

Experimental research setting in management

Saku J. Mäkinen¹

¹ CERN Switzerland/Tampere University of Technology, Dept. of Industrial Management, Finland

* Corresponding author: saku.makinen@tut.fi

Experimental research setting in management, business and innovation research has been gaining increasing traction in recent years (see e.g. Di Stefano & Gutierrez, forthcoming). However, experiments are not new, rather they are a long tradition in studies investigating phenomena in engineering and innovation related management disciplines in the micro-level of artefacts, processes and inside organisations. One early example is an experiment showing how primitive skills in combination can be used to create copper artefacts (Cushing, 1894).

Experimental setting has been criticised, especially in fields dealing with complex-phenomena implying large amount of variables at multiple levels, such as public management or strategy research. These fields mostly look at collectives, organisations or inter-organisational phenomena. These settings, however, also lend themselves to experimental analysis, although much more care needs to be exercised in the planning of the research. An early example of this type of approach is a public policy experiment of Australia investigating effects of import tariffs (Fred. Perry Powers, 1888).

The design of an experiment ideally eliminates extraneous factors concentrating on the causalities between variables and factors under study and further describes the process so that it is replicable (see e.g. Colin et al., 2016). And this is one of the main reasons why it has recently been called for in management and business research to aid in search for complex causalities. In addition to this, experimental research setting provides ample of opportunities for replication logic to test the causalities. Furthermore, experimental research manuscripts are increasingly being published, although in small numbers (Di Stefano & Gutierrez, forthcoming). The on-going call for papers “Experiments in Organizational Theory“ by Schilke et al. for a Special Issue of *Organization Science* (call open in August 1 - September 15, 2019, more info at <http://bit.ly/orgsci2019>) exemplifies the increasing interest of the research community on experimental research.

The current issue (Volume 2, Issue 2) of the *CIJ CERN IdeaSquare Journal of Experimental Innovation* displays the plurality of levels of analysis rather nicely, leaving only the policy level investigations untouched. The first paper by Aydogan and Tasal is an engineering-driven experiment to design a low cost spectrometer.

They have gone various cycles of innovative search processes for design choices. Their manuscript shows the designing and building of a Raman spectrometer with commercially available components that, for example, universities could use for educational purposes. Furthermore, as a low-cost device, this could give rise to all sorts of experiments around these devices.

The second paper is by de Leon *et al.* and it deals more with the dynamics of activities and processes at the team level as the above referenced artefacts are designed and innovated. They propose a design thinking inspired process for scientific discovery that takes interdisciplinary teamwork to the forefront. They also propose quite a few internal mechanisms that teams, collectives as organisations could use to engage in solving Sustainable Development Goals of UN and overall in their innovation development.

The third paper, by Kauttu, deals with inter-organisational experiments and how Open Source Hardware (OSH) facilitates experimentation and what results have been gained with these experiments. He specifically looks at how these experimental OSH projects are economically viable and engage communities of actors and how private-public projects interact and support structures of OSH. The case study revolves around CERN’s White Rabbit OSH project, which involves 32 committed partners worldwide.

Similarly to the de Leon paper, the fourth paper by Quiñones deals with the development of the creative design and innovation processes. This paper explores possibilities to bring the big data approach into the creative design processes. This is a fresh new line of thought on how big data could be used to stimulate design processes and in aid for more ideas and innovations.

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