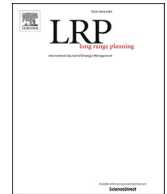




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# Long Range Planning

journal homepage: <http://www.elsevier.com/locate/lrp>

## Towards an adaptive framework of low-end innovation capability – A systematic review and multiple case study analysis

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### ARTICLE INFO

*Article history:*  
Available online xxx

*Keywords:*  
BoP innovation  
Disruptive innovation  
Frugal innovation  
Low-end innovation  
Qualitative research  
Systematic review  
Case studies

### ABSTRACT

Low-end innovations, defined as new products or services that expand a market by addressing consumers with a low willingness or ability to pay, have a dual purpose – they can be a prerequisite for firm survival and growth and a major driver of societal change. To overcome the scattered nature of existing low-end innovation research and its lack of an explicit capability conceptualization, which limits academia's ability to move extant knowledge about the domain forward and limits firms' abilities to reliably produce successful low-end innovations, we present the results of a systematic review of the literature (99 journal articles) and a multiple case study analysis (7 cases). The resulting framework helps understand what constitutes a low-end innovation capability. The findings show that firms need a specific and interdependent capability set consisting of internal dimensions (low-end culture and commitment, integrated cost-reducing innovation, high volume scaling), interface dimensions (distant customer needs acquisition, iteration, total solution development) and external dimensions (access creation, low-end support networking) to cope with low-end markets' unique characteristics. The study also identifies market- and firm-specific contingencies for each capability dimension and analyzes the relationship between low-end and “regular” innovation capability.

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### Introduction

*“I will build a car for the great multitude. It will be large enough for the family, but small enough for the individual to run and care for. It will be constructed of the best materials, by the best men to be hired, after the simplest designs that modern engineering can devise. But it will be so low in price that no man making a good salary will be unable to own one.”*

(Ford and Crowther, 1922, p. 73)

Henry Ford's Model T created a seismic shift in population mobility and profoundly reshaped the automobile industry by expanding the market at the low-end of the consumer spectrum. The Model T served consumers who were unable previously to purchase higher priced cars. More recently, GE Health Care has introduced robust, low-end medical devices into emerging

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<https://doi.org/10.1016/j.lrp.2018.01.004>

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Please cite this article in press as: Reinhardt, R., et al., Towards an adaptive framework of low-end innovation capability – A systematic review and multiple case study analysis, Long Range Planning (2018), <https://doi.org/10.1016/j.lrp.2018.01.004>

markets such as India and China, improving many lives while simultaneously generating profits (Immelt et al., 2009). These examples illustrate that low-end innovations can be drivers of growth and prosperity for both firms and societies in emerging as well as in developed markets (George et al., 2012; Gutiérrez and Vernis, 2016).

The Nielsen Global New Product Innovation Survey (Nielsen, 2015) emphasizes the importance of low-end innovations for consumers. Thirty thousand respondents from 60 countries report affordability as the number one reason for purchasing a new product. It was also the most frequently mentioned need by a wide margin across all regions, both developed (e.g., Europe, North America) and emerging (e.g., Latin America, Asia). These findings underline that low-end innovation is a currently important, global consumer topic.

Managers also report that affordability is the most important criterion for new product success, albeit the least well fulfilled (Winterhoff et al., 2014). While firms expect the frugal products market to double from 2012 to 2018, only 45% currently are successful from a management perspective and less than 30% of managers are satisfied with their profitability (Winterhoff et al., 2014). Our case studies point in a similar direction: that is, low-end innovation is important for firms, but difficult to implement successfully:

*“The pathway is really hard and complicated and the risk is high that after two years you still might not be able to implement [the low-end innovation plan] effectively or in a profitable way.”*(EnergyDev, CEO)

While developing innovations targeting low-end markets has received academic attention, successfully doing so is an ongoing problem in practice. We find three contributing issues with the current literature on low-end innovation.

First, low-end innovation requires different capabilities than regular innovation (Anderson and Markides, 2007; Schmidt and Druehl, 2008; Sood and Tellis, 2011; Viswanathan and Sridharan, 2012; Yu and Hang, 2010) but existing research lacks an explicit overall examination of the capabilities required to successfully develop low-end innovations. While previous research investigates various barriers or success factors, a comprehensive low-end innovation capability framework does not exist, as scholars have previously worked independently across isolated literature streams such as disruptive, Base of the Pyramid (BoP), and frugal innovation. A synthesis of the extant research across streams is needed to uncover and understand all relevant capability dimensions. A comprehensive framework could serve as a foundation for further empirical academic research as well as help practitioners better structure their low-end initiatives.

Second, identified low-end innovation capabilities likely need to be adapted depending on various firm and market contexts. Previous research has focused on specific and isolated sub-dimensions of low-end innovation such as market type (i.e., emerging markets) or lower product performance. However, capabilities that influence success may differ in configuration or relevance across context. Only by synthesizing across literature streams and adding case studies may we account for contextual factors and analyze the most relevant contingencies for each capability dimension. This is particularly important because the firm's or the product's context can change. For example, a firm may expand an innovation's target market from emerging to developed countries: the GE VScan and the Tata Swach are now marketed to customers in both developed and emerging markets (Bender et al., 2014; Rodrigues, 2011). Our approach contributes to the literature by providing an adaptive low-end innovation capability model that contains both capabilities independent of context as well as those that are strongly moderated by firm- or market-specific contexts.

Finally, previous research primarily considers direct influencers of success factors and barriers. However, this research goes beyond direct effects to consider interdependencies between capability dimensions to provide a more complete low-end innovation capability framework. Quantitative testing requires models that analyze both the direct and indirect influences of each capability dimension. Without knowledge of possible interdependencies, building low-end innovation capabilities may be difficult or nearly impossible for firms.

To address these gaps in the literature, we take a comprehensive perspective on low-end innovation and refer to that part of the market with the lowest priced products for consumers with the lowest willingness to pay (WTP) as a low-end market. Using this definition as a starting point, we used the systematic review methodology to analyze the literature explicitly or implicitly focusing on low-end innovation. We also conducted seven case studies to further develop the framework. This dual approach allowed searching broadly using previous research and deeply using case study data. The resulting low-end capability framework presents the capability dimensions, explains how these dimensions relate to “regular” innovation capability dimensions, demonstrates which contingency affects each dimension and shows how the dimensions are related to each other.

## Theoretical background

### *Low-end innovation*

As the field of innovation management has matured (Page and Schirr, 2008), research has taken a more fine-grained perspective in distinguishing radical from incremental (Slater et al., 2014), product from service (Papastathopoulou and Hultink, 2012) and product from process innovation (Frishammar et al., 2012). However, while these contingency perspectives have been reviewed and contrasted with the “traditional” or “regular” model of innovation, low-end innovation management lacks a similar review and framework development. Instead, low-end innovation research remains fragmented across multiple research streams and thus it is difficult to evaluate what is already known.

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