



A corporate system for continuous innovation: the case of Google Inc.

A system for continuous innovation

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Abstract

Purpose – History is full of companies that were once innovative leaders but lost their innovative ability. The purpose of this paper is to explore, from a firm-level perspective, organizational characteristics for continuous innovation in rapidly changing industries.

Design/methodology/approach – Findings from 28 interviews at Google Inc., are compared to previous research on organizational characteristics for continuous innovation.

Findings – Google's organization can be viewed as a dynamic and open corporate system for continuous innovation, involving the entire organization and supported by an innovation-oriented and change-prone top management and board. The relative importance of eight organizational characteristics in this corporate system is elaborated upon.

Research limitations/implications – There is a need for empirical research contributing to the development of a more comprehensive analytical framework for continuous innovation, including the role of culture and selection/facilitation of self-organizing individuals in innovation processes; and to study how to organize for both continuous innovation and continuous improvements.

Practical implications – The importance of factors such as culture and the selection of individuals, identified in the empirical study, needs to be considered by managers, and might influence their understanding of how to sustain continuous innovation over time.

Originality/value – This paper provides, from a firm-level perspective and based on a unique access to empirical data, increased understanding of organizational characteristics conducive to continuous innovation in rapidly changing industries, and highlights the importance of characteristics that received less emphasis in previous research literature.

Keywords Innovation management, Corporate innovation system, Organizational design, Organizational culture, Human resource management, Dynamic capability, Open innovation, Google

Paper type Research paper

Introduction

Continuous innovation, the ability to renew the organization and to develop new products and business models, is a central issue for most companies. However, it has proved extremely difficult to accomplish in practice. History is full of companies that were once seen as innovative but then lost their innovative ability, and many of these companies eventually even ceased to exist (Christensen, 1997). Since the early 1990s, a number of researchers have investigated different aspects of how companies could organize for continuous innovation in rapidly changing industries. Yet despite agreement on several organizational characteristics, there are still variations in the conclusions of existing research. In addition, these characteristics are frequently studied and discussed in isolation rather than included in a firm-level framework. Hence, there is a need for further empirical scrutiny.

The purpose of this paper is to explore, from a firm-level perspective, organizational characteristics for continuous innovation in rapidly changing industries. The paper is based on an empirical study of Google supplemented by literature reviews on



organizational characteristics for continuous innovation. Google was selected for the empirical study since it is active in a fast-changing environment and is continually innovating[1]. Based on a systematic empirical research study, this paper provides an analysis based on a unique access to leaders from various functional areas, directly involved in innovation processes at Google.

The paper is organized in the following way. First, we will present the method chosen for the study. Second, we introduce a selection of research studies on continuous innovation, including some empirically based studies from rapidly changing industries, and two single-case-based studies from mature industries, as a contrast (however, a more detailed account of these studies will be provided later, in "Discussion"). Third, we present the organizational characteristics behind Google's innovativeness based on our empirical study. Fourth, Google's organizational characteristics will be compared and discussed in the light of the research findings on organizational characteristics for continuous innovation in rapidly changing industries. Finally, conclusions and suggestions for future research will be presented.

Methodology

This qualitative study is based on an in-depth empirical study of Google, using an "abductive" methodological approach (Dubois and Gadde, 2002). The research team therefore started by conducting a literature review and developed a first skeleton for a theoretical framework, which was used for developing focus areas and interview questions. Analyses of empirical findings then contributed to a successive development of the original framework during the research process. The framework was also developed by new literature reviews, triggered by empirical findings. This iterative research process is described in more detail below.

The first literature review targeted studies on "innovation management," "innovation capability," "literature review on innovation," "sustaining innovativeness," and "sustaining innovation." The aim was to identify research literature that had focussed on firms' innovativeness and on organizational characteristics for continuous innovation and/or long-term competitiveness. As a result, the literature review was not conducted within a specific discipline but more guided by the "research topic." This review provided input for designing the interview guides for our empirical study. Secondary data on Google was used if Google itself had distributed it, e.g. YouTube clips, press releases, and the IPO letter. Previous research articles or books about Google, such as Iyer and Davenport (2008), Girard (2009), and Auletta (2009), were not included in the first collection of secondary data, as the intention was to research the company from the perspective of its employees (Buchanan and Bryman, 2007, p. 486) and not through the interpretations of other researchers or consultants.

By interviewing a critical number of interviewees – each with his/her unique experience, expectation, and position in the firm, and contributing with slightly different information – the researchers can create an interpretation of the interviewees' collective view of the firm's social world (Bryman and Bell, 2011, p. 402). The study included face-to-face interviews with 28 Google employees, collected over an eight-month period in 2010. The interviewees were selected through a three-step process: the research team created a list on requested "interviewee characteristics" (geographical region, function, position, product, and gender; experience of established/new products; successes/failures; tenure and interest in innovation). Then, the Google sponsor for the research project identified employees who matched the requested characteristics and created a list of potential candidates.

Finally, the research team selected the final sample of interviewees based on this list. The majority of the interviewees (80 percent) were physically located in Mountain View (HQ), and the others at other locations in Asia, Europe, or the USA. Most of the 28 interviewees were at a director level (accounts for fewer than 5 percent of the employees) but the sample also included two non-managers and two vice presidents. Seven interviewees were women (25 percent). The interviewees represented most functions such as: engineering, product management, marketing, corporate communication, sales, people operations, and finance. Product areas included were: search, geo, mobile, chrome, social networking, adwords and adsense, and external developers.

The interview guides were semi-structured with open-ended questions. Each interview lasted approximately one hour and was digitally recorded and later transcribed. At the end of each interview, the interviewees were asked to rank and then describe seven pre-defined organizational elements (characteristics areas) according to their relative importance for Google's innovativeness. The interviewees were also given the opportunity to add new factors to the list, although none of the interviewees chose to do so.

After the interviews had been transcribed, the two researchers who had jointly conducted interviews had coded independently and then transferred to post-its, which were then used to build sub-categories through an affinity technique. The two researchers conducted this grouping process jointly (cf. open and axial coding; Strauss and Corbin, 1998). These sub-categories served as a basis for writing the Google case study, which was organized around the theoretically identified elements that influence innovativeness. However, in the empirical analysis one of the pre-defined elements (leadership) was divided into two ("top management and board" and "facilitating leadership").

These empirical findings guided a second literature review, which focussed on research studies that from a firm-level perspective investigated organizational characteristics for continuous innovation in rapidly changing industries. Research studies on "capability for constant renewal" of an organization, "dynamic capabilities" and "ambidextrous organizations" are here viewed as corresponding to the concept "continuous innovation." The findings from Google were then discussed, based on the research studies identified.

Previous research on continuous innovation

Researchers have examined innovation and innovativeness from various perspectives and disciplines. This has caused the literature on innovation to be fragmented (Fagerberg, 2005) and "[...] our academic understanding of the phenomenon is not complete" (O'Connor *et al.*, 2008, p. 179). In our study, "innovativeness" or rather the ability to continuously innovate is a central concept. Innovativeness includes being successful on the market in launching new products and business models, but it does not necessarily mean that a company needs to be successful in all market launches. Continual success or "no failures" could as well indicate risk aversion, and consequently be an indicator of a less innovative firm. Also an ability to learn from mistakes, or to close failed attempts relatively early on, could be a sign of innovativeness. Innovativeness includes organizational innovations, which also can be directly influencing product innovativeness.

In literature, there are different definitions of "continuous innovation." Sometimes the dichotomy but also the interrelationship between continuous vs discontinuous

innovations is being emphasized, where a discontinuous innovation leads to turbulence converging into a “dominant design,” which in turn is followed by incremental continuous innovation (Utterback, 1994; Tushman and O’Reilly, 1997). However, Cole (2002, p. 1056) describes “continuous innovation” as a “probe-and-learn” process, i.e. “an experimental iterative process that operates successively to solve problems in markets characterized by turbulence, uncertainty and complex interactions” that is “well suited to fostering discontinuity and innovation.” Boer and Gertsen (2003) suggest that “continuous innovation” could be conceptualized as consisting of three core elements: continuous improvement, learning and innovation, “implying an effective, ongoing interaction between incremental improvement and learning, and more radical innovation and change” (Pasche and Magnusson, 2011, p. 257).

The connotation of “continuous innovation” in our study includes all types of innovation, i.e. both innovations based on ideas that break earlier patterns and ideas that build on previous products/technologies/business models. We also find it less relevant to distinguish between radical and incremental, as innovation typically is a combination of both radical innovation and incremental improvement. Another central concept in our study is “organizational characteristics,” which is used to include a broad range of factors influencing innovativeness, for example values, organization structure, capabilities, leadership, and incentive system.

During recent decades a number of researchers, from a firm-level perspective, have sought to identify organizational characteristics for continuous innovation. However, even though these studies have used a firm-level perspective (rather than a process, team, or individual perspective), the studies have aimed to answer different questions. For example, a number of studies have focussed on capabilities required in order to remain competitive in rapidly changing industries (Leonard-Barton, 1992; Teece *et al.*, 1997; Teece, 2007; Eisenhardt and Martin, 2000; Zollo and Winter, 2002; Wang and Ahmed, 2007). Others have studied what it takes to simultaneously manage exploration and exploitation (Tushman and O’Reilly, 1997; Tushman *et al.*, 2010). Some studies have explored how to capitalize on internal and external technologies (Chesbrough, 2003). Others have explored characteristics needed for continual renewal and innovation (Brown and Eisenhardt, 1997, 1998), and yet others have explored factors for sustaining corporate success (Matzler *et al.*, 2010) or how managers can affect innovation success (Lawson and Samson, 2010). Only a few studies have expressed ambitions to describe or create comprehensive organizational models for continuous innovation (Tidd *et al.*, 1997[2]; O’Connor, 2008; Garud *et al.*, 2011).

While most of the above research studies primarily focussed on the organizational characteristics for continuous innovation in fast-moving industries, Kalling (2007) used a different approach. He instead looked into the obstacles (organizational and institutional factors) to continuous innovation in a mature and more slow-moving industry. However, several of the characteristics identified are identical (to the fast moving), although in Kalling’s one-company case study those characteristics that would have been conducive to innovation were missing. Similarly, Danneels (2010) used the case of Smith Corona failing to renew itself, in order to empirically contribute to dynamic capability theory[3]. By observing the managers’ lack of understanding of their perceived key resources, he concluded that “resource cognition” would be an important addition to the theory.

Could learning from Google increase our understanding of what organizational characteristics are important for continuous innovation in fast-changing

environments? The next section will present the case of Google from a firm-level perspective.

The case of Google

Google is known for continuously creating new products and entering new business areas. Below, the organization behind Google's innovativeness will be described according to how the employees ranked seven organizational elements by their perceived influence on Google's innovativeness (1 = highest rank) (Figure 1).

Each element will now be presented below. The description is based entirely on interview data. Organization, performance and incentive system, and organizational learning are presented in the sub-section "Internal infrastructure." Unless otherwise stated, all quotations are from interviewees.

Innovation-oriented culture (Rank: 1)

Culture – which the research team defined as shared beliefs, values, norms, and priorities – was a factor that almost everyone interviewed considered crucial for Google's innovativeness. "The culture is a very important factor. Shared beliefs such as 'do no evil,' 'large impact', and 'we can change the world' [...]." Google's founders were behind and fostered the company's culture. From the start, they had a clear vision to change the world and a clear mission to organize the world's information and make it universally accessible and useful. However, the founders also wanted to create the best company to work for. In 2001, Google documented its core values, and in 2005 the founders appointed a Chief Cultural Officer (CCO) in order to sustain the culture over time. Today, there are culture teams all over the world supporting the CCO to develop and sustain the company culture. Google allows subcultures as long as the core values remain intact. This allows each country, function, or group to self-organize in a certain degree and figure out what works best for it. The essence of the culture is captured in the term "Googley," which indicates that an individual is behaving and acting according to the company's values. The employees used this term as a daily evaluation and "correction tool." The term "Googley" was also used in the hiring process and in the performance and evaluation system. Google's values, as found in our interviews, are categorized according to four dimensions in Figure 2.

The selection of individuals (Rank: 1)

According to most of the interviewees, one of Google's biggest advantages is the strength of its people. The individual, described in terms of commitment, depth, and diversity in competences, expectations, and emotions, was viewed by most interviewees as a key element behind Google's innovativeness. "The kind of people you

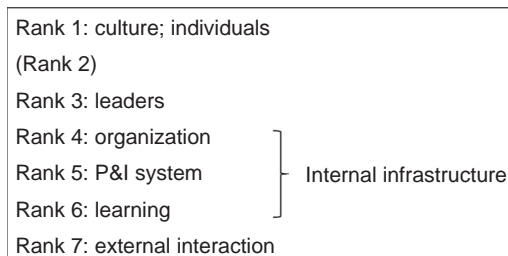
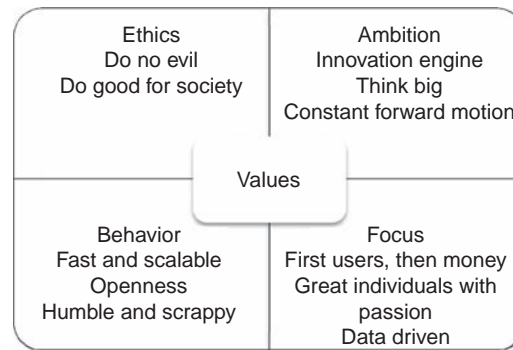


Figure 1.
Seven organizational
elements' perceived
influence on Google's
innovativeness

Figure 2.
Google's key values



Source: Interview data

recruit matters for innovation.” In order to support these highly talented individuals, Google had a human resource department (people operations) that developed programs to grow and sustain talent in the organization. Google had created special processes for hiring, socializing, and following up the satisfaction of its employees.

Almost all of the interviewees viewed the selection of employees as a crucial factor in Google's innovativeness. The hiring process filtered out the wrong people from the right ones by asking questions in four pre-defined areas: cognitive ability, role-related knowledge, leadership, and “Googliness” (the ability to be Googley). Googliness was a test of the cultural fit between the individual and the company. The interviewers from Google created a “hiring package” for the candidate, which later was sent to a hiring committee, i.e. not to a single hiring manager. The candidates who advanced in the internal hiring committee were ultimately reviewed by a sub-set of the operating committee. According to interviewees, Larry Page (founder and present CEO) remains involved and reviews a condensed version of all packages.

After being hired, the next step was the socialization process. The candidates had already been exposed to the Google culture in the hiring process, but were now more formally exposed to the culture by attending “Noogler” orientation days. People operations and the manager helped the new employee to quickly build an internal network, which according to many interviewees was crucial for succeeding in Google. After this first socialization, Google left the mandate to each group to socialize their own people.

Finally, in order to listen to the employees, Google used an annual survey called “Googlegeist.” The Googlegeist included a number of different areas, whereof innovation was one. Innovation was measured as the perception of being innovative. The perception was tracked between locations, functions, departments, and years. Each manager then received the result in a tailored report called “Mygeist,” which showed direct and indirect reports’ perception on how good the company was in the different selected areas. The Googlegeist is increasingly used as a business management tool at Google.

Leaders as facilitators (Rank: 3)

The research team defined leadership as leadership style, values, and behavior, as well as roles such as setting vision, goals, assigning tasks, providing resources, securing knowledge transfer, and rewarding and monitoring. Leadership was considered important for explaining Google's innovativeness, but the expressed focus

on the culture and the individual led to an interesting divide in how interviewees viewed the importance of leaders. Some saw the company as mainly self-organized and emphasized the culture and the creative individuals, while others considered leadership to be very important for creating an environment in which creative individuals can excel.

However, despite the difference in perceptions of leaders' relative importance for innovativeness, there was more agreement regarding the characteristics of good leaders. Leaders at Google were to act as cultural ambassadors and as connectors, meaning they should quickly absorb and diffuse information from other parts of the organization to their team, and serve as facilitators in the innovation process. Leaders should empower their employees, trust and support them in new projects, and minimize obstacles to innovation. Finally, leaders should set the vision and direction for their teams and make the teams' role clear in the organization.

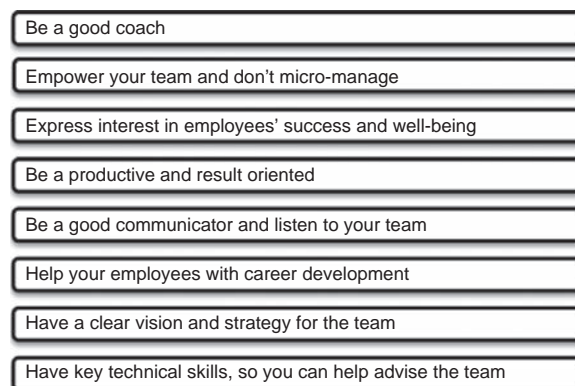
There was a belief among the interviewees that being a good leader at Google requires being born with a set of values that reflect the company's corporate values. Leaders were also thought to develop naturally in an environment of good role models. For this reason, people operations provided support for leadership development and conducted research into what kind of leadership behavior influenced good team performance. People operations identified eight habits of a leader that affect teams' performance; these are visualized in order of perceived importance in Figure 3.

Once a year, every leader at Google is evaluated against these eight habits. Leaders also received direct feedback from their direct reports in regular performance evaluation meetings. In addition, senior directors and above could receive feedback in a special coaching program. Moreover, a Great Management Award had been established where a bottom-up process was used to nominate the candidates.

Internal infrastructure

Under this heading there are three different areas: organization, performance and incentive system (P&I system), and organizational learning.

Organization (Rank: 4). Organization, which the research team defined as organizational policies, structure, and processes, was not considered one of the top three factors explaining Google's. However, it influenced innovation positively due to a



Source: People Operations (2010)

Figure 3.
Google's eight habits of
great managers

lack of policies, structure, and processes. “Very open and flat organizational structure [...] very thin layer of management and extremely productive workforce.” “Things are reasonably unstructured, which allows people to get their ideas out [...]” Google has tried to keep the mindset of a small company by actively and consciously avoiding bureaucracy and keeping the organization flat. For example, the company used “the rule of 7,” which means at least seven direct reports to each manager, small development teams running semi-independently, and a CFO-led yearly initiative called “bureaucracy busters,” which was intended to limit unnecessary bureaucracy. Google has sought to find the optimum between structure and chaos (a semi-structured organization), as the belief was that innovations need a certain degree of flexibility and freedom in order to flourish. Instead, heuristic rules played an important role in supplementing a minimum number of organizational processes. However, this semi-structured organization demands the recruitment of a certain kind of individuals: “I think, for people coming into Google, the skill I found helpful was to be a self starter, very quickly understand that Google is a place that isn’t very structured, take full advantage of that to express your ideas, generate your own initiatives, and being productive in a way which helps the team.”

The interviews did not reveal that Google used any separate department for new innovative initiatives. Instead, it was frequently commented that: “you can’t institutionalize innovation.” The common view was that it was not possible to appoint a formal manager responsible for innovation, or to formalize the innovation process, including formal measurements. Ideas were believed to come from anyone and everywhere in the organization, and the innovation process was primarily a bottom-up process. However, in parallel with ideas coming from the bottom up, clear goals, and priorities came from the top down.

P&I system (Rank: 5). The P&I system, consisting of key performance indicators, a process of evaluation, and material vs non-material incentives, was not seen as one of the top factors explaining Google’s innovativeness, but it played an indirect positive role in recognizing and rewarding creative people. Google used a combination of soft and hard data systems. The soft system included Google’s mission, which acted as a mantra and long-term focus for the firm. Furthermore, company values affected the direction of the employees. Google also used a number of heuristic rules that efficiently directed everyday work. One example was the “70-20-10 percent rule”: “You never get enough time at Google – we focus 70% on big core, 20% on areas close to core and 10% on very different things.” The formal processes were, e.g. the objective and key result (OKR) process for clarifying company priorities and setting goals. The processes for performance evaluation and promotion were interlinked with the OKR process. Twice a year, each employee was reviewed and potentially promoted. Criteria were a certain tenure, exceeding expectations three-quarters in a row, and a positive 360° review (270° if not a manager).

The extrinsic incentives for innovation were primarily of two types, explicit awards and spot bonuses. However, the intrinsic motivation from the work itself was considered more important for innovation, e.g. in terms of interacting with talented colleagues, technical difficulty in assignments, and the possibility to develop world-leading solutions. Also the opportunities of realizing one’s own ideas were a strong motivator, e.g. through a system of 20 percent own time. One interviewee compared Google in 2010 with NASA during 1962-1968.

Organizational learning (Rank: 6). The element “organizational learning,” defined as “systems for learning from successes and failures,” was not viewed as a key factor

explaining Google's innovativeness. The reason was that many interviewees viewed learning as more important for improvements of current products and processes than for new innovations. "Organizational learning is what we do at Google; we just learn and we improve, that's the core of what we do. I wouldn't put it first, because it has less to do with innovation, more to do with improving our products – but it does have an effect on innovation as well." Another reason mentioned was that Google did not have many company-wide formal systems for organizational learning. One identified system was a "post-mortem approach" to reflect upon and evaluate projects, although different parts of the organization practiced it in different ways. Instead, the interviewees emphasized the importance of building an internal network, being open and sharing as much as possible, because learning was believed to take place in peer-to-peer networks. Google did not have a general cross-functional learning system, but used virtual cross-functional or cross-product teams that met every week in order to share and exchange knowledge. An exception from the general rule was engineering, which had a number of more "formal" learning processes: "Google labs," the "Fish Food Program" (for testing a new product or feature on team members), the "Dog Food Program" (testing a new product or feature on employees), the "Beta Process" (testing the new product or feature on customers), and different procedures for quickly testing new products or features. The aim here was to have a rapid innovation cycle by launching new concepts quickly and then seeing what worked and what did not before improving and iterating again.

External interaction (Rank: 7). External interaction (defined as interaction with customers, suppliers, academia, and personal external networks) was ranked least important by our interviewees for explaining Google's innovativeness. The impression of introversion was fuelled by statements such as: "We don't care what others do," "We never talk about competitors," "The risk of listening to customers too much is that you only make incremental innovations," or "If you hear Steve Ballmer at Microsoft, he is obsessed with his competitors. At Google we are like allergic to that." However, many interviewees did think this factor would increase in importance in the future. Moreover, after interviewing one unit in the organization that focussed explicitly on the external environment, the first impression of introversion changed. "Our executive team is very plugged into networks and our board members are certainly external useful sources." "The acquisition group's goal is to find key companies with strong engineering power and succeeding where we are not." It was clear that Google was following an "open innovation" strategy. It became evident that the company had an aggressive acquisition strategy and that acquisitions had played an important role in Google's innovativeness over the last decade. It was also found that Google cooperated with leading researchers at universities and had its own venture capital business and spin-off process. Google's core business in the form of search and adwords/adsense was mainly based on internal innovations, while several of the new business areas have primarily depended on externally generated innovations. It emerged that Google's future growth will continue to depend on both internally and externally generated innovations.

In addition, Google seemed influenced by local norms in Silicon Valley. A number of common beliefs in the Valley were similar to those at Google; hence the Valley seems to have had a cultural influence on the company. According to Saxenian (2010) (*Interview*), "the region has been an important environment for Google as it provided the founders with leading research, an understanding of the value of a search engine, money, and a labor pool of very smart and experienced people." Moreover, it seems that

the Valley has contributed specific norms of how to organize (e.g. network-based organization) and how to think and behave (e.g. share, be open, think big).

Discussion

The empirical findings from Google will now be discussed and visualized in a model. Further, the empirical findings will be compared with findings in selected research studies on continuous innovation in rapidly changing industries.

Google’s organization for continuous innovation can be viewed as a dynamic and open corporate system for innovation, involving the entire organization, and supported by an innovation-oriented top management and board. The system is visualized in Figure 4, as consisting of five main building blocks: key drivers, facilitators, hygiene factors, external interaction, and the foundation. Each block includes organizational characteristics important for Google’s continuous innovation.

The first six organizational characteristics (an innovation-oriented and change-prone culture; competent and committed individuals with a passion to innovate; leaders that empower, coach, and remove obstacles to innovation; a semi-structured and ambidextrous organization; an innovation-oriented P&I system; and continuous learning) played different roles such as drivers, facilitators, and more or less necessary “hygiene factors.” The seventh organizational characteristic is the long-term commitment of the innovation-oriented and change-prone top management and board that was the foundation upon which Google has built its corporate system for continuous innovation. The eighth characteristic is that the corporate system was open enough to embrace good ideas and innovations from everywhere.

In the next section, each block will be discussed and compared with previous research on continuous innovation in rapidly changing industries.

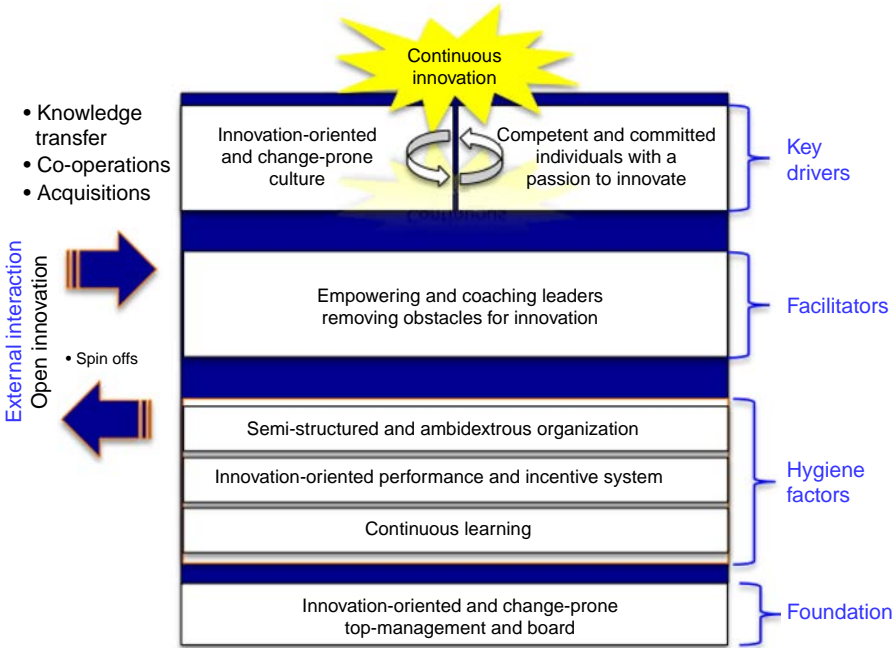


Figure 4.
Google’s corporate system
for continuous innovation

Key drivers of innovation

This building block consists of two organizational characteristics: a culture that is focussed on innovation, and individuals who are competent, committed, and eager to innovate. The strongly innovation-oriented culture, together with creative and smart individuals who have a passion to change the world and to innovate, generated a strong drive towards continuous innovation. This drive was further increased by a strong peer effect among individuals at Google. As the culture also emphasized constant renewal, the individuals were constantly prepared for change. This need for constant renewal was based on top management's mindset and then realized through the change-prone culture, which in turn affected, e.g., the organizational structure, management processes, and employees' expectations. The importance of culture and individuals meant that human resources had a very active role in creating/hiring and sustaining the right culture and talents.

Comparison with research literature. While culture is mentioned in most innovation studies reviewed, culture has not received the same position in these studies, except for Tushman and O'Reilly (1997, p. 220) who provide tools for analyzing and approaches for shaping innovation cultures, and who claim: "Managing culture is the most neglected, and highest leveraged, tool for promoting innovation and change." This is in line with Kalling (2007), who from an obstacles perspective argues for the importance of institutional factors such as culture, neglected in studies of learning and innovation. However, Leonard-Barton (1992) introduced values as an important addition to core capabilities (alongside the skills/knowledge base, the technical system, and the managerial system) and she stresses that values can also be something that can hamper innovation by contributing to "core rigidities." Other researchers emphasize the importance of a creative climate and an adaptive culture where managers expect change (Tidd *et al.*, 1997; Brown and Eisenhardt, 1998), and of attitudes, values, and norms that foster innovation, including encouraging individuals to take risks (Matzler *et al.*, 2010, p. 12), and tolerance of ambiguity (Lawson and Samson, 2010, p. 394). Brown and Eisenhardt (1998, pp. 31-33) provided an analogy to "jazz improvisation," characterized by frequent changes in the context of a few strict rules. Garud *et al.* (2011, p. 738) describe 3M's practices that "encouraged employees to cultivate events driven by serendipity and opportune moments," which can be seen as an integral part of a company innovation culture – reinforced by narratives of earlier successful innovations.

Thus, in several of the studies culture is mentioned as an important element, but expressed in more general terms. Looking at different kind of values in more detail, the traditional focus of entrepreneurship on risk taking, as well as the consequent need of allowing for mistakes, is only mentioned by one study. Risk taking was with a few exceptions not emphasized among our Google interviewees either, which, however, could be attributed to Google's stress on innovation and early testing that makes innovation and ambiguity a natural part of the job, not considered as unexpected risk taking. Other values that stood out in the Google case, such as "Think big" and "Scalable," were not mentioned in the other studies, although these values might be part of today's world-view in Silicon Valley (Saxenian, 2010). Also ethics in terms of doing good is a major value for Google, but was not mentioned in any of the other studies, except in one study elaborating upon the importance of higher goals and "noble purposes" for long-term commitment to innovation (Tushman and O'Reilly, 1997, pp. 100-101). This is interesting since, for several of the Google interviewees, this value was of importance to both

motivation and inspiration for new innovations, and it has from the start been strongly emphasized by the founders.

There are, however, other studies that take their starting point focussing explicitly on organizational innovation culture and creative climate. Ahmed (1998) makes a broad literature based overview of the field and under the heading of climate and culture he refers to several of the issues that we discuss under other headings, such as individuals, leadership, and the hygiene factors. In our empirical study of Google we identified a major part of what Ahmed (1998) refers to as a good climate and culture for innovation, e.g. in his list of norms conducive to innovation. A main difference is that Ahmed makes his analysis from the perspective of established firms and argues that senior leaders need to be aware of their impact on innovation culture, while in Google we found that the founders drove the innovation culture consciously, and with specific values from the start. Our empirical study of the company culture was based upon what our interviewees expressed (e.g. values/norms, behavior, and artifacts) in their views of Google's culture, however, individuals' deeply held basic assumptions were not included in our study (Miconnet and Alänge, 1999). Ahmed (1998) also mentions deeply held assumptions (but refers to companies' assumptions) and discusses the value of strong company cultures. In line with Leonard-Barton's (1992) "core rigidities" he points at the potential risk in strong cultures, something that also a start-up company like Google will need to consider not the least after rapidly having become an extremely successful and large company.

Martins and Terblanche (2003, pp. 67-68) suggest based on another literature review that organizational culture affect creativity and innovation in two ways: through as socialization process where individuals learn accepted behavior; and through the enactment of basic values, assumptions, and beliefs through established behaviors, which are reflected in structures, policy, practices, and procedures. They build a model of the main determinants of organization culture that influence creativity and innovation, which they identify as strategy, structure, support mechanisms (e.g. rewards and resources), behavior that encourages innovation (e.g. mistake handling and risk-taking), and open communication. Once again, the authors' use of "organizational culture" is wide and encompasses part of what is structured under other headings in our model. Most of the determinants suggested by Martins and Terblanche were also found in our empirical study of Google. The only exception was that we did not identify a need for conflict resolution in our interviews. Once again we saw that Google's emphasis on ethics and "do no evil" were not reflected in their study, although they with reference to Arad *et al.* (1997) pointed at the importance of doing something "purposeful." They concluded their paper by commenting that there is a need for further empirical research on the influence of culture on innovation.

A bit astonishing is that most of the studies reviewed do not put much focus on individuals and on providing them with opportunities to be creative. In addition, the extreme care that Google puts on the hiring process and in evaluating potential candidates is not emphasized in the literature reviewed. Instead, the approaches presented are more concerned with developing the existing workforce, expressed in terms of harnessing the competence base (Lawson and Samson, 2010, p. 390) or in skill and talent development (O'Connor, 2008, p. 323). One exception is, again, Tushman and O'Reilly (1997, pp. 65-67, 152-154) who, in the context of shaping organizational culture and building a comprehensive system for social control, outline a system of rigorous selection, and intensive socialization. However, the people dimension in their congruence model primarily urges managers to analyze whether

people have the required skills, what motivates them, how long they have worked together, and whether there are country differences to take into account. Some studies point at the importance of people for innovation, e.g. Lawson and Samson (2010) who emphasize empowered employees and the need to respect and invest in people, and Matzler *et al.* (2010, p. 8) who claim that people are the driving force behind change, not management systems and structures. Finally, Google's emphasis on providing individuals with opportunities to take initiatives, self-organize, and develop their own and others' ideas can be found in some studies. For example, Google's 20 percent and 3M's corresponding 15 percent time are frequently provided as examples (e.g. Tidd *et al.*, 1997; Brown and Eisenhardt, 1998; Lawson and Samson, 2010). Most similar to Google is 3M's approach: "Innovation is [...] having creative people in the company and letting them work on things that they think will be important for the future" – "allow people time on their own and time to make mistakes and pursue their own dreams" (3M employee quote in Garud *et al.*, 2011, p. 745). Also 3M's way of building relational dynamics between people is similar to practices at Google, e.g. in terms of socialization of new employees, cross-functional meetings, and rotation of people. Google's trust in its creative people is also visible in the amount of meeting places (cafés, restaurants, etc.) existing in order to allow ideas to develop out of serendipity in informal and non-planned encounters, i.e. a similar trust in its people and in the importance of opportune moments that had been identified at 3M. Steve Jobs implemented a very similar design idea when Pixar's new building was designed in 1999-2000. Jobs said: "Creativity comes from spontaneous meetings, from random discussions. You run into someone, you ask what they're doing, you say 'Wow' and soon you're cooking up all sorts of ideas" [...] "If a building doesn't encourage that, you'll lose a lot of innovation and the magic that's sparked by serendipity" (Isaacson, 2011, p. 431).

Top management as the foundation and leaders as facilitators

In the case of Google, the founders and other members of the Operating Committee and the Board had tenure and were innovation oriented and change prone. They created the very foundation for Google's continuous innovation by strongly influencing the culture, the organizational design, and all other organizational elements as well.

In general, leaders directed their teams, but they also encouraged innovations by acting as connectors, cultural ambassadors, and facilitators for innovation. Google's leadership was described as a "bottom-up leadership in parallel with an overall direction provided from a top management perspective." In order to encourage and sustain innovations, leaders were carefully selected, both during the hiring process and through the internal promotion system. The role of the leader had received an increased focus internally during recent years.

Comparison with research literature. A committed and competent top management and board are crucial for sustaining any large organizational innovation (Alänge and Steiber, 2009). In all of the selected research studies, leadership was a major issue. The way senior leaders emphasized constant renewal, and seemed to expect constant change, could imply that Google already from its early years was striving for developing dynamic capabilities (Teece *et al.*, 1997; Teece, 2007). Zollo and Winter (2002) found that dynamic capabilities originate from a learned and stable pattern of collective activities, and that firms differ in their dynamic capabilities partly because they implicitly or explicitly emphasize differently the strategic importance of change in the future. Google's dynamic capabilities might therefore be a result of a learned

and stable pattern of collective activities, supported overall by a change-prone top management.

Several studies elaborated upon the importance of simultaneous direction and freedom. At 3M one interviewee expressed as follows: “what management has to do is to provide that environment (a culture of innovation) and then get out of the way” (Garud *et al.*, 2011, p. 745). Brown and Eisenhardt (1997, 1998) found that a characteristic of innovative companies was a combination of clear responsibilities and priorities, and extensive communication, with a considerable freedom to design one’s own work processes. It was even expressed as “too little structure” and this way of working resembles Google’s approach closely. According to Brown and Eisenhardt (1997), it typically takes years to grow an organization showing the type of “semi-structure” (on the edge of chaos) that is typical for Google. Furthermore, sustaining this kind of “semi-structure” state requires constant management vigilance. At Google, the top management team has vigorously assumed this role. Brown and Eisenhardt (1997, 1998) also emphasized the importance of experimentation into the future through different cost-effective probes such as experimental products and meetings. This is also practiced at Google, including testing internally, a characteristic of innovative companies (Leonard-Barton, 1992). The choreographing of transitions that was a key finding of Brown and Eisenhardt (1997, 1998) is, however, less obvious in our empirical material from Google; rather it seems that Google’s long-term view and quest for changing the world are the primary guiding factor for launching innovations. Still, this might be dependent on the product area, and when it comes to operating systems, such as Android, there is a clear need of synchronizing with both hardware and software industries. Top leaders’ understanding and support of innovation (which was emphasized in Google) have been identified as important factors by several authors (O’Connor, 2008; Tushman *et al.*, 2010; Matzler *et al.*, 2010). Yet Danneels (2010) argues that an organization’s ability to renew itself may be reduced due to managers’ limitations in terms of “resource cognition”[4]. In a Google context, this could be an explanation for Google’s initial comparative weakness within social media. Although internally developed products (e.g. Orkut) were launched at the market already at a very early stage, it took some time for social media to become a focal development area.

Google has a strong and shared mission, a factor that also has been found important by other researchers (Tidd *et al.*, 1997; Lawson and Samson, 2010; Matzler *et al.*, 2010). Further, Brown and Eisenhardt (1998) emphasized the importance of driving strategy from the business level. This could be compared to Google’s ambition of driving the business strategy process bottom-up. Leaders also have the responsibility for re-patching businesses and shaping emergent strategies (Brown and Eisenhardt, 1998, p. 247), coordinating and redeploying internal and external skills, resources and functional competences (Teece, 2007, pp. 1341-1344), and constant reflection and reconfiguration (O’Connor, 2008, p. 322) in order to better position their organizations in a changing environment. These reshaping abilities were also present at Google, and primarily a responsibility for the top leadership group. Tushman and O’Reilly (1997, pp. 171-179) argue for a need of a top management team that can host diversity: contradictory strategies, structures, competences, and cultures. This view of a need to manage ambidexterity is based on their assumption of a punctuated equilibrium model of innovation, and reinforced by the fact that the companies they studied are not start-ups. Google is entering into this complexity with its main revenue-generating business showing some signs of maturing, where also incremental innovation is of

major importance, while other areas are more in line with a start-up mentality of going into new fresh business fields. Finally, one issue identified at Google was the importance of both selecting and developing leaders in order to support creative people. This need of leadership development has not been discussed explicitly in the other studies, although the importance of leadership capabilities is emphasized in almost all of them.

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The hygiene factors for innovation

Organizational structure, the P&I system, and organizational learning were found important to design correctly in order to positively affect Google's innovativeness. These three elements seem to facilitate innovative behavior if correctly designed, but also inhibit innovations if incorrectly designed. Because of this, they are referred to as "hygiene factors." The Google case strongly emphasized the importance of a semi-structured, non-bureaucratic organization with the mindset of a small company. In this organization, innovative ideas were believed to come from anyone and everywhere through a bottom-up process. In parallel with ideas coming from the bottom up, clear goals and priorities came from the top down. Furthermore, the P&I system rewarded innovative behavior, both financially and by recognition. Google's employees also emphasized the importance of intrinsic motivation generated by a challenging mission, smart colleagues, and a technical infrastructure that allows scalable solutions. Finally, organizational learning was a natural part of Google's mindset and was encouraged by the value of "openness" and "share as much as you can." The use of heuristic rules to guide and speed up the innovation processes indicates that Google utilizes previous learning by formulating rules of thumb.

Comparison with research literature. The way of organizing for innovation has been discussed by several authors. A major issue that differentiates the researchers is whether major/discontinuous innovation needs to take place in an identifiable organizational group or distinct unit (O'Connor, 2008; Tushman *et al.*, 2010) or as an integral part of main activities (Lawson and Samson, 2010; Garud *et al.*, 2011). The dividing line might, however, be in the way we look at innovation – whether it is a continuous process or a punctuated equilibrium process, i.e. a process of incremental change that periodically is replaced by more radical and discontinuous change. Both ways of looking at the process can find empirical support (Lam in Fagerberg *et al.*, 2005). Tushman *et al.* (2010) claimed, based on empirical data, that ambidextrous designs are more effective in executing innovation streams than functional, cross-functional, or spinout designs. Lawson and Samson (2010), on the other hand, argue for the need to integrate and manage both "newstream" and "mainstream" activities together. Garud *et al.* (2011, p. 738) also view innovation as taking place in regular work, and commented, based on research at 3M, that practices fostering ongoing interaction between the company's employees create opportune moments, and that these moments of serendipity did not lie outside or apart from moments of routine work. Instead, they were created through those moments. Google's bottom-up process for internally originated innovations is also a solution where innovations take place in regular work. Google has since its start been functionally organized, which according to our interviewees has provided stability conducive to innovation. The functional organization also naturally encourages a more exploration-oriented subculture in engineering, while sales/marketing/finance can focus more on exploitation and efficiency. Over the years, the company has conducted some experiments in organization, by creating separate development teams located far away

from the main US campus. The outcomes of these experiments have not been fully successful, however, so the functional organization with innovation projects, often initiated bottom-up, remains the organizing principle. But one interesting facet of Google's organization is that it keeps 50 different development units close to markets around the globe, which means that the amount of variety in organizing is considerable given local cultures and environments, which enables rapid learning processes.

O'Connor (2008, p. 319), who believed in a distinct unit for innovation, separate from main activities, specified in which areas coupling is or is not recommended for major innovation to take place. There is a need of tight coupling between the system for innovation and the strategic intent, a loose coupling to resources, networks, and business unit system, and no coupling to mainstream project management. At Google there is a strong coupling to strategic intent through the OKR process. Especially during early phases there is a loose coupling to resources and networks, which support bottom-up initiatives where other individuals can opt in so as to provide the idea with momentum in order to gain access to more resources in formal forums.

In our initial literature review, P&I systems were mentioned as being important for innovation, or important for not stifling innovation. For example, O'Connor (2008, p. 325) pointed at the need of appropriate performance metrics for high-risk and high-uncertainty objectives of major innovation management systems. Lawson and Samson (2010), viewing innovation as an organization-wide effort, stated that reward systems are a key to successful innovation, including dual ladder systems, suggestion scheme, public recognition, and financial rewards. However, according to our Google interviewees, the P&I system was not of major importance for explaining Google's innovativeness. Nonetheless, it had a role in recognizing innovative people and in directing the behavior of employees. Google's OKR process is of importance in providing the direction needed in a system characterized by less structure. Hence, the OKR process is a vital part of a comprehensive corporate innovation system. The incentive system, including recognition and awards, contributes primarily to building an innovation culture. There are some accounts of a similar view in the selected literature, for example stressing the importance of a comprehensive reward and recognition system in order to shape culture and desired behavior (Tushman and O'Reilly, 1997, p. 154) and in installing new values (Leonard-Barton, 1992). Also, some authors commented upon the importance of intrinsic motivation; that is, the job itself can create motivation through autonomy and accountability for significant aspects of tasks (Brown and Eisenhardt, 1997). The importance of intrinsic motivation has been clear all through our Google interviews, and the 20 percent rule is just one expression of the ambition of building a system allowing for intrinsically motivating work tasks. The use of simple rules has been presented primarily as a means to deal with complexity and less structure (Brown and Eisenhardt, 1998; Garud *et al.*, 2011), but heuristic rules can also be seen as a means for both providing direction and facilitating the creation of intrinsically motivating job tasks.

Finally, while capabilities, abilities, and competences are in focus in most studies, learning processes are treated in various ways and with varied depth. Google interviewees stressed the importance of open and intensive communication for rapid learning, which is also emphasized in literature (Brown and Eisenhardt, 1997; O'Connor, 2008). Tidd *et al.* (1997) call for the need of developing a learning organization where "learning to learn" and "to unlearn" are important. They stress that successful innovative firms expand training and personnel development activities. Tushman and O'Reilly (1997, p. 77) offer their congruence model as a tool

for systematic learning and point out that excellent managers are not paralyzed by studying problems, or by making mistakes; instead they are able to learn by doing. Brown and Eisenhardt (1997) emphasize the importance of future learning and experimentation, because the future is never predictable. Also O'Connor (2008, p. 322) stresses the importance of exploratory learning processes and of skill and talent development. Teece (2007) argued for the need of analytical systems (and individual capacities) to learn, sense, filter, shape, and calibrate opportunities. Further, Garud *et al.* (2011, pp. 748-749) presented the innovation narratives as a way to learn the culture of innovation at 3M. They also comment on the importance of cultivating ideas as these emerge into platforms of knowledge, in order to be able to use the ideas when the time is right. This broader way of looking at learning and accumulation of knowledge was not mentioned in our Google interviews.

As this brief summary of the literature indicates, the views on learning vary considerably between the authors. Our interviews at Google provided an account of various learning practices in place, including explorative learning in networks and through data-driven iteration. For example, Google's way of utilizing user data in rapid test cycles, as well as its preference to keep products on the market for extended periods in beta versions, indicate the importance of learning and development processes based on user input (cf. Cole, 2002; Ries, 2011). However, there was also a considerable variation between different parts of the company, i.e. the processes for learning were only to some extent standardized. Learning was nonetheless a core part of the "Google Way," and the frequent use of heuristic rules could be seen as an important application of previous learning. In line with Vera and Crossan (2003), Kalling (2007, p. 65) defines organizational learning as "the process of change in individual and shared thought and action." This definition fits quite well with the way Google works, while the more narrow view of learning as knowledge management systems and processes does not fit the description of Google.

External interaction and open innovation

Google's senior management had chosen to establish specific units with responsibility for external screening and sourcing. They have in other words taken measures to supplement their internal innovation processes. This has allowed the company to better sustain its ability to be innovative by utilizing innovations that originate both internally and externally. Therefore, Google's corporate system for innovation could be viewed as an open system. This, however, does not necessarily mean that the whole organization was open. Instead, parts of the organization were found quite "closed," as they strove to focus mainly on their own ideas or solutions in order to be able to create new major innovations. This might be one reason why this element was ranked low, since most of the interviewees did not work in the externally oriented units. Another reason could be how the questions were asked. Also the influence from Silicon Valley was perceived as not very important to explain Google's innovativeness. But a number of common norms in the Valley were similar to those at Google, so the Valley had influenced Google potentially more than the interviewees themselves realized.

Comparison with research literature. Ideas from the outside have been recognized as a major source of innovation within many industries (Chesbrough, 2003). The role of external ideas and innovations for sustained innovativeness of a company is not the primary focus for the selected studies, yet most of them explicitly comment upon the need of external consideration. Tidd *et al.* (1997) included a strong external

influence, by learning from markets and strategic alliances, in their approach of advising how to build an innovative organization. However, coming from a TQM perspective, they primarily addressed innovation in terms of continuous improvement and need of customer focus. Tushman and O'Reilly (1997) pointed at the importance of considering technology cycles that drive innovation streams, which is in line with their view of change resembling a punctuated equilibrium process, where strategy making should be based on the logic of "dominant design." While real-time informal and formal communication with external sources is of importance, strategic alliances provide access to leading-edge technology – and "patching" does not only refer to internal resources, but includes potential acquisitions (Brown and Eisenhardt, 1998, p. 232).

Other authors also emphasize the importance of linkage to external knowledge sources, both formal and informal (O'Connor, 2008, p. 320), and the need of creating processes to tap supplier and "complementor" innovation, developments of science and technology, changing customer needs (Teece, 2007, p. 1326), learning about customers and competitors (Lawson and Samson, 2010, p. 392), open innovation exploiting the knowledge of suppliers, customers, research institutes, and partner companies (Matzler *et al.*, 2010, p. 10), and interactions with lead users, customers, and industry (Garud *et al.*, 2011, p. 757). Google's way of obtaining user feedback by testing concept versions of new products on its global user base is unique, in terms of the speed and accuracy of the information about user preferences based on how real users behave. But the Google way, as described by many of our interviewees, is to focus almost exclusively on making the innovation process self-sustained, primarily built on creative internal individuals and Google's strongly innovation-focussed culture. And being a start-up company in a situation of continuous growth, the "internal" input has still contained considerable external flavors, as the number of new hires has been substantial. However, relying only on this inward-focussed innovation approach would in the long run raise concerns. In parallel to this internal innovation process, a large amount of Google's new ideas and innovations have their origin outside the company, and Google has established special units to identify, negotiate, and integrate ideas and competent people from the outside.

A corporate system for continuous innovation

Many of the organizational characteristics for continuous innovation identified in the Google case can also be found in previous research. However, the Google case has contributed an insight that these organizational characteristics need to be viewed in a corporate system perspective. For example, we could empirically identify Google's striving for a systemic organizational solution for innovation (O'Connor, 2008, p. 327), where different organizational characteristics were deeply integrated. Google's corporate system for continuous innovation was dynamic and open. While it was viewed overall as open, not all parts of the organization were "open." Instead, top management had created an organization in which parts of it were consciously "open," while other parts behaved in a more introverted way. Reasons for this introverted behavior could be a focus on "technology push" in combination with easy access to an extensive number of highly skilled and relatively recently employed individuals within the company walls.

Conclusions

The literature is increasingly recognizing the importance of continuous innovation and a number of researchers have investigated organizational characteristics for

continuous innovation. This paper compares the findings from an empirical study of Google Inc with findings identified in previous research on organizational characteristics for continuous innovation in fast-changing environments. While our own study as well as the major part of the literature selected for comparison had its empirical basis in fast-changing industries, there are reasons to believe that similar organizational characteristics would be useful for continuous innovation in more slow-moving industries as well. This was indicated by the two research articles based on cases from mature industries, package material, and type writers (a mature industry entering discontinuous change) as well as by 3M, the company that in many practices seems most similar to Google.

The organizational solution behind Google's innovativeness can be described as a dynamic and open corporate system for innovation, in which innovations take place in regular work. The main organizational characteristics of this corporate system for continuous innovation are: an innovation-oriented and change-prone top management and board; an innovation-oriented and change-prone culture; competent and committed individuals with a passion to innovate; leaders who empower, coach, and remove obstacles to innovation; a semi-structured and ambidextrous organization; innovation-oriented P&I systems; continuous learning; and open innovation.

Previous research findings on continuous innovation in rapidly changing industries are relevant and useful when discussing and analyzing Google's organization for continuous innovation. The comparison, however, identified a need for further elaboration and integration of current findings into an analytical framework for continuous innovation. Insights from Google provide additional understanding of how a corporate system conducive to innovation can be designed. There is a need to emphasize and better understand how factors such as culture and individuals influence firms' ability to innovate continuously. Data from Google indicate that culture and individuals are decisive for continuous innovativeness, and that important leader roles are to contribute to creating/sustaining an innovation culture and to facilitate for individuals to innovate. The importance of individuals and culture might in turn create a need for a change in managers' mental models of how best to run and therefore organize a company for continuous innovation, including how to select and develop people, not least for leadership roles. In addition, the roles of top management and the board in creating a foundation for continuous innovation are essential to investigate further. Also the issue of whether and under what conditions continuous innovation and continuous improvement can be managed in the same organization is essential to scrutinize. Finally, it would be of interest to develop a deeper understanding of how, in a corporate system, to successfully generate, incubate, grow, and integrate both internally and externally generated innovations.

Notes

1. In 2010, only 12 years after its formation, Google had US\$ 29.3 billion in revenue and US\$ 8.5 billion in net income (Google.com, 2011) and was the world's most valuable brand in 2011 (BrandFinance® Global 500, 2011). All this was based on initial innovations such as Search and Adwords, followed by a continuous stream of new innovative products such as Gmail, Maps, Earth, YouTube, Android, Google +.
2. Tidd *et al.* (1997) base their findings on data from companies like Apple, Google, and Microsoft, but also on literature that is not specifically focussed on rapidly changing industries.

3. The approach of using single-case failure cases in order to identify dynamic capabilities/ characteristics could be questioned, but these studies can be useful for comparison with studies based on success cases.
4. Cf. "surveillance, mentality and power filters," which explain why information does not reach decision makers and hence contributes to inertia and path dependency (Jarnehammar, 1995).

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