

Innovation Scale: Creating More Reliable Downstream Supply Chain Forecast

ABSTRACT

There has been much research into new products and their failure, yet in the study of supply chain management we seem to leave out the downstream consumer side and instead try to explain this phenomenon in other ways, such as management. This paper examines the downstream area of consumer innovation and looks at current innovation scales in order to develop a new more accurate scale that will in turn create more accurate forecasting for new products in the supply chain. This scale is generated and tested using the individual absorptive capacity.

Innovation and the supply chain

Supply chain management has long stressed the importance of creating products that are innovative (Steenkamp et al 1999). Yet half of the innovations that companies try to produce either fail to even make it into the market or fail to meet their target financial performance (Sivadas and Dywer 2000). Because of this there is a great concern in supply chain management to create innovative products that the consumers will adapt to. Integration is key to the success of a supply chain by linking suppliers, manufacturers, and customers (Bowersox et al 1989). This integration can create a competitive advantage by creating something rare and of considerable value (Anderson and Katz 1998). It has further been shown that integrating the customer adds

value to the customer and speeds up time-to market for new products and processes (Davis et al 1993).

Each component of the supply chain, supply, manufacturing, and demand are important to the overall performance of the supply chain (Barry 2006). This paper links supply chain management and marketing through the theory of knowledge management to add value to the supply chain through knowledge. The knowledge arises for the combination of the theory of absorptive capacity with individual consumer adoption to create a scale that can be used to see whether or not an individual will adapt to products. This creates the knowledge of the correct products to create and who they can be sold to. The supply chain can be broken into three main parts, supply, manufacturing, and demand, each having a detrimental impact on the other (Barry 2004). This paper is concerned mainly with the downstream management of the supply chain or the demand; however since the supply chain is in fact just that, a chain, each individual aspect affects the others.

Supply chain issues

Many problems can arise in the supply chain due to the failure of new products. Forecasting of new products can vary widely leaving too much of a product or in some cases not enough (Urban et al 1996). This can create problems for the parent company due to lack of product or financial burden of too much inventory (Urban et al 1996). If a new product fails all the work in Research and development in creating the product will also be lost with it. This can be a severe financial burden to the company yet the study of creating higher reliability of the end consumer is left out of the literature. This paper examines the consumer side to enhance the supply chain performance and decrease new product failure rates by creating an end consumer

scale that will accurately test a product before it is created. The research question is can firms create an individual innovation scale, through the theory of absorptive capacity, which will allow them to be more proactive in innovation creating and thus allow greater supply chain performance?

Absorptive Capacity theory

We know that new products have been studied in-depth in the supply chain management literature but many times their products still fail (Sivadas and Dywer 2000). Because of this high failure rate a better understanding of the consumer can add the knowledge necessary to increase the performance of the supply chain. This knowledge creation can increase to performance of the firm (Grant 1996). Knowledge is essential to the innovation and creation of the firm (Grant 1996). Individual knowledge gets amplified and can create knowledge for the entire firm (Nonaka 1994). Absorptive capacity creates an understanding of why consumers act the way that they do when a new product enters the market. Absorptive capacity has been studied at all levels including: individual, group, organizational, inter-organizational, and country (Deng et al 2008). It has been shown and empirically tested that individuals that identify, assimilate, and exploit impact the innovation of a firm (Cohen and Levinthal 1990). Zahra and George 2002 later expanded on absorptive capacity which later leads to a model redesigned by Todorova et al 2007. In this same way it is hypothesized that this absorptive capacity will impact an individual's innovation.

Innovation Diffusion

There has been much literature devoted to creating a product that has a fast adoption rate (Rogers 1995; Bass 1969). Rogers created a bell curve stating that people adapt to new products differently depending on several factors. Innovators consist of 2.5% of the population, early adopters consist of 13.5% of the population, early majority consist of 34% of the population, late majority consist of 34% of the population, and laggards consist of 16% of the population. This was then used to create the S curve of adoption where 50% the line between early majority and late majority is the equivalence point (Rogers 1995). Rogers said several factors create the rate of adoption which he called perceived attributes of innovation. These include relative advantage, compatibility, complexity, triability, and observability. He also pointed to communication channels, the social system, and a change agent effect on adoption rate (Rogers 1995). There has been literature to expand this to include price (Thomson and Sinha 2008), and four categories of risk: functional, economic, social, and physical (Ram and Sheth 1989). However through all of this literature there has not been a reliable scale developed that can identify who will adapt to new product. All of these categories fit the theory of absorptive capacity and this article will show that by developing a scale based off of the theory of absorptive capacity we can generate new product success measures before a product is created and thus create a better, more accurate forecasting tool for new products.

Survey creation

This survey combines the adoption areas mentioned into the importance of the absorptive capacity constructs including recognition of value, assimilation of the product and exploitation of the product. This will create a new individual consumer side to absorptive capacity. We currently do not have a reliable scale to provide supply chain managers with the knowledge of consumer

innovation. Absorptive capacity has never been tested on the consumer to provide valuable consumer innovation knowledge.

Once this scale is generated the individuals can be tested to see how certain group[s] Innovators/non-innovators respond to certain marketing companies and thus commercialize the product appropriately. All of which provides greater supply chain performance. In academia it allows researchers to run these empirical tests and further our knowledge on a very fuzzy subject area. It also creates an individual consumer side to the absorptive capacity literature, one that up to this point has not been explored.

Methodology

We will conduct a large-scale survey to collect data. The finished questionnaire will be given to students in Universities around the country. There are several reasons to pick these people:

1. They are consumers that participate in purchasing of products on a day to day bases
2. They have an understanding of the market
3. We have large access to them and they will provide a good response rate
4. They are more likely to return an accurate questioner
5. They can provide the relevant answers to our hypotheses.

Specifically the survey will follow the following steps:

1. Develop the measurement

Examples of measurement items would be:

- Use previous innovation scales to test for difference in outcome
 - Hofacker, Bessant
- Absorptive capacity measures (how well the individual recognizes, assimilates and exploits product to their advantage)
 - We will use previously used surveys that test for individual Absorptive capacity and relate to new products

2. Draft and validate the questionnaire

3. Pilot study

4. Large-scale survey

5. Using the data from the survey, the theoretical framework will be empirically tested by paired t-test to look for significant differences in the new scale created and current scales available.

Future research

Once a more accurate scale is created using consumer absorptive capacity, marketing can then look into how to create higher innovation by marketing towards consumer recognition,

assimilation, and exploitation of the product. This will shift the curve originally proposed by Rogers 1995 and create a generation of consumers that are consisting of more innovators which will create more need for new products and allow for a better faster supply chain with less failure rates of new products.

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