
Disruptime!—Guidance Towards Radical and Disruptive Innovation

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Abstract

Innovation remains a hot topic in business agendas. For years, the importance of the issue has been acknowledged by the vast majority of managers and academics, which has led to many aspects being well covered in the research and to many theories being developed. One such theory that finds broad support states that firms must commit to incremental and radical innovations simultaneously in order to grow profitable, not just in the short term but also in the long run. Radical innovations are inherently different to manage compared to incremental or sustaining ones, which is why they require specific managerial attention. A very special type of radical innovation is disruptive to the markets which it enters or creates. These disruptive innovations are difficult for any type of organization to introduce, mostly because they require measures that contradict common management literature and are in conflict with organizations streamlined for maximal efficiency. This chapter illustrates the critical aspects of managing radical innovations in general, before going on to discuss the critical issues in relation to disruptive innovations. The aim is to provide a better understanding of the theories of radical and disruptive innovations, as well as to offer recommendations on how to deal with the phenomenon of disruption. Disruptive theories as first presented by Christensen (1997)

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pose a great threat to established organizations, and therefore, the basic principles of disruption are essential knowledge for every manager.

2.1 Introduction

Most companies long ago reached a point of diminishing returns in their incremental improvement programs. Radical, nonlinear innovation is the only way to escape the ruthless hyper-competition that has been hammering down margins in industry after industry.—Gary Hamel, cited in Colarelli O'Connor and Rice (2001, p. 95)

Radical innovations have transformational power through their newness to the market or the firm or through their significant performance improvements or cost reductions (Colarelli O'Connor and Rice 2001). In contrast to incremental or sustaining innovations, they are not just mere improvements along the known attributes for performance evaluation, they change the attributes altogether. Disputes can arise over the degree of radicalness and the exact type of innovation. Hauschildt and Salomo (2011) provide illustrative and detailed frameworks for a precise classification.

While the definitions and exact degrees of radical innovations are open to debate, their necessity is undisputed (Denning 2005). Hamel, cited above, emphasizes their inevitability in order to escape brutal competition in a phase of incremental adjustments and strategic positioning, with all industry participants desperately looking for some edge over the competition. Such phases of fierce rivalry are usually seen in mature markets, where the dominant driver of competition has become price and products are treated as commodities (Christensen 2003). It is in these phases that radical innovation could offer solutions through growth. However, being radical is easier said than done.

Empirical literature repeatedly shows that more radical innovations are developed by small and entrant firms compared to large and incumbent firms (Yu and Hang 2010). Smaller firms generally seem to have bigger incentives to pursue ventures that might lead to radical innovations. The following sections outline some of the most dominant issues related to the management of radical innovation.

2.2 Managing Radical Innovations

The management of radical innovations is challenging for any type of firm. Therefore, it seems surprising to see that small firms are apparently more successful in bringing such ventures to market. What are the critical factors in managing radical innovation? How do they affect small firms and established players? These are the issues discussed in this first section.

2.2.1 Success as Legacy

The incentives for small firms to pursue radical innovation are bigger than those for established organizations (Chandy and Tellis 2000; Yu and Hang 2010). Not only are large companies apparently unsuited to radical innovation but successful ones in particular (Paap and Katz 2004). This makes one wonder, why? After all, they must have done something right to be successful in the first place.

Radical innovation signifies a departure from familiar territory, as stated above. Therefore, processes and routines that were essential parts and paths of an organization in the past might also have to be left behind (e.g., Davis 1985; Arthur 1994; Schreyögg et al. 2003 in the context of path dependence or path theory). Many of these are linked to successful value propositions, which cause issues of tie-up and attachment. The greater the success, the bigger the pride and the harder to let go. The omnipresence of popular processes and mental models (see e.g., Groesser and Schaffernicht 2012 in the context of mental models) culminates in the fact that new ideas and thoughts are drowned long before they reach a critical amount of attention. Ideas challenging history and past successes cause unease and concern, which help explain the struggle of successful incumbent companies to generate radical innovation (Lettice and Thomond 2006). There are, however, more factors contributing to that struggle, such as *core competences*, *cannibalization*, and *organizational unlearning*.

2.2.1.1 Core Competences

In the light of past successes being a cumbersome legacy and routines having to be thrown overboard, it becomes clear that strong reliance on and adjustment of a few core competences can have negative consequences in the long run. Undoubtedly it remains important to maximize the utility of competences and to align strategy, structure, and culture accordingly. But no matter how beneficial the alignment is in the short term, the more firmly it is made, the more cumbersome it might be in the long run (Birkinshaw and Gibson 2004).

It is tough to let go of formerly successful routines. The same applies for competencies, especially when significant investments were made in certain technologies or processes. However, firms should be careful not to fall into the sunk-cost trap and only focus on future investments. After all, who knows whether their current or past competencies will be of relevance in the future? Former core competencies can easily become core rigidities (Leonard-Barton 1992). See Prahalad and Hamel (1990) for basic insights into the concept of core competencies.

As radical ideas threaten to make current competencies obsolete, many firms stick to what they know and try to develop ever further on familiar territory (Yu and Hang 2010). Ahuja and Lampert (2001) refer to this issue of limiting thinking and acting to old competences as “the familiarity trap.” Through an extensive field study, the authors were able to confirm their hypothesis that “a firm’s creation of breakthrough inventions is related to its exploration of novel technologies in a curvilinear manner” (Ahuja and Lampert 2001, p. 527). Accordingly, adherence to core competences and to proven technologies will lead to fewer breakthrough inventions. The authors also proved that experimenting only in

unknown fields while ignoring established processes and knowledge results in a loss of control and a state of “chaos” with inadequate results (this explains the curvilinear shape). The curvilinear nature of the issue and the necessity for both core competences and broad experimentation leave managers with the dilemma of organizational dualism—which is addressed at a later point (Sect. 2.3.2).

2.2.1.2 Fear of Cannibalization

Exploring new fields in order to foster innovation immediately brings up the threat of cannibalization of established competences, services, and products. While still cited as a dominant inhibitor of radical innovations (Assink 2006), fear of cannibalization is irrational. If a new proposition manages to steal some (market) share from an established one, then it must be more appealing to a certain amount of customers. Eventually, the question is whether you want to steal share from your own products or whether you want the competition to do it. *Willingness to cannibalize* prior investments enables established companies to explore and experiment with radical innovations (Chandy and Tellis 2000; Tushman and O'Reilly 1996) and is therefore an absolute necessity.

2.2.1.3 Organizational Unlearning

Radical innovation and, as we shall see later, disruption are only possible if organizations intentionally think the unthinkable, expand boundaries, observe the world differently, challenge presuppositions, and so reconstruct their underlying mental models (Assink 2006). However, walking the talk can be a real challenge to large organizations. Over a period of years, processes and process optimizations have been implemented and redefined, and routine has found its way into the corporate daily life. But instead of hammering exact and limited ways of thinking and working into the employee's heads, the task of organizational unlearning is different: “The challenge is to get them to expand their thinking” (Hamel 2002, p. 8). Therefore, the whole organization needs to be able to “unlearn” knowledge, which it has so thoroughly accumulated in the past. Unlearning is the “process by which firms eliminate old logics and make room for new ones” (Prahalad and Bettis (1986), cited in Sinkula 2002, p. 255).

Organizations need to be able to unleash their entrepreneurial spirit (see e.g., Volkmann et al. 2010 in the context of entrepreneurship). They need to be foolish and bold again, live in the day without expectations and presuppositions. But, usually, the opposite is true. According to Hamel (2002), people take around 98 % of the industry orthodoxy for granted, whether they want to or not. This leaves them with only 2 % of space for possible business model innovations. This way, more or less deliberately, firms stay within their comfort zone on familiar ground—they are in the “propinquity trap” (Ahuja and Lampert 2001). To counter that, and to escape the propinquity trap, managers are periodically required to destroy what was so lavishly constructed in the past (Tushman and O'Reilly 1996). While a large body of literature praises the learning organization, let us not forget the importance of unlearning.

2.2.2 Organizational Dualism

Organizations need to pursue incremental and radical innovation initiatives simultaneously in order to succeed in the long run. As the management of radical innovations is vastly different from managing incremental innovations, companies are confronted with a dilemma. This is called “organizational dualism” (Paap and Katz 2004), and the solution lies in an “ambidextrous organization” (Tushman and O’Reilly 1996). Organizations need to be ambidextrous enough to master the challenging demands of radical and incremental innovation in parallel. As radical innovations strongly differ from incremental ones in dimensions such as market research, scope, skills, revenues, people, and culture (McDermott and Colarelli O’Connor 2002), one of the best ways to solve the dilemma is through structural separation (Stringer 2000).

Structural separation calls for a decentralized organization, where people are accountable for their own results, bureaucracy is limited, autonomy is maximized, and both experimentation and risk-taking are tolerated (Tushman and O’Reilly 1996). At the same time, organizations can still take advantage of their scale through a common corporate culture and wise management of their shared resources (Chandy and Tellis 2000). In contrast to hierarchical and specialized organizations, decentralized ones are also more open to change. The more thorough an organizational specialization is, the greater are individual expertise and control, which oppose change initiatives. Separate departments of organizations then begin to take everything coming from other departments for granted, assuming that everything is right. Also, departmental experts are likely to oppose change as they fear losing their current amount of control (Shulman and Stallkamp 2004).

An ambidextrous organization successfully manages the dilemma of organizational dualism. While Tushman and O’Reilly (1996) draw on the metaphor of juggling to illustrate the issues of organizational dualism, one can also think of the left and right hand in drumming. While a steady rhythm of incremental innovations is necessary to provide some structure (right hand), accents and completely new patterns also need to be mixed into the groove (left hand). To entertain an audience, both structure and variation, as well as incremental and radical patterns, are necessary. Separate units (hands) need to perform vastly different activities while still drawing on the same resource base (body; see also O’Reilly and Tushman 2004, and in the context of ambidexterity and leadership, Probst et al. 2011).

2.2.3 Culture

Aspiring radical innovators need to have a culture that is supportive for the issues discussed earlier; for instance, risk-taking, cannibalization, decentralization, failure acceptance, and so on are vital elements. Similar to core competences, it is important to regard corporate culture as an element in constant development. Too tightly aligned and deep cultures might work very well in the short run, while being cumbersome in case of required change (Birkinshaw and Gibson 2004). Firms need to commit to change. New ways

of doing things and experimentation with novel technologies will challenge opponents of change. Ahuja and Lampert (2001) provide detailed information on how to experiment with novel, emerging, and pioneering technologies in order to escape the traps of familiarity, maturity, and propinquity. Corporations will have to deal with those issues on a regular basis. The goal should be to incorporate a permanent ability to change and experiment. Companies need to be fast and nimble in order to adapt to environmental development. *Change—as a dynamic core competence* (Krüger 2009; Teece et al. 1997).

A culture that is opposed to change and risk will drown radical ideas with filters and systems long before they get past mid-level management (Stringer 2000). Risk in particular seems to play a crucial role; according to Foster and Kaplan (cited in Assink 2006), fear of risk-taking was the number one barrier to innovation in the surveyed Fortune 500 companies. Remembering that “the opposite of success is not failure, but mediocrity” (Raynor 2007) always helps when taking risks. Especially if you want to be disruptive, risk is part of the process. The credo must be to fail fast, but fail often, while trying to maximize learning and not betting everything on a single horse. All this goes hand in hand with a decentralized structure.

The idea that entrants are better in developing radical ideas is partially based on cultural differences. Young companies do not yet have the filters in place that “direct managers’ attention to maximize the utility of the current technology for current customers” (Chandy and Tellis 2000, p. 3). Entrants have no standard way in which things were always done, no status quo (Assink 2006), which makes them much more open to change. All these issues are amplified with size, which again speaks for the decentralized architecture (Stringer 2000).

Alongside a supportive corporate culture, a strong technological capability on an organizational and individual level is also required in order to develop breakthrough innovation (Chandy and Tellis 2000; Colarelli O’Connor and Rice 2001). Without a supportive culture that allows inventions to be transformed into market successes, technological capability alone is insufficient. This was proven famously by Xerox’s Palo Alto Research Centre (PARC), the Swiss Watch industry in the 1980s, and Kodak in regard to the digital camera (Assink 2006; Chandy and Tellis 2000).

2.2.4 People

Just like culture on a corporate level, people on an individual level play a crucial role in radical innovation. All the way from the usually individual effort of opportunity recognition (Colarelli O’Connor and Rice 2001) to mid-level management approving ideas (Christensen 2003) and top-level management setting up the right structures (Birkinshaw and Gibson 2004), people are a vital element. People must be able to identify and properly support radical ideas. Field studies show that educating employees about radical and disruptive innovation can have significant impacts on innovation management and performance (Raynor 2011).

As always when talking about people, incentives arise as an adjacent topic (not just in economics). It is important to note that innovation is no routine task; hence, the classic more-for-more approach will not yield the desired results (Pink 2011). Furthermore, less straightforward incentive structures such as stock option programs (Christensen 2003) can thwart the ambitions of radical innovators. Such programs will always persuade employees to pursue less risky and more predictable ventures, especially if they promise positive short-term benefits. Such structures and incentive plans will inhibit radical or disruptive ideas while promoting solely incremental ones.

2.3 Disruption

Disruptive innovation is a term coined by Clayton M. Christensen. His initial theories of the concept were published in 1997 and have been further developed ever since. Meanwhile “disruption” has become a buzzword, and any recent business magazine article about innovation is suddenly also about disruption. However, a lot of what is called disruptive nowadays is quite distant to Christensen’s initial theory—to which this article adheres. After a basic introduction to Christensen’s disruption, new-market and low-end disruption are discussed.

2.3.1 Basic Theory of Disruption

The standard disruption diagram illustrates how incumbent technology (narrow) and disruptive innovation (bold) evolve over time. Christensen’s disruption has two types: *new-market* and *low-end* disruptions. The diagram (Fig. 2.1) shows the case of low-end disruption as the performance axis remains the same for the incumbent and disruptive technologies (Raynor 2011). Whether in low-end or new-market disruption, the main concept is about making an existing product simpler, more accessible, or cheaper to provide it to a bigger group of customers. As shown in Fig. 2.1 as a bold line, at the very beginning of their life cycle, disruptive offerings are insufficient for even the lowest tiers of markets. However, as the offerings improve faster (with regard to the relevant driver) than the market needs, they conceal a “disruptive potential” (Christensen 2003) and will one day enter a market at its low end. When entering the market, the disruptive ventures provide a price point out of reach for incumbent players. Disruptors manage to be profitable in segments that are unattractive to incumbents. While the very -low-end or new markets are attractive to disruptors, high-margin and upper-level segments are more attractive to incumbents. This “asymmetric motivation” (Christensen 2003) will lead incumbent players to leave bottom segments to the new entrants and flee upmarket to higher margin segments and lead customers. A vital element in understanding the theories of disruption is to notice that at any given point, it will be more attractive for the incumbents to move up, towards higher margin segments. That is what their key account-management programs will want them

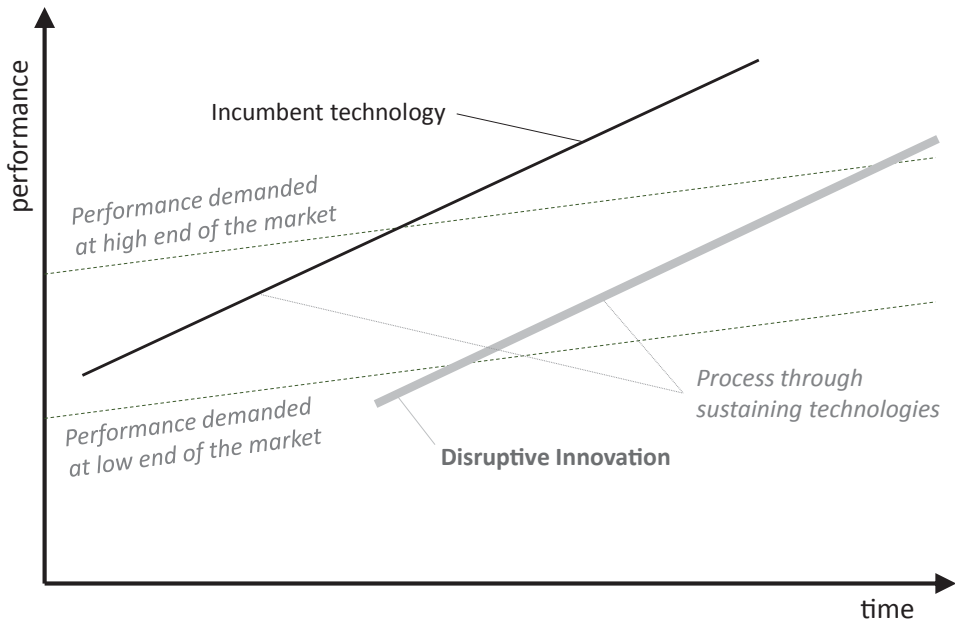


Fig. 2.1 The disruption diagram (according to Christensen (2003)) (source: own illustration)

to do, and since the incumbent business model does not allow profitability in low tiers of the market, their shareholders too will vote for an orientation towards the upper end of the market. Disruptive innovations have contrary attributes and ignore the expectations of high-margin tiers and evolve out of small opportunities (Assink 2006). This different approach causes a dilemma to established companies as they have trouble reacting to these low-performing threats and their new business models. The issues concerning radical innovations in general, as discussed above, will prevent established companies from reacting to disruptive entrants in a timely manner (Adner 2002; Charitou and Markides 2003).

Similar to incumbent technology, disruptive innovation too will evolve over time and improve through sustaining innovation. This will lead to an upward march into higher margin segments, while continuously stealing more and more market share from incumbent players. Eventually, true disruptions will change entire market structures—hence the term to *disrupt* (Adner 2002; Christensen 2003). Christensen's (2003) initial and famous examples are the hard disk drive and the steel mill industries, which were completely disrupted by entrant firms who started off with a low-performing value proposition. While these tales of successful disruption are impressive, it is important to note that small entrant firms are only better situated when it comes to radical and especially disruptive innovations. In the case of sustaining and incremental innovations, large established players are better positioned, as they know the relevant players better and as they have more resources on hand to nurture the business (Christensen et al. 2002).

While the definitions of Christensen (2003), Raynor (2011), and Adner (2002) stress the initial low-performing nature of disruptive ventures, the aspects of simplicity and making a product accessible to a larger audience get lost in later usage of the term. Lettice and Thomond (2006) define disruptive innovation as “A successfully exploited product, service or business model that significantly transforms demand and needs of an existing market and disrupts its former key players.” This approximates quite well to how the term *disruptive* is used in management literature nowadays.

Before specifying the challenges of new-market and low-end disruptions, as a reader you might wonder “Why should I care?” Well, you should. There is empirical research confirming the significantly greater likelihood of success of disruptive ventures in comparison to other growth/innovation initiatives (Christensen et al. 2002), and there is further empirical data confirming the transformative power of disruption (Christensen 2003; Raynor 2011). One might also argue that all this is too abstract—where is disruption now, is there any current example? Yes.

Think of a sports-and-outdoor camera. The names and brands going through your mind must include Sony, Canon, Nikon, and so forth—but also GoPro. The tale of the Volkswagen bus (VW-bus) entrepreneur Nick Woodman’s company is one of the most impressive start-up stories of the past decade. What started in 2004 with 35-mm analogue photo cameras has now evolved into a multimillion-dollar business with ultra-versatile HD video cameras (Mac 2013). GoPro represents a new-market and a low-end disruption simultaneously. The camera attracted many former nonconsumers but also stole significant shares of incumbents in outdoor photography. By 2014, 10 years after its introduction, GoPro holds a 42% market share in action cameras and is by far the dominant player in the field (NASDAQ OMX Group Inc 2014).

2.3.2 New-Market Disruption

Disruptive theory as introduced by Christensen (2003) knows two types of new-market and low-end disruptions, as stated above. New-market disruptions create entirely new value networks and markets on a third axis—compared to the one performance axis illustrated in the disruption diagram (Fig. 2.1). As a further differentiation, new-market disruptions do not compete against incumbents and their current offerings; they instead compete against nonconsumption (Christensen and Raynor 2003). Competing against nonconsumption allows new-market disruptions to create an even greater asymmetry of motivation. At a later stage, the outcomes of new-market disruption might migrate towards other markets. Through the sustaining developments that they have experienced since they were launched, they might reach good-enough levels in other markets too—and will start to create a similar dilemma to incumbent companies in those markets, as low-end disruptions do. The example of GoPro cameras, as introduced above, was a new-market disruption towards people who did not record their miscellaneous type of activities beforehand as there was no camera with the attributes of a GoPro available. Later on, GoPro

improved its HD Hero series to a level that it has found its way up into police and military training as well as into Hollywood (Mac 2013). This illustrates how GoPro is at the same time a new-market and low-end disruption.

Subsequently, critical issues linked to new-market disruption are discussed, such as customer orientation, uncertainty, funding, and structural requirements.

2.3.2.1 Customer Orientation

New-market disruption competes against nonconsumption, which is why strong customer orientation is toxic to it. Strong customer orientation is not only disadvantageous for disruption, it is also generally harmful for radical ideas. As exemplified empirically by Gatignon and Xuereb (1997), strong customer orientation leads to less radical ideas. Yes, it is important to listen to one's customers, however, not to the point that they take over the control of a firm's resource allocation (Adner 2002). Customers will never be able to precisely articulate what they actually want. Breakthrough innovations come from observing an unarticulated need (Hamel 2002). Hence, it is much more about observing *potential customers* than talking to current clients (Paap and Katz 2004).

The strong customer orientation is to a large extent also what prevented the incumbents in the camera industry from coming up with a product similar to a GoPro. The first types of cameras sold by GoPro founder Nick Woodman were bought for \$3.05 from a Chinese supplier and could take nothing more than a few blurry analogue pictures (Mac 2013). Think of an engineer at a heavily customer-oriented incumbent firm in the camera industry approaching his supervisor with a prototype that has bad resolution, low battery life, small storage, no video function, no display, and no special modes and options. The prototype would have inferior performance in almost all dimensions when compared with the incumbent's existing products. Hence the engineer would probably not spend too long in the office of his next-level manager. On the other hand, a marketer in the same firm who talks about a camera with new modes and a larger display might spend some hours discussing the venture with the next-level manager. Innovations that offer improvements in line with customer expectations are, however, not of a disruptive kind (Lettice and Thomond 2006).

When attempting new-market disruption, it is important to observe potential customers and their latent needs. Read the prior sentence again while emphasizing *observe*, *potential*, and *latent*. Many of the potential customers are nonconsumers at this point because they have been excluded from a market by one of the barriers *skill*, *access*, *wealth*, or *time* (Johnson et al. 2011). In the first instance, the GoPro cameras were clearly breaking the barriers of skill and wealth. With their unparalleled simplicity, versatility, and attractive price point, they invited large groups of nonconsumers to the scene of outdoor and action still and video photography.

2.3.2.2 Dealing with Uncertainty

Another central element of new-market disruption is uncertainty (see Volkmann et al 2010 for a brief overview of uncertainty, ambiguity, and risk in the context of entrepreneurship), where there is a lack of data. Markets that do not exist yet cannot be analyzed—especially

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