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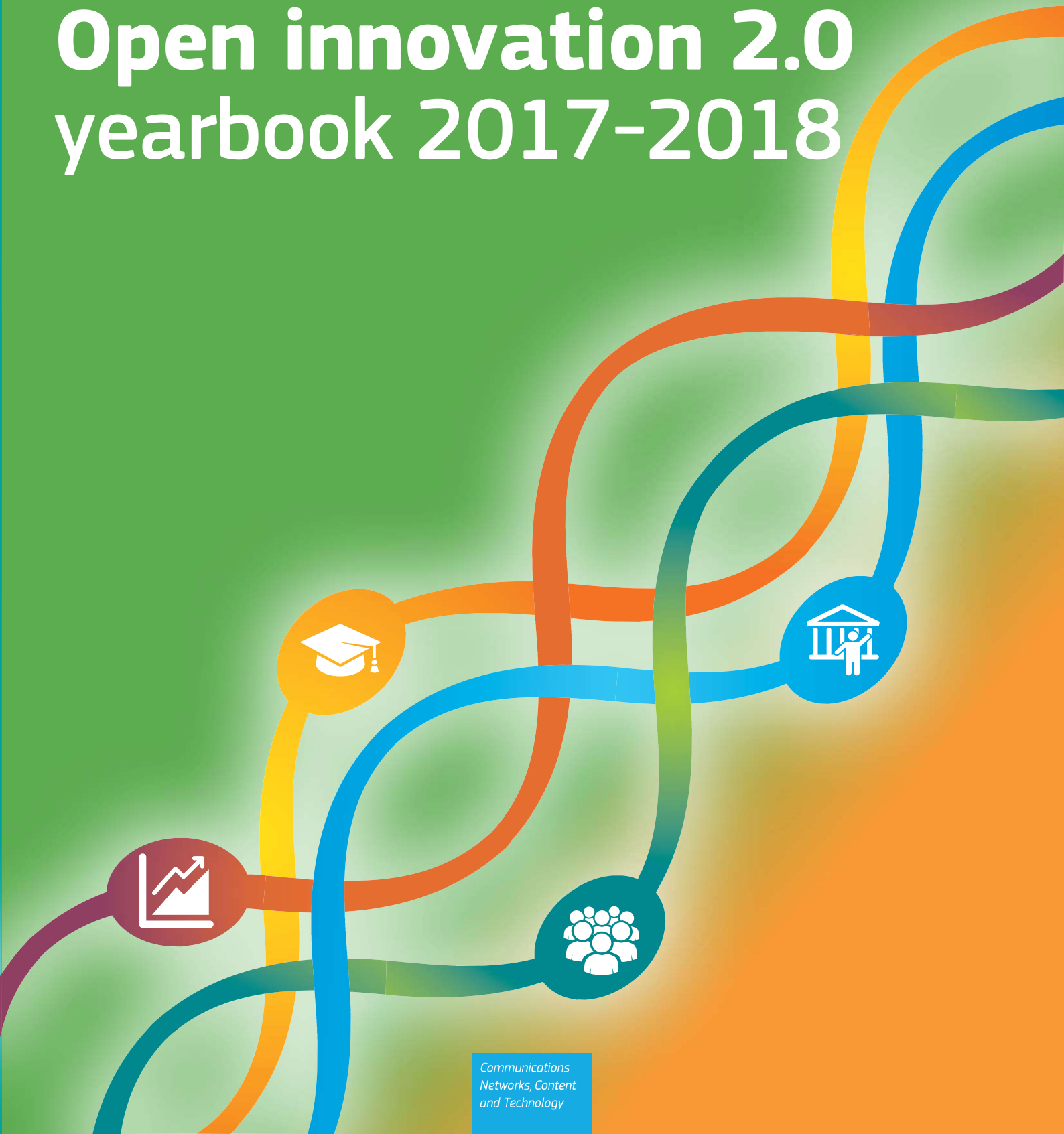
Open innovation 2.0 yearbook 2017-2018



Communications Networks, Content and Technology

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Open innovation 2.0 yearbook 2017-2018

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Contents

Executive summary

The *Open innovation 2.0 yearbook 2017-2018* builds on the experience of open innovation cases already introduced in the previous editions. Open innovation 2.0 (OI2) is gaining momentum and is scaling up in very many domains, as this publication will show.

We provide new perspectives on open innovation ecosystems. How to build and run them from the process and skills perspective is of great importance when scaling up open innovation 2.0.

Innovation measurement and modelling are topics we deal with as well, as it is important to understand the impact of the OI2 approach compared to traditional innovation patterns.

The yearbook is divided into four thematic chapters to help the reader to find the relevant content more easily.

In the first section on 'Making open innovation 2.0 operational' we introduce new functional modes necessary for the creation and take-up of open innovation ecosystems. The article by **Salmelin** highlights the importance of new professions in the dynamic processes necessary at ecosystem level. These new professions integrate the various quadruple helix players and make the innovation ecosystem inclusive, along with delivering results for the commonly agreed objectives. Together with industry, academic institutions are in key positions to create the curricula for these new professions.

In his article, **Curley** brings forward the pattern language he has worked on, making the use of open innovation 2.0 easier and more systemic. The dependencies/patterns are very clear, and if brought into the canvas of open innovation 2.0 they can contribute to the definition of a holistic approach.

Cuartielles et al bring innovation, and especially innovator discovery, forward. The Innovation Radar tool can be used to identify innovators in ecosystems, in turn facilitating the composition of winning teams around selected themes. The article describes several cases, the most well-known of which may be Arduino, the company that also received the Innovation Luminary Award in 2017.

In the article by **Edvinsson et al** the concept of modern innovation and learning spaces builds on more than 20 years of thinking on future centres, a movement that has seen worldwide growth. Examples of these spaces and their development into rich, stimulating spaces are illustrated by O-spaces, where O represents both ozone and optimism. Creativity requires new thinking in designing innovation spaces as part of open innovation 2.0 ecosystems. The article highlights several critical success factors for creative spaces and the processes within.

In 'e-Platforms' we have several interesting articles. One can see the platforms together building a foundation for common approaches, which will be set out through the work of the Open Innovation Strategy and Policy Group.

The first paper in this section, by **Kwakkel et al** describes a successful project environment which creates a strong underlying platform for sociotechnical interconnectivity. The Accomplissh project brings societal, cultural and economic aspects into innovation performance, providing clear indicators on how impactful projects need to be designed following the open innovation 2.0 approach. The article combines theoretical with practical experimental approaches and provides a better understanding of impactful ways of designing actions.

Knowledge management is an issue for open innovation application. In their article, **Berbenni-Rehm et al** explain their systemic approach to classifying knowledge for effective knowledge sharing. The approach is based on a modular structure developed in the PROMIS project. Interesting areas of take-up are identified, as the method can be used not only to find and share knowledge, but also to build teams based on competencies, very much in the spirit of open innovation 2.0.

Aarnio describes a systemic approach on how to apply open innovation in the medical field. He identifies two gaps where open innovation and the communities approach can significantly improve the success rate and take-up of innovation. The innovation gap is in finding the right competencies to bring forward solutions, and the take-up gap is to be covered by experimentation in the real world, i.e. having the right stakeholders and decision-makers involved in the process. The practical role of procurers in the health sector is obvious. The medical area is developing very interestingly to also include

devices for user communities to find out more and to co-create personalised services, which complements the strongly regulated professional aspects of this field. He introduces communities of practice as an important tool for the innovation flow.

Rubalcalba et al propose a powerful tool to describe the interrelations in functional open innovation ecosystems. Using this tool it is easy to visualise the complexity and the dynamics of such ecosystems over time. Combining this approach with others to find missing competencies can be a relevant opening for better dynamic resource management in larger innovation ecosystems.

In the section on 'Regions and cities' there are two articles.

The paper from **Valkenburg et al** focuses on co-creating smart cities in quadruple helix settings. The case of Eindhoven moving from triple helix to quadruple helix has been described before in our series of OI2 yearbooks. In this edition we see deeper guidance, based on best practice, on how to get citizens engaged, and on what that engagement means for open innovation ecosystems, including for the public sector and industry participants.

The paper by **Cakir** addresses the regional aspect in depth. How can we expand from well-functioning innovation hubs, for example living labs scaling the activity, to regions where not all the same possibilities to operate exist?

The 'Industry and transformation' section has interesting conceptual articles, but also very practical ones, describing key transformative factors that quadruple helix players need to take into consideration.

In the article by **Casprini et al** the transition process from open innovation to open innovation 2.0 is described in a systemic manner. The aspects to be taken into account reflecting the required new mindset for OI2 are very thoroughly described: a must-read for OI2 practitioners. The recommendations are based on Euripidis project findings and also tackle the structural and behavioural changes organisations need to face when moving to OI2.

The article by **Turkama et al** provides an interesting overview of open innovation, open innovation 2.0 and the pathways forward. It analyses and structures the drivers and added value of OI2 to all stakeholders in a very balanced and analytical manner, based on which clear recommendations on how and where to best apply open innovation can be formulated. The authors propose three dimensions where the traditional principles and processes of open innovation could provide significant contributions in the future.

The article by **Kune et al** reflects the current development of open innovation 2.0 and challenges the slow take-up. The changes in mindset from OI to OI2 seem to be a significant organisational barrier as the ecosystem practice in the spirit of OI2 is not yet fully in place. The article addresses how to engage the stakeholders in the new paradigm and what the new approach can create as added value for all of them.

The article by **Tanaka** describes the Japanese approach to things and systems (related to the Internet of Things) in the perspective of open innovation 2.0. It explains the rationale and also some very practical approaches to how the concept is implemented. The article highlights the collaborative role of industry and policymakers in the transition of Japanese industry, also leading to the use of OI2 principles in practice.

The article by **Sargsyan** tackles changes due to use of big data and opens new perspectives on how to interlink open data with new business models. Open data (stemming from both big data and little data), i.e. that kind of data which are very operational and highly context sensitive, need to be seen as complementary in the industry commons context.

The bonus article by **Hubavenska** illustrates how communication interlinked with open engagement platforms is crucial for continuous development of open innovation ecosystems. Besides new professions to build and run the ecosystems, continuous value needs to be created for all players to keep them actively contributing to the common goal.

We hope that, as the previous editions (which can be found at https://ec.europa.eu/digital-single-market/open-innovation-strategy-and-policy-group) already published, the *Open innovation 2.0 yearbook 2017-2018* can provide inspiring and useful reading on how open innovation 2.0 can be successfully taken on board and be fully integrated into strategies for open innovation ecosystems.

Article 8

Novel ways to structure, manage, communicate, reuse and capitalise on multilingual knowledge in an integrated way

Systemic open innovation requires creativity
Creativity is born out of needs
Needs are satisfied through knowledge
Knowledge requires structure
Structure asks for teamwork
Teamwork needs interdisciplinarity
Interdisciplinarity flourishes through communication
Communication requires the will to succeed
Will to succeed asks for creativity
Creativity generates systemic open innovation

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Introduction

Everything that we do in life is connected with data, information, knowledge and wisdom. This is the most valuable intangible human asset because it encompasses history, traditions, cultures and explicit knowledge, and also more and more tacit knowledge thanks also to social media.

This sounds good, but such a valuable asset and capital is very fragmented, lies in 'cemeteries of information' and is not used because it still lacks the structure, methods and instruments needed to filter and offer them in a way that brings tangible benefits to the users.

The problems we are facing nowadays at the global level are: (i) a lack of interactive communication and common understanding that make human knowledge and wisdom available at international level; and (ii) the ability to recognise in a short time the value, or non-value, of the enormous amount of data and information we are confronted with.

The more new technologies gather data and information on a large scale, the more we are confronted with our limited capability to recognise the difference between the essential, the necessary and the nice-to-have of data and information.

Socioeconomic value of the e-platform

When we started developing what has become the PROMIS® e-platform [1] we were seeking solutions to a European socioeconomic problem: to help 23 million European micro, small and medium-sized businesses (SMEs), from all different sectors, to be compliant with norms and legal requirements at national and European level in the fields of environment, safety and health, and quality. At that time, in the year 2000, it was a real challenge because these three domains did not even want to talk to each other, and technology was not mature enough to answer the needs and requirements of European SMEs.

We had to first understand the multisectoral, multilayered, multinational and multilingual requirements of the users in order to address the problem in an appropriate and sustainable way. The major challenge here was to simplify complexity from an 'eagle's eye' perspective, meaning that we first mapped the overall situation, analysing and understanding the status quo in a comprehensive way.

To simplify complexity, we first created three new frameworks for structuring and filtering information.

- **The knowledge pyramid** from generic to sector, theme and domain oriented. 1st level
- **myPROMIS®** from generic to process oriented, integrated management system framework, tailored to the structure of an organisation. 2nd level
- **Individual workplace/dashboard** - answer of users' questions at one's finger tips. 3rd level

As a business-enabling open innovation, the PROMIS® e-platform at present organises and tailors

integrated process management, legislation, learning, training and community building, and helps to capture structure and interlink all relevant information. It supports knowledge structuring and sharing, multilingual online collaboration and communication, communities of knowledge, e-mentoring and the generation of additional services out of the knowledge and content available in an organisation.

From software to brainware

Everything that we have done in the last few years, and will continue to do, revolves around open innovation and the circular economy of knowledge from a practice-oriented and human-centred perspective, which was defined as follows: (i) structuring knowledge; (ii) sharing knowledge; (iii) valuing protected knowledge (intellectual property rights (IPRs)); (iv) communicating knowledge; (v) managing knowledge; (vi) reusing knowledge; (vii) capitalising knowledge.

The result is a cloud/software-as-a-service and intranet e-platform of interactive services that allows organisations and institutions to find their way in the maze of legal standards, norms and other regulations to which they are submitted and, at the same time, to structure their processes and knowledge in a way that results in improved access to customers, better relations with regulatory authorities and financial institutions, faster and easier certification, smoother audits, improved operations and significant cost reductions.

With the integrated management system myPROMIS® the processes of an organisation are described, steered and linked to all company-relevant data, documents, tasks, people, infrastructure, materials, processes, etc. In this way the e-platform brings order and transparency, reduces risks and creates the conditions for a process of continuous improvement in different types of organisations.

The knowledge management system and approach has two directions: one business oriented and the other education and training oriented. This approach aims at supporting the creation of alliances between institutional and private stakeholders. The most important advantage of the knowledge pyramid is that the information can be translated automatically into different languages. Having learning material in their respective native language represents an important motivational tool to all users [2].

The e-platform of platforms

The core of the PROMIS® e-platform is a meta-layer generic integrated management system framework which gathers all relevant existing data from the operative systems that are available in an organisation and, at present, are mostly non-connected islands or silos.

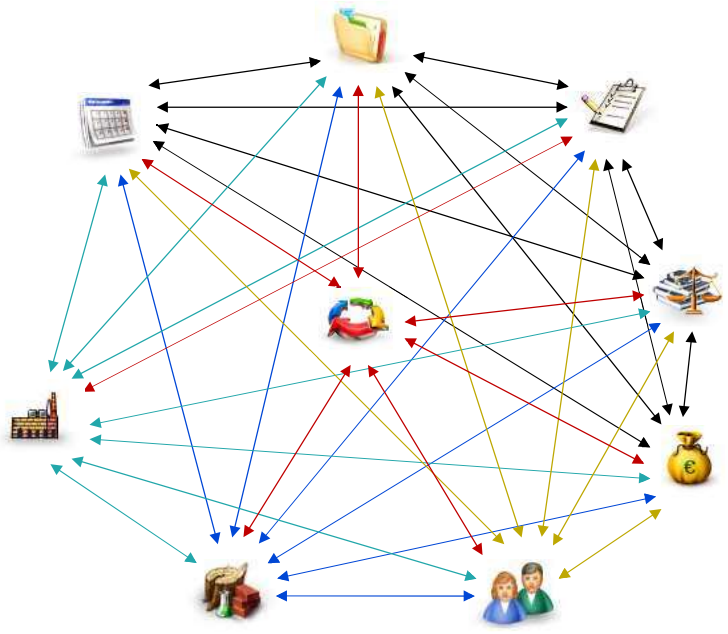
This generic integrated management system framework pursues a holistic, comprehensive approach linking all elements, objects and processes in a way that creates synergies, avoids redundancies, optimises economic value and achieves order and transparency. It controls the legal and normative requirements of an organisation into a single compliance-management system. In contrast to the operational enterprise resource planning systems with which the financial, physical and human resources are controlled, the PROMIS® core-component integrated management system manages the regulatory requirements that are necessary to comply with norms, standards and other legal requirements.

The possibility to link all individual containers with each other allows the creation of a data network that is a logical 'closed loop' in itself and is self-sustaining. Automated processes and procedures support a resource-saving maintenance of the PROMIS® integrated management system for any type and scale of organisation.

The knowledge within the organisation concerning 'how?', 'why?' and 'what are the rules?' is structured and made available to all managers and employees individually, in a task-related implementation and on a need-to-know basis so that all relevant requirements become transparent and are steered through the organisation to an easily accessed resource (Figure 1).

PROMIS® is an 'e-platform of platforms'. In addition to connecting organisations' systems at the operational level, it interlinks different types of stakeholder such as affiliates, institutions, regions and governments.

Figure 1:
Methodological Foundation (© 2000) — interlinking dependencies



The e-platform is available in nine languages and contains multilingual tools for both human and machine translation which allow the users to work in their mother tongue and to communicate online in all languages with the right to select the preferred machine translation.

The methodology is based on a system of order, in which all relevant knowledge and information related to the individual business processes and their derivatives are collected and maintained electronically, in a centralised form and free of redundancies, as much as reasonably possible.

It is also based on standardised reference models submitted for validation by neutral and independent organisations, and it is based on the collective experience and talent of the experts' community. The shared knowledge and innovations collaboratively developed by the community are continuously improved through the adoption of an evidence-based model of knowledge management [1].

This novel type of e-platform is now a multinational, multilingual and multi-client-enabled framework supporting multilingual integrated compliance and with online interactive collaboration between small and large organisations, experts, scientists and interested parties (e.g. suppliers, public authorities, banks). It is a generic framework to build and offer interactive services with sector- and theme-oriented turnkey solutions for organisations in Europe and beyond, with a high level of trust and confidence based on security, highly qualified, trusted community building and offering a balanced regulatory framework with clear rights regimes. Finally, its four innovative business models offer adequate protection and remuneration for rights holders.

Major components that build the systemic open innovation in PROMIS®

The e-platform consists of 79 modules in HTML5 and 2.0 technologies that allow the following.

All-in-one integrated compliance and governance

Instead of having 'islands' of different solutions in an organisation, PROMIS® offers a meta platform which collects all relevant data existing in an organisation and links all elements, objects and processes in a way that the users achieve great transparency and order. All norms and standards are available to all employees at their fingertips whenever and wherever needed, for example Occupational Safety and Health Administration 18000 (health and safety), International Organisation for Standardisation (ISO) 9000 (quality), ISO 14000 (environment), ISO 26000 (corporate social responsibility), ISO 27000 (ICT security), ISO 29990 (education), ISO 31000 (risk management), ISO 45000 (maintenance), ISO 50000 (energy), financial compliance and more.

Health and safety life cycle

Available at present: (i) current legislation; (ii) risk assessments (with stored standard catalogues); (iii) self-generated operating instructions; (iv) complete compulsory instruction and training scheduler; (v) accident report and statistics; (vi) medical check; (vii) competence, skills and training management; (viii) process descriptions and procedure instructions following related norms and standards; (ix) risk assessments (traffic light and Kinney methods); (x) responsibility matrix.

Life cycle of continuous improvement and reuse/capitalisation of knowledge

The toolbox allows the creation, administration, sharing and selling of additional services generated from the knowledge and content existing in an organisation.

The tools available at present are: (i) generator of multilingual questionnaires, surveys and tests; (ii) generator of knowledge pyramids/polyhedrons and 3D knowledge arrays; (iii) integrated management system templates; (iv) content management system; (v) report generator; (vi) report builder; (vii) administration of services and related members/clients/affiliates.

Communities of knowledge

Scientists, experts, managers, students and citizens can structure their knowledge and experience, then share/sell it in the desired language. In the past, offering content was perceived as a service consisting of pre-structured, static information. Now society and the market require that the systems allow users' knowledge to adapt and also 'customise' content to their specific needs and according to their own explicit and tacit knowledge. A clear structure was needed to establish communities founded on a collaborative model. This model is based on the concept of collaborative working environments and community building, which treats the collective wisdom and exchange of experience between public and private bodies, experts and their SME customers, and associations and their members as societal assets or 'common goods'. 'Common goods' are a kind of social capital that can be leveraged many times to both harmonise and improve the level of competitiveness and the quality of life [3].

The knowledge pyramids are produced by all those who are knowledge providers and are selected by/connected with those who learn from that knowledge, i.e. knowledge consumers.

In the knowledge pyramid the information can be structured using multilevel, vertical and horizontal

approaches. In such a way SMEs, enterprises, experts, associations and/or institutions can structure their knowledge in specific sectors, fields or domains into one or more knowledge pyramids. Afterwards, the content of the knowledge pyramid can easily be linked to a management system and directly connected to the relevant personnel and/or learners in a secure and protected way, also allowing communication and collaboration in different languages.

In addition to supporting the structure of multilingual information and knowledge, the pyramid is accepted more and more as an instrument to register and protect IPRs, also thanks to the innovative business model connected with it.

Multilingual communication
PROMIS® allows users to work in their mother tongue and to communicate online in all languages with the right to select their preferred machine translation.

Collaboration and online working
The e-platform is multi-client enabled, allowing the solution to be set up once and then copied to as many members/clients/affiliates as needed. Remote access is guaranteed and allows continual online work, collaboration and communication.

E-competence, e-skills
PROMIS® acts as a matchmaker between the competences of the personnel and the competences required by machines (e.g. servers or power engine), materials (e.g. toner or dangerous substance), etc. This is very important, in order, among other things, to support evidence-based compliance and to decrease risks.

E-training and e-learning
When someone's competence has expired the e-platform automatically sends them to the training module, where a trainer can generate training courses linking to external resources and/or reusing the knowledge and materials available in the organisation.

E-mentoring
When a person leaves an organisation, most valuable knowledge goes away with the person. With PROMIS® and the e-mentoring modules this knowledge is brought back into the organisation and provided in real time to the younger generation that has replaced the seasoned person who left.

Using this open innovation e-platform, dedicated information is made accessible to the learners in an interactive collaboration and e-mentoring mode, which improves the level of knowledge quickly and effectively while respecting individual knowledge ownership and methods (IPRs).

Standardisation

A business-enabling e-platform that brings novel methodologies, tools and business models inevitably also generates new terminologies, new professions and therefore new opportunities for qualification. In the case of PROMIS® the following two standardisations have been generated.

- CEN-CWA 16275 — 'Guidelines for the selection of consultants advising SMEs on integrated quality, environment, health and safety management systems' was developed by the consortium's partners during the deployPROMIS® project [4] and is now a widely required guideline for qualification worldwide (https://www.promis.eu/eu/wp-content/themes/promis/custom-2/files/CEN_CWA_16275_March_2011_FINAL.pdf).

- The 'Terminology policy to support generic applications of management systems with focus on smaller organisations in a multilingual environment' started during the PROMISLingua project [5].

Multilingualism
PROMIS® is currently in nine languages (graphical user interfaces, platform and structural content).

The implementation of multilingualism was accomplished by merging the multilingual workflow with the application management workflow in the following way: (i) integration, a key success factor because language technology has to fit seamlessly into integrated management systems. Natural language support is provided in two areas: (ii) tools for multilingual human translation; and (iii) tools for machine translation, including the collection of multilingual resources.

The tools must be flexible, adaptable to different configurations of languages and domains. This refers to the following integrated tools: (i) tools for content translation and localisation of the e-platform into different languages; (ii) tools for corpus analysis, sentential alignment, terminology extraction and machine translation; (iii) cross-lingual information retrieval and text-to-speech, including support for user query formulation, query expansion, synonym recognition, spelling correction, query translation into the document language(s) and support for document retranslation into the user's language.

The translation components are considered a quality assurance and productivity tool for humans, not a replacement [5].

When the content is structured in the e-platform, users can first select a preferred machine translation and then translate the content, in all languages allowed by the machine translation. As this happens in a secure and closed environment the e-platform allows the translation of case-sensitive content.

Business models and e-shop
The e-shop supports the sharing and/or selling of self-generated content and services (internal and external).

The four business models of PROMIS® are built upon what we believe is open innovation's mission:

- human-centred methodology and technology;
- respect for individual tacit knowledge and recognition of IPRs;
- clear definition between free-of-charge and paid-for content;
- clear and well-defined rules, duties and rights;
- collaborative community-based approach;
- communicate in different languages but always speaking the mother tongue.

And in this context of open innovation, ecosystem services are meant to:

- be multilingual, i.e. support communication and common understanding;
- structure and value existing, though non-structured, knowledge (internal and external);
- be interactive, i.e. support online working and collaboration;
- offer a high cost–benefit ratio and large economies of scale;
- embrace the whole of the ecosystem's life cycle; and
- support the process of continuous improvement.

The most important pillars of our business models are as follows.

Respect for tacit knowledge. A new paradigm of offering information to the users/customers. No longer offering content in a pre-structured way but valuing individual knowledge as intangible capital and building upon the fact that scientists, managers, experts and associations know best the needs of their customers, students and members. They are therefore well placed to do the job of structuring their existing content and knowledge; to link them to the common processes in an organisation; and to create turnkey sector solutions that can be offered as an innovative service to their clients and members. Industry, institutions, universities and associations have the opportunity to reuse and structure their existing content, data and expertise in the knowledge pyramids, as well as in the integrated management system, thus preparing turnkey sector solutions in such a way that their knowledge is offered to SME users at their fingertips and in full respect of their IPRs [3].

Win-win collaboration supporting public–private partnerships. Allows organisations to use cost-free content directly from institutions that are the owners of such knowledge and keep the responsibility for the quality, correctness and update of their content. In addition, thanks to the integrated management system, the content is brought to the employees with the logo and the look and feel of the institution/university/enterprise that provides the content.

'Industrialising knowledge'. I.e. do a good job once and sell/share it thousands of times.

After quality assurance and the signature of contracts covering the IPRs, as well as rights and duties, the knowledge pyramid and template solutions are offered to the communities via the e-shop and in the language-related countries. The content providers of the structured knowledge pyramids (scientists, experts/consultants, individuals, SMEs, institutions, associations, etc.) remain the owners of their knowledge and of other self-generated services (e.g. questionnaires, templates, files, e-training courses). Such services can be shared for free (e.g. among institutions, associations, chambers of commerce for their SMEs) or can be provided as a subscription service.

The services offered by this e-platform not only respond to private and public SME organisations' steadily increasing requirements and needs from different types of regulations, norms and quality performance standards at local, national and international levels; they also respond to the increasing needs of harmonisation, cross-lingual communication, collaboration and participation that European private and public organisations are experiencing in their natural cross-border market in Europe and beyond.

This e-platform provides the answer to major requirements of the digital agenda 2020, and in a digital single market that is still very fragmented PROMIS® will be a decisive ICT framework to enhance the competitiveness of European organisations and allow them to unleash their potential [5].

Systemic open innovation in PROMIS®: from theory to practice

The understanding of Bror Salmelin's spirit of open innovation refers to the fact that:
In the European context, open innovation is now used as a synonym for modern, highly dynamic and interactive processes … This new innovation culture leads to simultaneous technological and societal innovation and encouragement. We need

to be daring and also experiment with disruptive approaches as gradual improvement does not properly reflect the potential that the omnipresent, fast-developing ICT provides for parallel innovations. [7].

In our context **systemic open innovation** embraces all of the bits and pieces that interconnect knowledge on the journey from the theory to practice, and means going from a mere technology- and only money-driven society to:

human-centred politics *, human-centred security *, human-centred technology where the human person is core

Considering this as essential, the understanding of open innovation from the side of the PROMIS® community is based upon the following strategic framework.

During the 'Eighth European Innovation Summit — Future Now!', organised by Knowledge4Innovation, which took place at the European Parliament on 14-17 November 2016 in Brussels [8], the results of well-administered European Commission funding and successfully deployed knowledge-intensive interactive services for systemic open innovation were discussed during a 1.5-hour round table, using the example of two practice-oriented international pilot projects presented by their decision-makers: (i) Global Crisis and

Figure 2: Open innovation strategic framework

Disaster Resilience (Figure 2); and (ii) the WePROMIS® e-mentoring pledge to the Grand Coalition for Digital Jobs [9].

Hosted by the Member of the European Parliament Lambert van Nistelrooij with the participation of Bror Salmelin (DG Communications Networks, Content and Technology), Bernd Reichert (DG Research and Innovation/Executive Agency for Small and Medium-sized Enterprises) and Caterina Berbenni Rehm (CEO of PROMIS@Service and International Coordination of Deukomm). The global crisis and disaster resilience framework was represented by Ing. Albrecht Broemme (President of the German Federal Agency for Technical Relief) and Colonel Marc Mamer, Treasurer of the International Association of Fire and Rescue Service and President of the Fire Brigade Federation of the Grand-Duchy of Luxembourg. The WePROMIS® e-mentoring pledge was represented by Marie-Anne Delahaut, President of the Millennia2025 Women and Innovation Foundation.

Global crises and disaster resilience

This strategic programme aims at developing opportunities for goal-oriented coordination between operating institutions across Europe and around the world towards a uniform global approach to the prevention and management of global crises and disasters based on an algorithmic description of the sequence of events in the chain of cause and effect [10].

The call of the Tübingen Declaration of 8 July 2014 for unrestricted and uncensored dialogue between people everywhere [10] serves as the basis. Priority is given to the personal security and safety of people against all forms of violent threat.

Figure 3: *Source:* www.promis.eu

To realise this, open innovation interactive and multilingual services [11] have been developed with the support of the European Commission and will be the starting point to promote global communication and to facilitate conformity with legislation by:

- offering multilingual support, largely to avoid serious mistranslations;
- maintaining conformity with legislation and promoting evidence-based decisions;
- a multimodal, learning and multilayered knowledge and expert system (ecosystem) with high reliability and security by means of robust rights management that allows user-defined access to information with various levels of privacy;
- standardising terminology to promote mutual understanding and trust;
- implementing knowledge transfer between generations (e-mentoring).

Embedded in this programme is the MultiUniversus framework, already developed by a Capuchin friar [12], for implementing medium- and long-term strategies over the next 80-100 years and promoting dialogue between cultures and religions objectively and with clear goals in mind. This incorporates natural and social sciences. In an effort to promote social and cultural development, MultiUniversus focuses on the improvement of standards in the areas of each citizen's personal security, health, environmental protection, education, learning, culture and socioeconomic well-being.

The implementation of and communications within the global network is based upon the e-platform that supports future-oriented worldwide alliances through multilingual communication, along with clearly defined and harmonised rules, obligations and rights.

WePROMIS® — e-mentoring pledge to the Grand Coalition for Digital Jobs

The Millennia2025 Women and Innovation Foundation [13], a Unesco consulting partner, is a community of international voluntary researchers with 10 694 members in 137 countries. Its key values are equality between women and men, the respect of rights and diversity, the development of human capital and digital solidarity through e-skills, knowledge, communication and support with those who cannot access communications tools and who are nevertheless drivers of changes. The objective is to structure science, technology, engineering and mathematics scientists and other knowledge-supporting citizens, business start-ups, employees and students in building communities of knowledge and e-mentoring between the mentors (science, technology, engineering and mathematics scientists, corporate business leaders) and mentees (citizens, students, employees) at the international level. The Millennia2025 Intelligence Platform powered by PROMIS® [14] is developing e-skills to help mentors and mentees in the following areas.

Learning:
- how to structure knowledge and share it worldwide in any relevant topic, theme and domain;
- new skills by communicating directly with the mentors selected in the Millennia2025 community.

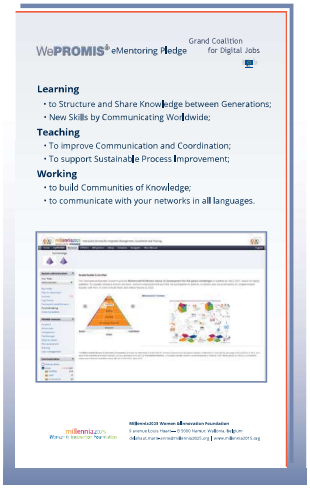
Teaching:
- how to structure and publish courses, lessons and online training with a high level of quality;
- how to improve internal communication and coordination throughout organisations and networks;
- how to support sustainable process improvement.

Working:
- to build communities of knowledge and contribute to equality between women and men and to women's empowerment;
- to create multilingual questionnaires and surveys to optimise research, user needs and market analysis;
- to communicate with your networks in all languages.

Conclusion

Innovation in Europe is still neither open minded nor on a 'fast track', because 'small tracks' are not enough to find fast solutions to big challenges. There is an important chance for Europe to open highways in order to find better solutions on a 'fast track'.

Figure 4: E-mentoring pledge



To achieve this, human factors based on human-centred security and human-centred politics are key to complementing the existing human-centred technology, because international challenges can only be faced and solved on a global level with: (i) worldwide communication and common understanding; (ii) intercultural and cross-cultural dialogue; (iii) knowledge transfer between seasoned and younger generations; (iv) communities of knowledge, where respect for tacit knowledge and recognition of intellectual property is key to developing structured intellectual capital.

However, it is not only about communications, as the processes are much more complicated than that. We need collaborative environments because of the complexity of the issues and their interdependence. And communication needs to lead to dialogue for understanding. As a consequence the trust-building process (by doing things together towards one common goal) in these collaborative environments is key to scaling up or failing [7].

We are all willing to create a European space, engaging people in the frontline to structure, share, reuse and communicate multilingual knowledge and asking all policymakers (e.g. the European Parliament, the Council of the European Union, the European Commission, the European Committee of the Regions) for active support towards better and shared futures.

References

[1] Rehm-Berbenni, C., Herbert, D. and Luckner, L., 'Process oriented integrated quality management internet services for SMEs', in Stanford-Smith, B. and Kidd, P. T., E-business — Key issues, applications and technologies, IOS Press, Netherlands, 2000, pp. 960-966.

Related to the PROMIS project: Process oriented integrated quality management internet services for SMEs. GA: C 26402 (http://www.promis.eu), eTEN, 2000-2001.

[2] Oros, R., Pester, A. and Berbenni-Rehm, C., 'Knowledge management platforms for online training', The International Conference on E-Learning in the Workplace, 2015 (www.icelw.org).

[3] Rehm-Berbenni, C., Druta, A. and Gowland, R., 'Communities of knowledge in the daily life of an SME — The PROMIS® example', in Cunningham, P. and Cunningham, M. (eds), eChallenges e-2012 Proceedings, IIMC International Information Management Corporation, 2012.

[4] deployPROMIS project — Process oriented integrated quality management internet services and eLearning for SMEs, eTEN Initial Deployment, GA 046303, 2007-2008 (www.deploypromis.com).

[5] PROMISLingua project — Performance operational and multilingual interactive services to support compliance for SMEs in Europe, GA: CIP-ICT-PSP-270913, 2011-2013 (www.promislingua.eu).

[6] Rau, T., RKW Berlin, ISO 29990 solution in PROMIS®, The German Center for Productivity and Innovation, BEUTH (https://www.promis.eu/de/din-iso-29990).

[7] Salmelin, B., Open innovation 2.0 yearbook 2013 (https://ec.europa.eu/digital-single-market/node/66129).

[8] 'Eighth European Innovation Summit — Future Now!', held at the European Parliament, 14-17 November 2016, Brussels (http://www.knowledge4innovation.eu/8th-eis-outcome).

[9] The Digital Skills and Jobs Coalition: (https://ec.europa.eu/digital-single-market/en/digital-skills-jobs-coalition).

[10] Hinderer, J. G., Katastrophen als Chancen, Deutsch-Europäische Kommission für Bevölkerungsschutz e. V, Tübingen/Karlsruhe, Theo Künstle Medien+Druck, Tübingen, 2011 and Tübingen Declaration, 2014

[11] European Commission, DG Research and Innovation, Directorate I — Climate Action and Resource Efficiency, I.2 — Eco-innovation, Expert workshop 'A systemic approach to eco-innovation' — Conclusions of the workshop on 2-3 June 2014, pp. 22-23.

[12] Berbenni, G., OFM Cap (Varese-Roma), 'Socio-ethnic sustainable development of the desert areas in Afro-Euro macro-continent inhabited by 45 states', Future Capitals World Summit, 2009, Abu-Dhabi, MultiUniversus (1996) and InGentibus (2001) Strategic Management.

[13] Millennia2025 — Women and Innovation Foundation (http://www.millennia2015.org/Millennia2025_WePROMIS).

[14] Millennia2025 — Intelligence Platform: (http://www.millennia2015.org/Millennia2025_Intelligence_Platform).

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