Industrial and Organizational Psychology (2019), **12**, 234–238
doi:10.1017/iop.2019.50

CAMBRIDGE UNIVERSITY PRESS

COMMENTARY

Lean is above all a human endeavor

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Nearly 30 years since the Toyota Production System (TPS; later called Lean) was introduced by Womack, Jones, and Roos (1990), as the focal article by Balzer, Brodke, Kluse, and Zickar (2019) highlights, Lean methodology and industrial and organizational (I-O) psychology are relative strangers to one another. Although both disciplines exist within an organizational context, there has been a lack of overlap in research and practice between the two. Whereas Balzer and colleagues have focused on the benefits that Lean methodology would see from implementing a scientific rigor common in I-O research, we feel that there is additional learning to be had for I-O science and practice from the wide and varied adoption of Lean practice in organizations. In this commentary, the authors, an I-O psychologist and a Lean sensei, will define some of the benefits we see in the application of Lean principles to organizational research. The adoption of the core tenets of Lean offers important opportunities for I-O research to be operationalizable, adaptable, and relevant in modern workplaces.

In the focal article, Balzer et al. (2019) rightly identify the scientist–practioner gap as a source of the lack of Lean research in top-tier I-O psychology publications. As an organizational methodology and toolkit, Lean is a practical application of continuous improvement philosophy, which has not benefitted from the rigors of systematic research. Although due, in part, to the lack of standardization across Lean implementation and the flexibility built into the continuous improvement approach, the authors focus on a lack of familiarity among I-O researchers. Balzer et al. highlighted several veins of potential research; however, the concepts highlighted in their article focus on Lean as an environmental context rather than a subject of research in and of itself. Research that views Lean as a context or environment in which work is done and Lean context as a predictor of worker behavior is potentially challenging, requiring long periods of time and sizable, interconnected groups. The consequence of not studying Lean methodology in its own right is that I-O psychology has distanced itself from one of the most revolutionary work methodologies of the late 20th and early 21st centuries. By ignoring Lean as a phenomenon in organizations, we have made the field less relevant for those practicing it in their workplaces.

We appreciate that the focal article has highlighted an important opportunity for I-O psychology to expand knowledge in this area. We propose that I-O psychology can also benefit from learning more about Lean methodology and incorporate Lean's principles into I-O researchers' thinking. Lean is all about efficiency and predictability. By I-O psychology and Lean practitioners partnering together, we predict an exponential increase in the improvements made both in applying and adapting Lean to better meet the needs of an organization. Balzer et al. (2019) identify expansive areas of I-O research where Lean could benefit from a more scientifically focused lens. Employee health and well-being, leadership, teamwork, climate, and culture are not areas ignored in Lean practices. Rather, they are viewed from a very different

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https://doi.org/10.1017/iop.2019.50 Published online by Cambridge University Press

perspective. Most Lean senseis have backgrounds in engineering or computer development. With a new perspective, research in these areas can provide continuous improvement specialists further ways to continually improve.

In addition to the lack of alignment between traditional I-O psychology research and Lean practice, I-O research would benefit from the mindset and philosophy behind Lean. There are three components of Lean methodology we feel present opportunities for I-O research and would provide a set of best practices that could benefit the field if applied more consistently across studies. First, Lean methodology focuses on the integration of people, process, and outcome in a way that should be familiar to those designing studies. However, in the case of Lean, the connection between the three is critical to the success of the method. Second, Lean best practice relies on multiple measures for success. These dependent variables are not independent from one another but rather integrated within a system of criteria. Third and perhaps most importantly, Lean methodology focuses on an end user—the customer—as the ultimate outcome variable. In doing so, employee attitudes and behaviors become an antecedent in the model, with customer attitudes and behaviors as the consequence. The benefit of this within I-O study is both internal—better adoption of findings due to more applicability—and external—a greater alignment with other disciplines such as behavioral economics. By considering the best practices and standard tenets of Lean, I-O research becomes more holistic, more directed, more actionable, and more generalizable to other disciplines.

As demonstrated in figure 1 of the focal article (Balzer et al., 2019, p. 217), the Lean house is key to understanding Lean. Although the simplified version of the house introduces a complex concept in a digestible format, the model as shown lacks the nuance and specificity needed to connect the model to the methodology and therefore its relevance to I-O psychology. As illustrated, the foundation of the Lean house is practices and principles. Lean practices focus on people and purpose. Just as I-O research focuses on workers' experiences as the bedrock of understanding work in organizations, Lean is also built with a foundation and focus on people. In the case of Lean, the experiences of individuals in the group provide the lens through which the success of Lean is viewed. In a team without strong leadership, clear goals, employee engagement and development, and mutual trust, Lean by definition cannot be successful. These are key themes throughout I-O psychology studies and demonstrate clear alignment with Lean management.

To expand the connection further, a core tenet of Lean is the five Lean principles, introduced by Womack and Jones (1996), which focus on stability and standardization. The five principles are (a) value, as defined by the customer; (b) the value stream, which is the entire life cycle of a product or service from inception to completion; (c) flow, which is the elimination of waste to ensure a frictionless path in the create of a product or service; (d) pull, which ensures that work is done as and when needed; and (e) perfection, reaching an optimal end state. The purpose of these principles is to ensure any work can be done the right way, every time, acknowledging that it is impossible to sustain improvements without stable processes. In a Lean environment, consistency is key. Although there is a strong focus on processes as the source of consistency, the implication is that consistent process and expectations provide a grounding for employees to engage with the organization, measure performance consistently, and increase productivity. Thus, the principles of Lean and the values of I-O psychology intersect in a critical way, with both sides potentially benefiting from the other when viewed in tandem.

Importantly, the five principles of Lean thinking build upon each other and create a continuous cycle of improvement. Identifying customer value ensures the business always meets or exceeds customer expectations with their development of products or services. Mapping the value stream provides a visual representation of how value flows through the organization, delivering a unified vison on both what works and what does not work in the process. Creating flow ensures efficiencies are maximized and waste is reduced in all areas of the business. Establishing pull drives delivery of what the customer needs exactly when they request it, and not a moment before. Finally, seeking perfection is not about truly seeking perfection but

https://doi.org/10.1017/iop.2019.50 Published online by Cambridge University Press

the pursuit of it. By constantly reviewing each of the principles, a Lean business never stops improving. Lean and I-O psychology share a basic purpose in improving the environment, productivity, and experience of employees. Whereas I-O traditionally measures employee outcomes such as productivity, Lean views this variable in the context of an organization's value creation for an end consumer and thus a financial outcome.

The most important criterion in Lean is the focus on the customer. In the house analogy, the customer is the roof over the entire system and the component that completes the process. Treating our customers as valued individuals and involving them in improving their experience is key to driving success in Lean. Although most of I-O methodology focuses on the intersection of people, processes, and technology, Lean practices forgo the focus on tools and instead focus on customer-defined outcomes. Similar to interventions that focus on organizational improvements with employees' well-being at the center, Lean uses a similar mindset at the customer level. It is a methodology that values consistent and constant improvements to evolve experiences—a natural connection with I-O psychology.

Solving customer-focused problems requires thorough planning and measurement. A single performance measure does not tell the entire story, no matter the context. The key to success of an organization results from clear strategic planning and balanced metrics. By keeping an eye on employee, process, customer, and financial health, we can easily observe the health of an entire system and on each of these levels as they build upon one another. As shown with the Lean house, employees are the foundation of the planning and measurement. At the employee level, Lean questions if employees have the right skills, technology, and resources to achieve the customers' needs. Using these components connects the employee to the process. The goal is to develop an employee and his or her resources within a process that allows for stability to ensure predictable achievement of goals. The combination of employee and process is then evaluated based on the impact on and value achieved for the customer. Important measurements in this space include ensuring that customer needs are met, value has been created, and experience has met expectations. Finally, success is evaluated using financial impact. Evaluating the interrelated variables in conjunction gives the organization information above and beyond the reach of any of the component parts. Starting from the employee level, through process, then customer, to financial impact allows a Lean practioner to use each of the earlier levels as a leading indication for the next level up. Foundational to the process is the employee, but Lean benefits from the information the other levels provide and creates a map to navigate business impact. Additionally, as each component is viewed in isolation and conjunction with the other variables, the Lean practioner can identify opportunities and threats within the system. I-O research, with its focus on the employee, provides a critical foundation for the Lean system, but Lean expands the value that I-O psychology can create by tying it to the rest of the work ecosystem.

With the focus on value creation for the end customers, their satisfaction, and purchasing behavior, we can also examine the impact of work on the employee. Employees are both integral to the measures of success and consumers of the metrics themselves. Inefficiencies in the work process or a lack of value creation for the end consumer are likely to impact employee engagement, productivity, and satisfaction, perhaps even prior to those impacts being reflected in a financial balance sheet. To reflect back on the Lean house, employees are foundational to the entire Lean methodology, and a focus on employees is critical to understanding the success or failure of a Lean implementation. Just as employee behaviors are predictors for process, customer, and financial outcomes, the customer experiences and behaviors also predict employee experience. Like a true ecosystem, the impact of single components on the others can be complex, multidimensional, and multidirectional.

Although the focus on employees is a critical source of understanding, Lean expands upon traditional I-O research with its emphasis on customer impact as the ultimate criterion. Using customer impact as an outcome measure brings us closer to other organizational imperatives such as business value, return on investment, and, ultimately, financial performance.

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Conversely, ignoring customer impact simultaneously ignores the most important motivator for organizations to perform and the extrinsic motivator for employees. Tying the measurement of Lean management could add important nuance and impact to research conducted by I-O scientists and practioners. Lean practice utilizes multiple, integrated metrics from several types of data sources, reiterated over time, for the understanding and application of all team members. It is, at its core, a practice that focuses on shared understanding, consistent application, and defined expectations.

Considering the end customers and their interactions with employees brings organizational psychology out of the sterile vacuum of research and into a practical context. As psychologists, we should be focused on the impact of work on human behavior, whether internal to the organization or in the external environment. There are significant gains to be made by leveraging Lean's focus on the end customer. By focusing on the end user of a product, service, or experience, we can develop much more sophisticated workplace interventions. Employees' participation in the system drives product development to meet customer needs. If this system, the value stream, is developed not only with the customer in mind but with customer participation, a value-driven eco-system can be established and measured. If we are ever to understand the true return on investment of a product or service, we are dependent on the customer for these key sources of information. Attention to the customer drives continuous improvement, requires flexibility, and promotes an obsession with improving all levels of the value stream. In short, it requires the pursuit of perfection.

It is critical that I-O psychology recognizes that Lean is not staying stagnant. As a system focused on continuous improvement, it is constantly growing and changing. TPS became Lean, which evolved into Lean Six Sigma and then Lean Start Up as the methodology encountered new challenges that required modification to the meet the end goal. The evolution itself is not linear but rather represents branches of Lean that support different organizational situations. By virtue of the focus on continuous improvement, Lean will continue to evolve over time. As demands on processes and results increase, as markets become more easily disrupted, and as more needs to be done with less, new continuous improvement tools and techniques are being developed to meet these customer-driven demands. Organizations are taking on Lean and Lean-inspired practices because of the boon of benefits these practices provide to an organization. When employees consistently apply Lean principles and practices, an organization sees incredible results. Improved customer service, greater productivity, improved quality, reduced complexity, reduced costs, more visibility to the customer needs, increased morale, and predictable delivery of customer value are only a few of the potential benefits.

Lean is a proven business improvement philosophy that focuses on the needs of the customer. As identified in the focal article, Lean practitioners focus on practical application with immediate benefit rather than deeper scientific study. However, hypothesis-based thinking is critical for sound Lean practices as demonstrated by the adaption of Ohno's (1988) and Deming's (1993) iteration and experimentation techniques, which are common practice in Lean. A partnership between I-O psychology and Lean would offer opportunities to enhance Lean practice with I-O's scientific rigor while making I-O research more applicable to practicing organizations. Also, Lean's focus on continuous improvement and research-derived practices indicates that this could be a natural and viable partnership.

Applying Lean practice to I-O research and vice versa provide benefits for both. As Balzer et al. gave a call to action for I-O psychology to study Lean methodology, we both echo that call to action and expand it to encourage I-O to also embrace Lean tenets in its work. Adopting the language, focus, and values of Lean provides a connection point that I-O psychology can use to make our work more generalizable to organizations, more relevant to the actual experiences of workers, and more actionable to implement. If I-O is only getting to Lean in 2019, when will we explore the other methodologies, each one building and "improving" upon a previous continuous improvement system to meet the needs of a modern world? The world is changing quickly.

https://doi.org/10.1017/iop.2019.50 Published online by Cambridge University Press

If we do not start this research now, "fad" or not, we will always be behind. We have an opportunity to contribute to a ubiquitous but under-researched area of employee experience. In order to research this space and provide actionable recommendations, I-O psychology must understand the environment in which Lean methodology functions and the core values, principles, and practices that underlie it.

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Cite this article: O'Brien K.R. and Forman J.B. (2019). Lean is above all a human endeavor. *Industrial and Organizational Psychology* **12**, 234–238. https://doi.org/10.1017/iop.2019.50

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