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How Leaders Market and Commercialize Healthcare Technology Innovation

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INTRODUCTION

Datta, Reed, and Jessup (2013) argued that new product innovation is often the lifeblood of a company, yet many innovations introduced into the market fail to commercialize (Frattini, De Massis, Chiesa, Cassia, & Campopiano, 2012). Organizational leaders regularly invest massive amounts of money in new product innovation, yet despite being technically and functionally superior to competing solutions, studies showed firms repeatedly fail to reach commercial success and market acceptance (Chiesa & Frattini, 2011; Talke & Snelders, 2013). Business leaders may assume that developing new product innovations which respond to customers' need or want will automatically result in market success; however, this is far from what previous research findings have indicated (Datta, 2011; Frattini et al., 2012; Teece, 1986).

Instead, new product innovation has commonly led to market success through the process of commercialization (Drucker, 2014). Chiesa and Frattini (2011) argued that commercialization is the most critical stage of the technological innovation process. Despite this fact, it is frequently the least well-managed phase of the entire innovation process (Chiesa & Frattini, 2011; Datta, 2011). New technology product innovations introduced into the market fail to commercialize at high rates (Frattini et al., 2012). For example, in 2013, approximately 40% of new product innovations introduced into the market failed to reach an adequate level of customer acceptance and or provide a return of investment for product development (Castellion & Markham, 2013). Thus, it appears that some business leaders who commercialize a new product innovation do so without adequately considering market acceptance and often have limited strategies to commercialize a new product innovation.

Literature addressing the commercialization process from a marketing perspective is relatively new. Until recently, scholars did not have an integrated framework for studying the collective set of strategic and tactical concepts involved in the commercialization process (Chiesa & Frattini, 2011; Frattini et al., 2012). There is however, extensive literature regarding each of the eight concepts in the commercialization of innovation (CoI) process; yet, most studies explored or examined the CoI concepts individually. As a result, this paper argues that research on what strategies some leaders utilized to commercialize a new product innovation has research merit.

Specifically, this paper investigates what strategies technology development marketing utilized to commercialize a new product innovation in the healthcare market. The enactment of the Affordable Care Act in the United States initiated an explosion of innovation in healthcare. Although healthcare business leaders are producing innovations that meet market needs and are superior to other products on the market, Frattini et al. (2012) maintained that an overwhelming number of commercialized innovations fail to achieve market success. Understanding how all eight strategic and tactical marketing concepts in the CoI framework collectively influence market acceptance may enable business health leaders avoid market failure, better use organizational resources, and subsequently result in increased profits (Chiesa & Frattini, 2011; Frattini et al., 2012).

The paper endeavors to make three contributions. First, the paper seeks to explore what strategies technology development marketing leaders use to commercialize a new product innovation in healthcare. Based on a review of the literature, this paper is the first exploratory case study to explore the CoI process in healthcare. Second, the paper identifies what strategies were implemented during each phase of the CoI process in this case study including the prelaunch phase, the pilot customer phase, and the broader market launch phase. Third, the paper identifies the pitfalls related to commercializing an innovation, especially a radical innovation. By doing so, the paper may support business health leaders maximize commercial success and diffusion of new product innovations in healthcare, which may lead to better patient outcomes and enhanced ways of practicing medicine. The commercialization of a new product innovation is key to entrepreneurial and business success. The COI framework represents a combination of activities that heavily influences commercial success. Confronted with these facts, the COI framework is important and useful to strategic management and marketing literature as evidenced by studies that previously used this framework (Aarikka-Stenroos & Lehtimäki, 2014; Chiesa & Frattini, 2011; Datta, Reed & Jessup, 2013; Datta, Mukherjee & Jessup, 2015).

THEORETICAL FRAMEWORK

In this study, we selected CoI as the theoretical foundation. Teece (1986) originally developed CoI theory to demonstrate how organizational leaders could earn a profit from technological innovation. Drawing from the fields of management, strategy, innovation, entrepreneurship, economics, and marketing, Chiesa and Frattini (2011), Datta, (2011), and Frattini et al. (2012) each extended the work of Teece by proposing several theoretical models that could potentially lead organizations and leaders to greater economic returns from an innovation. For example, Frattini et al. (2012) used the theory to explain the set of decisions or activities required for successfully introducing a new product innovation to market. Key constructs essential to the theory are three interrelated substrategies through which technology innovation moves including (a) early adoption strategy, (b) adoption network configuration strategy, and (c) mainstream adoption strategy since each of these substrategies comprise important commercialization concepts. Within the CoI framework are two classes of concepts: strategic and tactical (Frattini et al., 2012; Hultink, Griffin, Hart, & Robben, 1997). Unlike strategic concepts published in the late 1990s by Hultink et al. (1997), Chiesa and Frattini (2011) and Frattini et al. (2012) concentrated on concepts that influenced market failure or success. Strategic concepts included the following: (a) timing, (b) targeting, (c) positioning, and (d) partnerships and alliances (Frattini et al., 2012). Tactical concepts included the following: (a) product, (b) distribution, (c) communication, and (d) pricing (Frattini et al., 2012). Each of these eight marketing concepts has the potential to influence customer acceptance and subsequently influence an organization's financial performance.

Rival Theory

In contrast, Datta (2011) defined an integrative CoI framework based on the antecedents, mediators, and moderators of commercialization: (a) networks, (b) absorptive capacity, and (c) ambidexterity. Datta sought to identify why some organizations were better than others at bringing new product innovations to market. Datta (2011) described the ability to commercialize an innovation by a firm's capacity to manage three aspects of the innovation process: (a) identify a market for an innovation, (b) develop and manufacture the concept into a product, and (c) sell the product through distribution channels. In Datta's (2011) theoretical model, a firm's absorptive capacity and ambidexterity (ability to explore and exploit) and internal and external networks (structures and collaboration within and between firms) influence its ability to bring an innovation to market and reach the mainstream market.

Despite being interrelated, the two CoI theories are distinct and examine the CoI process from different levels of analysis. Datta (2011) and Frattini et al. (2012) considered CoI at the organizational level. However, Datta studied CoI from more of a strategic management of innovation point of view while Frattini et al. explored commercialization decisions from a marketing perspective. The paper utilizes Frattini et al.'s (2012) CoI model (Figure 1) as the conceptual framework to ground this case study based on the main research question.

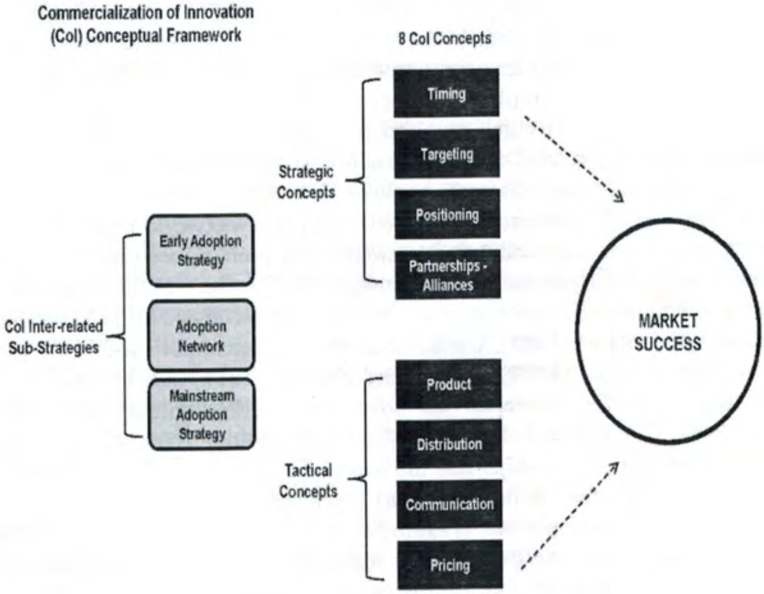

Figure 1. The CoI conceptual framework. Adapted from "Commercializing Technological Innovation: Learning from High-Tech Markets," by V. Chiesa and F. Frattini, 2011, *Journal of Product Innovation Management*, *28*(4), p. 441 and from "Bringing to Market Technological Innovation: What Distinguishes Success from Failure," by Frattini *et al.*, 2012, *International Journal of Engineering Business Management*, *4*(15), p. 9-10.

LITERATURE REVIEW

Innovation

Due to technological advances (Altuntas & Dereli, 2012), globalization (Keupp, Palmié, & Gassmann, 2012), and rapidly changing customer tastes (Altuntas & Dereli, 2012), new product innovation has quickly become an important strategic activity for companies (Calantone & Di Benedetto, 2012). Business leaders often maintained that new product innovation was a vital tool for competing in the marketplace and a key driver of growth and sustainability (Datta et al., 2013; Su et al., 2013). Siegel and Renko (2012) describe innovation as a process or object developed by a firm to create something original or more effective.

Different taxonomies of innovation existed. Businesses may have developed new product innovations, new services, new processes, or new business models (Datta et al., 2013; Teece, 1986). Companies may have to decide to enter new markets or existing markets (Keupp et al., 2012). Likewise, business leaders may have had to choose between developing radical or incremental innovations and between classifying the innovation as continuous or discontinuous (Datta et al., 2013; Frattini et al., 2012; Keupp et al., 2012). Thus, there were many strategies for business leaders to consider in the innovation process and the ability to commercialize new product innovations, which is in turn an important component of a company's strategy (Datta et al., 2013; Keupp et al., 2012).

Commercial Success

Customer acceptance and financial performance are two dimensions used to measure commercial success or failure of an innovation (Chiesa & Frattini, 2011). Commercial success occurs when short-term and long-term sales targets for the innovation are met using three criteria: (a) actual sales one year after launch, (b) actual sales four to five years after launch, and (c) whether the innovation was withdrawn from the market due to poor sales (Chiesa & Frattini, 2011). When actual sales meet or exceed expected sales and the innovation remains in the market as opposed to withdrawn from the market due to poor sales, the new product innovation is declared a commercialized success (Chiesa & Frattini, 2011).

CoI Substrategies

Frattini et al. (2012) noted varying degrees of radicalness and discontinuity of an innovation influence commercialization effectiveness. Business leaders launching a technology innovation reached commercial success by first distinguishing the characteristics of the innovation, the market under target consideration, and the associated behavior and consumption patterns (Frattini et al., 2012). Launch decisions which maximized the likelihood of success can undergo an assessment through a lens of three interrelated substrategies including (a) early adoption strategy, (b) adoption network configuration strategy, and (c) mainstream adoption strategy – a process suggested by Frattini et al. (2012).

Early adoption strategy is a set of commercialization decisions intended to fuel the diffusion of innovation in an early market resulting in a positive attitude by consumers toward the innovation (Frattini et al., 2012). Adoption network configuration strategy involved a set of launch decisions aimed at gaining support, thus enabling the diffusion of the innovation to extend to the mainstream market (Frattini *et al.*, 2012). Similarly, the mainstream adoption strategy comprised a set of commercialization decisions meant to stimulate the diffusion of innovation within the mainstream market (Frattini et al., 2012). Each CoI substrategy requires a distinct set of commercialization concepts to maximize market acceptance.

Strategic Concepts

Chiesa and Frattini (2011) suggested commercialization decisions are divided into two classes of concepts, strategic decisions and tactical decisions. Strategic decisions involved concepts within the overarching innovation strategy (Chiesa & Frattini, 2011) and mostly involved answering questions such as *what* to launch, *where* to launch, *when* to launch, and *why* to launch (Frattini et al., 2014). Business leaders undertake strategic decisions well before an innovation development and launching (Chiesa & Frattini, 2011). Strategic concepts that comprised the CoI framework included the following: (a) timing, (b) targeting, (c) positioning, and (d) partnerships and alliances (Frattini et al., 2012).

Timing. Timing or market entry decisions were often critical to commercial success (Suarez, Grodal, & Gotsopoulos, 2013; Zachary, Gianiodis, Payne, & Markman, 2014). The timing concept happens when a firm launches a new product innovation into the market, when the firm introduced the new product innovation with a preannouncement, and when a firm established partnerships and alliances (Chiesa & Frattini, 2011). When making timing decisions, business leaders must consider strategic intent, risk exposure, resource capabilities, partner relationships, market conditions, and industry evolution (Carmeli & Markman, 2011; Suarez et al., 2013; Teece, 1986; Zachary et al., 2014). There were three primary entry timing strategies that business leaders may have choose from when launching an innovation: first-mover, follower, and late entrant (Lieberman & Montgomery, 2013). Most researchers studied the advantages and disadvantages of first movers and followers with limited research on late entrants (Lévesque, Minniti, & Shepherd, 2013). Although researchers studied launch timing or market entry strategies for decades, entry-timing theories remain incredulous with many shortcomings (Fosfuri *et al.*, 2013; Lieberman & Montgomery, 2013; Zachary et al., 2014).

Targeting. Audience targeting or market selection was the foundation of all business leaders' CoI decisions (Căpățînă, 2014; Chiesa & Frattini, 2011; Weinstien, 2014). The targeting concept described the strategic decisions business leaders made in defining the group or groups of customers who shared similar needs and buying behaviors, and were more likely to adopt the innovation (Chiesa and Frattini, 2011; Weinstien, 2014). Targeting was important because commercial success strongly depended on a firm's knowledge and understanding of the characteristics, needs, and buying intentions of early adopters (Frattini et al., 2012; Reinhardt & Gutner, 2015). According to Chiesa and Frattini (2011), innovators who failed to produce a positive post purchase attitude among early adopters were those firms who failed to target a specific market segment. Business leaders who launched technology innovations applied the concept of targeting to best identify markets to pursue, to adequately develop new product innovations that satisfied initial buyers, and to communicate specifically to particular markets during the launch process (Chiesa & Frattini, 2011; Frattini et al., 2012; Weinstien, 2014).

Positioning. Once business leaders identified the target market for the innovation and understood early adopter characteristics, firms could make appropriate strategic decisions regarding the positioning concept. Positioning was described as how a new product innovation was intentionally placed in the hearts and minds of consumers relative to competitors and substitute products (Chiesa & Frattini, 2011; Frattini et al., 2012). Scholars have conducted little research on the effectiveness of positioning strategies from the consumers' perspective or how the performance of such strategies should be measured (Eryigit & Eryigit, 2014; Fuchs & Diamantopoulos, 2012), much less from the early adopter's point of view or through the lens of an integrated marketing/innovation framework such as CoI.

Partnerships and alliances. Regardless of size, innovating firms were rarely capable of successfully commercializing a new product innovation on their own and often-sought commercialization partners (Aarikka-Stenroos, Sandberg, & Lehtimäki, 2014). Partnerships and alliances were essential relationships external to the organization (Chiesa & Frattini, 2011). Network relationships served two main purposes: supplement resources and foster adoption (Aarikka-Stenroos & Sandberg, 2012; Partanen, Chetty, & Rajala, 2011). Aarikka-Stenroos et al. (2014) posited that partnerships and alliances contributed to the commercialization process in three key ways: (a) created markets, (b) performed commercialization tasks, and (c) facilitated new product innovation diffusion or adoption. Aarikka-Stenroos and Sandberg (2012) also argued that network partners might complicate the commercialization process and emphasized the importance for business leaders to be clear about tradeoffs and benefits.

Tactical Concepts

In addition to the strategic class of CoI concepts outlined above, business leaders also made tactical decisions during the commercialization process (Frattini et al., 2012). Tactical decisions encompassed key components of the marketing mix made later in the process and were typically the operational parts of the CoI framework (Căpățînă, 2014; Chiesa & Frattini, 2011). Drechsler, Natter, and Leeflang (2013) argued that marketing plays a greater role in new product innovation development than many other departments and was capable of linking strategies and tactics to the firm's financial performance. Tactical concepts that comprised the CoI framework included the following: (a) product, (b) distribution, (c) communication, and (d) pricing (Chiesa & Frattini, 2011; Frattini et al., 2012).

Product. Developing the right product at the right time was an essential concept of the CoI process (Chiesa and Frattini, 2011). Frattini et al. (2012) described the product concept as how a new product innovation was configured relative to early adopter needs, wants, and market acceptance. Frattini et al. (2012) argued that business leaders should completely configure new product innovations when innovations were commercialized. On the contrary, Rasmussen and Tanev (2015) maintained that entrepreneurs face greater uncertainty than established firms and should focus on creating minimal viable products (MVPs) to survive the commercialization process. MVPs were product prototypes aimed to test the consumers' expectations.

Distribution. Distribution partners provided products, services, and information to end users (Kou & Lee, 2015). The distribution concept involved decisions business leaders made about which type of delivery channels were optimal and what critical functions each channel partner would perform in the commercialization process (Frattini et al., 2012). Selecting the right distribution channels was an essential decision in the commercialization process that influenced market acceptance and new product innovation diffusion, especially when devising the mainstream adoption strategy (Frattini et al., 2012).

Communication. Frattini et al. (2012) argued that business leaders must understand how each of the eight concepts in the CoI framework, including communication, influence performance achieved by the innovation. Similarly, Lopez and Sicilia (2012) maintained that communication was an essential element of new product innovation adoption. At the beginning of the commercialization process, consumers were not aware of the innovation's existence (Chuhay, 2013). After defining a target market, business leaders make important CoI decisions regarding communication tactics to create awareness and interest (Frattini et al., 2012). The communication concept involves business leaders' decisions about what types of advertising and promotional channels, and what messages may increase effectiveness for product diffusion and market acceptance (Chiesa & Frattini, 2011; Frattini et al., 2012).

Pricing. Pricing is a key component of the marketing mix (Balan, 2014) and represents the last tactical concept from the CoI framework. Among other factors, such as customer and market demand, business leaders set prices to match the innovation's positioning and differentiation strategy (Balan, 2014). Poor pricing practices jeopardize market acceptance and diminish the business leader's chance of acquiring a product advantage (Ingenbleek, Frambach, & Verhallen, 2013). Ingenbleek et al. (2013) quantitative study, which included 144 production and service companies on the effects on market performance and price level determined that pricing decisions are pervasive and best driven by the firm's objectives, product conditions, and market conditions before business leaders select a value, cost, or competition-based pricing strategy.

METHODOLOGY

In the study, we used a case study design to explore and analyze strategies utilized by technology development marketing leaders to commercialize new product innovations within the healthcare market in Washington state of the United States of America.

A case study methodology offered provided several advantages over other research designs. First, case study design enabled the researchers to explore contemporary real-life experiences about a decision or set of decisions and to consider data from multiple sources (Yin, 2014). Second, a case study is the preferred design to explore the complexities of behavior and processes bounded by time within an organization (Yin, 2014). Eisenhardt and Graebnar (2007) generally advocate for a multiple case study in lieu of a single case; however, we selected a single case study since literature about the phenomenon under study is limited and fragmented, and as Datta (2011) noted, researchers still need to explore when a phenomenon is limited and fragmented. Furthermore, Yin (2014) suggested a single case study is informative when researchers want to discover a more in-depth understanding of the specifics and unique characteristics of a particular case.

Sample

Researchers use sampling procedures as the basis for including or excluding participants from a study (Davis, 2013; Kolb, 2012). Census-based sampling is a sampling method used by researchers to study everyone in the target population (Daniel, 2012). In the research, we employed census sampling and interviewed all members of the targeted population that qualified using the eligibility criteria, which in this study included healthcare business leaders. The eligibility criteria consisted of all technology development marketing leaders within a large healthcare market which exploited various strategies to commercialize new product innovations healthcare market. The targeted sample were technology development marketing leaders (managers, directors, or executives) who represented different disciplines including (a) strategy, (b) marketing, (c) technology, (d) product management, and (e) sales; and held decision responsibility for the commercialization process. While there are some health leaders and firms that only market a technology innovation, participants in this study were those who developed and marketed a new technology innovation.

FINDINGS

Twelve subthemes emerged from the data. We grouped the subthemes into three major themes: (a) strategies implemented during the prelaunch phase, (b) strategies implemented during the pilot customer phase, and (c) strategies implemented during the broader market launch phase. Strategies implemented during the prelaunch phase included (a) first-mover timing strategies, (b) market segmentation targeting strategies, and (c) cocreation product strategies. The specific strategies implemented during the pilot customer phase included (a) a mix of positioning the innovation as a real technological breakthrough and something more commonly known or incrementally innovative, (b) a mix of parent and subbrand branding strategies, (c) a skimming pricing strategy, (d) a mix of messages highlighting the sophisticated and technical product features and then communicating the innovation as something more commonly known in the market, (e) a thought leadership communication strategy, (f) a distribution strategy that utilized the pilot customer's existing customer base to field trial the product on patients, and (g) a partnership and alliance strategy of selecting an early adopter pilot customer who funded redeployment of technology for the healthcare market. Strategies implemented during the broader market launch phase included (a) penetration pricing and (b) targeting through identifying new sectors in healthcare and diseases that might benefit from the innovation market segmentation strategies. Table 1 identifies the 12 strategies implemented within the eight strategy categories from the CoI framework during each phase of the commercialization process.

Table 1

Strategies Implemented During Each Phase of the CoI Process

Strategy Category	Prelaunch Phase	Pilot Customer Phase	Broader Market Launch Phase
Timing	First-mover strategy driven by Affordable Care Act		
Targeting	Segmented the market based on highest cost centers in healthcare and willingness to pay	Alpha company allied with one pilot customer to gain a foothold	Identified additional sectors in healthcare and more conditions that might benefit from the innovation
Positioning		Used an inconsistent mix of parent and subbrands when positioning the innovation throughout the CoI process; mixed positioning strategies by positioning the innovation as a real technological breakthrough and then sometimes positioning the innovation as something more commonly known or incrementally innovative	
Distribution		Utilized pilot customer's existing customer base to field trial the product on patients	
Pricing		Initially used a skimming pricing strategy	Transitioned to penetration pricing strategy
Communication		Mixed messages of highlighting sophisticated product features and then communicating the innovation as something more commonly known in the market; selected thought leadership as communication strategy to educate the market	
Product	Conducted focus groups for cocreation strategy re: product configuration at launch		
Partnership & Alliance		Selected early adopter pilot customer who funded redeployment of technology for healthcare market	Pilot customer continued to make the app available for their patients to use as the company pursued other customers.

Emergent Theme 1: Strategies Implemented During the Prelaunch Phase

The first major emergent theme was strategies implemented during the prelaunch phase of the CoI process. The strategy categories represented in the data during this phase were (a) timing, (b) targeting, and (c) product strategies. As confirmed by interview data and company documents, the specific strategies implemented during the prelaunch phase included (a) a first-mover timing strategy, (b) a market segmentation strategy based on highest cost centers in healthcare and willingness to pay, and (c) a cocreation product strategy. The three prelaunch strategies align with Frattini et al.'s (2012) early adoption substrategy from the CoI framework. As noted in the CoI framework timing, targeting, and product strategies were necessary to diffuse the innovation in the early market and build a positive attitude toward the innovation. Frattini et al. (2012) suggested considering communication strategies during this phase; however, we did not consider communication strategies in this our study until the pilot customer phase.

Timing Strategies. Opportunity drove Alpha company's timing strategies. With the enactment of ACA, there was a shift from volume to value-based healthcare, which means that healthcare organizations and consumers are more motivated than ever to demonstrate outcomes and change patient behavior. Participants believe there is a huge need in healthcare for their technology, and it is an untapped market.

Targeting Strategies. Alpha company's targeting strategies were selected based on (a) where was the biggest need for their technology, (b) who was going to benefit from the innovation, (c) who had the money to pay for the innovation, and (d) where the company had relationships. Medication adherence is a big problem in healthcare, and pharmaceuticals seemed to be where there was a convergence of need, desire, and willingness to invest to improve medical adherence. The leaders of Alpha company believed that patients, physicians, payers, and pharmaceutical companies would all benefit from the patient using their digital health platform.

Product Strategies. With pharma identified as Alpha company's first pilot customer, the product was configured to match the needs of patients with neurological disorders (ND); a specific therapy class linked to one of pharma's top drugs. Cocreation was a heavily used product strategy. A participant and company documents confirmed that Alpha company conducted four focus groups to determine the most common challenges ND patients faced in managing their health, the tools they currently used, and feedback on product features (Focus Group Summary 1; Focus Group Summary 2). Other individuals interviewed noted that they determined the product configuration from specifications applied in the company's other markets. Alpha company proceeded with a beta launch to uncover additional insights from the marketplace and then planned to reconfigure the product based on customer feedback.

Emergent Theme 2: Strategies Implemented During the Pilot Customer Phase

The second major emergent theme was strategies implemented during the pilot customer phase of the CoI process. The strategy categories present in this phase were (a) positioning (b) distribution, (c) pricing, (d) communication, and (e) partnerships and alliances. As confirmed by interview data and company documents, the specific strategies implemented during the pilot customer phase included (a) a mix of positioning the innovation as a real technological breakthrough and something more commonly known or incrementally innovative, (b) a mix of parent and subbrand branding strategies, (c) a skimming pricing strategy, (d) a mix of messages highlighting the sophisticated and technical product features and then communicating the innovation as something more commonly known in the market, (e) a thought leadership communication strategy, (f) a distribution strategy that utilized the pilot customer's existing customer base to field trial the product on patients, and (g) a partnership and alliance strategy of selecting an early adopter pilot customer who funded redeployment of technology for the healthcare market. Frattini *et al.* (2012) argued that positioning and partnerships and alliances were critical for gaining support that is necessary for diffusing the innovation in the mainstream market. In this case, positioning strategies were inconsistent, and partnerships and alliances were limited. Table 1 shows the five strategy categories and specific strategies implemented during the pilot customer phase of the CoI process.

Positioning Strategies. Alpha company implemented a mix of positioning the innovation as a real technological breakthrough and something that was more commonly known or incrementally innovative during the pilot customer phase. One of the biggest challenges Alpha company faced was positioning the innovation. Each participant and various company documents described the innovation as something different. Because the technology was so revolutionary to this market, the company found it difficult to explain what their solution was and how it fit into the existing infrastructure. If the company described the technology as artificial intelligence, the market seemed uncertain and afraid of the platform. If the company described the innovation as a digital health platform, the innovation seemed to be perceived as a substitute product for hundreds of other digital health solutions in the market. Describing the innovation as something the market was familiar with seemed to position the innovation as a me-too product. Whereas, describing the innovation as something distinct and unique seemed to create confusion and uncertainty. The only things that do what Alpha company's technology does are human beings. The new product innovation would replace what humans are currently doing.

Distribution. When participants were interviewed regarding distribution strategies, they all stated that they didn't have any distribution strategies in place yet. Alpha company viewed the pharma company that funded the initial development for the ND platform as a customer, not a distributor. Because each customer and disease state would require a different product configuration, they didn't see distribution channels as an option just yet. However, Alpha company implemented a distribution strategy that utilized the pilot customer's existing customer base to field trial the product on patients.

Pricing Strategies. When it came to pricing the innovation, Alpha company began with a skimming pricing strategy. Initially, the company charged the pharma pilot customer a fixed fee, which was used to fund the development of the platform. Of those interviewed, several of participants from Alpha company indicated the company implemented a pricing strategy in the CoI process. While others claimed a high price, or price skimming strategy, was used initially at launch. Price skimming was applied when business leaders want to recoup quickly the substantial financial investments made in the development of the innovation (Shaw, 2012). Company documents did not mention a pricing strategy, but other scholars confirmed the importance of implementing a pricing strategy when launching an innovation. Kuester, Feurer, Schuhmacher, and Reinartz (2015) maintained it was difficult for innovators, especially for radical innovations, to price new products when equal or similar products do not exist yet.

Communication Strategies. Alpha company implemented two strategies from the communication category in the CoI framework. There was a mix of messages highlighting the sophisticated and technical product features and then communicating the innovation as something more commonly known in the market, and there was a thought leadership communication strategy during the pilot customer phase of the CoI process. While Alpha company appeared to have success with their thought leadership strategy, the messaging strategy was problematic. One participant acknowledged that modifying the message to something that people understood was one of their biggest challenges. Frattini et al. (2012) argued that positioning and messaging remain difficult with radical innovations like this technology.

Partnerships and alliances. Similar to the participant's view about distribution strategies, the technology marketing leaders from this case maintained that partnerships and alliance strategies were not implemented. Participants viewed the pharma company as a customer, not a partner. Participants claimed they did a lot on their own and were still in the process of identifying partners to help them go to market. However, Alpha company implemented a partnership and alliance strategy of selecting an early adopter pilot customer who funded redeployment of technology for the healthcare market.

Emergent Theme 3: Strategies Implemented During the Broader Market Launch Phase

The third major emergent theme was strategies implemented during the broader market launch phase of the CoI process. The strategy categories present in this phase were targeting and pricing. Within these two strategy categories, as confirmed by interview data and company documents, Alpha company implemented a targeting strategy of identifying new sectors in healthcare and diseases that might benefit from the innovation and a penetration pricing strategy. I discovered that Alpha company transitioned from the initially adopted strategy to another approach. In this case, the market segmentation strategy expanded over time and Alpha company transitioned from a skimming pricing strategy to a penetration pricing strategy. Table 1 identified the two strategy categories and the specific strategies implemented during the broader market launch phase of the CoI process.

Targeting Strategies. During the broader market launch phase, Alpha company decided to start exploring other market segments in healthcare to grow revenues and profitability. As indicated by participants, the company needed to understand where the money was being spent. There were other sectors in healthcare and other disease states that might benefit from the company's technology. Specialty pharmacy was another segment they began to explore because this sector was increasingly responsible for demonstrating improved health outcomes. Although the specialty pharmacy market does not usually have the same large revenues and profits as pharma to pay for these types of innovations, Alpha company believed their innovation could drastically reduce operational costs, which might make the innovation more attractive.

Pricing Strategies. After initially implementing a skimming pricing strategy, the company transitioned to a penetration strategy. Alpha company decided the skimming strategy was not sustainable and chose to secure funding on its own to build the product, so it could sell the platform based on market value and penetrate the market quicker. Hinterhuber and Liozu (2014) asserted that unlike established products and services, which may build their pricing strategy on costs, competition, and customer value, business leaders often price innovations based on launch goals (Shaw, 2012). As well, participants noted in some instances, a pricing strategy evolved throughout the launch process to a penetration strategy, which meant lowering the price, which enable what some participants called risk reduction, enabling the deployment of the product faster, which is necessary since consumer acceptance of new products is influenced by perceived price fairness and judgments on as-similar-as-possible reference transactions, which supports Kuester et al., 2015 assertion that it is necessary to make a product consumable; and that it makes sense in a buyer strategy. Such steps offer the potential to shorten the time gap to close new business when changes to a pricing strategy improve the perception of price fairness. Kuester et al. (2015) claimed highly innovative consumers, who were more likely to purchase radical new products, generally viewed high launch prices more favorably than less innovative consumers.

DISCUSSION

The objective of this research was to determine what strategies some technology development marketing leaders used to commercialize a new product innovation in the healthcare. Five technology development marketing leaders from one healthcare company in Washington state participated in semistructured interviews. In addition to interview data, we analyzed a reflective journal and company documents from the CoI process.

After collecting and analyzing data, three major themes emerged including (a) strategies implemented during the prelaunch phase, (b) strategies implemented during the pilot customer phase, and (c) strategies implemented during the broader market launch phase. Strategies implemented during the prelaunch phase included (a) first-mover timing strategies, (b) market segmentation targeting strategies, and (c) cocreation product strategies. The specific strategies implemented during the pilot customer phase included (a) mix of positioning the innovation as a real technological breakthrough and something more commonly known or incrementally innovative, (b) a mix of parent and subbrand branding strategies, (c) a skimming pricing strategy, (d) a mix of messages highlighting the sophisticated and technical product features and then communicating the innovation as something more commonly known in the market, (e) a thought leadership communication strategy, (f) a distribution strategy that utilized the pilot customer's existing customer base to field trial the product on patients, and (g) a partnership and alliance strategy of selecting an early adopter pilot customer who funded redeployment of technology for the healthcare market. Strategies implemented during the broader market launch phase included (a) a penetration pricing strategy and (b) a targeting strategy of identifying new sectors in healthcare and diseases that might benefit from the innovation.

The specific business problem for this study was that some technology development marketing leaders have limited strategies to commercialize new product innovations in the healthcare market. Although limited to a narrow set of commercialization strategies, the results of this study included findings that might have the potential to influence the success of a new product innovation and help business leaders avoid market failure, apply better use of organizational resources, and increase profitability. The study participants and company documents demonstrated the strategies that were used by technology development marketing leaders in this single case. Organizational leaders must make their own assessment and select the strategies that make the most sense based on market research and their type of innovation. Healthcare business leaders must identify whether they are launching a radical or incremental innovation since different types of innovation require a different set of commercialization strategies.

The results of this study demonstrated the challenges associated with being a first-mover, having an unclear positioning strategy, and not having the right partnerships and alliances in place to stimulate diffusion of the innovation. An additional contribution of this study is an illustration of how the three prelaunch strategies from this case aligned with Frattini et al.'s (2012) early adoption substrategy from the CoI framework, which stated that timing, targeting, and product strategies were necessary to diffuse the innovation in the early market and build a positive attitude toward the innovation. In this case, positioning strategies were inconsistent, and partnerships and alliances were limited.

Implications

The enactment of the Affordable Care Act initiated an explosion of innovation in healthcare. Although healthcare business leaders are producing innovations that meet market needs and are superior to other products on the market, Frattini et al. (2012) maintained that an overwhelming number of commercialized innovations would not reach market success. Some healthcare business leaders have a limited understanding of the strategies that influence commercial success and failure. The findings from this study are relevant to improving business practice because the findings revealed the set of commercialization decisions made by technology development marketing leaders in the case, what phase of the CoI process specific strategies were implemented, and some of the pitfalls of commercializing a innovation, especially a radical innovation.

The findings of this study may enable healthcare business leaders optimize market success by being aware of some of the strategies used in this case. Healthcare business leaders might choose a pilot customer or early adopter to fund the development of the innovation. This strategy may help businesses that need additional capital to develop or launch the innovation. Participants in this case also used a cocreation product strategy to determine the optimal configuration at launch. Other healthcare business leaders may choose this product strategy to maximize the use of resources by identifying which features or functionality are most important to early adopters.

Business practice might be improved by extending knowledge about what strategies were used throughout different phases of the CoI process. *Frattini et al.* (2012) suggested that effective commercialization was maximized when specific strategic decisions were made through the lens of three interrelated substrategies: (a) early adoption strategy, (b) adoption network, and (c) mainstream adoption. In this case, some of the strategic categories used during the prelaunch, pilot, and broader market phases aligned with this CoI framework; whereas, in other instances some of the strategic decisions did not align. Healthcare business leaders might enhance their commercial success by better understanding the significance of implementing specific strategic categories during precise phases of the CoI process.

The findings of this study may also facilitate healthcare business leaders to circumvent failure by avoiding some of the pitfalls of commercialization identified in this case. Being first to market with an innovation does not always guarantee market success (Zachary *et al.*, 2014). The findings from this case demonstrated the challenges with being first to market, especially with bringing a radical innovation to market. Launching an artificial intelligence platform to meet some of the needs in healthcare was unprecedented and healthcare business leaders struggled with reaching potential customers who were less risk averse. Healthcare business leaders were unsure how to position, brand, and message the innovation. The unclear positioning, branding, and messaging resulted in limited support from the adoption network and a narrower diffusion of the innovation throughout the market. Healthcare business leaders might enhance their commercial success by gaining a deeper understanding of the strategies that influence commercial success and failure.

LIMITATIONS & FUTURE RESEARCH

Limitations

Leedy and Ormrod (2013) defined limitations as potential weaknesses beyond the researcher's control that may influence the results of the study. The research design was an exploratory single case study, which may limit the transferability of findings to other firm sizes or geographic locations. Likewise, the findings from this study may not reflect the perspectives of all leaders within the organization. Participants may not accurately recall each decision made in the commercialization process.

Further Research

Recommendations for further research are studies (a) in different geographical locations, (b) of different firm sizes, (c) of different phases of the company life cycle, (d) which are a multiple case study, and (e) conducted concurrent with the CoI process. The explosion of new product innovation within healthcare businesses warrants a deeper exploration of the commercialization strategies used to reach market success and the strategies used to improve commercialization practices in healthcare businesses. Researchers should conduct further studies with different market segments of technology development marketing leaders outside the healthcare market and to a broader geographic area. Additional research with other firm sizes and other regional locations may provide added insights into what commercialization strategies are being implemented and overlooked by business leaders.

A comparative study among cases with businesses at various stages of a company's lifecycle such as what commercialization strategies were used for a start-up versus a mature company might be useful for business leaders. A further opportunity to expand the data is achievable by researchers to collect data while the CoI process is taking place instead of a historical look back on the commercialization decisions made in the past to ensure a complete representation of the commercialization process. Finally, technology development marketing leaders should analyze the impact of specific strategies on new product innovation performance to inform healthcare business leaders on what strategies have the greatest impact on reaching market success.

CONCLUSION

Based on the literature, this paper is the first in-depth inquiry concerning the commercialization of innovation strategies used by healthcare business leaders. Previous research explored and examined the strategic and tactical marketing decisions made in the commercialization process independently. The paper examined strategies implemented during the prelaunch phase, strategies implemented during the pilot customer phase, and strategies implemented during the broader market launch phase responds to calls in management, innovation, and marketing literature to advance existing knowledge about the strategies that might influence CoI success and failure. It also provides guidance for business health leaders who need more strategies to commercialize a new product innovation in the healthcare market.

The paper identified there are pitfalls to commercializing an innovation, especially a radical innovation. There are challenges associated with being a first-mover, having an unclear positioning strategy, and not having the right partnerships and alliances in place to stimulate diffusion of the innovation. The findings of this paper are relevant to improving the commercialization decisions made by technology development marketing leaders.

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