

Lean Product and Process Development and Set-Based Concurrent Engineering in the Dining Industry: the experience of an American-Asian fusion restaurant

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Abstract: The purpose of this paper is to investigate the implications of a culinary innovation process when adopting manufacturing industry concepts such as LPPD: Lean Product and Process Development. The action research structured in five steps (semi-structured interviews, process mapping, training, and implementation of a new process, process observation, and compilation/feedback of results) allowed the introduction of the LPPD in the culinary innovation process. Results showed that despite the innovation process of a restaurant being based on tacit knowledge, concepts from the manufacturing innovation process could be adopted. Findings can contribute to the multidisciplinary studies involving innovation, the hospitality industry, and the action research application on operations management.

Keywords: Dining innovation, Culinary innovation, Lean Product Development, Set-Based Concurrent Engineering, product development

Desarrollo de procesos y productos Lean y ingeniería simultánea en negocio gastronómico: el experiencia de un restaurante de fusión americano-asiático

Resumen: El propósito es investigar las implicaciones de un proceso de innovación gastronómica cuando se adoptan conceptos de la industria manufacturera como LPPD – Lean Product and Process Development. La investigación-acción estructurada en cinco pasos (entrevistas semiestructuradas, mapeo de procesos, capacitación e implementación de un nuevo proceso, observación del proceso y recopilación / retroalimentación de resultados) permitió la introducción de la LPPD en el proceso de innovación gastronómica. Los resultados mostraron que a pesar de que el proceso de innovación de un restaurante se basa en el conocimiento tácito, se pueden adoptar conceptos del proceso de innovación manufacturera. Así, esta investigación puede contribuir a los estudios multidisciplinares relacionados con la innovación, la industria de la hospitalidade y la aplicación de investigación-acción sobre gestión de operaciones.

Palabras clave: Innovación gastronómica, innovación culinaria, Desarrollo de product lean, Ingeniería Concurrente, Desarrollo de productos

1. Introduction

Continuous improvement methodologies and practices in the hospitality industry are at the core of the development of new products and processes. The food industry particularly has several examples of innovative product development that are part of society's life, to name a few: pasteurised milk, infant formula, canned food, and gluten-free foods (Mishra 2016). However, scholars have been neglecting studies involving both products and process areas (Farrington et al. 2018). Product and process development are critical activities employed by most companies to remain competitive, regardless of the industry type or size. Through the new product development processes, companies seek commercial viability, competitiveness, profitability, and effectiveness, and therefore innovation plays a central role (Hébert and Link 2006).

Among different product and processes development approaches, those improved by the Toyota automaker gained prominence (Liker 2004; Monden 2011; Shingo and Dillon 1989). The Lean Product and Process Development (LPPD), based on Toyota's Product Development System and introduced in the early nineties, focused on a tripod, based on value, knowledge, and improvement (Womack et al. 1990). Also, Set-Based Concurrent Engineering: SBCE played an essential role in the development and design of new products in Toyota (Ward et al. 1995). In this latter approach, creators explicitly communicate and share their set of alternatives, instead of presenting a single *point to point* design, in which the designing process moves step by step. The success of these models helped Toyota to reach the leading position in the car manufacturing industry in the last decade.

Despite the significant contributions of these models to improving efficiency in the manufacturing sector and increasing academic production, their implementation in other industries is scarce. Recent studies discuss the application of lean principles in health care, (Drotz and Poksinska 2014; Poksinska et al. 2017; Tay 2016; Vinodh 2018), financial services (Delgado et al. 2010; Vashishth et al. 2017) and public sector (Antony et al. 2016; Antony et al. 2017), but none in the dining industry.

According to Harrington (2004), in the dining business innovation has not been clearly articulated regarding products and processes. Restaurant business owners recognise the importance of innovation. However, they find difficulties in establishing a systematic practice to create and design new menus (Ottenbacher and Harrington 2007). The food and hospitality businesses require a continuous innovation process, in order to attract consumers and thereby create a sustainable business model (Chattopadhyay and Shah 2014; Cho et al. 2018).

Levitt (1972; 1976) criticised the transference of manufacturing logic for servicing operations. Notwithstanding, a sequence of works, especially in the 2000s brought the universal contribution of lean thinking for organisations: Middleton (2001) in software development, Comm and Mathaisel (2003) in the context of academia, Swank (2003), Leite and Vieira (2015) and Smith et al. (2017) for servicing business. Those authors suggested that principles of lean thinking are universal, and can bring benefits to the organisation. Therefore, service companies can improve efficiency implementing manufacturing principles in their operations, mainly due to the *mass customisation* effect: – the use of flexible processes and structures to produce varied and individually customised products at the low cost of a standard product. (Bowen and Yiungdahl 1998).