortens the perception time and increases attractiveness of the idea;
- keep the user connected to the system for a longer time.
- help better understand the situation under analysis compared to the pure digital information.
- may lead to errors or undesirable/unforeseeable consequences.

The perception of the whole information technology is a very suitable instrument to perceive the whole more precisely

- to have access to the available information and posts of all platform users,

Idea ratings. most people are likely to evaluate only a tiny fraction of the ideas,

- usually the first ideas get more attention compared to the subsequent ideas.
- also often a disconnection between the voting and the idea evaluation criteria.

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E-health CAP platform: the aim

- The e-health CAP model is based on the life-cycle of an idea where the main object of management is
  - the idea passing through all knowledge management cycles
- The e-health CAP **management model** is
  - a sequence of actions

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Research methodology

Interviews 50

- Findings - the role distribution among stakeholders (initiators, auditor, finishers, managers)

Social network analysis: 44 projects, 50 stakeholders

- No society in the network,

Survey: 1000 users from society; 1000 professional users (IT companies, medical profesionals, managers)

- User profile

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CAP: streams of communiction

- Two compete streams of communication:
  - between experts
  - between other stakeholders,
- The different rules and aggregation of individual stakeholder thinking is incorporate in CAP with the purpose to propose the compete source of knowledge for emergency of collective intelligence

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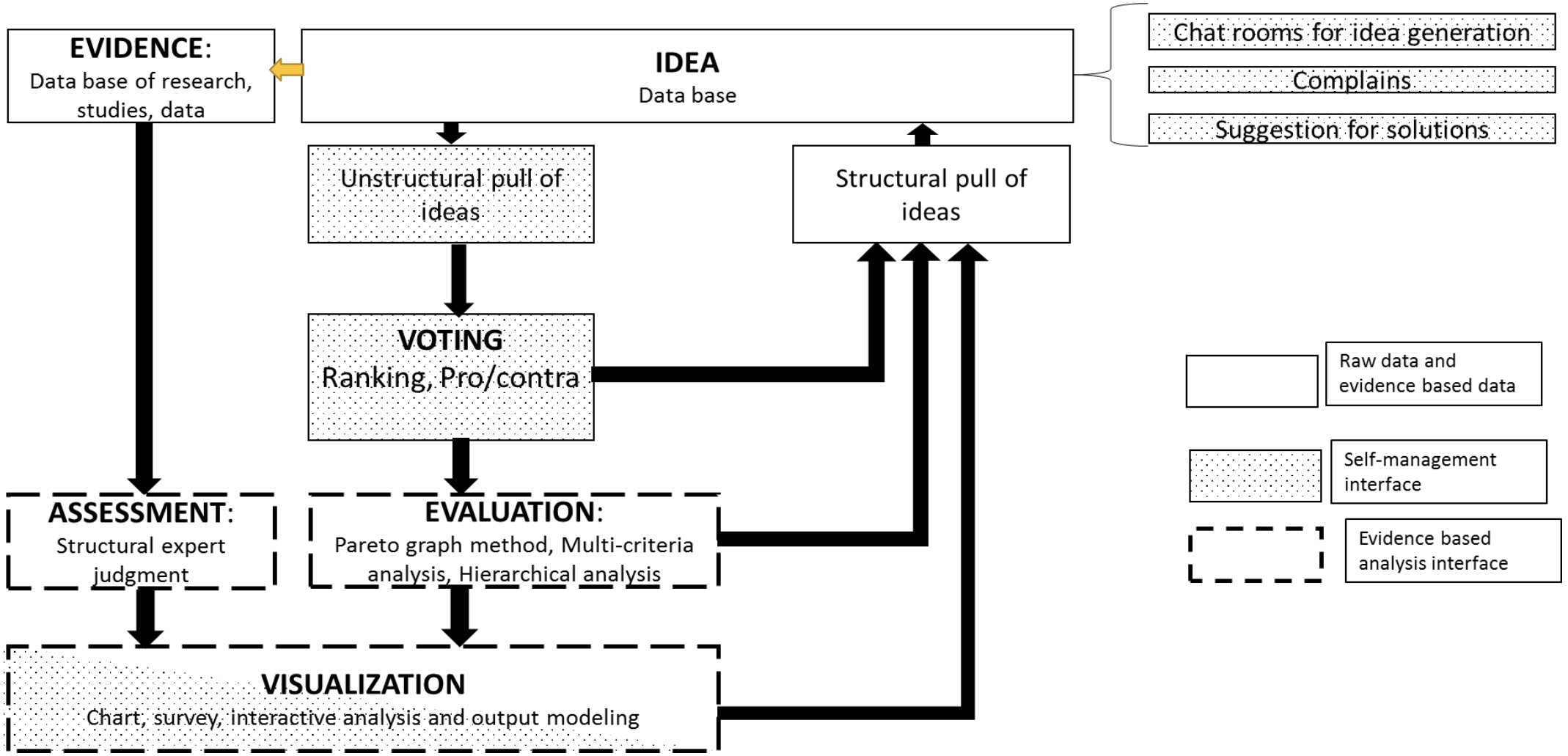
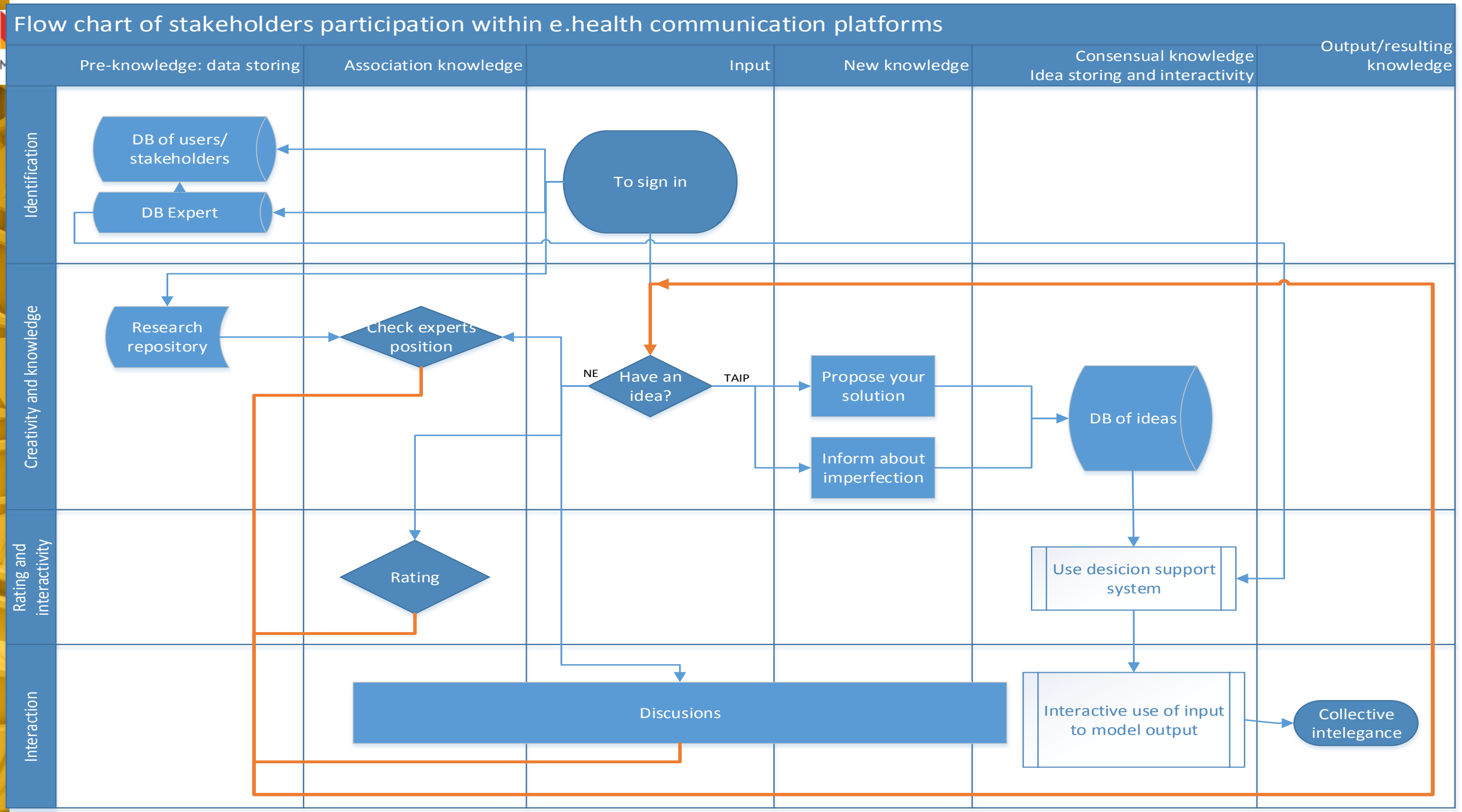
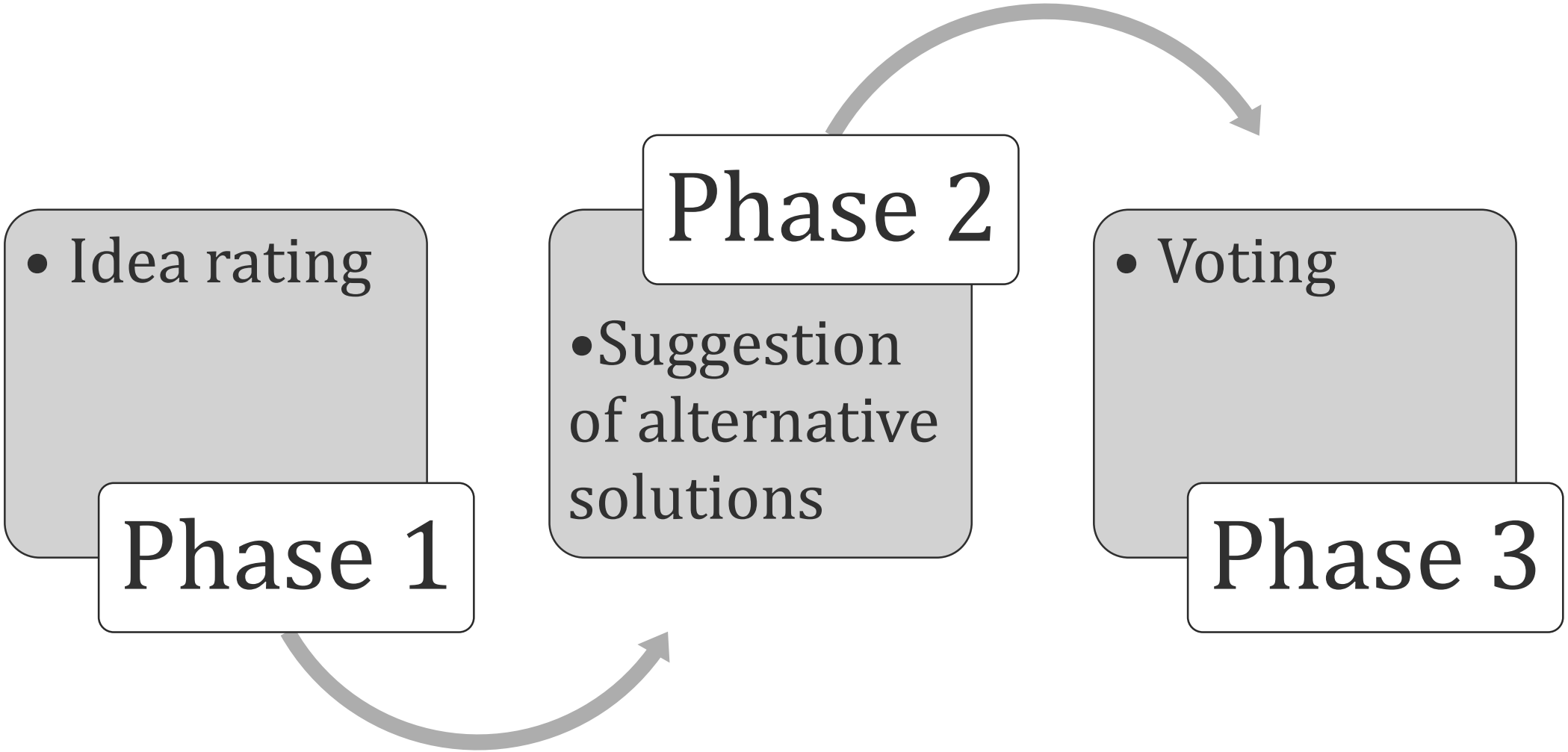
Idea management forE-Health CAP




Flow chart of stakeholders participation within e.health communication platforms
Pre-knowledge: data storing
Association knowledge
Input
New knowledge
Consensual knowledge
Idea storing and interactivity
Output/resulting knowledge
Identification
Creativity and knowledge
Rating and interactivity
Interaction
DB of users/ stakeholders
DB Expert
To sign in
Research repository
Check experts position
NE
Have an idea?
TAIP
Propose your solution
Inform about imperfection
DB of ideas
Rating
Use desicion support system
Discusions
Interactive use of input to model output
Collective intelegance

Testing the e-health platform for stakeholder cooperation

- The e-platform has been piloted by simulating the real platform performance conditions.
  - Two coordinated sessions
    - During conference:
      - Participants: politicians, researchers, nurses, doctors, patients, managers
    - Inside health care organization
      - Participants medical personnel and manaagers)
- The **aim** of piloting the e-health CAP was to test practical significance of the structure and management model of the e-platform


• Idea rating
Phase 1
Phase 2
•Suggestion of alternative solutions
• Voting
Phase 3

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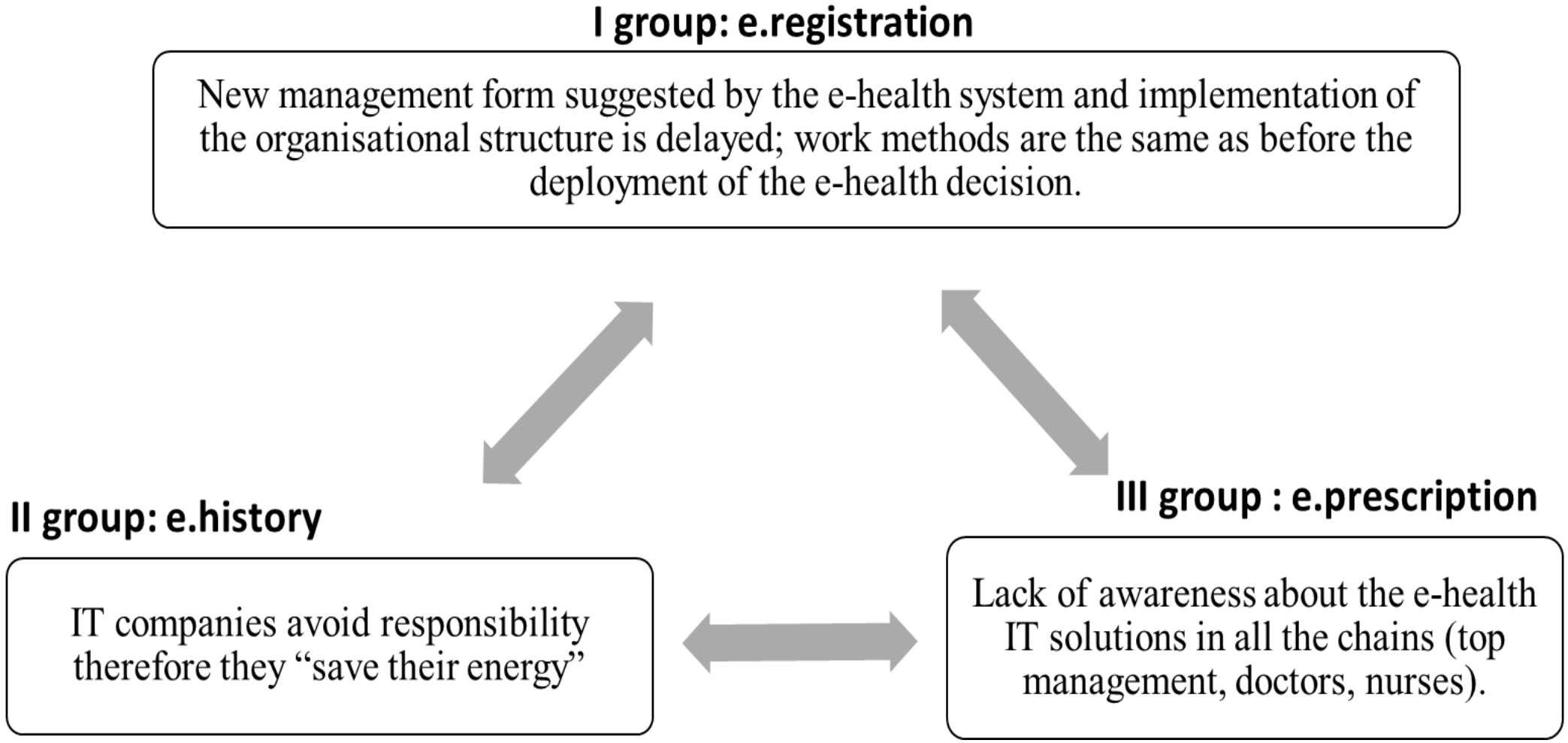
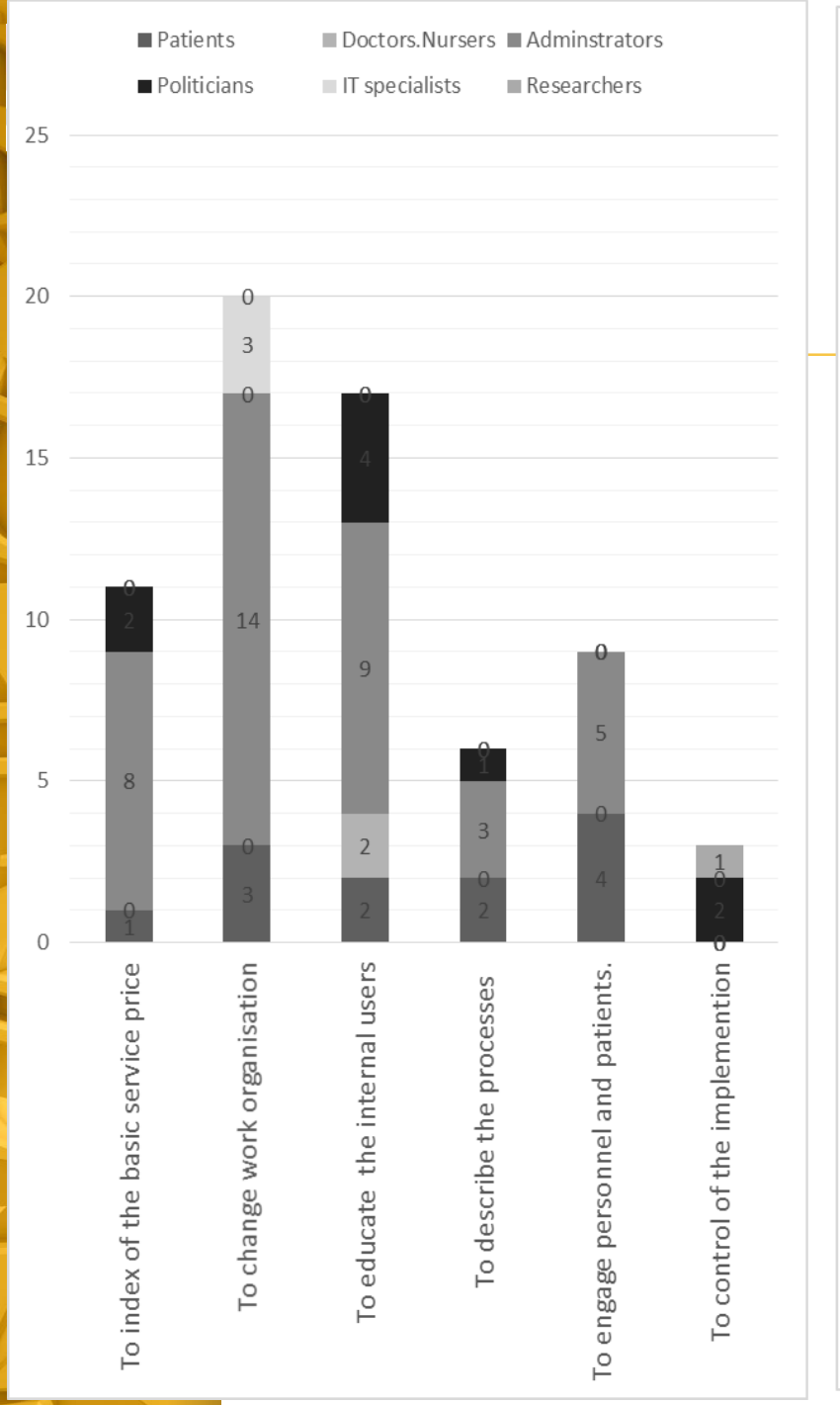
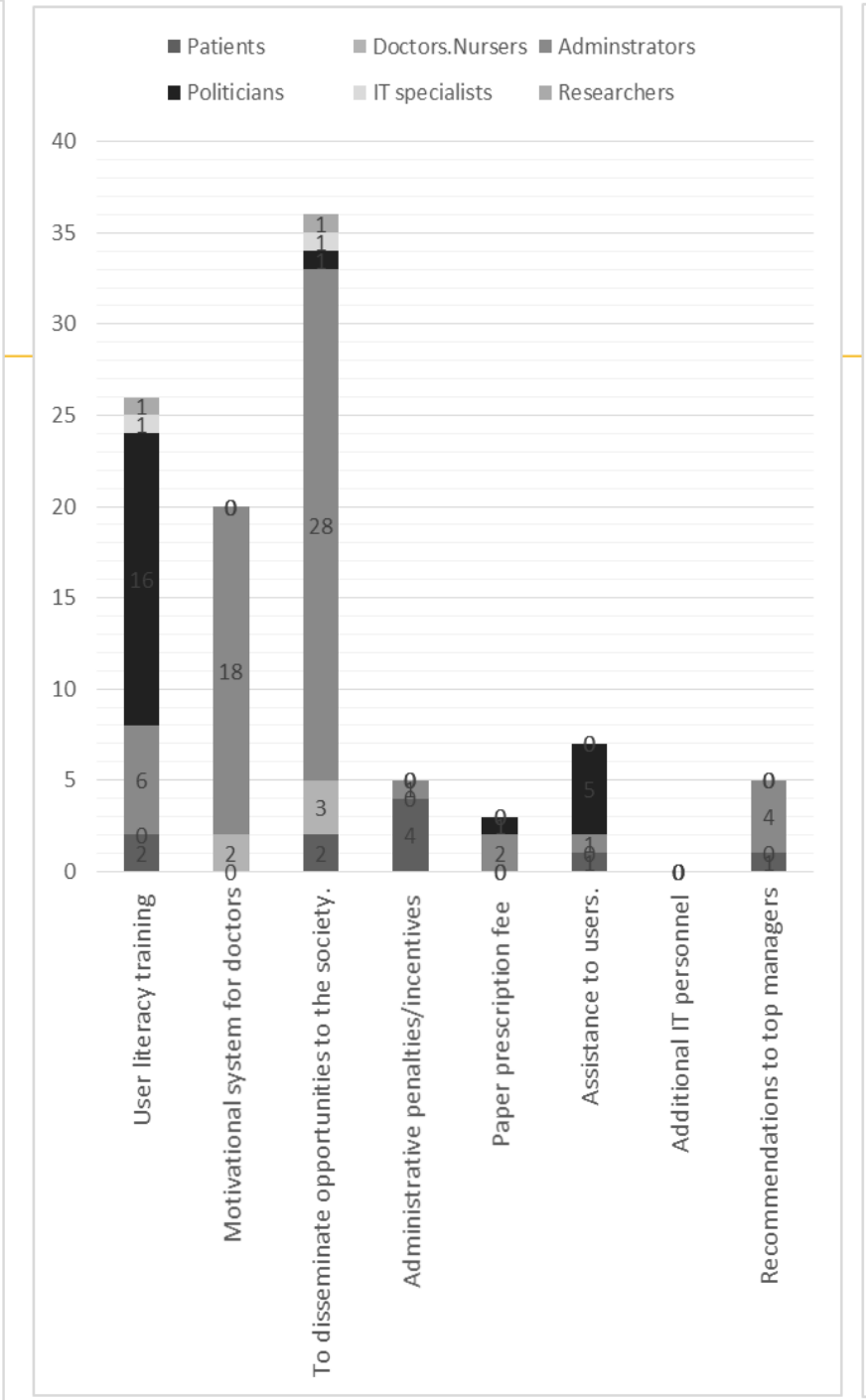
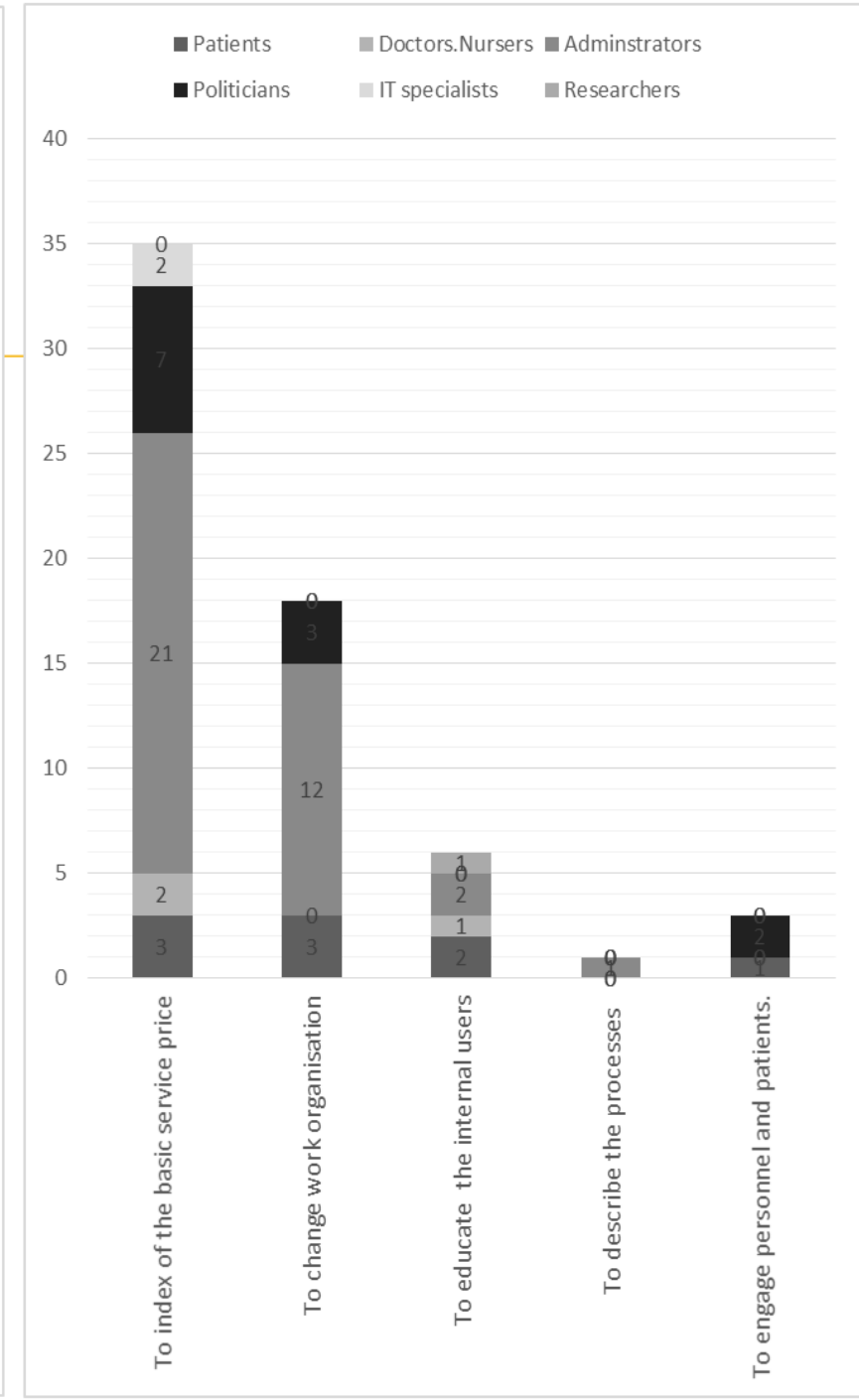



Patients
Doctors.Nursers
Adminstrators
Politicians
IT specialists
Researchers
To index of the basic service price
To change work organisation
To educate the internal users
To describe the processes
To engage personnel and patients.
To control of the implemention


Patients
Doctors.Nursers
Adminstrators
Politicians
IT specialists
Researchers
User literacy training
Motivational system for doctors
To disseminate opportunities to the society.
Administrative penalties/incentives
Paper prescription fee
Assistance to users.
Additional IT personnel
Recommendations to top managers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Conclusions of testing the e-health platform for stakeholder cooperation

- The experiment revealed the necessity of an e-platform.
- During the experiment stakeholders demonstrated that they are informed and have relevant knowledge on the development and problems of e-health system; at the same time they indicated the importance of the information update.
- respondents were glad to be engaged and discuss the problems.
- Voting for the alternative proposals has also revealed the need for engagement and more active participation which could be treated as motivation to develop the e-health system.

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Window for SEJ

- Uncertainties
  - As a natural randomness of a quantity
  - As a lack of knowledge of a quantity.
- List of the source of uncertainties from CAP
  - Stakeholder bias and confrontation
  - Stakeholder preferences
  - Stability and dynamics of stakeholder preferences
  - Different pathways to generate idea and structuralize them

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Window for SEJ

- Benefits from SEJ
  - To formalize expert output
  - To highlight stakeholder bias in front of expert evaluation
  - To face elicitation probability/uncertainties vs preferences
  - Additional pathway to structure ideas
  - To recognize experts from the pool of stakeholders could be as bonus to motivate stakeholders to say tie up to CAP

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e-platform benefits

- The tested e-platform benefits included:
  - Generation of multiple ideas; some of them were unexpected and could not be planned in advance.
  - Ideas emerged from the periphery (the majority of respondents were administrators and doctors/nurses from the chain of intermediaries).
  - Opportunity to switch the roles (to assume not only the executor's role but also the role of an innovator or initiator).

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Conclusions

- IT-based collaboration systems shorten the remote social relations or establish the ties which in real life could never be developed.
- Since the e-health stakeholder CAP is not yet operational, social relations are very rare and remote, and trust is very fragile.
- This was confirmed during the testing procedure.
  - Regulators, i.e. the persons most remote from the experiment participants have been repeatedly identified as the ones at fault for e-health system interferences during all the phases.
  - On the other hand, such a frequency of ideas shows that the community is ready for centralised solutions.

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THANK YOU FOR YOUR ATTENTION

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