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The Open2-Innova8ion Tool – A Software Tool for Rating Organisational Innovation Performance

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http://design.open.ac.uk/itool/

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Software Review: Review of Open2-Innova8ion Software Tool; Development and evaluation of an innovation rating web-tool

Abstract

The Open2-Innova8ion Tool is an interactive, multi-media, web-based software tool for rating organisational innovation performance. This tool was designed for organisations to use as an adaptation of the European Commission's work on developing empirical measures of national innovation performance with the Summary Innovation Index (SII). It is designed for users with experience of employment in an organisation, from senior managers to all types of employees, with an interest in rating the innovation performance of their organisation. The Tool is quick and intuitive to use, and provides textual feedback, together with graphic ratings using Google meters. Feedback is based on user perceptions of organisational indicators of Innovation Enablers, Activities, and Outputs to provide an overall rating of innovation performance; this can be compared with a self-rating of innovativeness to allow some interpretation of the congruence between the user and their organisation. This prototype Tool was trialled and evaluated during a workshop on low carbon vehicle innovation, with participants (innovators) representing organisations from the surface transport industry as part of the U-STIR programme with EU Framework 7 funding. This publically available web-tool has applications to education, training, and research http://design.open.ac.uk/itool/.

Description of the Open2-Innova8ion tool

The Open2-Innova8ion Tool is an interactive web-based software tool for examining and rating organisational innovation performance. It has been designed for users with experience of employment, from senior managers to all types of employees with an interest in rating the innovation performance of their organisation.

Over the last 40 years, the innovation literature has sought different factors to explain what enables successful innovation and how this can be fostered by organisations. In the 1980s, there was an emphasis on enterprise, small firm start-ups and organisational spin-offs, with increased understanding of the innovative role of entrepreneurs, intrapreneurs and social entrepreneurs. In the 1990's, there was a focus on multidisciplinary approaches, multi-functional teams and

collaborative networks as a source of innovation. In the 2000's, the role of users and industry supply-chain intermediaries attracted particular attention. More recently the Internet and the availability of Information and Communication Technology (ICTs) infrastructure, devices and technologies have led to new trends in innovation, including the growth of online users and virtual communities that are capable of innovating independently of organisations, in pursuit of personal or collective goals. New organisational practices capitalise on these opportunities for innovation with for example, crowdsourcing or outsourcing a task to an open community; and open-sharing or free-revealing information on product components & architecture, and toolkits to online user communities.

The Open2-Innova8ion Tool draws on these ideas, together with recent research on the indicators of innovation performance, to offer a tool for rating organisational innovation performance. In particular, it builds on the European Commission's work on developing *measurable* indicators of national innovation performance based on recent statistics from Eurostat and other internationally recognised sources of innovation data [1]. This resulted in the development and application of The Summary Innovation Index (SII) to provide a comparative rating and trend analyses of national innovation performance on the European Innovation Scoreboard (EIS) based on the average for EU Member States. The Open2-Innova8ion Tool was developed as an adaptation of the SSI measures of national innovation performance to provide extrapolated ratings for indicators of organisational innovation performance. It also includes measures of user innovation, originally omitted from the SSI, even though research surveys showed that half of EU companies currently active in process/ product modifications actually engage users in the innovation process [2].

This interactive, self-assessment tool is freely available http://design.open.ac.uk/itool/. The user is invited to respond to 28 statements by selecting a response option to show if they tend to agree or disagree with a statement. This takes about five minutes to complete. Questions are classified in terms of the key indicators of innovation performance, namely: enablers, organisational activities, and performance outputs:

- **Innovation Enablers** refer to the human resources, finance and organisational resources for innovation;
- **Organisational Innovation Activities** include organisational investments in innovation-related expenditures to support innovation activities; connections established between organisations, disciplines, and users; and intellectual property (IP) generation;
- **Innovation Outputs** include innovation introductions, resource efficiency innovation, valuable IP, and economic effects;
- A **self-rating of personal innovativeness** is also included to explore the congruence between the user and their organisation.

This is summarised in Table 1.

Insert Table 1: Adapted Table of Indicators for Organisational Innovation (for the Open2-Innova8ion Tool)

When the responses are complete the user selects 'My Score'. Scoring of mostly high (i.e. > 50%) or mostly low scores provides the results for the rating measures. Based on their responses, the user receives feedback and interpretation about their organisation's innovation performance. An 'overall' rating of organisational innovation, together with three component ratings for innovation 'Enablers', 'Activities' and 'Outputs', and a 'Self-rating', are graphically presented to the user in the form of Google meters, together with textual feedback.

The feedback is useful for thinking about an organisation's innovation performance. Strengths and weaknesses of innovation performance are interpreted by examining the matches and mismatches between each rating measure and the overall rating of innovation performance. For example, an organisation that has a high score for enabling innovation activities but low innovation outputs could do more to capitalise on innovation activities and convert this potential to deliver greater economic benefits. In addition, the user is provided with feedback on the congruence between their self-rating and organisation's innovation performance.

Technical aspects for consideration are presented in Table 2. The Open2-Innova8ion Tool is quick and intuitive to use, and works well with most Internet browsers, as well as providing useful feedback that is displayed in a visually pleasing way.

Insert Table 2: Technical Aspects of The Open2-Innova8ion Tool

Evaluation of the Open2-Innova8ion Tool

The Open2-Innova8ion Tool was designed to be used as a starting point by organisations to think about innovation performance. It was first trialled at a workshop on low carbon vehicle innovation for 'Innovators' held at the Open University. This was part of the U-STIR European Framework 7 programme that funded research on the role of organisations in the development of radical surface transport innovation concepts and to inform the innovation policy measures needed to achieve transition to an ultra-low carbon transport system by 2050. (http://www.u-stir.eu) [3]. The workshop brought together 20 participants representing manufacturers, commercial organisations, energy suppliers, public sector organisations, community groups, consultancies and universities, that were interested in low carbon vehicle innovation and the infrastructure required to support successful market diffusion; this included organisations involved with the Milton Keynes and London Electric Vehicle InfraStructure projects (ELVIS).Participants were invited to trial and evaluate the Open2-Innova8ion Tool during workshop activities.

(*Insert Colour*) Figure 1: The Open2-Innova8ion Tool

Overall the Open2-Innova8ion Tool helped to create an energised discussion about innovation and how organisational innovation performance in transport areas should be measured. The measures of 'Innovation Enablers' were generally approved, although people thought this overplayed the importance of a highly educated workforce and higher education qualifications, when there is some historical evidence of the role of uneducated entrepreneurs in innovation. One person commented '*Innovators are forward thinkers but do they require a degree?'* Whilst the sentiment that formal qualifications may be over-valued is understandable, most recognised that an educated workforce was important.

Most people agreed that the emphasis on organisational linkages and inter-disciplinary partnerships in measures of 'Activities' was very important for achieving innovation outputs. Other indicators of innovation activities, such as organisational investment in IP generation activities were viewed by some people as being too narrow to apply to public sector organisations, charities and consultancies. One comment was that the tool was '*Too product specific – patents are not always relevant to SME, Charities and public sector.'* To counter that, the tool has been designed to apply to a wide range of innovation activities, including innovative services, products and systems; and to refer to many types of IP including copyrights, designs and trademarks. It also covers a range of possible innovation outputs including:

- Innovation introductions, including product, process, service design and innovation and evidence-based service improvements;

- Valuable IP that is saleable and transferable;
- Resource efficiency innovation, such as reducing labour, materials, and energy costs;
- Economic effects, such as new sales, exports and employment growth

These measurable innovation indicators are potentially applicable to all organisations. Most people agreed that empirical measures were important for calculating economic benefits, and one person said '*Innovation capability should be judged by outputs'.* This needs to be weighed against the benefits associated with employee and organisational creative activities that produce no tangible innovation IP outputs. Further research will help identify other less tangible indicators of innovation activity that should be included in refinements to the Open2-Innova8ion Tool.

A key question is whether the Open2-Innova8ion Tool offers empirical measures of innovation performance. Users' perceptions are subjective and will reflect their role and position in the organisation, and their knowledge and understanding of innovation. Furthermore there was some discussion of how to rate innovation performance in large multi-national organisations, where performance varies within the organisation. In particular, mature, large organisations may have multi-innovation cultures rather than a mono-innovation culture, and this would need to be reflected in the way innovation is measured. These issues may lead to variability in the way organisational staff provide ratings about innovation performance in different parts of an organisation.

The main application for the Open2-Innova8ion Tool is in an educational or training setting. Here the subjective characteristics of the organisational rating is a strength of the Tool, as it may be used to explore varying perceptions of innovation performance within an organisation, and identify the reasons for the perception diversity and thereby help identify some measures to improve innovation performance. There are also research applications for using the Tool to explore and compare the innovation performance of different types of organisations. Another application is for senior managers to use the Tool to establish thresholds and targets for monitoring organisational innovation activities and performance; this could be supported with evidence-based data collection on innovation. The value of applying empirical measures of innovation performance is evident from the EC surveys of companies in EU member states for using the SII index to provide comparative ratings and identify national trends [1,2].

Conclusion

The Open2-Innova8ion Tool is a multi-media, interactive web-based software tool that has been designed for users with experience of employment, from senior managers to all types of employees with an interest in examining and rating the innovation performance of their organisation. The tool is easy to access and use, and provides useful feedback that is displayed in a visually pleasing way using Google charts. Its primary application is in educational, training or workshop activities where the use of the Tool helps to stimulate and energise discussion about organisational innovation performance. In this context, it offers an opportunity to explore different perceptions amongst staff about an organisation's innovation performance and could support catalyst initiatives for converting organisational capability into improved innovation performance. It has other applications for supporting research, and could be adapted for use by senior management for measuring and monitoring organisational innovation performance. It was trialled and evaluated during workshop on surface transport innovation and infrastructure with innovators, although the tool has wider applications to other areas of innovation. Whilst this tool requires further refinement, it catalyses critical thinking about innovation performance and how organisations may convert capability into economic benefits.

Acknowledgement

The Open2-Innova8ion Tool is developed from an adaptation of the work of the European Commission in developing the Summary Innovation Index (SII) to provide a comparative assessment of the national innovation performance of EU Member States with the European Innovation Scoreboard.

This Tool was developed to support Open University (OU) work on the U-STIR project. U-STIR (User-Driven Stimulation of Radical Technological Steps in Surface Transport) is a collaborative project funded by the EU Framework 7 initiative to conduct research on radical transport innovation, and involves partners from Austria, Bulgaria, Italy, Spain, Germany, France and the UK. The OU project researched the role of users and intermediaries in developing the infrastructure needed for the successful market diffusion of Low Carbon Vehicles. (See http://www.u-stir.eu)

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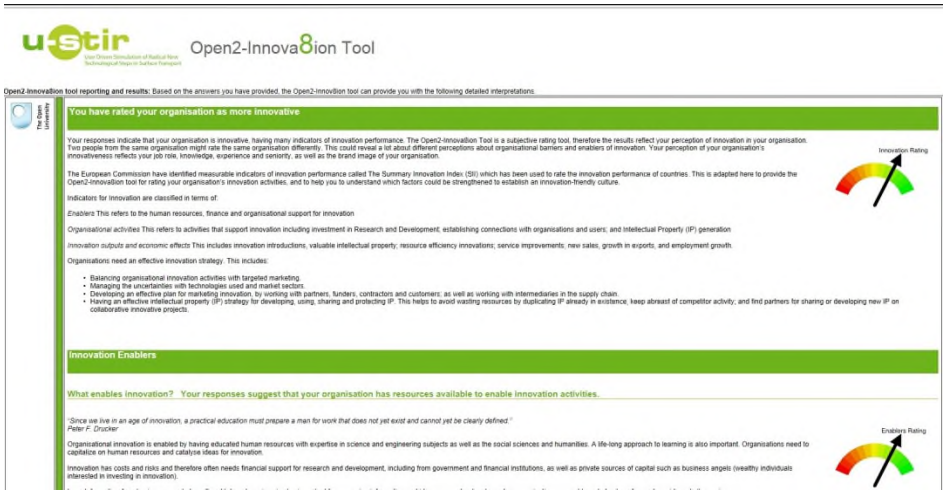
[3] The U-STIR (User-Driven Stimulation of Radical Technological Steps in Surface Transport) programme was funded by the EU Framework 7 initiative, to conduct research on radical transport innovation (http://www.u-stir.eu)

Table 1: Adapted Table of Innovation Success Indicators (for the Open2-Innova8ion Tool)

Enablers	**Human Resources** Are you? Are your colleagues or employees?	Educated to graduate level …in science and engineering (S&E) …In social sciences & humanities (SSH) Educated to post-graduate or doctoral level …in science and engineering (S&E) …In social sciences & humanities (SSH) Participating in tertiary or further education Supporting life-long learning Participating in education & training linked to innovative projects
	Finance and support Are you aware/ or is your organisation benefiting from?	Public R&D expenditures Venture capital Private credit Advice & support for innovation Broadband access
Organisational activities	**Organisational investments** Does your organisation provide?	Business R&D expenditures, for research and development, major modifications, incremental changes, new designs, mock-ups, mash ups, new combinations of existing products, and technology adoption. ICT expenditures Non-R&D innovation expenditures
	Linkages & entrepreneurship Does your organisation support?	Inter-company collaborations with innovative organisations Spin-off innovative organisations Innovative-projects in-house Multi-departmental, multi-functional & multi-disciplinary collaborations Linkages with customer/user groups /user communities Public-private research co-publications
	Throughputs What is the evidence of innovative operations in your organisation?	Community trademarks Design & copyright publications Technology transfer Patents (e.g. European Patent Office, US Patent &Trademark Office etc) Open Source or Copyleft mechanisms e.g. licensing schemes permitting other organisations to reproduce, further develop & distribute intellectual property
Outputs	**Innovation** Have you or your organisation been involved with the introduction of product, process system or marketing, organisational innovations?	**Radical technological innovation** to achieve an exponential improvement in performance, or a significant reduction in cost **Incremental innovation** with minor or major modifications to existing products/systems/services/organisational practices, or re-engineering to improve performance, efficiency, standards, value & other success outcomes. **Disruptive innovation** with a major impact on the market. i.e. destroying & replacing the value of an existing technological base, range of products/systems or services, or organisational competencies.
	Economic effects What are your innovation outputs?	Innovation introductions of product, process, service Resource efficiencies, e.g. reducing labour, materials, energy costs Valuable Intellectual Property Rights, e.g. patents etc New-to-market &New-to-firm sales Exports Employment Opportunities (especially technological, manufacturing & in knowledge-intensive services)

Table 2: Technical aspects of The Open2-Innova8ion Tool

Technical environment	Uses multiple choice quiz script with functionality based on and derived from script www.javascriptkit.com, an open source library Programmed in standard HTML with functionality added using JavaScript. No copy protection – uses uncompiled JavaScript library Uses temporary session cookies to pass the results of the questionnaire to the interpretation webpage. No persistent data storage requirements. There was no need to serialise the JavaScript objects. No data is held beyond the session
User interface	Designed to be quick, easy and intuitive to use online No password required Simple online instructions with no paper documentation required Uses webforms-based applications with multiple pages, including initial data entry and consequent results page Visually pleasing graphical feedback provided using Google Charts API objects e.g. Google meters, based on key metrics derived from test results
System specifications	Freely available online. http://design.open.ac.uk/itool/ No installation required Operates on standard open source Linux-based webserver Application tested on most generally available browsers, e.g. Google Chrome, Internet Explorer, Firefox, Safari (iPad, iPhone devices) Works on standard ICT devices e.g. Desktop pc, laptop etc. No particular requirements for CPU, RAM, or Operating system No requirements for optical drive or specialised video card



(*Insert Colour*) Figure 2 The Open2-Innova8ion Tool



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