DIAGNOSING THE

MARKET-DRIVEN APPROACH TO INNOVATION:

LEARNING FROM PRACTICE

by

George S. Day
The Wharton School
University of Pennsylvania
3730 Walnut Street
Philadelphia, PA 19104-6340
Telephone: 215-898-8245
Email: dayg@wharton.upenn.edu

Forthcoming in *Strategic Management Review*

Keywords: Innovation, Organic Growth, Market Orientation, Dynamic Capabilities, Strategy Formulation

DIAGNOSING THE MARKET-DRIVEN APPROACH TO INNOVATION:

LEARNING FROM PRACTICE

Market-driven innovation features an outside-in approach to strategic growth issues. This approach is guided by an organic growth strategy and a dashboard of innovation metrics, while iterating between outside-in considerations and the possibilities and constraints of inside-out factors, and enabled by dynamic sensing and seizing capabilities. This paper describes how this approach is integrated with technology-driven approaches to innovation, and activated through four core activities: identifying growth opportunities, selecting and validating the best opportunities, containing risks in the portfolio of innovation initiatives, and then launching and scaling the outcome of the development activities. We propose a research agenda that addresses the antecedents, moderators and consequences of market-driven innovation, and the process of implementing this approach.

There is a well-established and intuitively plausible distinction between market-driven versus technology-driven approaches to managing innovation activities. Does this familiar distinction furnish useful guidance for the strategic choices of the scope, direction and resourcing of internal innovation or the development of innovation capabilities? These questions are the fulcrum for a deeper enquiry into the innovation[1] approaches used by firms pursuing the strategic objective of superior organic growth rates in their revenues, earnings and returns.

Market-driven approaches,[2] and variants such as customer-centered or demand-pull innovation, emphasize identifying and meeting the needs of present and potential customers better than rivals. Technology-driven or supply-push approaches start with advances in the enabling technologies, and then develop markets for the new capabilities and functionalities. This distinction has a long history (Mowery & Rosenberg 1979) and remains widely used (Pisano 2015; Habtay & Holman 2014; Chasten 2017) as a handy way to simplify and communicate the diversity of innovation approaches. The approach used by a firm may be an explicit choice informed by strategic realities, or a result of path dependency (Cohen & Levinthal 1990), inertia and the inclination of managers to stay with familiar practices.

In the spirit of being market-driven, this paper aims to address the needs of the target audiences of thoughtful practitioners and scholars of innovation and corporate renewal, for an integrated and strategic approach to managing innovation. We put forward the five mutually reinforcing elements of *market-driven innovation* as: (1) an outside-in perspective on strategic growth issues, that is (2) Directed by an organic growth strategy, (3) Iterating between outside-in considerations and the possibilities and constraints of inside-out resources, factors, (4) Enabled by dynamic sensing and seizing capabilities, and (5) Guided by a dashboard of innovation metrics.

We find continued validity and utility to the distinction between market and technology-driven approaches (in the dictionary sense of an approach as a distinctive way of dealing with something), with three provisos: First, that superior organic growth through innovation requires a tightly-coupled integration of the two approaches. It is not an "either-or" choice of emphasis. Second, the market-driven approach adopts a wider lens for identifying potential growth opportunities and a more expansive mental model for firms to apply in their choice of how to grow. Third, that an integrated approach to innovation for growth will be messy, iterative and anything but orderly in keeping with the inherently risky and exploratory nature of innovation (Coyne and Van de Ven, 2023 forthcoming).

The productive integration of the market-driven and technology-driven approaches is activated through the core innovation activities of: **identifying** growth opportunities, **selecting** and validating those to be developed, **containing** the risks in the portfolio of innovation initiatives and projects, and then **launching** and scaling the outcomes of the development process into the market, while learning from market feedback. These activities require choices about where, when and how to innovate, that exhibit each of the defining features of strategic decisions (Leiblein, Reuer & Zenger 2018). The performance outcomes of these choices depends on: (1) The fit of *what's possible* – with the firm's capabilities, culture and configuration, when combined with accessible advances in technology – with *what's needed* by customers and consumers, (2) The actions and reactions of present and prospective

competitors, partners in the innovation ecosystem, regulators and other influencers, and (3) They require escalating commitments of resources that both enable and constrain future strategic choices. The difficulty of making these choices is compounded by uncertainty in market and economic prospects, advances in technology performance and cost, and competitor actions and reactions

Approaches to innovation are subject to continuous improvement through the mechanisms of experimentation, advances in management practices, diffusion of next practices through observation and the movement of talent, and by advances in scholarship. To guide the development and dissemination of research on innovation we propose a research agenda addressing questions about the *antecedents* and moderating properties of successful firms, the growth and financial *consequences* of the alternative approaches that suggest a contingency theory, and the *iterative process* of innovation in an increasingly fast-paced, turbulent, and uncertain environment.

MARKET-DRIVEN INNOVATION

Being market-driven emphasizes the need to be "relentlessly compelled" by market realities and opportunities for growth, as implied by the dictionary meaning of "driven." The term is intended to be broader than customer-led or customer-centric, to address the concerns of Christensen (1997) and others, that firms should not be myopically focused on satisfying their current profitable customers, and pay closer attention to potential customers in embryonic but growing markets that could support new concepts.

Govindarajan et al (2011) have clarified this issue by distinguishing between mainstream and emerging (marginal and potential) customer orientations that would normally be fused into a market-driven approach. They found that a "mainstream" customer orientation had a positive impact on the introduction of radical product innovations that draw on a substantially new technology, whereas an "emerging" customer orientation had a positive effect on disruptive innovations that introduced a

different set of performance attributes relative to what already exists. They concluded that the two orientations were not mutually exclusive; successful market-driven innovators must be ambidextrous. Both mainstream and emerging customer orientations co-exist and are complementary.

Market-driven firms serve their current customers, while being vigilant for opportunities in underserved, emerging or potential markets that can apply advances in the enabling technologies. To be most effective, market-driven innovation approaches need to be guided by a growth strategy and feedback from performance metrics indicating whether the strategic objectives are being realized. We turn now to our synthesis of the five elements that define this approach.

(1) Starting with an Outside-In Perspective

A wide-angled, outside-in lens on organic growth possibilities considers all the present and prospective customers, collaborators and competitors (Brandenberger 2017, Day 2022) in the market ecosystem, by taking their vantage points. This perspective has a close affinity to a market orientation, which is the identification and satisfaction of customer needs better than competitors, achieved through collective behaviors that generate, disseminate and respond to market intelligence (Kohli & Jaworski 1990). These manifested behaviors reflect and shape an organization's culture (Homberg & Pflesser 2000). This lens is an antidote to the narrowing effect of an inside-out perspective that asks, "how else could we deploy our resources and capabilities to achieve our growth aspirations?" This is an essential question, but when asked prematurely, it can constrain the innovation possibilities being considered.

An illustrative contrast of the outside-in and inside-out approaches is the choice of where to start a new product development (NPD) process; should it begin with a product or technology map that emphasizes product features and functions, or a customer experience map that reveals the benefits these features should provide to meet emerging or latent customer needs (Kim et al 2014)? The technology map narrows the scope of the innovation lens by limiting the options to what is likely

possible, versus what will be needed. It risks turning the development process into solving a technical puzzle, rather than finding an improvement to the total customer experience that leverages anticipated advances in technology.

A wide-angle, outside-in perspective is fueled by collective curiosity about the early signals of potential opportunities identified by the scanning activities, and the exercise of empathy to see the firm from the perspective of external agents.[3] As Nonaka & Takeuchi (2021) observe, "…empathy is facilitated inside the brain, but needs…to expand beyond the individual level. Empathizing with others is synonymous with sensing and understanding others, not just on a shallow intellectual level but on a deep emotional level."

The advantages of outside-in perspective are illustrated by the dynamics of the e-book device market from 2006 to 2012 (before digital books moved to the cloud). Both the Sony eReader and the Amazon Kindle devices were intended to provide a better experience than printed books at a lower cost. Although Sony had a two-year head start, their global market share had shrunk to 9.4 percent by 2012, while Amazon held a 48.0 percent share.

When the Sony eReader was introduced it was hailed as the iPod of the book industry. As a device the eReader was exceptional: slim, lightweight and easy to navigate. Yet a reader is of little value without accessible and desirable content, (which the publishers were loath to provide to Sony), and a convenient process for getting e-books into the reader (Adner 2012). Sony required the user to find, buy and download the book file to a PC, before transferring the book to the eReader. Their inside-out focus on designing a device to fit their capabilities meant they weren't attuned to the full experience of the book reader or to meeting the needs of the ecosystem of publishers, distributors, and computer makers.

The Amazon Kindle was larger and bulkier than the Sony eReader, with an inferior user interface. However, it was much easier to connect via a wireless network and offered a vast book library.

Because Amazon deeply understood the requirements of publishers, their design choices emphasized protecting these publishers' digital rights. The publishers were reassured and willing to offer their full list of books. The Kindle emerged from the signature outside-in approach to innovation within Amazon that requires development teams to begin with a "future press release" announcing an innovation and the benefits to consumers, as though it was ready to be launched (Bryar and Carr 2021).

(2) **Directed by an Organic Growth Strategy**

Innovation approaches are a means to an end, which is superior firm performance. Since Penrose (1959) first articulated the "theory of the growth of a firm," this performance objective has been generally accepted as the achievement of a superior rate of organic growth (Denrell, et al 2012).

A growth strategy states how a firm's innovation activities will achieve the organic growth aspirations. An effective strategy clarifies priorities, guides the commitment of people and financial resources, and promotes the alignment of diverse functional activities. To realize these benefits, a growth strategy addresses four questions:[4] (1) How fast do we want to grow with our own resources? (2) How broadly will we search for organic growth opportunities? (3) What is our risk appetite (will we be a disruptor or a fast follower?), and (4) What is our allocation of resources to protecting the core business, versus entering adjacencies or new arenas?

Among the most consequential strategic choices are those crystallized in the relative emphasis on incremental versus discontinuous transformations (Agarwal & Helfat 2009). The practitioner literature (Zott 2004, Manly et al 2015) advocates a portfolio approach, that acknowledges that incremental innovations are necessary to match competition and exploit existing capabilities, but rarely generate much additional organic growth. Conversely discontinuous or transformative innovations are much riskier, and the rewards (if any) are accrued in the future. Moves into adjacent markets and

technologies achieve a better balance of risk and reward by striking into new territory while applying the resources, capabilities, and knowledge base of the business.

Behavioral theories of organizational innovation point to a cognitive bias toward incremental innovation in most firms (Furr and Eggers 2021). These biases could afflict such innovation activities as: (1) searching for opportunities; leading to a bias toward familiar domains and an aversion to distant search. (2) evaluating transformative/disruptive opportunities that is prone to favoring familiar ideas that fit the identity and business model of the firm, or a bias against transformative innovations due to metrics and rewards systems designed for managing established products, and (3) resource allocation biases that may lead to overlooking future options value when there is uncertainty and ambiguity.

Evidence of the contribution of an explicit, well-articulated and widely understood growth strategy to innovation performance is sparse. A study (Day, 2019) of senior innovation leaders in 168 global companies found that *innovation ability* (comprising the innovation culture, capabilities and configuration of the firm) was essential to growth leadership, but not sufficient. It was the interaction of innovation ability with *strategic growth-seeking discipline,* measured by whether the process for setting the growth strategy was systematic, and this strategy was well-articulated and understood throughout the firm as well as the adequacy of resource commitments, that explained why organic growth leaders outperformed the average growth rate of the industry.

An organic growth strategy is formulated within a broader context of three other avenues for corporate renewal: resource redeployment, mergers and acquisitions and divestitures (Feldman & Sakhartov 2021,Agarwal & Helfat 2009). These alternative avenues may be complements or substitutes. A judicious investment in an early-stage start-up many provide access to complementary technological capabilities and cutting-edge talent that enables subsequent internal innovation projects to proceed. There is substitution during the allocation of scarce financial and R & D resources to innovation projects,

during an iterative negotiation process between functional groups, the leadership team, and the board of directors, while considering the reactions of equity analysts. This is the strategic context in which market-driven innovation is managed.

(3) Iterating Between Outside In and Inside Out

The rationale is that superior organic growth is achieved with innovations that emerge from an iterative learning process that seeks the best combination of outside-in and inside-out considerations. This process starts with an outside-in search for possible innovation opportunities. This sets an expansive context for the inside-out considerations of internal capabilities, core assets and resources to leverage, with a recognition of the constraints to be managed. Each iterative cycle creates new insights and deeper questions that feed the next cycle with cumulative learning.

Conversely, starting from the inside out, with leveraging the scarce, inimitable and valuable resources of the firm (Barney 1991), may prematurely narrow and anchor the search for growth to what exists now, versus what might be possible in the future. An apt illustration of these possible limits of inside-out thinking is the observation by Shin Sakane (Unger 2018), a leading Japanese innovator, on the problems of slow-growth Japanese companies:

> *"The most important factor is finding a theme to work on. Many Japanese companies manage to make steady profits, but they don't produce the new products or services that they might. Instead of finding a theme, they focus on the technologies they already have, and the value they already know how to create. I think this is one of the core reasons for their not growing.*
>
> *For example, some electronics companies – active in the electronics world, with global sales and marketing networks – have narrowed their scope to niche categories, like liquid crystal TV. They use the same core materials, and reach for the same resources, each time. It's better to look for a theme based on customer needs. What do people want that they don't have yet and that isn't available elsewhere?"*

The concept of dualism of yin and yang in ancient Chinese philosophy is an apt expression of the desired interaction of outside-in and inside-out processes. This dualism describes how seemingly contrary forces or processes are actually complementary and interrelated; one gives rise to the other. To achieve a balanced approach both outside-in and inside-out processes need to be employed effectively and tightly integrated.

The efficacy of a flexible and iterative process is endorsed by research on strategy formulation processes by Burgelman et al (2018). They propose a process framework marked by episodes of strategy making initiated by the accumulation of emerging challenges such as performance shortfalls, formal capital appropriation cycles, or a new leadership team. The outcomes are decisions to begin new growth initiatives or changes in the strategic direction. Decisions to seize emergent opportunities eventually require deeper commitments that put constraints on future actions. To maintain flexibility, they argue that it may be desirable to make staged commitments by partnering, outsourcing and building multi-purpose facilities and capabilities.

When resources are constrained the innovation initiatives may come from an emergent, "bricolage" process that starts from the inside out (Miller 2021). Bricolage is defined by Bakker and Nelson (2005 p. 333) as, "making do by applying combinations of the resources at hand to new problems and opportunities." Examples of bricolage are the enumeration of existing resources and experimenting with new resource combinations, encouraging employees to alter their work routines, or relaxing the selection mechanism.

(4) Enabled by Dynamic Capabilities

The operational capabilities and codifiable routines used to efficiently manage the established operations of a firm are not suitable for managing most innovation processes – especially within highly uncertain environments. This is the role of dynamic capabilities for: 1) *Sensing and shaping*

opportunities and threats (including the "identification, development and co-development of technological opportunities in relationship to customer needs"), 2) *Seizing* opportunities and parrying threats with the "mobilization of resources to address needs and opportunities, and to capture value from doing so" (Teece 2007, 2014), and 3) *Transforming the organization* by redesigning the organization structure to adopt an agile, entrepreneurial mindset. These dynamic capabilities reside mainly within the capacity of individual managers and the leadership team. They are given meaning by the choices and commitments of these leaders and managers (Adner and Helfat, 2003, Helfat and Martin, 2015). While dynamic capabilities are distinct from an organization's intentions, motivations, and strategy (Teece et al 2016), their effectiveness depends on the skills of the leadership team, the clarity of the strategic direction and the degree to which the organization is aligned with this strategy.

The dynamic capability for "generative sensing" is a key enabler of innovation and opportunity identification activities. These sensing capabilities are used to generate and test hypotheses, explore the reasons for perceived threats and opportunities, and explain anomalous findings. Drawing on design cognition research, Dong et al (2015) have identified the essential cognitive activities underpinning the sensing capability: 1) Framing, that yields a schema for interpreting situations, problems or findings, 2) Abduction, which is the problem-solving process used to explain findings, and then 3) Generating and testing hypotheses using prototyping and experiments as an input to decision making.

The enabling role of dynamic capabilities was highlighted in a bibliometric analysis of the co-citation frequencies in a set of 1555 articles on the sources of innovation published between 1991 and 2006 (Di Stefano et al 2012). The most cited article – by a factor of five – was the foundational article on dynamic capabilities by Teece, et al (1997). Two pertinent conclusions from this study were that: "resources, competencies and knowledge can themselves be sources of innovation," and second, "that dynamic capabilities were needed to enable firms to match the two sources of innovation (referring to demand pull and technology push) and thus deliver the right innovations to the market."

(5) Guided by Meaningful Metrics

A dashboard of innovation metrics has many uses. It is necessary for identifying the weak links in the overall innovation process, and costly disconnects between the growth strategy and the portfolio of growth initiatives. It is also used to hold managers accountable, by setting targets for improvement and linking incentives to reaching their targets. An adroitly chosen metric with a challenging target is a strong signal of a shift in strategic priorities. A.G. Lafley (Lafley and Martin 2013) successfully transformed the innovation process in Proctor & Gamble by setting a goal of obtaining 50 percent of their innovations from outside the company.

Innovation dashboards comprise measures of *inputs*, such as R&D spending and the number of concepts in the pipeline; *process effectiveness*, such as the average time to market; and *performance outcomes* such as the percentage of sales from new products launched in the past three years, customer satisfaction, and the net present value of the innovation portfolio. In practice most dashboards emphasize outcomes, and provide few diagnostic insights into the reasons for performance shortfalls But, outcome measure do not yield actionable insights into what is working or not working. Were the poor results due to inadequate or unreliable inputs, or a cumbersome and slow stage-gate process that stalled projects? Were too many small projects absorbing scarce resources and creating traffic jams in the development process? Performance outcome metrics are also susceptible to distortions such as surrogation – maximizing the score rather than what matters (Muller 2018). The widely used metric, "percent of sales from new products launched in the past three years," is prone to this distortion, stemming from elastic definitions of what is a new product.

Combining the Elements

How are the five elements of market-driven innovation combined to achieve superior organic growth performance? Is this strategic objective best served with an additive, multiplicative or

compensatory (where a deficiency in one element can be offset by prowess on the other four) combination of elements? Inferential evidence from a study of innovation activity systems (Day & Shea 2020) was that organic growth leaders were distinguished by the superiority on each of the following four factors, in their order of importance: (1) Making investments in innovation talent, in order for leadership to signal the importance of innovation capabilities and ensure the people could enable these dynamic capabilities, (2) Encouraging prudent risk-taking, which is an aspect of the growth strategy, (3) Adopting an outside-in innovation process, based on deep market insights, and (4) Aligning metrics and incentives with innovation activities , using a dashboard of innovation metrics to create a credible link to rewards and recognition for innovation accomplishments. This study did not address the importance of technology-push factors as they iterate with market-pull factors, but showed that growth leaders had no points of weakness which suggests an additive combination was in operation.

Technology-Driven Innovation

The steady stream of advances in digital technologies, from blockchains and fintech to interpretive AI, life sciences that enable human organs on demand, and electric vehicle batteries gives a vivid impression that technology is the primary driver of innovation. In practice, few firms adopt a pure-play technology approach like that used by Flagship Pioneering, a venture-creation firm whose mission is to conceive, make and commercialize breakthrough innovations in previously unexplored domains of the life sciences (Afeyan & Pisano 2021). Their working definition of a breakthrough technological innovation is a discontinuity that changes what is possible or considered possible (such as the messenger RNA vaccine to protect against Covid infections), that generates new sources of value by solving important problems or “creating demand that did not exist previously.”

Firms that emphasize technology-driven innovation appear to arrive at this approach through outside-in and inside-out analyses. This was the case with Corning Glass, after they became an

inadvertent victim of the sharp drop in demand for fiber-optic cable for global communication networks. Leadership was forced to rethink their growth strategy, and ask what the "repeatable keys" to past success were. They concluded that the company could build on its core glass technology, a deep appreciation of customer problems, and a willingness to take big but well understood risks. Its biggest opportunity was based on a manufacturing process it had originally developed for auto windshields, but could be applied to the glass substrates for flat LCD displays. This "Gorilla Glass" technology was extended to cell phones initially, then to laptops and desktop monitors, and onward to television screens and ever larger displays.

A technology comprises functionality, problem solving, and production knowledge (Kapoor & Teece 2021). Economic value is created when a technology is commercialized through its enabling possibilities and when it is embedded in firm-level and ecosystem level activities. The enabling nature of a technology depends on the degree to which it improves and evolves over time to enable a wide array of applications and spawn complementary innovations. Only when a technology is embedded in new offerings and business models will it have a material impact on firm performance (Souder 1989).

INTEGRATING THE MARKET-DRIVEN and TECHNOLOGY-DRIVEN APPROACHES

A stream of innovations that accelerates the rate of organic growth emerges from the intersection and interaction of market-driven and technology-driven approaches. This integration is activated through four core innovation activities:[5] (1) Identifying opportunities to develop, (2) Selecting and validating the best opportunities, (3) Managing the portfolio, and (4) Developing and launching the innovation, and learning from market reactions. These activities feed development processes that iterate continually between outside-in and inside-out considerations. Each firm will determine their best path to market-driven innovation, depending on their strategy, their aspirations for growth and the

anticipated rate of technological change in their industry sectors. The relationship of these core activities in the context of market-driven innovation is shown in Figure 1.

<Insert Figure 1 here>

Identifying Innovation Opportunities

Innovation funnels can be filled with potential growth opportunities from many sources. Reactive approaches will surface numerous possibilities: The R&D group will envision new offerings and enhancements enabled by advances in core technologies; the distributors, salespeople and employees will suggest new services; and there will always be pressure to match or leapfrog competitors by imitating and improving their innovations. More proactive approaches apply creative ideation techniques such as brainstorming, metaphor elicitation (Zaltman & Zaltman 2008), sponsoring an innovation tournament (Terwiesch and Ulrich 2009), or finding "Blue Oceans" (Kim and Mauborgne 2014) by challenging the prevailing value profile to reduce or eliminate features the industry takes for granted, raise some features above industry standards, or create new features that have never been offered. The essence of this approach is a creative challenging of industry conventional wisdom.

These ideation techniques are often embedded in design thinking processes (Brown 2008, Martin 2009) that start with a trend or discontinuity, such as abrupt pandemic-induced shift to remote working. The office furniture maker Herman Miller used their deep insights into office design and anticipated that employees would need to have more autonomy to shape their own workplace. The company created a clever "un-system" of furniture that's meant to be moved easily on demand – pushed into groups or pulled away for solo work – without getting approval or needing help.

The Herman Miller example illustrates the four iterative steps in the design thinking process of generating new ideas and concepts through empathetic listening, and then narrowing the focus: (1) Empathize by deeply understanding customer's problems, often through observation, (2) Define the real

problem the customer has, while being open to changing this definition as new insights emerge, (3) Ideate using brainstorming and other tools to generate alternative solutions, and (4) Prototype and test with users, then listen to their reactions to redefine the problem.

Identifying growth pathways. The venerable Ansoff (1959) matrix was the earliest enumeration of the possible ways for a firm to grow. This matrix suggested four growth paths (market and product development, diversification and market penetration), by combining existing versus new markets and products. In the six decades since, there have been significant advances in our understanding of how firms could grow that are better revealed with an expansive approach based on stretching and reimagining each dimension of the customer value proposition (CVP) and business model, that together comprise the competitive strategy of a firm or business unit (Zott & Amit 2007).

This market-driven opportunity identification process yields twelve possible innovation pathways, shown in Figure 2 and extends earlier approaches for identifying innovation pathways (Sawhney et al 2005, Keeley et al 2013). Each pathway can be initiated with an outside-in perspective. An example is how the ZARA apparel chain, pioneer of the "fast-fashion" concept, rethought their business model. Most clothing makers start with their designers, who plan collections as much as a year in advance, and require long lead times and manufacturing in Asia to contain costs. At ZARA, fashion and sales trends are monitored continuously to guide their in-house designers, who fashion what is hot. These designs are sent to company-owned factories, where just-in-time systems can move a blouse, dress, or coat from the drawing board to a store in less than a month. Because Zara is more attuned to the latest fashions, it can change more often and doesn't have to mark down large inventories.

<Insert Figure 2 here>

In practice firms vary in how they deploy this approach for the directed search for innovation opportunities, depending on their responses to these questions: First, is there a dominant pathway for

each industry, that absorbs most of the resources allocated to innovation? Thus, pharmaceutical and digital platform companies emphasize pathway 7 (*Develop new offerings*). Second, do the growth leaders consider and allocate more resources to growth pathways other than the dominant pathway? Third, what heuristics or rules of thumb are used to put guidelines in place or impose boundaries on the search; are these imposing constraints on the search process (Bingham & Eisenhardt 2011). Finally, who is responsible for initiating and guiding the search process: R & D? Marketing? Strategy? as this will influence the emphasis and ambition of the search.

Each innovation pathway has many supporting themes and methods. Consider pathway 1 (Satisfy latent or emergent customer needs). Uncovering latent needs requires skilled observers who can immerse themselves in the target customer's needs and see what is, "evident but not yet obvious." To better hear the "voice of the customer," firms could apply lead user analysis (von Hippel 1988; Lillien et al 2002) or monitor carefully their complaining or defecting customers, for insights into emerging needs and requirements.

Adobe, Inc followed multiple, reinforcing pathways to make a successful transition from a packaged software business model for their popular Photoshop image-editing program, to a cloud-based subscription (Software-as-a-service) model. The reasons for this digital transformation were: (1) A slow-down in the sales growth of their boxed software, followed quickly by a decline in their stock price, (2) The looming threat or potential opportunity from the anticipated decline in image storage costs in the cloud, which could be the vehicle for a new and unwelcome competition to enter the market, and (3) The inability of younger creatives to afford the up-front price of a perpetual license granted by the purchase of boxes software. Both market and technology forces converged and reinforced each other at the same time.

Although Adobe, Inc started with a business model innovation (pathway 12), enabled by an emerging trend toward cloud computing (pathway 6), they also overcame cost barriers to consumption (pathway 2), improved the customer experience (pathway 4), and changed the value profile (pathway 8). A plausible hypothesis is that the greater the number of innovation pathways that are engaged, the harder it will be for rivals to copy of leap-frog, the more difficult the innovation will be to implement, and the greater the long-term rewards to the innovator.

Using a strategy lens to surface opportunities is supported by recent studies of reconfigurations of customer value propositions (Nenonen et al 2020). They consider the emergent character of complex market systems, such that a single firm is not alone in influencing a market system by their strategic moves. The combined and sometimes synergistic moves of all firms pursuing an emerging opportunity can create an inflection point resulting in a new market. Whether this emerging market presents an attractive growth opportunity for a firm, depends on whether they pursued the opportunity before others, and gained an early mover advantage.

Selecting and Validating the Best Opportunities

Organic growth leaders take an integrated technology and market-driven approach to organic growth that balances *divergence* – to widen the search for the best opportunities – with *convergence* on those that best support the growth strategy. This systematic approach was only practiced by 27 percent of the companies surveyed by McKinsey in 2019 (Cvetanovski et al 2019). When the funnel metaphor is extended to opportunity selection, the implications are misleading. If the process behaved like a funnel, the growth opportunities entering at the top would eventually pass through, and the process would be more like prioritization from the best to the worst opportunities, than selection. The aim should be to filter out poorly conceived, inconsequential or infeasible ideas.

The convergence process is *selective* by intention, *dynamic* as new opportunities are constantly being entered into the evaluation, *susceptible* to organizational pressures, decision biases including a preference for familiar, constrained by prior commitments and competition for available resources, and subject to uncertainty. Among these uncertainties are the likely response of the target market segment (accentuated by unforeseeable competitive moves, including being preempted), the feasibility of the technology (will it work at scale?) whether the intellectual property and tacit knowledge can be protected, and whether the firm has access to essential capabilities, and has the talent needed to manage the project.

Dealing with uncertainty. In the transition from the "exploitation of old certainties to the exploration of new possibilities" (March 1991), the reality calibrated risk probabilities of disappointing results become unquantifiable uncertainties (Teece et al 2016) that must be managed differently. A useful tool is discovery-driven planning (McGrath and MacMillan 2009), that argues, "that as your plan unfolds, you want to be reducing…the assumption-to-knowledge ratio. When this ratio is high…one should prioritize learning fast, at the lowest possible cost." The crucial question is, "Which assumptions must prove true to ensure the projections can be realized?" The focus is on validating those assumptions that are high in strategic importance and low in confidence in the available insights.

Caution is especially warranted when there is high uncertainty shrouding the answers to crucial questions. This caution can be exercised through the purchase of strategic options; relatively small investments that create the right – but not the obligation – to make further investments as the future unfolds. This approach works especially well when there is an asymmetry in the distribution of returns, with greater upside potential than downside exposure to losses (Bahrami and Evans 2011). It applies when an investment can be terminated easily, while retaining the right to make further investments if the initial pilot or prototype seems promising.

Another way to contain uncertainty is conducting low-cost experiments designed to test critical unknowns (Shrage 2014). Growth leaders build a portfolio of these experiments to expand their repertoire of known patterns of needs and response. These experiments are used to test competing hypotheses, learn from the results, then make the indicated changes, experiment further and keep learning. As the body of knowledge expands, some real options can be exercised and give way to bigger bets made with greater confidence.

Selecting and Validating Innovation Opportunities

There are many ways to select the best opportunities from a larger set of possibilities. While their common goal is to guide an informed selection of concepts to be advanced into development, the most useful are also learning mechanisms that expose flawed assumptions, gaps in knowledge, and potential pitfalls, to ensure that avenues for refinement and improvement have been followed. In practice, the initial concept statement will undergo significant change and hopefully improvement during this learning process.

Among the "screening for learning" selection methods that employ a market-driven approach (O'Reilly & Binns 2019, Gatignon, et al 2016), and reveal the risk versus reward potential of an opportunity are:

- Lean innovation methods (Ries 2011) that focus on designing and running quick experiments to test feasibility. This approach applies a "build-measure-learn" logic to put a minimally viable product in front of potential customers and then rapidly iterate and improve based on what was learned.
- Value Proposition Canvas (Osterwalder et al 2014) that integrates insights into customers, based on their "jobs-to-be-done" and the pain points in their customer experience, with a value profile that describes how new value will be created for customers.

- Innovation tournaments (Terwiesch & Ulrich 2009) are a variant of crowdsourcing, using informed insiders to generate and evaluate a menu of opportunities created in response to a specific challenge.
- "Working backwards" is a catch-phrase used by Amazon to describe a customer-focused approach to innovation that requires a development team to start with a press release describing a step-change improvement in customer experience (Day 2023) 41-47.

A widely-used screening tool – advocated by growth leaders such as 3M and W. L. Gore & Assoc. – follows the precepts of market-driven innovation. There are three sequential sets of questions (Is it Real? Can We Win? Is It Worth It?). These are initiated by asking: "Is the market real?" to probe for evidence of a need or desire for the product and whether customer can and will buy it. This enables and sets the context for the next block of questions: "Is the product real?" by asking whether there is a clear concept and can the product be made?

The Real-Win-Worth It (R-W-W) screen is not an algorithm for making go/no-go decisions but, rather, a disciplined process that can be employed at multiple stages of product development to expose faulty assumptions, gaps in knowledge, and potential sources of risk, and to ensure that every avenue for improvement has been explored. The R-W-W screen can be used to identify and help fix problems that are weighing on a project, to contain risk, and to expose problems that can't be fixed and therefore should lead to termination of the project.

Sometimes, the members of the development teams are both evaluators and advocates; this duality of roles can compromise the evaluators. Team member's convictions about the merits of their project can subvert their doubts, because they might fear that a deep assessment could imperil the project or reduce their leverage in the competition for resources and leadership support. For this reason, growth leaders may enlist a credible facilitator, from outside the division or business.

Managing the Innovation Portfolio: Containing Risks and Allocating Resources

An innovation portfolio (Eckert & Husig 2022; MacMillan & McGrath 2002) is comprised of the growth opportunities that have been selected for further development. Healthy portfolios have a balanced mix of *incremental* innovations to strengthen and defend the core business, plus projects that extend the business into *adjacencies* that can apply capabilities and technologies and/or market access and *transformative* projects that reframe existing categories (for example, frozen yogurt or liquid bandages) or *disrupt* categories and threaten incumbents. These projects are eventually justified with a discounted cash flow logic to answer whether the expected net present value of the project will exceed the cost of capital.

Firms invest their innovation resources along a spectrum of ambition and risk; once a project is sufficiently evolved to be in the portfolio most of the uncertainty has been converted to risk (probability of success is a widely used metric). Growth leaders – having realized a price/earnings premium of 15% or more over their peers – allocate about 70% of their innovation activities to incremental innovations, 20% to adjacencies using market or technology capabilities, and 10% to transformative innovation (Nagji & Tuff 2012). This study didn't distinguish organic from inorganic sources of growth, nor address the challenging strategic question of how much to spend on innovation.

In practice, portfolio management processes are often subverted[6] by an overemphasis on incremental improvements that comfortably fit the experience and mental models of leadership, and by dilution of resources that are spread over too many projects (exacerbated by a lack of discipline in pruning faltering projects with high level sponsorship). Because of the complexity of most portfolios, compounded by interactions among projects, allocation models are impractical or ignored.

Sharing risk with partners. A tenet of an outside-in approach is the adoption of a wide-angle lens (Adner 2012) that includes possible partners in the ecosystem. These enable firms to collaborate

and combine to create and capture value. It is helpful to distinguish multi-product ecosystems (that enable firms to stitch together new forms of offerings around broad customer needs) and multi-actor ecosystems (where the focal firm acts as a system integrator). The latter ecosystems require the sharing of rewards. They are an alternative to using either an open market or a vertically integrated system that magnifies risk because of the capital commitments (Jacobides 2022). Risk reduction with partners can be achieved by strengthened the assets and capabilities of the firm to enable the offering to be more competitive, while reducing the overall risk exposure.

Launching Innovations and Learning from the Market

Firms that are proficient with launch activities have superior capabilities[7] for forecasting the acceptance of their innovations, developing the market, and capturing a share of the value that is created, so they have a viable investment. Market-driven innovators are better at understanding competitor and customer reactions, and then quickly making course corrections in their pricing, branding, supply chain, channel and production decisions (Gatignon et al 2016).

Concurrently the firm has to scale or grow the capabilities to produce the innovation and get it to the target market. This is less problematic for incremental innovations that can be integrated into the existing organization and processes. But, entering an adjacent market or bringing a transformational innovation to a nascent market, is a fraught time of organizational vulnerability (O'Reilly & Binns 2019). The new initiative needs to add customers and capacity rapidly, to capture the market ahead of rivals who are watching carefully and learning about mis-steps to avoid.

"Never invest ahead of learning" is a useful mantra for launching and scaling in the face of uncertainty. Andy Grove, the Legendary CEO of Intel was forcefully reminded of the need to proceed cautiously when he championed an entry into teleconferencing (Borgelman 2002). The project failed

after five years of effort and an investment of $750 million. Grove later said, “We assumed that just because it could be done technically there would be high demand…it’s just that we were wrong.”

This Intel mis-adventure is a case of an unbalanced technology-driven innovation proceeding without market feedback. But the obverse may also happen, possibly in the tragic case of the anti-arthritis drug, VIOXX. This drug was launched by Merck & Co in 2000, and withdrawn in 2004 after being held responsible for tens of thousands. One analysis (Jasper, et al 2019) implied that the exercise of a market orientation led to overshooting, “to the dark side of the competitor-orientation, and that warning signs were ignored…decisions were very much driven by short-term profit objectives.” (page 239). A contributing factor was that VIOXX was the second entrant in this class of arthritic drug treatments.

Jasper et al (2019) imply that VIOXX is an indictment of market-driven innovation. Yet, there is no evidence of customer considerations in the opportunity identification of the lengthy drug development process. Indeed, a close observer of pharmaceutical drug development, noted recently that some pharmaceutical companies explicitly shield their research groups from market inputs when deciding which programs to pursue (Pisano 2015). Another explanation is that the VIOXX tragedy was aggravated by a strong sales orientation within Merck, with sales reps incented to gain immediate sales and down-play adverse clinical results. Perhaps the emphasis on shareholder value creation by the board of leadership of Merck came at the expense of a market orientation that tries to apply advances in technology to the creation of customer value.

Innovating the Approach to Innovation

A market-orientation underpins the market-driven approach to innovation, while shaping the strategic orientation of a firm (Hakala 2010). A strategic orientation sets a durable direction for the firm’s strategic choices, directions, and resource allocation priorities, and is reinforced by the values,

beliefs, and behaviors of the culture. If reflects the dynamic interplay of the diverse stake-holders of a firm in the on-going quest for competitive advantage. This strategic orientation suffuses all innovation activities from the crafting of an organic growth strategy to how the approach to innovation is reconceived and changed to realize the aspirations for organic growth. This was the impetus for an initiative begun in 2016 by Proctor & Gamble that led to a shift of their R & D activities from big centralized teams to a decentralized model, with 150 small teams lodged within their ten business units (Day & Shea 2021).

The change program started by studying which innovation activities had produced "irresistible superiority" in the past. The results were used to develop a narrative about a future in which P&G delivered a customer experience so much better than competitors, that it was indeed "irresistible." This meant forging long-term relationships with its target consumers. Functional superiority was not enough; the innovation had to make an emotional connection. This required excelling on 4 of 5 measures of superiority. The newly envisioned future included P&G exploring many smaller scale innovations within and across business units, with quick learning conducted in close collaboration with consumers, and driven by consumer problems and needs. It was clear to leadership that P&G had to work differently to make this a successful move. P&G's traditional approach to technology-driven, large-scale R&D would need to change. To make this happen P&G embarked on an ambitious initiative called "*GrowthWorks*" that aimed to:

- Build strong working connections between the commercial and technical functions.
- Incorporate the lean innovation methodologies of fast-prototyping and fast-to-fail. Lean thinking defines value as, "providing benefit to the customer; anything else is waste." (Ries 2011).

- Convert a solutions-focused mindset into a problem-focused one. The teams' new mantra, "Fall in love with the problem, not the solution." The aim was to innovate around consumer problems or "opportunity spaces."
- De-risk investments in innovation with metered funding and short time-lines for teams to demonstrate their learnings.

The P&G culture changed and the desired narrative about the future was realized by changing the approach to innovation. By FY2022 organic sales growth had increased to 7 percent per year, and the operating profit margin rose from 14.8% in 2018 to 18.4% in 2022.

SUMMARY AND DIRECTIONS FOR RESEARCH

Innovation is like a tonic that boosts the organic growth rate of a firm. This pharmacological analogy is apt because understanding how a drug works is akin to diagnosing how firms successfully innovate. There are many active ingredients, but the mechanism of action is hard to establish, and the influence of the active ingredients may vary with the situation. Our purpose in the paper is to advance the understanding of how innovation works in firms facing mounting market and technological uncertainty, by addressing two questions: What is market-driven innovation? How does it work?

Market-driven innovation adopts an outside-in approach to strategic growth challenges that is analogous to a market orientation, guided by a growth strategy and a dashboard of innovation metrics. This approach is enabled by dynamic sensing and seizing capabilities, while iterating between "outside-in" considerations and an "inside-out" analysis where a firm considers its own capabilities, resources and constraints on what it innovates.

We hypothesize this approach functions through collective and beneficial "mechanisms of action" on four innovation activities. The first activity is the systematic identification of potential growth

opportunities by reimagining and stretching each dimension of the customer value proposition and the enabling business model that comprise the strategy of a firm. Second, is the selection and validation of the best opportunities before entering them into the development process. Third, the process of market-driven innovation requires the adroit containment of the inevitable risks of innovation, especially for disruptive or transformative innovations where uncertainty is high (Calantone et al 2010). Finally, the outcome of the development activities is launched, and the performance results are assessed in light of the objectives. These four innovation activities establish how the work of innovation gets done in a firm: the tasks, talent, information distribution, decision allocations, measurements and rewards (Day and Shea 2020).

We have drawn on the disciplines of strategic management, design thinking, systems theory, and dynamic capabilities, to illuminate market-driven innovation. There are many aspects that need to be better understood. While there is supportive and suggestive evidence that market-driven innovation processes work better in most circumstances, this is an area in need of further enquiry. In this spirit we propose the following research agenda that addresses the antecedents and consequences and the process of implementing this approach.

Antecedents and Moderators

A priority is testing the implied hypothesis about the role of the antecedent properties and their relationships; especially the influence of leadership commitment to an outside-in perspective, and the roles of collective curiosity and organization-wide empathy. This raises a host of measurement issues: what are the organizational outcroppings of these antecedents? How is leadership commitment and vision to be evaluated and communicated throughout the organization? Can they be measured relative to present and prospective rivals?

Further research is needed on the mechanisms through which knowledgeable and committed leadership is exercised. One possibility is by signaling, through a willingness to expend resources and devote time to innovation activities. Another mechanism is through making, honoring and remaking commitments, especially those pertaining to the adequacy and consistency of innovation resources. Here, we use commitments in the sense of actions taken in the present that bind an organization to a future course of action (Ghemawat and del Sol 1998).

Many of these antecedents are embedded within the culture of an organization. At the deepest level of this culture are traits and values, expressed as norms about expected behavior. What are these collective norms in growth leaders and how can they be changed? Further research is needed on the role of organizational configuration, including formal and informal structures, how resources and decision rights are allocated, who is accountable for achieving the organic growth objectives, and how success is measured. Research is needed on how these antecedents interact, and how a weakness in one element afflicts the others. For example, a rigidly-siloed organization structure is likely to be less able to share outside-in information.

There are numerous possible moderators between the antecedents and the performance consequences of market-driven innovation including: the strength of competitive forces (especially the threat of new entrants and technology substitutes); the rate of technological change in the science base and especially the consequences of digitization on the strategy and core processes; the financial capacity of the firm and the diversity of the business portfolio; regulatory constraints and the value of patent protection; and the global versus local scope of operations and aspirations. An especially important moderator that can also influence the hypothesized antecedents is whether the firm is an organic growth leader, an average performer in the sector, or an organic growth laggard. Finally, the role and importance of market-driven innovation is likely to be influenced by the customer value strategy, and

whether the emphasis is an achieving price value, performance value or relational value leadership in the served market.

Consequences and Contingencies

Numerous studies have examined the relationship of market orientation and subsequent innovation and financial performance. A recent synthesis of these studies by Gatignon, et al (2016) concluded that they "…confirm the overall positive impact of customer and competitor orientation on innovation success" (page 117). Their conclusion was informed by two meta-analyses (Kirca et al 2005 and Calantone et al 2010). Both studies acknowledge the strong influence of moderating factors to account for the heterogeneity of results. A somewhat broader meta-analysis (Saeed et al 2015) assessed the influence of the strategic posture (whether outside in or inside out) on a variety of indicators of innovation activity, such as the number of new products/services that were introduced, new product success rates, and the extent of exploitative or incremental versus exploratory innovations. This study found strong positive effects for both definitions of posture on firm performance, including profitability and growth. These meta-analyses are susceptible to the usual difficulties of untangling the interdependence of a firm's resources, capabilities, and market position (Henderson and Mitchell 1997). They also don't incorporate the multi-faceted nature of market-driven innovation that goes beyond strategic posture and market orientation, or the consequences for performance relative to rivals.

There is a need for a contingency theory explaining the relative emphasis on market- or technology-driven approaches. An outline of this theory has emerged from the contrast of a pharmaceutical business model innovation and a science-based biofuels initiative (Day & Schoemaker 2016). The business model innovation by Novartis aimed to help their 25,000 sales representatives engage with prescribing doctors through a consultative two-way dialogue. This was a sharp departure from the traditional detailing model of one-way communication from rep to doctor. Their new sales

model was enabled by advances in mobility and digital technologies. The DuPont biofuels initiative aimed to employ enzymes at scale to convert cellulosic materials into sugars that could then be converted into fuel. The impetus was the potential opportunity in the fuels sector, and the foreseeable demands of energy security and climate change.

The contingency factors best explaining innovation approaches were: The scale and timing of investment commitments, the rate of technological change, the value of patent protection, constraints imposed by regulators, and the length of the time horizon. An especially challenging contingency concerns the relationship of the needed dynamic capabilities and existing platform of operational capabilities that are the basis of the current competitive advantage. Operational capabilities are path dependent, hard to imitate by outsiders and deeply embedded within the organization. These rigidities create inertia and impede attempts to innovate.

The iterative Processes of Market-Driven Innovation

A central hypothesis is that superior growth opportunities will emerge when iterating between outside-in and inside-out considerations, while continuously learning and creating deeper market insights. The nature and functioning of this process needs much deeper investigation, especially as it pertains to differences between organic growth leaders, laggards and average performers. Specific research questions are: Is this a deliberate or emergent process amongst growth leaders? Is this iterative process continuous or episodic, and who are the participants in the process? How and when is the involvement of ecosystem partners considered? Does the extent of leadership attention act as a filtering mechanism for aligning initial technological capabilities and market opportunities?

In summary, the weight of evidence and experience is supportive of the benefits of a market-driven approach to innovation, but many open questions remain. This is a healthy state of affairs in the dynamic domain of innovation where the questions promise to be more challenging as uncertainty

increases. The answers are needed to help organizations navigate greater turbulence that spawns potential growth opportunities, but raises the level of threat to firms that are unable to innovate effectively.

ENDNOTES

[1] For this purpose, innovation is, "…the design, invention, development and/or implementation of new or altered products, services, systems or business models for the purpose of creating new value for customers and financial returns for the firm" (U.S. Department of Commerce, 2008).

[2] Being market-driven has sometimes been misunderstood to mean being customer led as, "…a business orientation that is based on understanding and reacting to the preferences and behavior of players within a given market structure," (Jaworski, Kohli and Sahay 2000), or that, "…market-driven processes…rarely produce the type of radical innovation… (that) delivers a leap in customer value through a unique business system." (Kumar, Scheer, Kotler 2000). A consequence is the emergence of separate streams of research on "driving markets" (Jaworski et al 2020), that has expanded to "market creation" (Sprong et al 2021), but can be readily subsumed under the rubric of market-driven innovation.

[3] There is a close affinity to an outside-in, market-driven process and design thinking. This is in iterative process of creative problem solving (O'Reilly & Binns 2019). The dominant feature of design thinking is user-centeredness and involvement. Empathy is considered the primary means of achieving this user-centeredness (Carlgren et al 2016).

[4] These dimensions of a growth strategy (also referred to as an innovation strategy) draw from: Anthony et al (2008), Christensen and Raynor (2008), Govindarajan & Trimble (2005), and Pisano 2015). See also Hunsaker & Knowles (2021).

[5] We have adapted the familiar new product development/stage-gate (Cooper 2017) process of Identifying => Selecting => Developing => Launching, by adding the risk containment and resource allocation activities that determine the portfolio of innovation projects and initiatives. This sequential (and highly iterative process) was in turn derived from the variation => Selection => Retention model of innovation, from evolutionary biology (Furr & Eggers 2021).

[6] There is an extensive academic and practitioner literature on the complexities of managing innovation portfolios and finding an heuristic for allocating short-term and long-term resources and management attention. See for example, Eckert & Husig (2021) and Cooper & Edgett (2009).

[7] Internal organizational politics are especially hard to navigate. If the existing business unit is tasked with launching a major innovation that is a departure from the mainstream it may be viewed as competing for scarce resources, as a potential rival for the core business, or held to the performance standards of the existing offering's (O'Reilly & Binns 2019.)

Figure 1

MARKET-DRIVEN INNOVATION PROCESSES

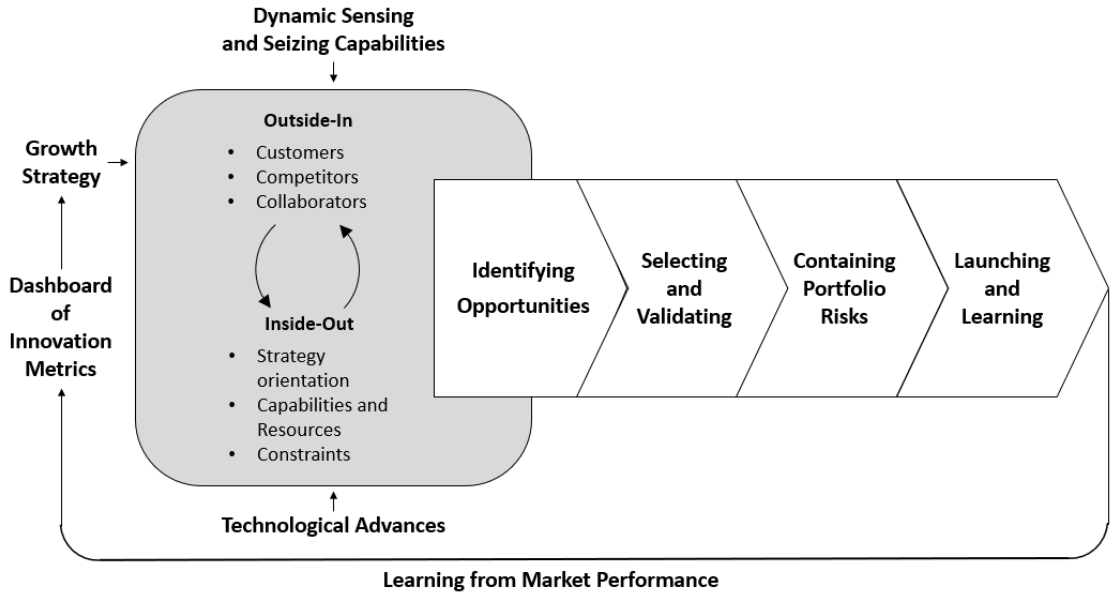
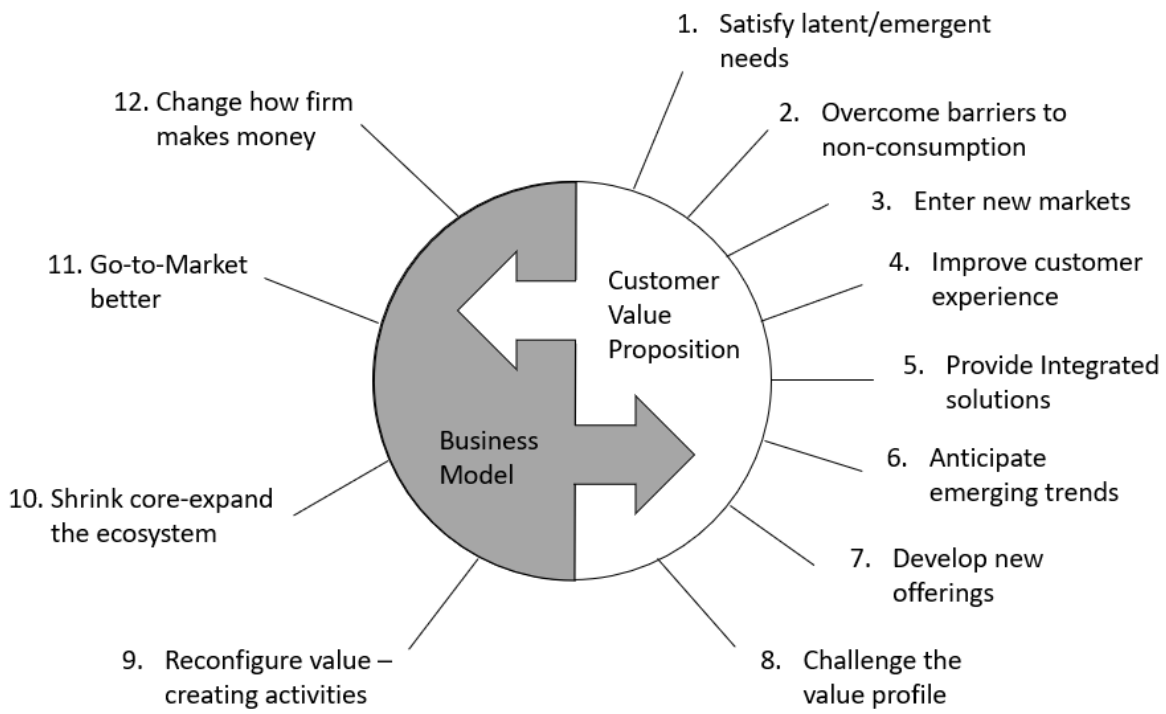


Figure 2

INNOVATION PATHWAYS



REFERENCES

Adner, R. (2012). *The Wide Lens: A New Strategy for Innovation*, New York: Penquin.

Adner, R. & Helfat, C. E. (2003). Corporate effects and dynamic managerial capabilities. *Strategic Management Journal*, 24(10), 1011-1025.

Afeyan, N., & Pisano, G. P. (2021). What evolution can teach us about innovation. *Harvard Business Review*, (September-October), 2-11.

Agarwal, R., & Helfat, C. E. (2009). Strategic renewal of organizations. *Organization Science*, 20(2) (March-April), 281-293.

Ansoff, H. I. (1957). Strategies for diversifying. *Harvard Business Review*, 35 (September-October), 113-124.

Anthony, S. D., Johnson, M. W., Sinfield, J. V., & Altman, E. J. (2008). *The Innovator's Guide to Growth: Putting Disruptive Innovation to Work*. Boston MA: Harvard Business School Press.

Bahrami, H., & Evans, S. (2011). Super-flexibility for real-time adaptation: perspectives from Silicon Valley. *California Management Review,* 53/3 (Spring), 21-39.

Benner, M. J., & Tushman, M. L. (2003). Exploitation, exploration and process management: the productivity dilemma revisted. *Academy of Management Review*, 28(2), 238-56.

Bingham, C. B., & Eisenhardt, K. M. (2011). Rational heuristics: The simple rules that strategists learn from process experience. *Strategic Management Journal*, 32 (December), 1437-1464.

Brandenberger, A. (2017). Where do great strategies really come from?. *Strategy Science*, 2(4).

Brown, T. (2008). Design thinking. *Harvard Business Review*.

Bryar, C., & Carr, B. (2021). *Working Backwards: Insights, Stories and Secrets from Inside Amazon*. New York: St. Martin's Press.

Burgelman, R. (2002). *Strategy Is Destiny*. New York: Free Press.

Burgelman, R. A., Floyd, S. W., Laamanen, T., Mamere, S., Vaara, E., & Whittington, R. (2018). Strategy Processes and Practices: Dialogue and Interactions. *Strategic Management Journal*, 39, 531-558.

Calantone, R. J., Harmancloglu, N., & Droge, C. (2010). Inconclusive innovation returns: A meta-analysis of research on innovation on new product development. *Journal of Product Innovation Management*, 27/7, 1065-1081.

Carlgren, L., Bauth I., & Elmquist, M. (2016). Framing design thinking: The concept in idea and enactment. *Creative Innovation Management*, 25(1), 38-57.

Chasten, I. (2017). Technological entrepreneurship: *Technology-driven vs market-driven innovation*. New York: Palgrave MacMillan.

Christensen, C. M. (1997). *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Boston: Harvard Business School Press.

Christensen, C. M., & Raynor, M. (2003). *The Innovator's Solution: Creating and Sustaining Successful Growth*. Boston MA: Harvard Business School Press.

Cohen, W. M., & Levinthal, D. A. (1990). "Absorptive capacity: A new perspective on learning and innovation." *Administrative Science Quarterly*, 35, 1 (March), 128-152.

Cooper, R. G. (2017). Winning at New Products: *Creating Value Through Innovation (Fifth Edition).* New York: Basic Books.

Cooper, R. G., & Edgett, S. J. (2009). *Product Innovation and Technology Strategy*. Product Development Institute.

Coyne, W. E., & Van de Ven, A. (forthcoming 2023). Increasing the odds of maneuvering the innovation journey. *Strategic Management Review*.

Cvetanovski, B., Hazan, E., Perrey, J., & Spillecke, D. (2019). *Are you a growth leader? The seven beliefs and behaviors that growth leaders share*. McKinsey & Co, (September 26).

Day, G. S. (2007). "Is it real? Can we win? Is it worth doing? Managing risk and reward in an innovation portfolio," *Harvard Business Review*, 85 (December), 110-120.

Day, G. S. (2019). Explaining organic growth performance: Why dynamic capabilities need strategic direction. In Teece, D. J., & Heaton, S. (Eds.), *The Oxford Handbook of Dynamic Capabilities*, Oxford: Oxford University Press.

Day, G. S. (2022). "Commentary on formulating strategy from the outside in." *Long Range Planning*.

Day, G. S. (2023). Why working backwards works better. *Management and Business Review*, 2 (Spring).

Day, G. S., & Schoemaker, P. J. H. (2016). Adapting to fast-changing markets and technologies. *California Management Review*, 58(4), 59-77.

Day, G. S., & Shea, G. (2020). "Changing the work of innovation: A systems approach." *California Management Review*, 63(1), 41-60.

Day, G. S., & Shea, G. P. (2021). Innovating how innovation works at P & G. *Strategy & Leadership*, 49 (November), 2-8.

Di Stefano, G., Gambardella, A., & Verona, G. (2012). "Technology-push and demand-pull perspectives in innovation studies: Current findings and future research directions." *Research Policy*, 41/8, 1283-1295.

Dong, A., Garbuio, M., & Lovallo, D. (2016). Generative sensing: A design perspective on the micro-foundations of sensing capabilities. *California Management Review*, 58/4 (Summer), 97-117.

Dyer, J., Gregerson, H., & Christensen, C. M. (2011). *The Innovator's DNA: Mastering the Five Skills of Disruptive Innovation*. Boston: Harvard Business School Press.

Eckert, T., & Husig, S. (2021). Innovation portfolio management: A systematic review and research agenda in regards to digital service innovations. *Management Review Quarterly*, 72, 187-230.

Feldman, E. R., & Sakhartov, A. V. (2021). Perspective on corporate renewal. *Strategic Management Review*, 2, 193-204.

Furr, N. R., & Eggers, J. P. (2021). Behavioral innovation and corporate renewal. *Strategic Management Review*, 2, 285-322.

Gatignon, H., Gotteland, D., & Haon C. (2016). *Making Innovation Last (Volumes 1 and 2): Sustainable Strategies for Long-Term Growth*. London: Palgrave Macmillan.

Gatignon, H., & Xuereb, J-M. (1997). Strategic orientation of the firm and new product performance. *Journal of Marketing Research*, 34(1), 77-90.

Ghemawat, P., & del Sol, P. (1998). Commitment versus flexibility? *California Management Review*, 40/4, 26-42.

Govindarajan, V., & Trumble, C. (2005). *Ten Rules for Strategic Innovators: From Idea to Execution*. Boston MA: Harvard Business School Press.

Govindarajan, V., Kopalle, P. K., & Danneel, E. (2011). The effects of mainstream and emerging customer orientations on radical and disruptive innovation. *Journal of Product Innovation Management*, 28(51), 121-132.

Habtay, S. R., & Holmen, M. (2014). "Incumbent responses to disruptive business model innovation: The moderating role of technology vs. market-driven innovation." *International Journal of Entrepreneurship and Innovation Management*, 18/4, 289-309.

Hakala, H. (2010). Strategic orientations in management literature: Three approaches to understanding the interaction between market, technology, entrepreneurial and learning orientations, *International Journal of Management Reviews*, (October 26).

Helfat, C. E., & Martin, J. A. (2015). Dynamic managerial capabilities: Review and assessment of managerial impact on strategic change. *Journal of Management*, 41(5), 1281-1312.

Henderson, R., & Mitchell, W. (1997). The interactions of organizational and competitive influences on strategy and performance, *Strategic Management Journal*, 18 (Summer), 46-52.

Homburg, C., & Pflesser, C. (2000). A multiple-layer model of market-oriented organizational culture: Measurement issues and performance outcomes. *Journal of Marketing Research*, 37, 449-462.

Hunsaker, B. T., & Knowles, J. (2021). Effective innovation begins with strategic direction. *MIT Sloan Management Review*, (October 5).

Jacobides, M. G. (2022). How to compete when industries digitize and collide: An ecosystem development framework. *California Management Review*, 64/3, 99-123.

Jasper, S., Leenders, A. A. M., & O'Shannassy, T. (2019). The dramatic breakdown of the market orientation concept in the pharmaceutical industry: Lessons from V10XX. *Journal of Strategic Marketing*, 27(3), 227-247.

Jaworski, G. J., Kohli, A. K., & Sarin, S. Driving markets: A typology and a seven-step approach. *Industrial Marketing Management*, 91(September), 142-151.

Jaworski, G., Kohli, A. J., & Sahay A. (2000). Market-driven versus driving markets. *Journal of the Academy of Marketing Science*, 28(1), 45-54.

Kapoor, R., & Teece, D. J. (2021). "Three faces of technologies value creation: emerging, enabling, embedding." *Strategy Science*, 6(1), 1-4.

Keeley, L., Pikkel, R., Quinn B., & Walters, H. (2013). *Ten Types of Innovation: The Discipline of Building Breakthroughs*. Hoboken N. J.: John Wiley & Sons.

Kim, W. C., & Mauborgne, R. A. (2014). *Blue Ocean Strategy: How to Create Uncontested Market Space and Make the Competition Irrelevant*. Harvard Business School Press.

Kirca, A. H., Jayachadran, S., & Bearden, W. O. (2005). Market orientation: A meta-analytic review and assessment of its antecedents and impact on performance. *Journal of Production Innovation Management*, 27/7, 1065-1081.

Kohli, A. K., & Jaworski, B. J. (1990). Market orientation: The construct, research propositions and managerial implications. *Journal of Marketing*, 54, 1-18.

Kumar, N., Scheer, L., & Kotler, P. (2000). From market-driven to market driving. *European Management Journal*, 18(2), 129-142.

Lafley, A. G., & Martin, R. L. (2013). *Playing to win: How strategy really works*. Boston, MA: Harvard Business School Press.

Leiblein, M. J., Reuer, J. J., & Zenger, T. (2018). "What makes a decision strategic?" *Strategic Science*, 3(4), 558-573.

Lillien, G., Morrison, P. D., Searis, K., Sonnack, M., & von Hippel, E. (2002). Performance assessment of the lead user generation process for new product development. *Management Science*, 48(8), 1042-59.

MacMillan, I. C., & McGrath, R. G. (2002). Crafting R&D project portfolios. *Research Technology Management*, 45(5), 48-59.

Manly, J., Ringel, M., Taylor A., & Zablit, H. (2015). "The prerequisites of profitable adjacent growth." Boston MA: Boston Consulting Group.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2 (February), 71-87.

Martin, R. (2009). *The Design of Business: Why Design Thinking is the Next Competitive Advantage*, Boston MA: Harvard Business School Press.

McGrath, R. G., & MacMillan, I. C. (2009). *Discovery-driven growth: A breakthrough process to reduce risk and seize opportunity*. Boston, MA: Harvard Business School Press, 2009.

Miller, D. J. (2021). Corporate renewal through internal innovation: The four 'R's' of corporate bricolage. *Strategic Management Review*, 2, 323-354.

Mowery, D. C., & Rosenberg, N. (1979). The influence of market demand upon innovation: A critical review of some recent empirical studies. *Research Policy*, 8(2), 102-153.

Muller, J. Z. (2018). *Tyranny of metrics*. Princeton, NJ: Princeton University Press.

Nagji, B., & Tuff G. (2012). Managing your innovation portfolio. *Harvard Business Review*, (May).

Nenonen, S., Storbacka, K., Skylar, A., Frow, P., & Payne, A. (2020). Value propositions as market shaping devices: A qualitative comparative analysis. *Industrial Marketing Management*, 87, 276-290.

Nonaka, I., & Takeuchi, H. (2021). Humanizing Strategy. *Long Range Planning*, 54, (August).

O'Connor, G. C. (2008). Major innovation as a dynamic capability: A systems approach *Journal of Product Innovation Management*, 25, 313-330.

O'Reilly, C. O., & Binns, A. J. M. (2019). The three stages of disruptive innovation: idea generation, incubation and scaling. *California Management Review*, 61 (Spring), 49-71.

Osterwalder, A., Pigneur, Y., Bernarda, G., & Smith A. (2014). *Value Proposition Design*. New York: Wiley.

Penrose, E. T. (1959). *The Theory of the Growth of the Firm*. Oxford: Blackwell.

Pisano, G. P. (2015). You need an innovation strategy. *Harvard Business Review*, June, 2-12.

Ries, E. (2011). *The Lean startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. New York: Currency.

Saeed, S., Yousafzai, S., Paladino, A., & De Luca, M. (2015). "Inside-out and outside-in orientations: A meta-analysis of orientation's effects on innovation and firm performance." *Industrial Marketing Management*.

Sawhney, M., Olcott, R. C., & Aroniz, I. (2006). The 12 different ways for companies to innovate. *MIT Sloan Management Review*, (Spring), 75-81.

Schrage, M. (2014). *The innovator's hypothesis: How cheap experiments are worth more than good ideas*. Cambridge, MA: MIT Press.

Souder, W. E. (1989). Improving productivity through technology push. *Research Technology Management*, 32, 19-24.

Sprong, N., Driessen, P. H., Hillebrand, B., & Molner, S. (2021). Market innovation: A literature review and new research directions. *Journal of Business Research,* 123, 450-462.

Teece, D. (2019). Innovation and dynamic capabilities: Strategic management under uncertainty. In L. Trigeorgis (Ed.), *Innovation Flexibility, Organization and Strategy*. Boston MA, MIT Press.

Teece, D., Peteraf, M., & Leih, S. (2016). Dynamic capabilities and organizational agility: Risk, uncertainty and strategy in the innovation economy. *California Management Review*, 58/4 (Summer), 13-35.

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and micro-foundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28 (13), 1319-50.

Teece, D. J. (2014). The foundations of enterprise performance: Dynamic and ordinary capabilities in an (economic) theory of firms. *The Academy of Management Perspectives*, 28 (4), 328-352.

Teece, D. J., Pisano, G., & Shien A. (1997). "Dynamic capabilities and strategic management." *Strategic Management Journal*, 18(7), 509-533.

Terwiesch, C., & Ulrich K. T. (2009). *Innovation Tournaments: Creating and Selecting Exceptional opportunities*. Boston: Harvard Business Press.

U. S. Department of Commerce (2008). *Advisory Committee on Measuring Innovation*. Washington, D. C.

Unger, D. (2018). Strategy in three dimensions. *Strategy + Business*, (May), 38-45.

von Hippel, E. (1988). *The Sources of Innovation*. New York: Oxford University Press.

Zaltman, G., & Zaltman L. H. (2008). *Marketing Metaphonia: What Deep Metaphors Reveal About the Minds of Consumers*. Boston, MA: Harvard Business School Press.

Zhou, K. Z., Yim, C. K., & Tse, D. K. (2005). The effects of strategic orientations on technology- and market-based breakthrough innovations. *Journal of Marketing*, 69, 42-60.

Zott, C. (2004). *Beyond the core: Expand your market without abandoning your roots*. Boston MA: Harvard Business Review Press.

Zott, C., & Amit, R. (2007). The fit between product market strategy and business model: implications for firm performance. *Strategic Management Journal*, (August), 1-26.