

Special Issue on Design Science in Organizations

Editorial

Impact beyond impact factor: The Design-science way

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“Neo, sooner or later you’re going to realize just as I did that there’s a difference between knowing the path and walking the path” – Morpheu

In 2003, the following questions were exposed to the scientific community of operations management: “Do we contribute so little because we are irrelevant?” or “Are we irrelevant because we contribute so little?” (Ford, Duncan, Bedeian, Ginter, Rousculp & Adams, 2005, p. 36). It is not a new issue for the scientific community, but it remains today. The criticisms focus on rigor in conducting research at the expense of its usefulness. The literature has portrayed this situation as a trade-off between relevance and rigor. Besides, examples of dysfunctionalities of logic ‘publish or perish’ are also abundant.

In fact, *in theory, there is no difference between theory and practice – in practice, there is* – Yogi Berra (Schwendenwein, 2013). Several alternatives have been presented to address this gap between researchers and practitioners. Based on the ideas of Herbert A. Simon exposed in his book *The Sciences of the Artificial* (1969), the concepts associated with ‘Design Science and Design Science Research’ are derived. From the 2000s, Prof. Van Aken from the Eindhoven University of Technology published a set of papers highlighting the need to transpose these concepts to the field of operations management. From these works, many authors realized that the *Design Science and Design Science Research* could contribute to reducing the apparent gap between relevance and practice.

In this way, ‘Design Science’ establishes itself as the research paradigm that seeks to generate knowledge of a prescriptive and design nature. Meanwhile, ‘Design Science Research’ is a research method that allows the rigorous generation of useful artifacts (pragmatic validity) (Dresch, Lacerda & Antunes, 2015). Many new concepts present themselves to the scientific community in this context, such as artifacts, classes of problems, satisfactory solutions, utility, abduction, etc. So, this is a journey that begins.

This journey seeks to achieve impact, beyond the impact factor. In other words, if you are looking to generate research that impacts by:

- Contributing effectively to better management;
- Facilitating management activities;
- Increasing the efficiency and competitiveness of organizations;
- Generating positive externalities in the economic, social, and environmental terms.

Many other attributes could be listed and are in the set of needs of the organizations’ professionals. That is, build satisfactory and useful (pragmatic validity) solutions (artifacts) for a class of problems and, as a consequence, extend the scope of your results to the largest number of organizations as possible. The real impact happens in organizations, society, and the environment. This impact needs to be observed, measured, and disseminated so that the operations management research is increasingly necessary for the target audience.

At the same time, the knowledge developed in the building of these solutions must be reliable, refutable, and generalizable. The artifacts developed and the solutions reached need to be robustly evaluated and expressed to facilitate the understanding and expand their reach in the scientific community. Scientific knowledge, under the ‘Design Science’ paradigm, consists of artificial objects (artifacts), on how to design, develop, and evaluate them to achieve the desired solutions. A knowledge that expands our ability to design and generate solutions. In other words, it is not reduced to a means for generating the ‘true’ scientific theory, possessing objects of another nature. Therefore, all the existing scientific and methodological frameworks should not be omitted, instead, the abductive reasoning, classes of problem, artifacts, and ‘Design Science Research’ are added.

The articles in this special issue share the desire to impact beyond the impact factor. The difficulties for this are not few. They begin with the teaching of ‘Design Science in Management Education’ itself. This theme is addressed in the article *Mixing Oil with Water: How to Effectively Teach Design Science in Management Education?* written by Prof. Dr. Duygu Keskin and Prof. Dr. Georges Romme (2020) (Distinguished Scholar-Practitioner Award of the Academy of Management), both from the Eindhoven University of Technology.

Other difficulties refer to the context, scale of coverage, and conflicting interests of the actors. Maybe the terms ‘Smart Cities’ and ‘Public Value’ will help to dimension the challenge proposed by the article *The Smart Cities Methodology Based on Public Value: The First Evaluation Cycle*. In this article, Prof. Dr. Josiane Brietzke Porto (UNISINOS) and Prof. Dr. Mirian Oliveira (PUCRS)

seek to impact cities and public services by proposing and evaluating the ‘Smart Cities Methodology’ (SCML), consisting of ‘Smart Cities Reference Model’ (SCRM) and the ‘Smart Cities Assessment Method’ (SCAM), developed from the perspective of ‘Public Value’.

Besides those two works, other ones in this special issue show the amplitude and diversity of application fields where ‘Design Science’ can contribute to organizations. For example, in Brazil, the agribusiness sector has significant participation in the economy. In particular, small and medium-sized Brazilian farmers have a socially relevant role. In this sense, the article *A Design Research Business Model: A Framework Built with Brazilian Farmers* proposes a model to support small to medium-sized Brazilian farmers (Debastiani, Alperstedt, Santos & Koerich, 2020). In fact, small businesses need support from the scientific community. The e-Qualifácil, proposed by Bianchi and Ferraz. (2020) consists of an artifact to support micro and small businesses in adopting a quality management system.

The university itself is an environment with many problems requiring our attention. A sensitive aspect in higher education institutions, particularly in universities, is the alignment of projects and the implementation of the strategy (Lacerda, Caulliriaux & Spiegel, 2014). Especially, public universities have characteristics that make this process complex. The research *Promoting and Selecting Strategy-Aligned Projects through Consensus in Universities* by Barbosa and Löbler (2020) sought to develop an approach to address this problem. The research by Gaspareto and Henriqson (2020), in turn, proposes a *Business Model Analysis from the Activity System Perspective*.

Finally, current research, and highly relevant in the context of COVID-19, refers to mobile knowledge workers (MKW), which are a growing phenomenon in 21st-century society. One can imagine the difficulties in maintaining communication and, above all, making this work collaborative. For this challenge, the research *Understanding Collaborative Problem-Solving on the Move: A Design Science Research Journey* encapsulated a method in a mobile application to allow collaboration in solving problems in such environments (Francisco & Klein, 2020). It is important to realize that there are possibilities of application for traditional environments as well. This is a characteristic of research in ‘Design Science’, that is, they refer to a class of problems that may exist in different contexts.

All articles in this special issue aim at generating solutions that can be used immediately in organizations. They also share the courage to learn new methods, propose and implement solutions, and, consequently, engage in the effort to make organizations more competitive. This special issue constituted a favorable *locus* for research with these characteristics. Despite this initial effort, there is still a wide field to be explored, investigated, and developed in ‘Design Science’ and ‘Design Science Research’ within organizations. In this sense, it seems opportune to suggest some paths for the development of research in ‘Design Science’ and ‘Design Science Research’.

In 2014 the *Journal of Operations Management* created the Design Science department, recently named Intervention-based (Chandrasekaran, Treville & Browning, 2020). In this sense, maybe we should consider the possibility of concentrating research that aims to publish articles that generate artifacts and contribute to the development of management theory in a specific

department. Of course, some benefits are evident: sedimentation of research practices, the concentration of artifacts produced, and ease of access by organizations and professionals. This is a path that might be considered.

'Design Science' and 'Design Science Research' have been developing in several themes and areas of knowledge. Wherein each exposes its position and what is considered appropriate for the construction of knowledge. The Brazilian scientific community in general, and the *Brazilian Administration Review* in particular, can develop their autonomous thinking and contribute to a broader understanding of 'Design Science' and 'Design Science Research'.

Is the knowledge produced in 'Design Science' different from what we have produced? In epistemological terms, how do we justify and accumulate this knowledge? The ontological and epistemological aspects are not clearly explained in the 'Design Science' (Iivari, 2007; Piirainen & Gonzales, 2013). The nature of the knowledge generated from the design and construction of artifacts needs to be better explained and understood (van Aken, 2015). In other words, we need research and reflections that better address these issues, providing opportunities for our contribution in global terms.

Another opportunity lies in the interrelationships between artifacts and knowledge on how to design them and the production of knowledge under the paradigm of traditional science. The design and the artifact are important both to incorporate knowledge and to integrate different theories (Haynes & Carroll, 2007). There are developed artifacts that later contributed to the advancement of traditional scientific knowledge (LENOIR, 2005). In other words, traditional science and 'Design Science' have complementary and synergistic relationships.

The classes of problems as an organizer of knowledge and artifacts in 'Design Science' can be an important research path. Knowledge is usually linked to a discipline (Gibbons, Trow, Scott & Schwartzman, 1994; Veit, Lacerda, Camargo, Kipper & Dresch, 2017). Organizing research into classes of problems can help focus efforts and facilitate the development of problem-oriented research (Gauss, Lacerda & Miguel, 2020).

Finally, we need to investigate how 'Design Science Research' can be used for technological development within organizations. In Brazil, we have several companies that develop knowledge and technology in the areas of aerospace, oil and gas, mining, food, among others. In this context, could 'Design Science Research' be a method for conducting research and development in organizations? Anyway, these are some research directions in 'Design Science' and 'Design Science Research'. Our scientific community has all the conditions to think autonomously and contribute to the debate that is under development in the international community.

We hope that this special edition of the *Brazilian Administration Review*, in times of the COVID-19 pandemic, will be the 'first case' of impact for 'Design Science' and 'Design Science Research' to have exponential growth, without flattening the curve, to approach and expand the absorption of operations management research by organizations.

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