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Last-Mile Supply Network Distribution in Omnichannel Retailing: A Configuration-Based Typology

Stanley Frederick W. T. Lim
University of Cambridge, UK
wtsfl2@cam.ac.uk

Elliot Rabinovich
Arizona State University, USA
Elliot.Rabinovich@asu.edu

Dale S. Rogers
Arizona State University, USA
Dale.Rogers@asu.edu

Timothy M. Laseter
University of Virginia, USA
LaseterT@Darden.virginia.edu

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Stanley Frederick W. T. Lim¹, Elliot Rabinovich², Dale S. Rogers³ and
Timothy M. Laseter⁴

¹*University of Cambridge, UK; wtsfl2@cam.ac.uk*

²*Arizona State University, USA; Elliot.Rabinovich@asu.edu*

³*Arizona State University, USA; Dale.Rogers@asu.edu*

⁴*University of Virginia, USA; LaseterT@Darden.virginia.edu*

ABSTRACT

This monograph develops a configuration-based typology describing last-mile supply network (LMSN) distribution configurations in omnichannel retailing. The goal was to integrate relevant terms that have been used disjointedly, with fragmented bodies of theory describing various forms of LMSN. A review of the academic and practice literature was conducted and complemented with secondary observations identifying the key configuration dimensions. Established guidelines for typology and theory building (e.g., Doty and Glick, 1994) were employed in order to develop the typology.

The proposed typology comprises four ideal types: Simple LMSN, Hyperlocal LMSN, One-Stop LMSN, and Protean LMSN. The four types are described along the dimensions of: (1) network structure, (2) network flow, (3) relationship governance, and (4) service architecture. Referred to here

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as the SHOP typology in LMSN, each type is associated with one or more core logistics capabilities elaborated on in a capability profile.

The typology identifies useful LMSN evolutionary patterns and enables scholars to develop models and theories based on the four configurations relating their findings to a specific configuration or across them, rather than expanding efforts on separate and unconnected studies. Notwithstanding, it incorporates elements of the omnichannel context which updates the previous “chain-centric” typology developed by Boyer *et al.* (2005). It also serves as a stepping-stone toward improved insights on what drives, facilitates, and inhibits “fit” potential of LMSN distribution configuration. The research output enhances managers’ understanding of the various forms of LMSN and assists in the identification of possible routes to establish configuration footprints across different LMSNs to support retailers’ omnichannel retailing strategies.

Keywords: Last-mile supply network, Configuration, Logistics capabilities, Typology, Omnichannel

1

Introduction

Omnichannel retailing (OCR) strategies have recently emerged as a powerful engine of growth in the retail industry (Lim and Srari, 2015). These strategies aim to give consumers the ability to move freely between various retail channels (e.g., online, mobile devices, and several different types of physical stores), all within a single-transaction process. Their goal is to provide consumers with a seamless and consistent shopping experience across different channels and devices (Piotrowicz and Cuthbertson, 2014).

OCR strategies have been evolving since the advent of Internet retailing over the last two decades, driven by increasing consumer demand for instant gratification and endless variety. Numerous firms have attempted to claim a stake in the OCR field. A number of them (e.g., Urbanfetch, Kozmo, and eBay Now) have failed in part due to poor design conceptualization and execution of trade-offs between fulfillment responsiveness and product variety, which led to unsustainable inventory and delivery costs.

Success in implementing OCR strategies depends on sophisticated compromises between fulfillment responsiveness and product variety across different product types, consumer segments, and shopping

occasions (Laseter *et al.*, 2015). To carry out these trade-offs, retailers must be adept at operating multiple distribution configurations simultaneously for the so-called “last mile” in the supply chain while delivering a consistent and seamless service experience to consumers. The challenges associated with carrying out these trade-offs are compounded by the high costs and significant inefficiencies present in last-mile operations in the supply chain (Gevaers *et al.*, 2011).

Failures in OCR to optimize the trade-offs between responsiveness and variety are rooted in a poor understanding of how OCR strategies should build on last-mile supply network (LMSN) distribution configurations. To address this issue, we developed a typology of LMSN distribution configurations in OCR. Typologies are complex theoretical statements that help advance new theories and can be empirically tested (Doty and Glick, 1994). Typologies are useful as they: (1) provide a mechanism for incorporating holistic principles of inquiry into organizational research; (2) explicitly define patterns of constructs that determine dependent variables, while enabling researchers to move beyond traditional linear theories; (3) provide a means to incorporate *equifinality*; and (4) establish connections between the findings of various studies (Doty and Glick, 1994).

The existing literature covers a number of last-mile typological systems in the supply chain. For example, Boyer *et al.* (2005) developed four extended supply chain models; Lee and Whang (2001) proposed five e-fulfillment strategies; Lejeune and Yakova (2005) presented four relational configurations based on the concept of interdependence; Chopra (2003) brought forth six forms of delivery structures; and Gevaers *et al.* (2011) developed a typology of last-mile subflow types. However, these typologies do not provide a satisfactory characterization of various forms of LMSN in OCR and their unique structure, product/order and information flow, service architecture, and relational and governance aspects. This is critical because these aspects interact as a part of the broader OCR systems, whose interactions can provide performance outcomes within these systems (Miller, 1986). Moreover, unlike previous typologies, our typology goes beyond distribution configurations that focuses exclusively on the last leg of the supply chain, in which orders

are fulfilled from retailer stations to customer homes. Our typology also considers instances in which orders are fulfilled to remote pickup locations (e.g., lockers and third-party sites) from retailer stations or are fulfilled by retailer vendors (i.e., wholesalers and manufacturers) to customer homes or remote pickup locations.

In addressing these deficiencies in the literature, our typology updates the linearly “chain-centric” extended supply chain models developed previously (Boyer *et al.*, 2005). It also provides a framework that integrates multiple theoretical domains and terminologies that have so far been used disjointedly in order to describe the various forms of LMSN distribution configurations in OCR. The typology comprises four LMSN distribution configurations, described along the dimensions of: (1) network structure, (2) network flow, (3) relationship governance, and (4) service architecture: Simple LMSN, Hyperlocal LMSN, One-Stop LMSN, and Protean LMSN. Referred here as the SHOP typology in LMSN (see Figure 1.1), this typology aims to assist researchers in establishing a point of reference for the examination of different LMSN distribution configurations and their associated theories and concepts. Moreover, this typology will help practitioners by providing them with a juxtaposition between benchmarks of existing configurations against ideal LMSN types. It will also serve to examine alternatives and trade-offs and identify possible paths to establish configuration footprints across different LMSN forms to assist in the implementation of OCR strategies. Henceforth, the term “form”, “type”, and “distribution configuration” are used synonymously in this monograph.

To this end, we explicitly differentiate between “strategies” in OCR and “configurations” in LMSN distribution. Strategy is defined as the “determination of the basic long-term goals and objectives of an enterprise, the adoption of courses of action and the allocation of resources necessary for carrying out these goals” (Chandler, 1974, p. 13). On the other hand, configuration relates to a particular permutation and arrangement of key elements giving different forms of supply network (Srai and Gregory, 2008). In short, strategy determines the business goals and suggests the “how” in achieving them while configuration specifies the forms of LMSN supporting or enabling the chosen business strategy.

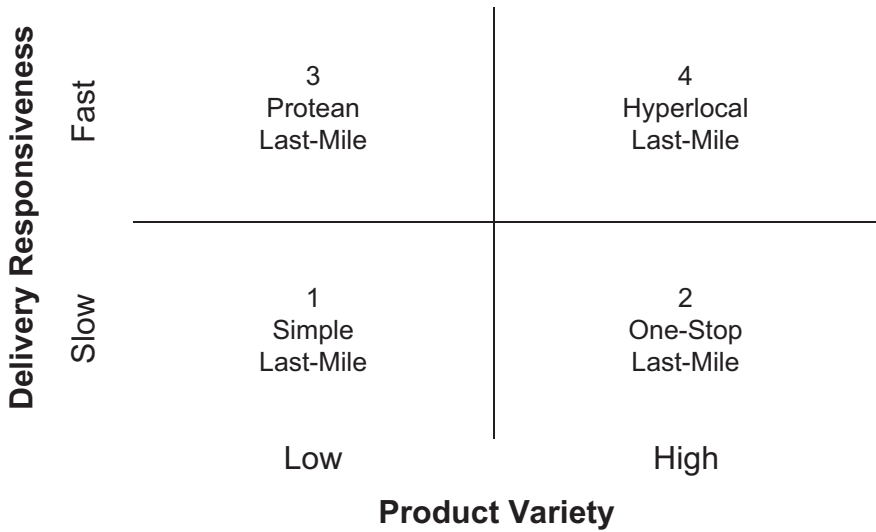


Figure 1.1: The SHOP typology.

The rest of the monograph is organized as follows: Section 2 presents a review of the literature; Section 3 describes the methodology we used to identify the different configuration dimensions and provides definitions of the terminologies; Section 4 describes the LMSN configuration-based typology, whereas Section 5 presents the LMSN evolution patterns through the discussion of example cases; Section 6 highlights the key insights derived from the typology, elaborates on the academic implications, and suggests some research extensions; and lastly, Section 7 discusses the managerial implications and provides a conclusion.

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