"OPEN INNOVATION ECOSYSTEM 2.0" DIGITAL PLATFORM FOR AGRICULTURE, FORESTRY AND FOOD INDUSTRY

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Abstract

The paper presents an "OPEN INNOVATION 2.0" digital platform that allows multilateral interaction between independent parties. The platform is based on a web portal and offers information, collaboration and communication resources and services for organizations and users who can work together and create value based on innovation. It facilitates transactions between customers and companies. The business environment, research institutions, civil society and public administration - Quadruple Helix model can work together in dynamic and diverse innovation ecosystems online through this platform. The digital platform contains specific instruments: innovative instrument for trading the demand and supply of RDI in the field of agriculture, forestry, food industry and related fields (databases with research results, patents and section dedicated to communication and discussions on topics specific to the trading of supply and demand of RDI; databases with entities involved in open innovation and technology transfer: Universities, Clusters, Stakeholders; open discussion forum to address new topics specific to innovation and technology transfer; e-learning section in the field of open innovation, agriculture, forestry and food industry, as well as related fields; events section, newsletter etc.

Key words: Open innovation ecosystem, digital platform, innovative instruments.

INTRODUCTION

The "Open Innovation Ecosystem" is an important component of the European innovation system, in which all stakeholders must interact in promoting the ideas and results of innovative research in the development of new systems (Traitler et al., 2011). The European Commission has shown that innovation policy needs to be designed in a complex framework that promotes innovation and research capabilities in an integrative way that bridges research, industry and entrepreneurship. (EU Open Innovation Strategy and Policy Group, 2013). The platform addresses all actors in the innovation process and facilitates collaboration between research and development institutes, universities, clusters and stakeholders in the field of agriculture, forestry and food industry and related fields (https://ec.europa.eu/eip/agriculture/). The platform was designed with the clear intention of helping researchers, agriculture,

forestry and the food industry and related fields to find each other in a simple way, without intermediaries, restrictions or hidden costs (https://bigdata.cgiar.org/).
The platform facilitates the opportunity for collaboration between companies, thus increasing the chances that certain technologies will benefit from technology transfer.

MATERIALS AND METHODS

The digital platform "Open Innovation Ecosystem 2.0" can be accessed at https://inma-ita.ro/op20 from the most important browsers: Google Chrome, Microsoft Edge, Opera and Firefox.

Platform menu
The "Open Innovation 2.0" platform has a tree structure, consisting of the main menu containing the main buttons and the secondary menu containing buttons adjacent to the main buttons. The main buttons are: About the Platform, Quadruple Helix Entities,

Internationalization, Database, E-learning, Events, Legal Support, Forum, Newsletter.

Figure 1 shows a screenshot of the "Open Innovation Ecosystem 2.0" platform. Below is the description of the main buttons.

About O.I. 2.0

When accessing the "ABOUT O.I. 2.0" button (Figure 2), the "Open Innovation 2.0" section opens with the following adjacent buttons (submenus): "Prospective study - Open innovation", "Prospective study - Ecosystem", "Prospective study - Open Innovation 2.0" , Prospective study - Structure and architecture of digital tools for "Open Innovation Ecosystem", "Technological study - digital instruments implementation ", which in turn by access it opens the prospective or technological studies mentioned.

Quadruple Helix Entities

When accessing the "QUADRUPLE HELIX ENTITIES" button, the section in Figure 3. It contains the following adjacent buttons: "About Quadruple Helix", "Universities", "Research Entities", "INMA-ITA" and "Stakeholders".

Internationalization

When accessing the "INTERNATIONALIZATION" button (Figure 4) the user is directed to the following adjacent buttons: "Enterprise Europe Network - EEN" (https://een.ec.europa.eu/), "HORIZONT 2020", "European Cluster Collaboration Platform EECP" (https://clustercollaboration.eu).

Database

By accessing the "DATABASE" button (Figure 5) the user has access to the following databases: "Universities", "Specialists", "Research Entities", "Clusters", "Patents", "Stakeholders", "Research Results" , "Innovation and Technology Transfer", "Digital Innovation Hub" and "Technology Information Centers". Digital tools such as the database of research results, patents and the section dedicated to communication and discussions on topics specific to the trading of supply and demand of RDI: ("Ideas and patents", "Open Innovation", "Partnerships / Project proposals") are an innovative tool for the trading of supply and demand of RDI in the field of agriculture, forestry and food industry and related fields.

Another digital tool is databases with entities involved in open innovation and technology transfer: Universities, Specialists, Research Entities, Clusters, Stakeholders. When accessing the adjacent button "Research results" the user is directed to a web page where the results of the research obtained by the CD institutes in the country are presented. When accessing the adjacent button "Research results" opens "Published articles" where you can find scientific articles in the field of RDI published in prestigious scientific journals indexed ISI or BDI.
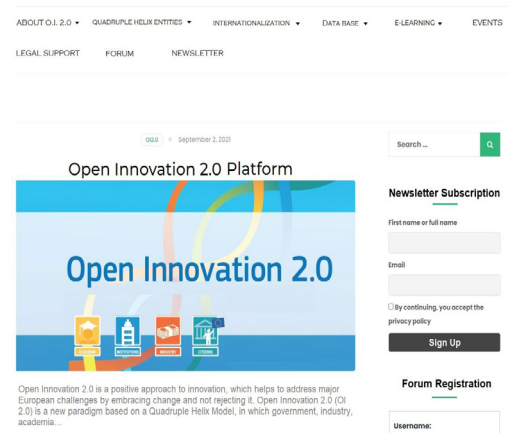

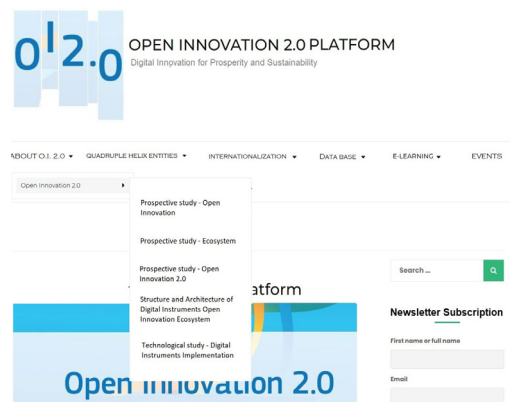Figure 1. Screenshot "Open Innovation Ecosistem 2.0" platform
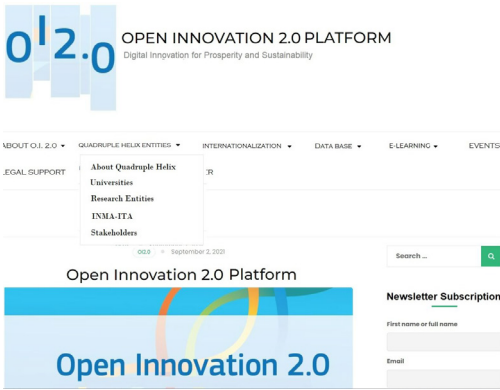

Figure 2. Screenshot "About O.I. 2.0" main button

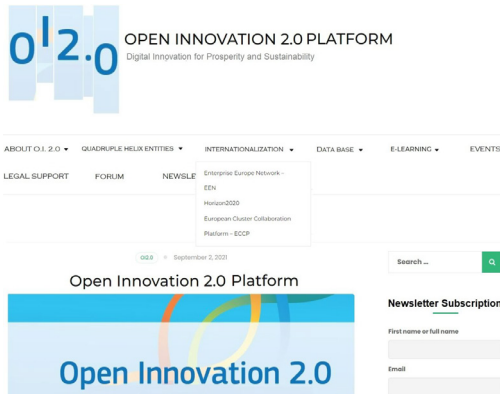Figure 3. Screenshot "QUADRUPLE HELIX ENTITIES" main button

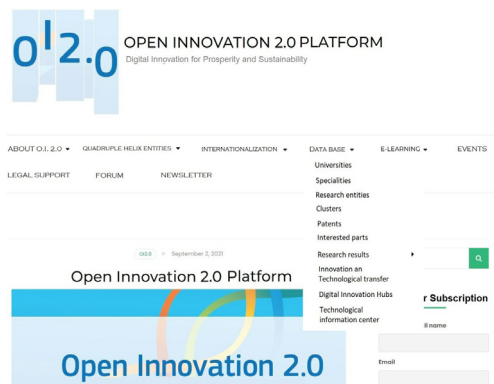Figure 4. Screenshot "INTERNATIONALIZATION" main button

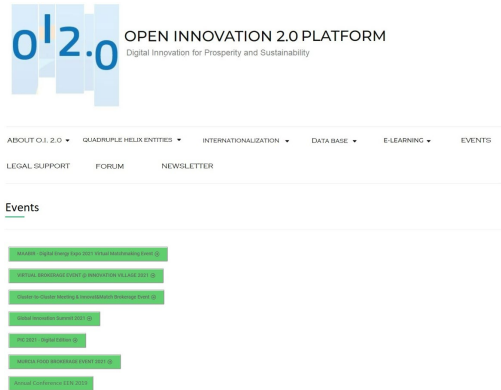Figure 5. Screenshot "DATABASE" main button

Figure 6. Screenshot "EVENTS" main button

E-learning

When accessing the "E-LEARNING" button, the web page opens with the section dedicated to e-learning trainings in the field of open innovation, agriculture, forestry and food industry, as well as related fields, it is a digital tool.

Events

When accessing the "EVENTS" button (Figure 6) the user is directed to the Facebook pages of some organized events. By simply connecting to Facebook, the user finds out details about those events. The "EVENTS" section will be completed with other events depending on their development.

Legal Support

By accessing the "LEGAL SUPPORT" button, the user has access to the legislation that regulates the field of research, development and innovation, contained in laws, decrees, Government Decisions, Orders, etc.

Forum

When accessing the "FORUM" button, the platform offers the user a series of topics for discussion, for example: "Ideas and patents", "Open Innovation", "Partnerships / Project proposals" (Figure 7).
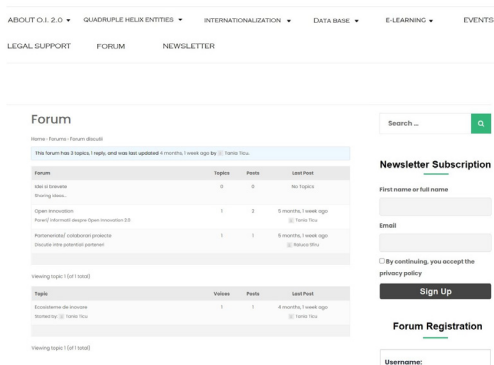
Figure 7. Screenshot "FORUM" main button

To participate in discussions or initiate a discussion proposal, the user must create a username and introduce a valid e-mail address, then access the "Register" button. The open discussion forum for addressing new topics specific to innovation and technology transfer is a digital tool. The user will receive an e-mail address with which he registered on the platform. By accessing the link, the user is directed to a page containing two fields: username and new password. Once the new password is entered, the user can use it to log in to the discussion forum. Each discussion forum participant must be registered with a single email address (username). The discussion forum contains Topics, Posts, and Last Posts. For each discussion topic posted on the platform, user comments are counted by displaying the user's name and the date they made the comment, as shown in the example in Figure 8.
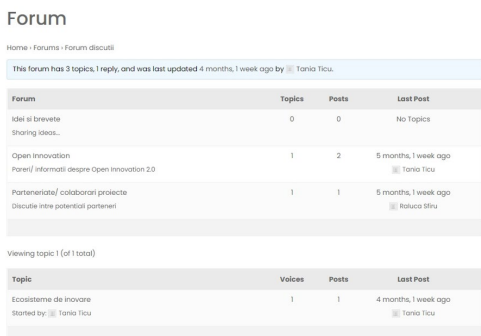

Figure 8. Screenshot of topics, posts, and recent posts on the "FORUM" page - digital tool

Newsletter

The "NEWSLETTER" button allows the user to subscribe to the newsletter generated by the platform administrators by filling in the platform "First name or full name" and "E-mail", and by checking the box from "By continuing, you accept the privacy policy "the user accepts the privacy policy. After completing the required fields, the user will receive an e-mail confirming that he has subscribed to the newsletter of the digital platform "Open Innovation 2.0" at the e-mail address he entered in the form in which he requested the subscription,

By accessing the "Newsletter" button, the user is informed about the events related to the field of agriculture, forestry and food industry and related fields that will take place in the next period.

The user has at his disposal the "Read more" button where by accessing he can find out more details about the event and can post a comment in the "Leave a Reply" section (Figure 9).
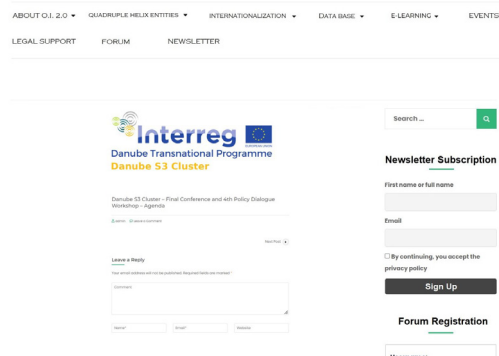

Figure 9. Screenshot - posting a comment in "Newsletter" section

RESULTS AND DISCUSSIONS

The digital platform "Open Innovation Ecosystem 2.0" together with the digital tools contained, have been tested in terms of functionality and performance.

Platform performance testing was performed using open source web.dev software (https://web.dev/measure/).

The test resulted in a test report (RUN AUDIT), which details the results of measurements related to: Performance, Accessibility,

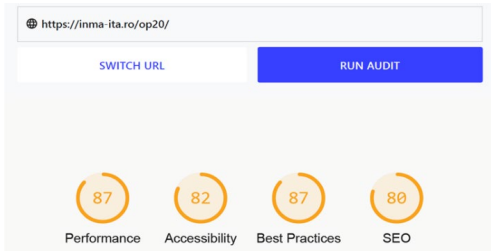Best Practices and SEO (Search Engine Optimization) (Figures 10-14).

Figure 10. Screenshot - "RUN AUDIT" report generated by web.dev software

The following shows the results of the component testing.
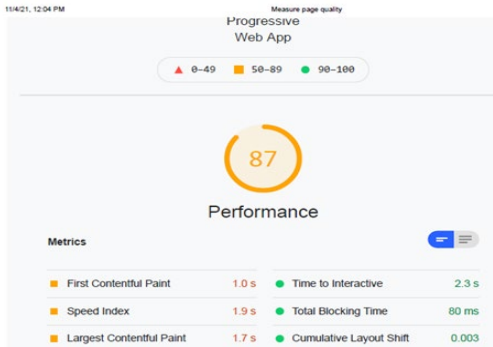• Performance = 87 points

Figure 11. Screenshot "Performance"
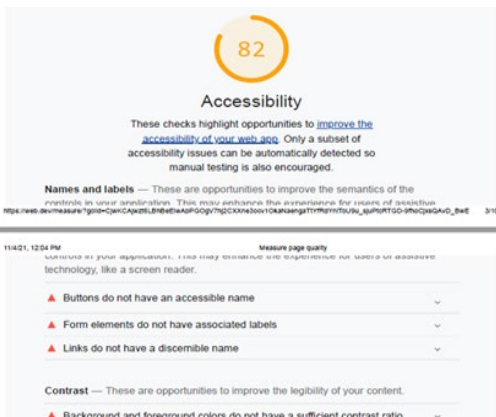
• Accessibility = 82 points

Figure 12. Screenshot "Accessibility"
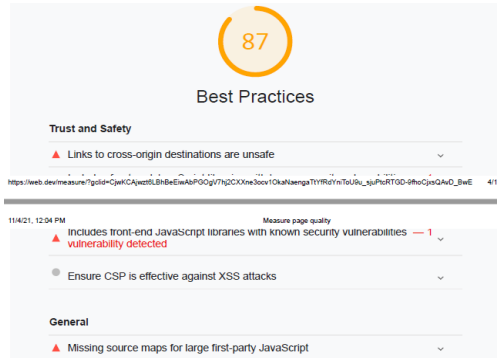
• Best Practices = 87 points

Figure 13. Screenshot "Best practices"
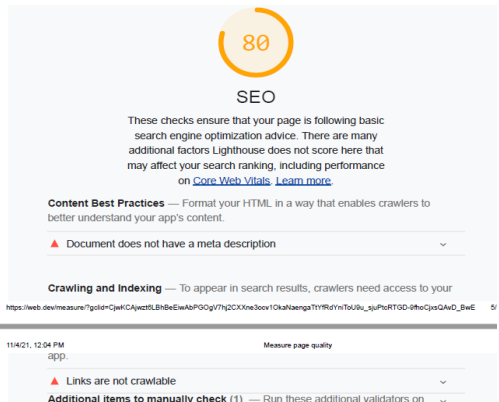
• SEO (Search Engine Optimization) = 80 points

Figure 14. Screenshot "SEO (Search Engine Optimization)"

CONCLUSIONS

The digital platform contains innovative tools to which users have free access, as follows:
- Innovative tool for trading the supply and demand of RDI in the field of agriculture, forestry and food industry and related fields (databases with research results, patents and section dedicated to communication and discussion on topics specific to the trading of supply and demand of RDI: "Ideas and patents" ,"Open Innovation","Partnerships/Project Proposals", etc.);
- Databases with entities involved in open innovation and technology transfer: Universities, Specialists, Research Entities, Clusters, Stakeholders in agriculture, forestry and food industry and related fields.

- Open discussion forum to address new topics specific to innovation and technology transfer;
- Section dedicated to e-learning training in the field of open innovation, in the field of agriculture, forestry and food industry, as well as related fields.

The digital platform "Open Innovation Ecosystem 2.0" together with the digital tools contained have been tested in terms of functionality and performance, using several types of internet connection from various providers (RCS-RDS - guaranteed bandwidth 300 Mb/sec., TELEKOM - guaranteed bandwidth 150 Mb/sec., RCS-RDS - no guaranteed "home" bandwidth, ORANGE - mobile telephony, ORANGE - internet stick). The performance tests of the platform were very good (between 85 and 100 points): Performance (87) and Best practices (87) and good (over 80 points): Accessibility (82) and SEO (80). All deficiencies found after functionality tests have been fixed. The platform has been tested for speed when accessed simultaneously by multiple users, and the results have been good. If any deficiencies occur, they will be remedied in a timely manner.

The content of the "Open Innovation Ecosystem 2.0" platform will be enriched with interesting discussion topics depending on the feedback received from users.

The "Open Innovation Ecosystem 2.0" platform will be updated according to the development of events in the field of research-development and innovation and the elaboration of e-learning courses.

ACKNOWLEDGMENTS

REFERENCES

EU (Open Innovation Strategy) si Grupul de politici, 2013 (Policy Group, 2013).

Traitler, H., Watzke, H.J., Saguy, I.S. (2011). Reinventing R&D in an Open Innovation Ecosystem. *Journal of Food Science*, *76*(2), 62–68.

***Enterprise Europe Network, https://een.ec.europa.eu/.

***European Cluster Collaboration Platform: Homepage, https://clustercollaboration.eu/.

***Platform for big data in agriculture, https://bigdata.cgiar.org/.

***The agricultural European Innovation Partnership (EIP-AGRI), https://ec.europa.eu/eip/agriculture/.

***web.dev, Measure page quality. https://web.dev/measure.
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