Patterns of Implementation of OI in MNCs

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12.1 INTRODUCTION

Open innovation (OI) is an innovation paradigm first described by Chesbrough ten years ago (2003a). Since then it has received substantial interest from practitioners, with firms in many sectors progressively adopting a variety of open practices. Policymakers are also increasingly recognizing OI’s potential economic value and are encouraging its adoption. Some academics envision a future where the OI model will be fully integrated in firms’ innovation management activities (Huizingh, 2011) even though a recent review (Schroll & Mild, 2012) estimates that OI activities have currently been implemented in only 20–45% of companies (Schroll & Mild, 2012) and very few single determinants behind the adoption of OI practices have been identified. The highest rate of agreement is that turbulent environments (industry, market, and/or technology) encourage the adoption of OI (Schweitzer et al., 2011), whilst there is high uncertainty on other factors.

Underpinning the successful OI implementation is an understanding of how firms adopt this model to determine what approaches work and what do not. As OI is for many firms an innovation in itself (Christensen, 2006), studying OI adoption also presents a new opportunity to enhance the theory of innovation implementation.

Only a few scholars to date have committed efforts to researching OI implementation patterns (e.g. Chesbrough, 2003a; Chesbrough, 2006a; Chiaroni et al., 2010; Chiaroni et al., 2011; Christensen et al., 2005; Mortara & Minshall, 2011). This line of enquiry has been popular particularly in European firms (and more specifically, in Italy, e.g. Buganza et al., 2011; Chiaroni et al., 2010; Chiaroni et al., 2011; Di Minin et al., 2010; Pellegrini et al., 2012; Petroni et al., 2012).

In an attempt to consolidate the knowledge to date on OI implementation, this chapter reviews the richest available data, i.e. the evidence on OI adoption.
in large multinational corporations (MNCs). Based on case study research (the method we consider best suited to revealing the complexities that underpin the adoption of OI), this chapter develops a model of OI implementation and highlights future research needs. In section 12.2, we summarize the relevant theories useful to study this phenomenon and the general trends applicable to OI implementation. In section 12.3 we delve into a review of the evidence published in the literature, highlighting the patterns and key traits of OI implementation that can be used to characterize OI adoption in firms. Finally, we propose a framework which can be used to examine the OI implementation approaches of firms with process research methodologies (Pettigrew, 1990).

12.2 CHESBROUGH’S OI MODEL: A POINT OF DISCONTINUITY IN OI IMPLEMENTATION

Evolutionary theory has been used to analyze OI adoption in firms (Christensen et al., 2005). Accordingly, companies have adopted various approaches to opening their innovation processes but only the “fittest”—i.e. the most successful in that context—survived. However, many of the cases in literature are “static” descriptions of the OI practices and models such as those of Whirlpool (Muller & Hutchins, 2012), Air Products (Tao & Magnotta, 2006) or P&G (Huston & Sakkab, 2006), whilst the abandoning of specific types of innovation activities is not widely recorded. The study of “negative” or “failure” examples (Chesbrough, 2012b; Huizingh, 2011) as well as studies of the disadvantages of adopting OI (Vanhaverbeke et al., 2008) could help clarify what forms of OI did not work and why. It is unfortunate that the memory of negative experiences (i.e. abandoned practice) is hard to identify and document, skewing the evidence to surviving or recently adopted—but not yet tested—approaches.

Since 2003, the widespread diffusion of Chesbrough’s OI model (Chesbrough, 2003a) has encouraged firms to experiment with OI practices (Mortara & Minshall, 2011), moving the adoption from a phenomenon of emergent to that of planned change (Livne-Tarandach & Bartunek, 2009). Hence, the OI model represents a new contingency in the implementation of OI. For example, when the head of R&D at FIAT started opening the firm’s innovation processes during the early 1990s in response to a sharp performance downturn (Di Minin et al., 2010), there was no OI model to support the implementation of this strategy. In contrast, any firm seeking to do something similar post-2003 had the benefit of a clearly accessible OI model and widely publicized examples to support the design, development, and implementation of activities. Teleological theory would hence seem appropriate to analyze OI implementation after the OI model had become explicit. Adopting this theory, the OI paradigm becomes a goal to pursue and organizations set out to achieve its implementation faster compared to firms
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who opened up in a more evolutionary manner. In firms where the choice to implement OI came as a conscious decision, several other theories could concur in studying OI such as Bounded Rationality (which assumes that managers who decide to adopt OI are only marginally aware of all the possible consequences of their implementation choices (Simon, 1945)) or Upper Echelon theory (that proposes that firms are direct manifestations of their top managers’ personalities (Hambrick & Mason, 1984)). Also, clearly relevant is the change management theory of how companies pursue and maintain the change momentum, and if and when they are ready for change (Jansen, 2000; Jansen, 2004).

It is also evident that the increasing debate surrounding the OI model and its associated terminology has concurred to create “noise” in the ten years since its first publication. The example of other firms, especially within similar innovation systems, provides an extra stimulus to test and develop OI practices. This is evident from the story of OI implementation at Roche (Nakagaki et al., 2012) where managers decided to experiment on OI primarily following the examples of other firms, rather than being pushed by an explicit need. Hence, in the evaluation of recent cases, researchers need to consider the “bandwagon effect” in adopting OI practices (Xu et al., 2012). This is not a new situation in management research (Abrahamson & Fairchild, 1999; Bikhchandani et al., 1992, 1998) which has often looked at issues concerning industry trends of innovation adoption and diffusion (e.g. Webb & Pettigrew, 1999).

Therefore, the study of OI implementation is particularly suited for dynamic (West et al., 2006) and process research methodologies which pursue the “how” question (e.g. Huizingh, 2011; Pettigrew, 1990; Sminia & de Rond, 2012), bringing together the knowledge about contextual (internal and external) and process (evolution of actions). Qualitative and longitudinal methods are hence the most appropriate (Yin, 2009). Although such lines of enquiry are frequently followed by change management and strategy implementation scholars (Sminia & de Rond, 2012), this approach has not been systematically used in evaluating OI implementation.

We focus on the analysis of evidence drawn from published case studies of OI implementation in multinational corporations (MNCs), extracting a set of features which could be used to characterize OI implementation. For each we highlight some key gaps which need further work. We will then show how these characteristics could be used to pursue more developed process studies of OI implementation.

12.3 OI IMPLEMENTATION KEY CHARACTERISTICS

From the current OI literature and particularly from examples of implementation in large companies, we present a comprehensive set of characteristics that
can be used to describe OI implementation. These features are summarized at
two levels in the following sections:

- Macro characteristics: i.e. characteristics that indicate the high-level,
  firm-wide tendencies of firms’ OI approaches.
- Micro characteristics: i.e. internal characteristics of the process and internal
  dynamics of OI implementation.

12.3.1 OI Implementation Macro Characteristics

Four key dimensions characterize the macroscopic implementation of OI
whose variability is also illustrated:

- Process: Inbound—Coupled—Outbound
- Internal change stimulus: Top-down—Bottom-up
- Coordination: Decentralized—Centralized
- Approach to location: “Go to key places”—“Come to me”
- Networks: Types of partners

12.3.1.1 Processes

To date, research on OI has been based on differentiating between the inbound
and the outbound processes of OI, whilst many have pointed also at the existence
of coupled or reciprocal processes (Enkel et al., 2009). These three labels help researchers to categorize various OI activities (formal and informal) which companies set up. It has been generally acknowledged (e.g. Bianchi et al., 2011; Enkel et al., 2009; Mortara & Minshall, 2011) that inbound processes are favored, in particular by large companies, and researchers have attempted to measure the impact of these processes on performance. We cannot delve here into the description of each of the instances of inbound, outbound, or coupled processes. However, what is still lacking is a longitudinal analysis to determine when the specific instances of processes get modified or abandoned. From examples where open approaches did not prevent a company from failing we could infer the limitations of these open approaches. For example, Kodak adopted OI approaches when faced with the threats and opportunities of digital imaging. They focused primarily on inbound OI, firstly via strategic alliances (Grant, 2012), then moving towards the model of externalization of the exploration through intelligence operations (Mortara, Thomson, et al., 2010). Although the firm adopted OI activities to support the development of an ecosystem for easy sharing of images (Easyshare) (Grant, 2012) the changes in the technology moved faster than the capability of the firm to adapt to its environment and to develop a sufficiently robust
business model. The outcome of this was that the firm filed for a “Chapter 11” (which permits reorganization under the bankruptcy laws of the United States) in early 2012. The adoption of a strong outbound business model has been missing from Kodak’s portfolio until very recently, with the firm only now systematically out-licensing non-strategic IP. It could be argued that enabling outbound processes at an earlier stage might have helped the firm to leverage the broad IP portfolio and build more open business models. However, adopting coupled or outbound processes is not a recipe for success as an evolution of approaches could be seen in many firms. Nokia for instance showed a reverse approach to modifying its strategy in response to a change of technology. They followed an exploitation strategy whilst developing the first two generations of mobile telephony and moved to an exploration strategy for the third generation (Dittrich & Duysters, 2007). Nokia also planned to develop an ecosystem around open source technology (see Chapter 4 and West & Wood, 2013) to establish a new stronghold based on a coupled-outbound approach. However, as this model did not match the challenge and the Symbian technology lost the battle for dominancy, they recently decided to abandon the further development of their own ecosystem and instead developed a strategic partnership with Microsoft with the same aim. Some authors (e.g. Chesbrough, 2006a; Buganza et al., 2011; Ferrary, 2011) have attempted this line of enquiry providing some initial insight. Future work should continue to review in greater detail the underlying successes and limitations of each of these business models, linking more strongly the study of OI with that of strategy (Chesbrough, 2012b) and the improved understanding of firms renewal and resilience mechanisms (Hamel & Välikangas, 2003; Vanhaverbeke & Peeters, 2005).

12.3.1.2 Internal Change Stimulus and Coordination of OI Implementation

The OI adoption impetus can be viewed as coming from two opposite directions. In many firms top management are the stimuli for the implementation of open practices such as in P&G (Cloyd & Euchner, 2012) or LG (Ryu, 2011). As might be expected, these firms have adopted coordinated and centralized approaches to OI implementation often relying on teams of OI managers (Mortara & Minshall, 2011). We will discuss the role of individuals, teams, and top managers in the next section. However, it should be highlighted that it is not uncommon for the adoption of OI to originate from lower levels in the business hierarchy and then move upwards. The stimulus may come from middle management who seek to develop innovation procedures starting by experimenting with different practices in isolated pockets (Mortara & Minshall, 2011). When these managers realize the disaggregation of their activities, they may attempt to coordinate their efforts through communities of practices with
the ambition to demonstrate validity of OI and then get buy-in from the top. This is shown by the case of Roche (Nakagaki et al., 2012) which is currently relying on OI champions for the implementation and is seeking both coordination of OI implementation through an open innovation “Network of Practice” and a “eureka moment”—a demonstrator of the benefits of OI—prior to sharing the changes with top management. In this and other cases, open practices started to appear organically, distributed throughout the firm (i.e. decentralized OI). At a later stage, when the firm recognizes that OI could be used to explain the changes that have already happened, it may use OI as a language to frame and coordinate the various activities. For example, BT started many OI activities in the 1990s and early 2000s (e.g. it experimented with a corporate incubator activity known as “BT Brightstar” (Ford & Probert, 2010) for the commercialization of new discontinuous technologies internally developed. A coordination team for innovation was formed in 2006 with the name of Innovation Central that later became BT Innovate and Design. This function was set up “[...] to deliver strategic innovation and technology vision for BT through effective and coherent engagement with other parts of the business as well through powerful relationships with third party organisations—including some of the world’s most famous academic institutions.” The OI terminology started appearing soon after in presentations and articles (e.g. Bross, 2009).

Recent observations have indicated that some companies tend to move from decentralized activities to centrally coordinating OI approaches (Mortara & Minshall, 2011) but more data is required to evaluate if reverse cycles also exist. Tirpak et al. (2006) observed that there are on occasion centralization–decentralization cycles in R&D. What is not known is whether the centralization of coordination is always the successful approach in implementation (Linton, 2002) as some recent evidence shows that both structures have benefits (Hollenbeck et al., 2011). Linked to this is the need for an investigation of the R&D structures and how they change because of the advent of OI (Petroni et al., 2012).

12.3.1.3 Approach to Location

OI implementation could also be evaluated according to the infrastructure deployed and the choice of location for different OI activities. OI infrastructure can range from the “hard” (e.g. on-campus research labs and new venture incubators) to the “soft” (e.g. on-line platforms for innovation competitions and technology scouting activities) (Minshall et al., 2014). Some infrastructure is location-independent (e.g. use of innovation competitions or website portals to attract ideas) while some geographically embedded traits are fundamental for their functioning (e.g. development of open innovation campuses around corporate R&D labs). Some infrastructure requires substantial and long-term investment (e.g. establishment of embedded labs within universities) whereas others require more modest, short-term commitments (e.g. sponsoring student projects).
There are examples of OI infrastructure aimed at attracting partners to a specific location. We brand these the “come-to-me model.” Examples are the OI campuses developed on corporate R&D sites to foster an array of OI activities as well as to generate returns from high cost laboratory facilities. Among the most famous OI campus examples is that of the High Tech Campus at Eindhoven developed around the former Philips’ R&D infrastructure (Doppen, 2008; Tödtling et al., 2011; Torkkeli et al., 2009). Another example is that of Colworth Science Park, formally housing exclusively Unilever’s corporate R&D facilities that has now been developed and managed under a joint venture with a property development firm, Goodman. This joint venture enabled the raising of additional funding from a regional economic development agency that wanted to stimulate the economy in that part of the East of England and saw the development of OI infrastructure as an effective means to achieve that goal (Minshall et al., 2014).

The opposite approach to OI location is the “go-to-key places.” For instance, the location and OI organizational structure links are important for Italcementi. It created an office in Brindisi specifically to operate in a particular European Union region with priority access to public funding (Chiaroni et al., 2011). Also Nokia (along with many other technology intensive multinational corporations) decided to set up research centers worldwide in partnership with key institutions (mainly universities) to develop long-term future options. A categorization of OI infrastructure and analysis of the suitability of different approaches in specific contexts would seem to be a useful path for exploration. This analysis would need to draw together diverse literature ranging from, among others, regional innovation systems (Asheim & Gertler, 2005), the changing role of universities within national innovation systems (Etzkowitz, 2003), use of innovation competitions (Lampel et al., 2012), business incubation (Hackett & Dilts, 2004), technology intelligence (Kerr et al., 2006) and corporate venturing (Markham et al., 2005). Such work would also complement the issues discussed in Chapter 8, where the established literature on global R&D location is merged with OI literature to provide insight into the role of geography in OI implementation.

12.3.1.4 Networks

Collaboration with external partners is the core of OI implementation and it has been widely used as a measurement of OI since the publication of Laursen and Salter’s 2006 paper (Laursen & Salter, 2006; Schroll & Mild, 2012), mainly utilizing two indices: the breadth of partners (i.e. how many different types of partners) and the depth of interaction with partners (i.e. how strong is the collaboration with the partners). Some researchers have verified that openness towards customers, suppliers, and universities has a significant positive impact on the different innovation performance measures (Inauen & Schenker-Wicki,
2011). However, different and sometimes contrasting results appear in the literature relative to the merit of collaborating with each single partner type (see for example Bianchi et al., 2011). This may be because, even when the relationship is with only one type of partner, there is the potential for a variety of different types of relations to be established (e.g. with the whole university, one of its departments, or an individual academic) (Melese et al., 2009). For example, an increasing body of literature looks in particular into universities as partners. These are being encouraged to place greater emphasis on the commercialization of research results, but have variable levels of maturity with respect to commercialization activities (Philpott et al., 2011). Regulations regarding ownership of research results between firms and university partners vary with location and time (Rhoten & Powell, 2007). In particular, the Bayh-Dole Act (Kenney & Patton, 2009) has drastically modified the commercial position of US academia, and its indirect effects are also noticeable on universities in many other national innovation systems (Etzkowitz, 2003).

As for the analysis of the other OI implementation features, the understanding of the evolution of the partnerships over time requires further attention. Although network analysis has been advocated by scholars researching implementation theory (Linton, 2002) and can be pivotal in understanding how companies have evolved their OI strategy over time (Bianchi et al., 2011; Dittrich & Duysters, 2007; Vanhaverbeke & Cloodt, 2006; West et al., 2006), there is still a lack of understanding about how partners and networks impact on the process of adoption of OI in large firms and which ones best fit each context.

12.3.2 OI Implementation Micro Characteristics

The dynamics of implementation internal to the firm can be characterized by observing:

- Implementers: Top management, champions, and OI implementation teams, departments and functions.
- Divisibility: Incremental—“single stroke” implementation.
- Social interactions: Training, recruitment and retention processes and communication and PR implications of OI.

12.3.2.1 Implementers

Many scholars highlight that the role of top management is fundamental in the implementation of OI (Elmquist et al., 2009; Giannopoulou et al., 2010) but literature to date has not yet seriously approached this theme. The role of the leadership is advocated to create a sense of urgency and disruption (Buganza et al., 2011), and as the swaying element (Slowinski et al., 2009) for
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the establishment of OI. For instance, in P&G, A. G. Lafley’s leadership for OI was reported as being key. He put himself personally at the forefront of the OI adoption and publicly set the target for 50% of innovation to be achieved using external sources. His commitment and credibility were pivotal in P&G’s transformation to OI, according to Cloyd (2012). The leadership role is important also if OI is not directly the target. For instance, at BP, Lord Browne’s clear strategic interests in developing sustainability as part of corporate strategy and branding led in 2005 to the creation of an Alternative Energy business that used OI principles. This new business was set up to create an ecosystem of partners through investments in technology and firms operating alternative energy businesses, in particular biofuels and wind power. Similarly, the appointment of a new CEO, convinced of the importance of developing more sustainable vehicles, started the experiments with OI in a motorbike manufacturer, and in a cement manufacturer the CEO’s original commitment to the idea of applying photocatalytic elements to cement advanced their first OI project (Boscherini et al., 2010).

Therefore, even if the study of leadership’s responsibility in the implementation of change is prone to biases (Linton, 2002), several aspects related to OI and leadership should be investigated in more detail. There is for instance uncertainty on what particular characteristics of leaders could facilitate the implementation of OI. The entrance of top management with experience outside the industry or from firms with very different cultures could enable change because they “help […] to challenge existing routines and practices” (Di Minin et al., 2010). Managers from other backgrounds bring personal expertise from other domains and sometimes have been purposefully recruited, such as the IP manager at Italcementi who had previously worked in pharmaceuticals (Chiaroni et al., 2011). However, the long-term experience within a firm could facilitate the establishment of trust and the recognition of the authority in directing changes. For example, it was the head of R&D at FIAT, Gian Carlo Michellone, who had been with the firm many years, who successfully implemented a long-plan transformation towards open practices (Di Minin et al., 2010). This could be a particularly important factor for companies where the influence of the leader is potentially greater, such as SMEs and family-owned and family-run firms, situations that are more common in certain countries than in others (e.g. South Korea (Ahn & Minshall, 2012)). For this particular type of study, Upper Echelon Theory could provide helpful foundations (Hambrick & Mason, 1984).

Other influential figures in implementation are the managers who, at an operational level, design and lead the activities that drive OI implementation. Many firms who wanted to adopt OI soon after the publication of Chesbrough’s OI model in 2003 relied on OI implementation teams, often lead by senior R&D managers tasked with establishing new practices and changing the culture (Mortara & Minshall, 2011; Mortara, Slacik, et al., 2010). As the role of
OI in firms became gradually more strategic, OI functions and roles have been progressively formalized (the “Institutionalizing” phase of change (Lewin, 1947)). For instance Unilever started committing to OI in the mid-2000s and since then it has progressively acquired strategic importance that has been signalled by the appointment in 2008 of a Vice-President for OI. The experience of Unilever is not uncommon, as illustrated by the examples of OI Directors at Crown Packaging and Philips (Manceau et al., 2011). This analysis should be extended to consider a) the maintenance and further development of OI activities and b) the impact that taking on this OI championing role has on managers’ long-term careers.

12.3.2.2 Divisibility

Small-scale implementation activities for OI have been reported in the literature (Boscherini et al., 2010; Mortara & Minshall, 2011) and Chesbrough indicates that incremental approaches can be a successful recipe for implementing new open business models (Chesbrough, 2006a). In contrast, many firms across the FMCG domain such as P&G decided to plan for a big overhaul (e.g. Cloyd & Euchner, 2012). Perhaps it is still early to evaluate the relative success of these two strategies, but this remains a variable worth monitoring.

12.3.2.3 Social Interactions

There is a range of social dynamics linked to OI implementation. In particular, we would like to highlight two areas where we feel further work is needed: 1) the Human Resource (HR) management issues regarding the ways in which firms hire, progress, and integrate employees in the age of OI; and 2) the connections between communication/public relations (PR) and OI.

HR: There is evidence that firms adopting OI are changing the way in which they recruit new staff and the skills they are seeking. FIAT, for instance, changed the way it recruited personnel by including “entrepreneurial attitude” in the assessment of prospective staff (Di Minin et al., 2010). The changes brought in by OI relate also to the development and support of staff key capabilities. Petroni at al. argue that the Anglophone model of dual career ladder, with those with technical competence confined to R&D activities, does not provide the “T-men” required for OI (Chesbrough, 2012b). The required model, they argue, is instead that of an “open dual ladder” whereby firms promote mobility of R&D employees across the firm (Petroni et al., 2012). Several case studies also mention the need for stimulating entrepreneurial behavior in their R&D workforce (e.g. Cloyd & Euchner, 2012; Di Minin et al., 2010; Dodgson et al., 2006; Huston & Sakkab, 2006). Case studies have shown how firms pursued this aim using different means. For example Qualcomm encouraged and rewarded entrepreneurship through an internal Idea Competition, the “VentureFest”
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(dos Santos & Spann, 2011). FIAT organized a program called “researchers with the briefcase” not only to train researchers to become effective gatekeepers, but also to explain where the boundary between open versus closed should be drawn (Di Minin et al., 2010). Similarly, Unilever attempted to roll-out a training program to develop professional OI managers (Duff, 2011), where the practices and skills of OI are linked to the Want/Find/Get/Manage process outlined by Slowinski (2010). Philips instead chose to setup an incubator for spinning out internally developed ideas that did not immediately fit the strategic pipelines of the core businesses. Like Xerox (Chesbrough, 2002), they encouraged their workforce to create new businesses by transferring the required management skills to new opportunity areas (Ford et al., 2010).

Other aspects deserving further attention concern the management of innovation systems, the integration of internal and external knowledge (Wallin & Von Krogh, 2010) and the knowledge management procedures adopted to do so. There is some evidence that shows that there are different ways in which employees integrate with the main business unit (Broring & Herzog, 2008). However, there is not conclusive understanding of the effectiveness of these aspects.

PR: It is now becoming increasingly clear that the OI implementation and the firm’s image are linked. In particular, the aspect of corporate communication for building and maintaining reputation, once the domain of marketing strategy, is becoming more relevant for innovation activities in an OI context. However, with few exceptions (e.g. Pfeffermann, 2011a, 2011b), studies to date have not yet concentrated on communication and its impact on OI implementation. Four initial themes emerge from our exploratory research on this topic. Firstly, to succeed in OI, a firm is required to be perceived as a potentially attractive partner. This can be shown by the experience of scouts at Kodak: “[…] We knew that contacts would be doing their “due diligence” on us, both as KER (Kodak European Research), and us as individuals—we would be “Googled”! We wanted to make sure that they found accurate and “open” information that would help facilitate interaction” (Ruth Thomson, Innovations Leader for KER 2006-2009, cited in (Dang et al., 2011)). Communication can be seen as one of the competences that employees need to possess and which could impact on how they are recruited and promoted within an OI environment.

Secondly, given the open nature of OI, political and social pressures seem to influence the adoption of OI innovation practices. Several examples point towards the need of understanding whether and how communication and PR issues mediate in the adoption of OI. For instance, as a response to the environmental crisis in the Gulf of Mexico in 2010, BP’s management set up an open portal to collect suggestions and solutions to the emergency. The studies on idea competitions and crowdsourcing highlight how very few of the ideas submitted are sufficiently ready or feasible to be accepted (Alexy et al., 2012; Poetz & Schreier, 2012). However BP, already in the news spotlight,
was highly criticized and negative PR issues quickly emerged. In particular some contributors felt that their ideas were not given sufficient consideration. Similarly, in idea competitions, exposing the public to firms’ innovation processes could also lead to biased outputs (Mortara et al., 2013). Whilst firms in a closed innovation model do not have to give public account on how they select certain ideas rather than others, in these public contests ideas might be selected with criteria other than those of immediate self-interests. For example they need to aim to produce public goods or take into account what the public thinks (Lampel et al., 2012). An example is shown by the case of GE in its Ecomagination challenge, whereby GE invited comments on submissions from the public. The ideas which found favors with the public were not necessarily those which the firm would have acquired, but were nevertheless awarded prizes (Chesbrough, 2012a).

Thirdly, the impacts of adopting OI on the public image of the firm could also be included in the evaluation of the success and performance of OI practices. For example, idea competitions help to develop the public profile and branding of participating firms (Cornelissen et al., 2012). For example GE used this method to support the “Ecomagination” brand (Chesbrough, 2012a). Reputation building is mentioned by many firms as an additional success factor considered whilst planning for this type of activity (Mortara et al., 2013). For this purpose, idea competitions are often linked to a message of firms’ social responsibility, such as sustainability (e.g. Shell’s “Springboard” idea competition targeted at identifying low carbon business ideas from UK SMEs). Positive messages have the effect of facilitating the “obtaining” of innovation at the start of the inbound process (West & Bogers, 2013) by providing intrinsic motivations to contributors (West & Gallagher, 2006). On the other hand, this same factor could be a limitation for the implementation of these OI methods for firms in industries of potentially lesser public appeal such as defense (Mortara et al., 2013).

Fourthly, an as yet underexplored link between OI and PR is the use of OI as a term to represent the firms’ innovation activity. In some cases the term “open innovation” is not part of the language used by firms to communicate their innovation activities, whilst in others OI is used publicly as a defining image of the firm. For instance since the 1980s Rolls-Royce has developed a network of research centers integrated in universities (University Technology Centres or UTCs) which, starting from the UK, were gradually extended across the globe. These UTCs focus on many engineering domains and the relationship with the experts in the partner universities is clearly strategic for the firm. However, the term “open innovation” does not appear at all on their website. In contrast, Nokia has decided the opposite and has clearly used the label “Open Innovation” for its Nokia Research Centers worldwide: “Nokia Research Center is actively engaging in Open Innovation through selective and deep research collaborations with world-leading institutions. […]” So which strategy might be more
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effective? And more importantly what is the PR value of OI? Firms such as P&G used OI as a message to promote its path to renewed growth. Having become such strong symbols for OI, the success or failure of these single firms, independently from their specific choices in OI, might impact on the OI implementation phenomenon. This theme would seem to be one that merits further research.

12.3.3 Moderating Factors: Enablers and Barriers

A number of elements have been described as potential enablers and obstacles for the implementation of OI. The most widely acknowledged is culture, but to date this theme has not been explored in depth (Elmquist et al., 2009; Giannopoulou et al., 2010). Some qualitative studies have attempted to tackle this subject but the only quantitative study in this area is one that reviewed employees’ attitudes and cultural metrics in open and closed innovation at Evonik Industries’ Creavis (Herzog & Leker, 2010). Culture is seen most often as a barrier in the adoption of OI in large companies but has also been signaled as an enabling factor (Mortara & Minshall, 2011). Lichtenthaler and Ernst defined six different attitudes which could distort, act as barriers or overlay the importance of OI (Lichtenthaler & Ernst, 2006), of which the “Not-Invented-Here” (NIH) syndrome (Katz & Allen, 1982) is the most frequently cited. From the examples of Roche (Nakagaki et al., 2012) and the firms studied in Italy (Boscherini et al., 2010; Chiaroni et al., 2011) it emerges that “demonstrators” can be important enablers for the acceptance of OI, particularly to institutionalize the change. Westergen and Holmström use the case of LKAB (a traditionally very closed company at the start of the process of opening up) to show that the building of trust with external partners supported the implementation of the initial OI projects, and thus provided a demonstrator for further OI activities (Westergren & Holmström, 2012). Mortara et al. (2010) found that to support the establishment of an OI culture, the OI champions supported different groups in R&D, providing specific types of motivators in accordance with the underlying subculture. Particular emphasis was placed on the delivery of skills and the creation of boundary spanning objects. Control mechanisms such as incentives were found to have a positive impact on external (outbound) (Persson, 2006) and internal (Minbaeva, 2005) knowledge transfer and on the search performance (Salge et al., 2012).

Whilst the company’s OI culture is clearly important, national (Savitskaya et al., 2010; Chesbrough & Crowther, 2006) and regional (Tödtling et al., 2011) culture may also impact on OI implementation. Culture is a subject as yet understudied in the context of OI. This theme could be particularly suited for more qualitative analysis, for instance by adopting a close analysis of the “social dramas” that may be a feature of the adoption of OI.
Other internal firm characteristics, primarily concerning the presence of internal R&D capacity (e.g. Berchicci, 2013; Cassiman & Veugelers, 2006) and that of a set of OI capabilities (Lichtenthaler & Lichtenthaler, 2009) such as absorptive capacity (Bogers & Lhuillery, 2011) have been suggested as enablers or barriers. Certain management practices have been observed to support the implementation of OI (Salge et al., 2012). For example, in Creavis, three types of projects enable the firm to access and integrate external knowledge (Broring & Herzog, 2008). The experience of P&G (Dodgson et al., 2006) and Italcementi (Chiaroni et al., 2011) shows also that IT systems can support the shift towards OI. IT infrastructure is seen as an enabler of communication across boundaries (Boscherini et al., 2010) and as an element of control (Kuschel et al., 2011). Management tools (Griffiths et al., 1998), taxonomies (Di Minin et al., 2010), or “watch lists” (Mortara, Thomson et al., 2010; Tao & Magnotta, 2006) can also be used to find the balance between what to do openly or internally. The impact of the adoption of “virtual” platforms for carrying out specific innovation activities such as the interaction with users has also been explored (Bughin et al., 2008). In addition, as a change of strategy is often linked to leadership, the political climate and the internal dynamics of power need to be viewed as mediators in the adoption of OI (Pye & Pettigrew, 2006).

12.4 THE OI IMPLEMENTATION FRAMEWORK

The external environments in which organizations are embedded provide the context and the underpinning drivers for these transformations. The literature reveals that turbulence is associated with the implementation of OI (Schroll & Mild, 2012; Schweitzer et al., 2011). Technology characteristics (e.g. its uncertainty, appropriability and clockspeed (Buganza et al., 2011)), and industrial systems of innovation and ecosystems dynamics (Christensen et al., 2005) provide the background factors influencing the opening of innovation processes. The dynamics of the transition from closed to open, documented via case studies (Buganza et al., 2011), has also been confirmed quantitatively in a sample of Dutch firms, indicating that the timing of the shifts from closed to open differs from industry to industry (Poot et al., 2009) and that the discontinuities in OI adoption may be particularly linked with crises (e.g. FIAT (Di Minin et al., 2010), ENI (Pellegrini et al., 2012) and related changes of management (Mortara & Minshall, 2011)). Other exogenous contextual factors such as proximity have a less clear implication for OI adoption (Schroll & Mild, 2012). Schroll and Mild’s conclude that OI adoption is certainly on the rise but that more data is required to understand its determinants (Schroll & Mild, 2012).
We feel that OI implementation should hence be evaluated contingently to understand OI implementation traits in relation to external determinants. The next problem is that of judging the “successful” implementation. According to prior research (Linton, 2002) there are four different levels to assess implementation, not only related to economic performance:

- Implementation, Integration, and Institutionalization: Has the innovation changed how work is performed? Has the change been institutionalized (become a routine) or has it been abandoned before routinization? This is the approach of works such as Charoni et al. (2011).
- Human Partnership Dynamics: Does the innovation change the nature of the organization’s structure or employee interaction with work?
- Economic Performance: How does the innovation perform in quantifiable economic terms? (this is the favorite approach of quantitative studies).
- Operational Effectiveness: Does the innovation improve the operation in a manner which cannot be easily quantified?

Other methods of evaluation of what constitutes “success,” such as goal attainment or management satisfaction, are more value-laden and can be more difficult to use (Linton, 2002).

Figure 12.1 attempts to bring all the elements related to OI implementation described above into a coherent framework which can be used to evaluate the patterns of implementation of OI in large firms, linking external contextual to internal characteristics of the implementation and monitoring their evolution. We believe this analysis could bring increased understanding of OI and its potential, and better explain why companies in similar circumstances (i.e.

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**Figure 12.1 An open innovation implementation framework**
Letizia Mortara and Tim Minshall

facing similar turbulence) have adopted OI in different ways with variable rates of success (e.g. Cisco & Lucent, (Ferrary, 2011)).

12.5 CONCLUSIONS

This chapter reviewed the current knowledge on how companies, specifically large multinationals, implement OI, drawing upon—and highlighting the benefits of—longitudinal case studies to shed light on this complex multi-dimensional issue.

Firstly, as a result of the 2003 discontinuity in the adoption of OI, we have emphasized that the study of OI implementation needs to use different theoretical bases. Evolution theory provides a strong foundation, already used to analyze OI emergence. However, the high visibility of OI in recent years means that some firms may view openness as an end in itself (i.e. the 2003a Chesbrough OI model has been a disruption in the implementation trend) rather than a mechanism by which firms respond to some other internal or external disruption. The patterns of OI implementation evolution hence do need a broader theoretical basis which includes Teleology, Upper Echelon, Bounded Rationality and the understanding of “bandwagon” effects in the adoption of innovations. We feel that a process research approach is the best suited to study OI implementation in that it is capable of linking context to content and action. The nature of the discontinuities that firms are facing needs to be taken into account when analyzing OI implementation, pointing to a rich area of potential research that makes this connection much more explicit, and delivers insight at a finer level of granularity, bringing OI research more strongly linked with strategy research. Longitudinal analyses of databases and the use of ethnographic studies are most suited for this purpose.

Hence, from an analysis of the current state of the art in OI implementation research we proposed a framework which not only aids by expanding on the theory of implementation (Linton, 2002), but also comprises the elements needed for a process analysis. In particular it lists the key implementation traits in firms along which OI implementation should be characterized over time. These are divided into: (1) Macro-characteristics illustrating high-level traits of OI implementation and (2) Micro-characteristics which concentrate on internal factors and social dynamics in OI implementation. In addition the framework lists moderating factors (enablers and barriers) and suggests a method of evaluation for OI implementation successes and failures.

The template in Table 12.1 summarizes all the dimensions in the framework and the key specific areas for future research we have highlighted along the way. This schema could also be used to capture the evolution of approaches for each individual firm.
Table 12.1 Key areas for future research.
This template summarizes the key OI implementation features in MNCs (in the gray boxes). The template provides also the chance to recapitulate the key areas for future research in OI implementation discussed in the chapter (in the white boxes).

<table>
<thead>
<tr>
<th>External Contingencies</th>
<th>Time-- &gt;</th>
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<tbody>
<tr>
<td></td>
<td>Pre 2003</td>
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<tr>
<td>External Market</td>
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<tr>
<td>External Industry</td>
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<tr>
<td>Technology</td>
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<tr>
<td>Uncertainty Appropriability Clockspeed</td>
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<tr>
<td>OI Implementation traits</td>
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<tr>
<td>Macro Processes</td>
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<tr>
<td>Inbound OI Implementation stimuli</td>
<td>Top-down</td>
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<tr>
<td>Coordination</td>
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<td>Centralised</td>
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<tr>
<td>Approach to location</td>
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<tr>
<td>Come-to-me</td>
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<td>Go-to-key places</td>
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<td>Networks</td>
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<td>Depth</td>
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<td>Breadth</td>
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</table>

How did the Macro OI implementation features change over time?
How did they match the external contingencies?
Which configuration of OI implementation is more successful in what circumstances?

(continued)
<table>
<thead>
<tr>
<th>OI Implementation traits</th>
<th>Micro</th>
<th>Enablers and barriers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementers</td>
<td></td>
<td>Culture</td>
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<td></td>
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<td>Politics</td>
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<td>Internal R&amp;D</td>
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<td></td>
<td>Innovation and Knowledge management tools and procedures</td>
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<td>Leadership</td>
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<td>OI Managers-Teams</td>
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<td>Champions</td>
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<td>Functions</td>
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<td>Single-stroke</td>
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<td>Incremental</td>
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<td>HR</td>
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<td>PR</td>
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<tr>
<td>Is culture a barrier or an enabler of OI implementation?</td>
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<tr>
<td>What are the detailed consequences of OI implementation on firms’ culture?</td>
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<td>How is OI influenced by political tensions?</td>
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<tr>
<td>To what extent do internal R&amp;D capabilities facilitate or hinder the adoption of OI?</td>
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<tr>
<td>How/which management practices help or hinder the implementation of OI?</td>
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<tr>
<td>What characteristics of leadership facilitates the implementation and the maintenance of OI practices?</td>
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<tr>
<td>How are the OI champions continuing their career, after OI has been adopted?</td>
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<tr>
<td>How do individual functions interpret and implement OI?</td>
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<tr>
<td>What is the impact of OI implementation strategy on success outcomes?</td>
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<tr>
<td>How are the HR practices changing because of the implementation of OI?</td>
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<tr>
<td>What is the role of OI for PR (and vice versa)?</td>
<td></td>
<td></td>
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</tbody>
</table>
NOTES

1. http://www.whitehouse.gov/open/toolkit
5. See, for example, http://www.guadian.co.uk/environment/2011/jul/12/bp-deepwater-horizon-oil-spill-crowdsourcing
   http://blog.crowdspring.com/2010/06/crowdsourcing-bp-oil-spill-innocentive/