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Innovator's Dilemma: Review of the Main Responses to Disruptive Innovation

Abstract

Objective: This paper aims to summarize and discuss key findings in the literature around the main responses used by incumbents in order to anticipate or counter-attack disruptive up-starters and hence to partially or totally tackle the innovator's dilemma.

Methodology: The research method is based on critical and comparative literature review. Hence, by narrowing down the scope of studies papers using a multi-stage selection process, this paper discusses other scholars' research and findings on the topic of disruption innovation and the directions well-established firms choose to avoid being disrupted.

Findings: This paper enumerated some main strategies invoked in a finely selected literature advised for incumbents willing to escape disruptive threats. It suggests that these strategies share a common exploitation/exploration basis but are implemented in distinct ways and have different impacts across the organization. It also discovered many missing parts in the literature that stand for interesting research opportunities.

Value added: This literature review contributes to the current body of knowledge by providing an overview of the main incumbents' responses to disruptive threats. It also identifies some current gaps in research and provides recommendations on how to close them.

Recommendations: This paper builds on hitherto literature in order to present state-of-the-art approaches to disrupt or resist disruption. It categorizes these responses into internal and external, and proactive vs. reactive. While these strategies are studied in different contexts and are labeled distinctly, this study proposes a common frame displaying a similar underlying purpose to all of them. It also provides some updated research avenues for scholars to inspect.

Key words: Disruption, innovation, value network, ambidexterity, exploitation, exploration.

JEL codes: L24, O32

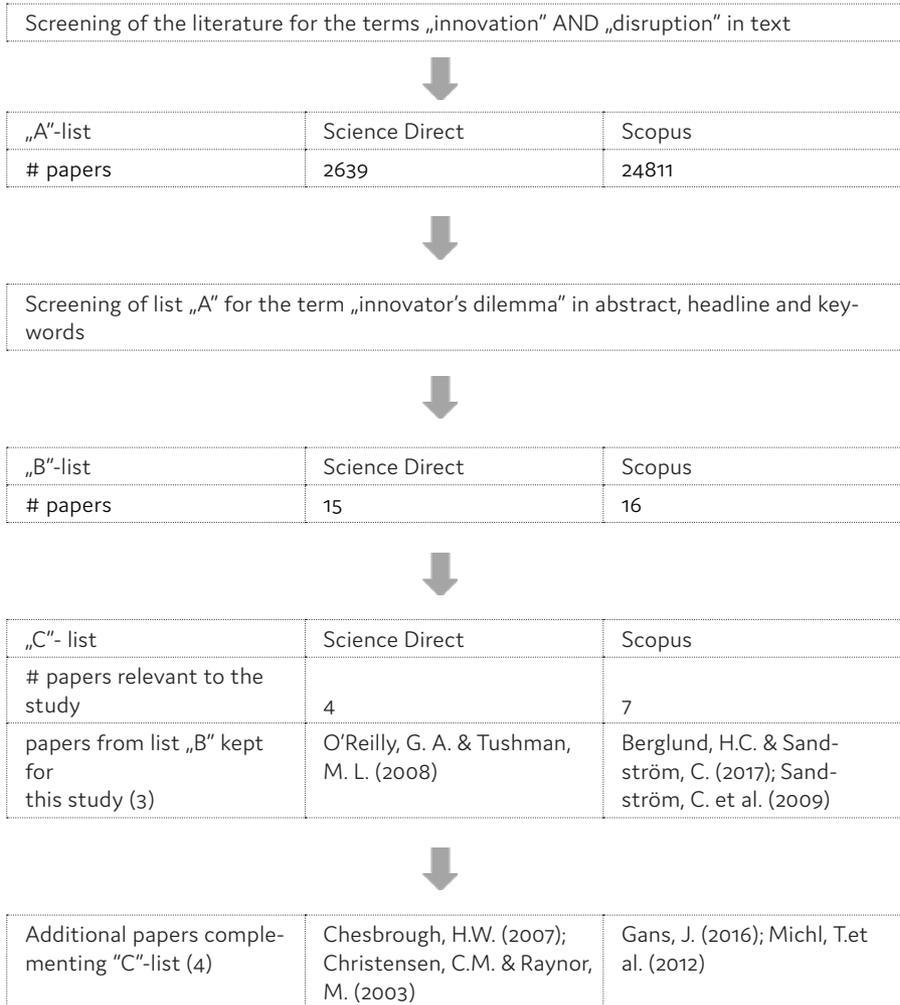
Introduction

By basing his analysis on the technological shifts of the disk drive and steel mills industries, Christensen (1997) elaborated the well-received innovator's dilemma theory. The central idea of the latter refers to the tradeoff a firm should make between keeping focus on its main revenue sources, i.e. its mainstream customers, also referred to as the "exploitation" part of the business, or dedicate resources to "explore" or inspect other disruptive avenues. The fact of the matter is that, in a disruptive process, the stakes are quite high for well-established firms. Incumbents may end up losing a significant market share as entrants move up the market, or may even go out of business like in the Kodak case with digital cameras. In face of these threats, many responses have been suggested and studied by scholars in the last two decades. The objective of this article is to display an updated list of the main responses or

strategies used by incumbents to tackle the exploration side and to identify some likely directions for future research as well.

Materials & Methods

This paper uses a critical and comparative analysis as a main research method. The selection of the pool of papers, which were used a basis of our study, was run as a multi-step process. Firstly, a comprehensive screening of the terms "innovation" AND "disruption" was done in the databases of (i) ScienceDirect and (ii) Scopus. 27450 articles were found at this first stage entitled "A"-list. Hence, in order to sort through the significant quantity of studies published around the topic of disruptive innovation, a particular focus on specific responses to the innovator's dilemma had to be made. The "B"-list screened through "A"-list for the term "innovator's dilemma" in abstract, headline and keywords. 31 articles were found at this step. The next logical step was to narrow down this number by sorting out irrelevant articles to the study. Subsequently, a "C"-list included only 11 non-redundant articles among which 3 articles were selected to inspect in-depth. This selection was made after reading the abstract and conclusion of each of the 11 articles and looking for links with the title of this study, particularly whether the paper focuses on an incumbent's response to innovation/disruption or not. 4 additional papers which are not part of the "C"-list seemed relevant to the study and thus were selected as well (cf. figure 1).

Figure 1. The process applied for literature review

Source: author’s study.

Current state of knowledge

The literature review revealed two basic responses to the innovator’s dilemma, namely (1) internally driven responses and (2) externally driven responses.

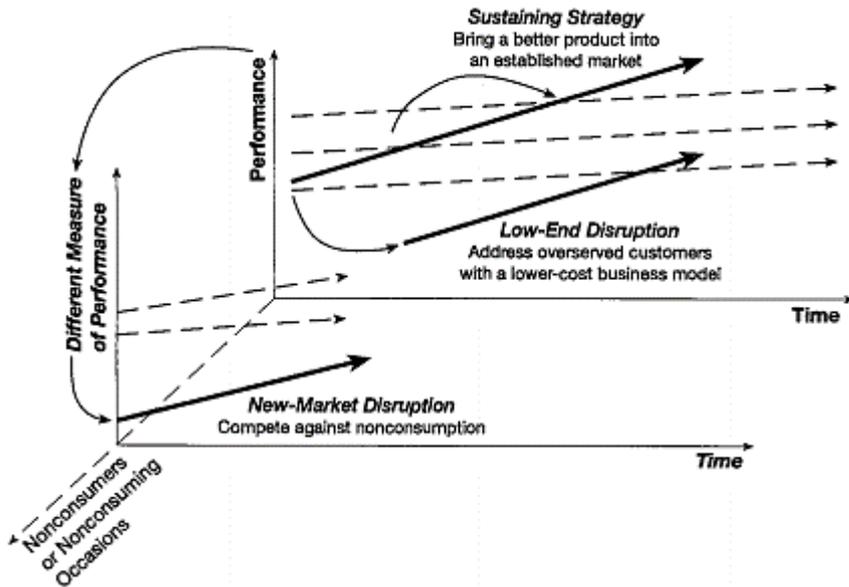
Among the first one, the most popular are (a) autonomous unit, (b) integration and (c) organizational ambidexterity. While among the latter, the following can be pointed out: (a) strategic alliances, (b) spin-along and (c) open-innovation. Both sides are further detailed below.

1. Internally driven responses to innovator's dilemma

i. Autonomous unit

Christensen (1997) elaborated on the notion of value network. This latter stands for the ecosystem within which a firm establishes a cost structure and operating processes and works with suppliers and channel partners in order to respond profitably to the common needs of a class of customers (Christensen, C.M., Raynor M., 2003, p. 44). In this context, three innovation types are displayed in figure 1. A low-end disruption would evolve in the same plan as the precedent sustaining innovation while a new-market disruption would need a new value network and is hence drafted on a different plan with a different performance dimension.

Figure 2. Low-End vs. New-Market disruptions



Source: based on: Christensen, & Raynor, 2003, p. 44.

A canonical response suggested in the disruption theory (1997) is to set a separate organizational unit tasked with developing or commercializing the new innovation. Thanks to its financial and hierarchical independency from the parent firm, this unit can act freely and with more agility in the hope of slowing down or surpassing the disruptive up-starter. It can actually be considered as a startup owned by the incumbent, but which does not have to follow short-term performance and optimize margins. Another advantage of its autonomy lays down in circumventing traditional stage-gate innovation and new product development processes that do not meet certain standards and metrics. This approach has been broadly and empirically supported by many studies (e.g. Gilbert, 2003, pp. 27–32).

ii. Integration

Although appealing, creating an independent unit turns out to be more difficult in practice than it sounds in Christensen's theory (1997). In fact, incumbents' value network can be too complex and rigid for change. In many cases, disrupted incumbents find themselves unable to transfer the new technologies into their mainstream operations because doing so requires them to fundamentally change their business model (Gans, 2016, pp. 78–80). This is referred to as "supply-side" disruption, whereas demand-side disruption deals with customers' preferences and market shares. The supply-side considers the impact that a disruptive innovation has on the value chain and network as a whole. Some innovations fall mainly into the demand-side disruptive bucket. Web-based platforms like the peer-to-peer hospitality service unicorn "Airbnb" can be considered a demand-side disruption since any well-established hospitality player such as Accor Hotels could create the same or a better platform innovation without a need to restructure its entire operations. On the contrary, a complex product requires a team with not only the necessary **component knowledge** but also an **architectural knowledge** related to fitting-pieces-together know-how (Henderson, & Clark, 1990, pp. 10–11). Given the fact that component knowledge can be acquired in a relatively simple way (e.g. hiring the right resources), architectural knowledge seems to be the most involved in a supply-side disruption. Gans (2016, pp. 81–82) adds that creating a separate unit which tackles the demand-side and focusing on supply-side threats by organizing the business toward deeper integration are two opposing approaches. The reason is that Independence is about erecting barriers between divisions. If a new disruptive threat emerges from the supply-side, there will be no way of providing a path by which new architectural knowledge can be integrated into the mainline business because of the barriers that have been erected.

iii. Organizational ambidexterity

The ever-increasing trend of innovation seems to be hindering firms from finding the appropriate balance between implementing growth strategies and initiating risky innovative activities (Radovanović, N. et al., 2017, p. 120). In this particular context and as a solution to the innovator's dilemma, Tushman and O'Reilly (1996, pp. 24–25) came up with the notion of **organizational ambidexterity**. It stands for "the ability to simultaneously pursue both incremental and discontinuous innovation [...] from hosting multiple contradictory structures, processes, and cultures within the same firm". In other words, ambidexterity often refers to a balance or tradeoff between two distinct business areas: **Exploitation** and **Exploration**. The simultaneous combination of both approaches seems to be a strong strategy advised for incumbents facing a disruptive threat. Even the primacy of Christensen's autonomous unit solution has been challenged at the expense of ambidexterity when the unit in question has a strategic importance and can benefit from the firm's assets and capabilities (O'Reilly & Tushman, 2008, p. 28). The basic problem confronting a company is hence to "engage in sufficient exploitation to ensure its current viability while devoting enough energy to exploration to ensure its future viability" (March, 1991, pp. 72–73). Namely, the integration of the exploration side into incumbents' business seems the toughest part. Well-established firms need to be able to come up with new ideas, for instance through design thinking, open innovation, etc. Then the best ones should be incubated within the organization (e.g. by allocating the right resources...), and finally comes the phase of scaling up the promising projects. On a managerial level, ambidexterity brings about many implications. Senior management need to set and diffuse a clear strategy based on a double alignment of the organization and its assets towards a certain balance of exploration vs. exploitation and insure a sufficient capacity to run both ad hoc architectures. It also has to keep different cultures, but common vision and values within the firm (O'Reilly & Tushman 2008, p. 33).

There seems to be clear pattern in the extant literature. This latter points out to the positive correlation between ambidexterity on a side and performance, innovation and survival on the other (Tushman & O'Reilly, 2013, pp. 4–8). Three ambidextrous approaches have been inspected: Sequential, Structural, and Contextual. Sequential ambidexterity refers to the shift or “rhythmic switching” from exploration to exploitation and back. Studies suggest that sequential ambidexterity may be more useful in stable, slow-moving environments (e.g., service industries) (Tushman & O'Reilly, 2013, p. 9). A structural or simultaneous approach is the common form of ambidexterity. As defined previously, it stands for the simultaneous balance between exploitation and exploration. It has been argued that this is more of a leadership issue (O'Reilly, & Tushman 2011, p. 8). While sequential and structural ambidexterity approach the exploitation/exploration dilemma from a unit or senior management level, contextual ambidexterity gives more weight to the individual employee in the resolution of this tension. It is defined as “the behavioral capacity to simultaneously demonstrate alignment and adaptability across an entire business unit” within an organizational context characterized by an interaction of stretch, discipline, and trust (Gibson & Birkinshaw, 2004, p. 215). Hence, a key shortcoming of contextual ambidexterity is that it does not really consider how a firm can simultaneously conduct radical forms of exploration and exploitation.

2. Externally driven responses to innovator's dilemma

i. Strategic alliances

Looking to close down their exploration gap, incumbents may develop an external form of ambidexterity via partnering (Adler et al., 2013, p. 41). In this regard, in a study of 325 biotech firms, Rothaermel and Deeds (2004, pp. 216–219) showed how alliances could be used to enhance both exploration

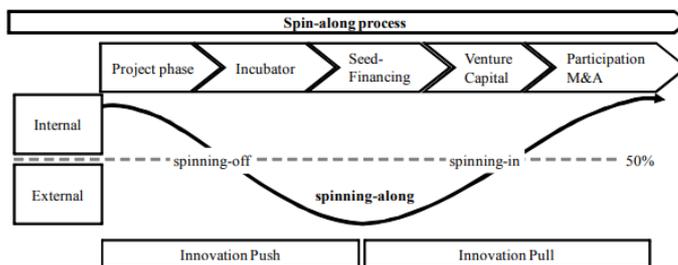
and exploitation. Partnering with or licensing startups' technology is another way to explore. At first sight, it may seem counterintuitive to collaborate with disruptors which may threaten the profit share of the incumbent. Yet, a study of the population of entrants into the worldwide speech recognition industry from 1952 through 2010 led Marx et al. (2014, pp. 3122–3126) to conclude that while disruptive innovation might be preferable from the entrepreneur's perspective, the incumbent may want to preserve its existing profits first by not cannibalizing his products for instance. This means that an entrant may be well-positioned to test the market potential of disruptive technologies by experimenting (e.g. Minimum Viable Products) then taking the products to market themselves. That is, competition may precede cooperative commercialization strategies (e.g., licensing or acquisition).

ii. Spin-along

Enlarging the scope of strategic partnering, incumbents may opt for strategic investments by acquiring partial or full control of a highly regarded disruptor. This also could be considered as a form of external ambidexterity aiming to promote exploration through venturing schemes (Michl et al., 2012, p. 49). Namely, since its introduction by the Deutsche Telekom Laboratories, the spin-along approach was defined as a separate organizational unit, which is kept under control by and has linkages to the parent firm that aims to support the innovation activities at the parent firm (Michl et al., 2012, p. 50).

As illustrated in figure 3, the spin-along approach contains spin-offs and spin-ins at specific points in time. The spin-along phase is a period of time (generally in the range of 2–10 years) when the venture stays organizationally outside the parent firm but – to some extent – is still controlled by and has certain linkages to the parent firm.

Figure 3. The spin-along process within the global venturing picture



Source: based on: Michl. et al., 2012, p. 49.

Despite being in its infancy and the wide use of classical venturing schemes such as pure M&A (Christensen et al., 2011, pp. 48–57) or spin-outs, it seems that spin-along approach has the advantages of a hybrid venturing approach that combines internal and external corporate venturing elements supporting incumbents' innovation activities (Michl et al., 2012, p. 50). Furthermore, this venturing form help avoid some issues part of the classical schemes. For example, Spin-along scheme may be able to receive support, protection and resources from the parent firm, but are also able to keep most of its autonomy vis-à-vis its business model. However, for this approach to be successful however, Michl et al. (2012, p. 59) argued that ambidextrous senior management is a great facilitator to align parent firm's and spin-along' perspectives in order to achieve a high innovative performance.

iii. Open innovation

The model of open innovation stands for the business ecosystem where companies are open to external collaboration with some firms developing new ideas then partnering with or selling it to another commercializing (often better branded) firm (Chesbrough, 2007, p. 22). Since then, more and more companies in a wide array of fields are adopting or experimenting with this model (Fayard et al., 2016, p. 303). Namely, the FMCG leader Procter & Gamble

(P&G) launched a program entitled “Connect and Develop” which licenses and acquires products, technologies and ideas from external players, mostly medium and small companies.

Open innovation displays many advantages for incumbents beyond allowing the “exploration” of new opportunities and the proactive preparation against disruption. For instance, consider the fact that in most high-tech industries, R&D costs has been increasing while new products’ lifecycle has been shortening (Chesbrough, 2007, p. 24). Both trends put more pressure on managers to justify new innovation investments. Open innovation can tackle both issues. On the cost side, the model leverages a wide range of R&D external resources, hence saving time and money in the New Product Development -NPD process. On the revenue side, open innovation allows the creation of new products in a faster pace and also the licensing of new technologies (Chesbrough, 2007, p. 24).

Results

Table 1 sums up the discussion while categorizing each incumbent response into Internally driven (I), i.e. depending mostly on internal resources, or otherwise externally driven (E). Each response is also labeled proactive (P), i.e. centrally intending and mostly adapted to prevent or anticipate disruption, or reactive (R) aiming to deal with disruption after it has already started. This last labeling can be criticized as being subjective since it mostly relies on the author’s understanding of the studied responses from the extant literature. Nonetheless, it can provide interesting insights for scholars willing to inspect this part in further studies. Finally, table 1 is complemented with the most notable advantages or benefits (+), drawbacks or difficulties (-) and major academic contributors (MC) for each strategy based on the hitherto literature.

Table 1. Summary of the main responses to disruptive threats

Strategy	+ / -	I / E	P / R	MC
Independent unit	<p>Creating an autonomous unit (e.g. spin-out) tasked with radical and disruptive products.</p> <ul style="list-style-type: none"> + Minimal interference with the incumbent's business model; + More freedom to innovate and explore; - Fewer resources than incumbent. 	I	R	Christensen, C.M.; Raynor, M.
Integration	<p>Deep integration seems to be key to the absorption and exploitation of a supply-side disruption, since helps develop the right "architectural knowledge".</p> <ul style="list-style-type: none"> + Integrated, interdependent or proprietary architecture allowing more control and flexibility; - May be costly and inefficient; - Hard to combine with the "independent unit" strategy. 	I	P	Gans, J., Henderson, R.; Clark, K.
Structural ambidexterity	<p>This stands for the simultaneous combination of "exploration" and "exploitation" within an organization by aligning different resources to each side under the same cultural and leadership umbrella.</p> <ul style="list-style-type: none"> + Access to incumbents' resources; + A double culture Exploit/Explore may result in positive synergies; + Positive correlation with performance and innovation; - Organizational difficulties (e.g. limiting friction and conflicts, attributing roles). 	I	P	O'Reilly, G.A.; Tushman, M.L.; March, J.
Strategic alliance	<p>Incumbents may enhance their complementary assets and develop an external form of ambidexterity via partnering.</p> <ul style="list-style-type: none"> + Relative low investment costs; + Large set of possibilities; - Friction for disruptive technology transfer from up-starters to incumbents before cooperative commercialization strategies. 	E	R	Lavie, D.; Rosenkopf, L.; Kauppi-la, O.P.

Spin-along	The spin-along phase is a period of when the venture stays organizationally outside the parent firm but – to some extent – is still controlled by and has certain linkages to the parent firm. + Combining advantages of spinouts and spin-ins; - Necessity to have similar long-term vision with the parent firm in order to be efficient; - Little extant research into this topic.	I/E	R	Michl., T.; Rohrbeck, R.
Open innovation	This approach uses purposive inflows and outflows of knowledge to accelerate internal innovations. + Extending the collaborative knowledge about innovations; + Reducing R&D costs and opening new revenue streams; - Possibility of ideas and technology leaks, mostly for outbound open innovation.	E	P	Ches- brough, H.W.

Source: own study.

Final remarks

While each strategy has its own requirements and implications, it can be confidently observed that the issue can be formulated in a simple – maybe simplistic way. Each approach considers one of the two sides of the same coin or both: Exploitation and Exploration. In fact, while some scholars argue that both can be run in parallel within the same organization (e.g. ambidexterity) and may be backed up by some dynamic capabilities (e.g. integration) and competitive advantages (e.g. patents, brand name). Others opt for a separation between these two aspects by externalizing the exploration part through spin-out or spin-along for instance.

Although these strategies or approaches are the ones encountered the most in the innovation and disruption literature, the non-exhaustive character of our review is noteworthy. In a VUCA field of study such as disruptive innovation management, it is totally conceivable that other incumbents in particular industries use alternative methods to predict and deal with

entrants' threats. For instance, it seems that Lobbying units attached to well-established organizations can play an important role in influencing the regulatory instances in order to keep entry barriers high or make a market favorable to some technologies and standards and less to others. Namely, the expansion of UBER, the ride sharing application, has been regularly slowed down since the taxi industry and many city councils have responded by demanding that Uber comply with already-existing taxi regulations (Posen, 2016, p. 427). Another limitation of this study comes down to the exclusive consideration of English articles.

Many research avenues are noteworthy in this field. Namely, in-depth literature is lacking around some strategies (e.g. Spin-along). In this regard, it may be wiser to get over the hardships of setting a longitudinal study in such recent fields by running more accessible research methodologies such as cross-case analysis of multiple case studies, which it enables the researcher to look for comprehensive patterns (Eisenhardt, 1989, pp. 532–550). Furthermore, leadership aspect can take a significant role in the implementation and success of one or many above approaches, particularly the internal ones. Research has shown that managing tensions related to both "exploration" and "exploitation" requires leaders or certain leadership styles than can balance the competing pressures of different organizational architectures. Case in point, transformational leadership is more likely to be associated with exploratory innovation while transactional leadership was more associated with exploitative innovation (Jansen et al., 2009, p. 5). That been stated, many pieces in the literature linking leadership to disruptive and radical innovation are still missing. Last but not least, it seems important to inspect which criteria a manager or C-level stakeholder within incumbent players should rely on to make a sound decision vis-à-vis which strategy or combination of strategies to adopt in order to disrupt instead of being disrupted. Given that Firms differ in many dimensions, including their innovation potential and actual innovation performance (Brodzicki, 2017, p. 92), such research avenue should probably take into consideration the specificities

of the industry, the maturity level of incumbents and the disruption impact (e.g. time-to-market, expansion or replacement rate, etc.) of the innovation, among other control variables.

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