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Article

Enabling Open Innovation: Lessons from Haier

Arie Y. Lewin^{1,*}, Liisa Välikangas² and Jin Chen³

¹ Fuqua School of Business, Duke University, P.O. Box 90210, Durham, NC 27708, USA

² Hanken School of Economics, Aalto University, P.O. Box 479, 00101 Helsinki, Finland; liisa.valikangas@aalto.fi

³ Research Center for Technological Innovation, School of Management and Economics, Tsinghua University, 30 Shuangqing Rd., Haidian District, Beijing 100084, China; chenjin@sem.tsinghua.edu.cn

* Correspondence: ayl3@duke.edu; Tel.: +1-919-660-7832

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Abstract: Open innovation has become a dominant innovation paradigm. However, the actual adoption of open innovation organizational designs and practices remains elusive, and ongoing examples of large companies practicing open innovation in mature industries or beyond R&D activities are rare. Despite the continuing interest in open innovation and the surging research on the topic, not much is documented about how, in particular, large companies interpret and implement open innovation or develop and sustain an innovation-enabling culture. This paper reports on a study of Haier's adoption of six radical innovations as it implements an open innovation organization over a period of seven years. The study is unique in that the cases reveal how open innovation is enabled by the socially enabling mechanisms developed under Chairman Ruimin Zhang's leadership. These varied enabling mechanisms open the organization to serendipity at every level, from the bottom up to suppliers. Most importantly, the mechanisms imprint and sustain an open innovation culture recognized as important—yet often left unarticulated in terms of how it is practiced—in the prior literature. The paper contributes to and highlights the centrality of socially enabling mechanisms underlying an organization's innovation absorptive capacity.

Keywords: Open innovation implementation; Socially enabling mechanisms; Serendipity

1. Introduction

Since the publication of Chesbrough's (2003) book on open innovation, the idea of companies and organizations adopting open innovation has become a dominant innovation paradigm. However, the actual adoption of open innovation organizational designs and practices remains elusive, and ongoing examples of large companies practicing open innovation in mature industries are rare (see, e.g., Mortara & Minshall, 2011; West & Bogers, 2014). Dahlander and Gann (2010: 707) review the open innovation research literature and conclude:

As we have demonstrated, empirical work using qualitative and quantitative approaches to analyze

open innovation processes has begun to emerge. It is important to note the risks of being pre-occupied with exploring the optimal level of openness rather than probing how openness has changed in a qualitative sense. Perhaps openness is today taking different forms than in the past...

While Dahlander and Gann refer to new innovation technologies that may facilitate openness, Chesbrough and Brunswicker (2013: 3) in a survey of large firms in Europe and the United States conclude that cultural norms are as important as formal practices. Despite the continuing interest in open innovation and the surging research on the topic, not much is documented about how, in particular, large companies interpret and implement open innovation. West et al. (2014: 27) confirm that “researchers more often focus on obtaining innovations, rather than the phases of integrating and commercializing those innovations”.

For a large, established organization to transition to and integrate open innovation capabilities is not an inconsequential transformation. Longstanding evidence describes and implies that companies experience severe innovation-to-organization impediments: resources, processes, and meaning-making add up to an “anti-innovation configuration” (Dougherty & Hardy, 1996: 1146; see also Crossan & Apaydin, 2010, for a review of the innovation literature). Indeed, in their study of large companies, Dougherty and Hardy (1996: 1133) found that “where individual innovation projects were successful, they depended on the efforts of particular individuals to use their organizational positions ... to further and protect innovation efforts; they did not result from an organization-wide commitment to innovation”. Organizations may lack the absorptive capacity to recognize and develop the potential of innovative products and technologies (Cohen & Levinthal, 1990), or they may simply lack the requisite organizational enabling mechanisms to carry forward potential ideas that often require persistence, experimentation, and complex coordination across the organization. Innovative ideas may also be contrary to the dominant logic of the company (Prahalad & Bettis, 1986) and hence lack institutional legitimacy or by their very nature present a disruptive hazard to the strategic direction to which the company is committed (Christensen, 1997). The inescapable consequence is that the innovation does not gain sufficient attention to move forward but remains in the shadows and misses its opportunity for impact.

In sum, many authors have judged organizations to be far from open and rather impermeable to innovation despite the common talk of its importance in competition (see Table 1). One may thus conclude that the dominating management “best practices” select against innovation rather than support it (see, e.g., Doz & Kosonen, 2008; Hamel & Välikangas, 2003; Van de Ven, 1986). The difficulties include connecting innovation with routine operations, lack of targeted resources at innovation, insufficient collaborative structures and processes that would coordinate innovative ideas, and no actionable strategy that would value innovation over the current way of doing business. Innovation seems to be selected against unconsciously and without scrutiny in a competition for attention and resources, while the embedded routines of annual incremental budget and planning practices determine short-term decision-making and leadership selection processes inside large organizations.

Table 1. Innovation Barriers as a Selection Regime Thwarting Open Innovation ¹

Innovation Barrier	Authors	Implied Selection Regime
Insufficient or non-available resources	Siguaw, Simpson, and Enz (2006)	Difficult to attain resources for exploration and experimentation
Perceived riskiness of innovation	Leifer, O'Connor, and Rice (2001), Marsh and Stock (2006), O'Connor and Rice (2013), Hewitt-Dundas (2006)	Selecting against risks that are unknown
Focus on current business or customers/routine operations	Christensen (1997), Johnson and Regner (2009), Snihur and Zott (2013)	"Invest in what is rather than what could be" (Hamel & Välikangas, 2003: 60)
Myopia or complacency related to current performance	Starbuck and Hedberg (2003) Levinthal and March (1993)	Satisfaction with good enough and the familiar
Structural issues such as centralization, formalization, or routinization	Amabile et al. (1996), Jung et al. (2008), Damanpour (1991)	In-built bias toward the peripheral and the informal
Lack of ability to coordinate around or absorb innovative ideas	Dougherty and Hardy (1996), Foss, Laursen, and Pedersen (2011), Galunic and Rodan (1998), Cohen and Levinthal (1990)	Giving up when faced with the requirements of persisting attention or organizational complexity; absorptive capacity
Company history shaping cognition; inability to make sense of the new across the organization	McAdam (2004), Smith and Alexander (1999)	Insensitivity or lack of alertness to what is novel in the business environment
Inability to gain institutional legitimacy for innovative ideas	Galunic and Rodan (1998), Bartel and Garud (2009)	Strong heritage rules; leadership fails to support the radical or the disruptive
Unwillingness to take risks at the individual level	Shalley and Gilson (2004), Kotter and Schlesinger (2008)	Lack of motivation or biased incentives
Lack of sufficient attention	Ocasio (1997), Joseph and Ocasio (2012)	Everyone is busy already; lack of integrative channels for attention
Organizational resistance to change	Hannan and Freeman (1984), Dougherty and Hardy (1996), Criscuolo, Nicolaou, and Salter (2012), Starbuck (1983)	Lack of history of rehearsing/undergoing change; change implies risk; low aspiration levels for change

¹ We thank Yuhan (Emily) Zhao PhD student at Zhejiang University School of Management for a research summary on impediments to innovation.

A key catalyst for our study is captured in a statement by an executive from a leading white goods manufacturing company that was approached by a supplier to collaborate on a radical product innovation. Although he was very intrigued by the proposal, his response was, "...it would take me 18 months to go through our internal bureaucratic approval process to receive approval for a budget and a team to collaborate on this project". This executive did not choose to proceed with the troublesome bureaucratic process. The supplier approached other major companies in the industry and was turned down in sequence. The innovation was eventually proposed to Haier, which co-developed the innovation and successfully marketed it. In retrospect, it is not surprising that every major white goods company that was approached to co-develop the innovation did not have the requisite effective selection regime, defined by Canales (2015: 2) as "constructive confrontation and negotiation based on power and influence". No confrontation or negotiation resulted, as it would simply have been too time-consuming.

Beyond the time-sink efforts required to break embedded rational cost benefit business routines to approve novel departures, recent research by Christensen (2016) on why the approval of incremental innovations dominates innovation decision processes underlines the point attributed to Niccolo Machiavelli: “The benefits to the innovator are uncertain but the costs to those affected by the changes involved are not”.

Or, to put it differently: Innovation is a distraction—until it pays off, usually on the watch of a later manager who was not involved in the initial decision to launch the project.

2. Toward an Open Innovation Organization at Haier

One exception is represented by Haier, where an 18-month study of the company’s adoption of six radical product innovations combining external and internal openness provides the basis for the lessons we draw about effecting the transition to becoming an open innovation organization.

Under the leadership of Chairman Ruimin Zhang, who assumed leadership of the failing Qingdao Refrigerator company in 1984, the company has undergone five strategic reorientations as summarized in Table 2.

Table 2. The Five Strategic Reorientations at Haier

Strategic Reorientations				
Quality, lean mfg., and building brand (1984–1991)	Diversification (1991–1998)	Internationalization (1998–2008)	Open innovation (2009–2015)	Micro enterprises and Networking (2015–)

Each strategic reorientation was preceded by a series of “letters to Haier employees” or speeches in which Chairman Ruimin Zhang expounded and evolved his ideas and directed attention (Ocasio & Joseph, 2008) to future imperatives that Haier would need to confront. The very first imperative was to rescue the broken-down refrigerator company, which was highly inefficient and was producing notoriously poor-quality refrigerators. This involved a top-down directed transformation to adopt Japanese total quality and lean manufacturing production systems. His speeches during these formative years covered such imperatives as providing customers with high-quality products by applying scientific management of total quality, becoming quality conscious, making every employee a quality “doer”, ensuring that paying attention to little things was management job number 1, and acknowledging that a defective product is a waste and conserving cash is more important than profit.

As the company successfully adopted total quality management and lean manufacturing systems, Chairman Ruimin Zhang also began to communicate his evolving contemplations about branding. In 1991 he adopted a new company name by borrowing from the German name of the company’s partner Liebherr. The name Haier is derived from the last two syllables of the Chinese transliteration of Liebherr (pronounced “Li-bo-hai-er”). As discussed by Chen (2016), the Chinese characters of Haier are quite symbolic: Hai (海) er (尔) literally means “you are the sea”. The adoption of the new name became the beginning of the Haier brand, but it also served to reconnect the people of Haier to a foundational 1994 speech—“Haier is the Sea” —which we discuss in a later section of the paper.

The focus of this paper is on the fourth strategic reorientation transitioning to becoming an open innovation company. The transition was again preceded by a series of letters to Haier employees and speeches beginning in 2007, in which Chairman Ruimin Zhang directed attention to what became known as the three “nos”: no tail, no wattage, and no water. “No tail” anticipated use of electricity for remotely activating lights or charging batteries without cords or cables connected to an electrical outlet. “No wattage” suggested greater efficiency in the use of electricity, and “no water” directed attention to the need to conserve water, for instance, in washing machines and dishwashers. These largely informal ruminations were consolidated into a formal letter to Haier employees November 2009, which also added a fourth “no”—no compressor—as well as the need for Haier to become an open innovation organization. Unlike the previous three strategic reorientations, which laid out specific strategies, the “open innovation” letter did not outline or mandate specific organizational design transformation with the exception of creating an informal corporate coordinating committee and the recruitment of Tom Wang as the director of open innovation.

3. Six Radical Product Innovations

The summary of the six radical product innovations is based on an 18-month field study conceived by Professor Jin Chen and conducted by the first author with the support of Professor Yu-Shan Su of Taiwan Normal University. In total, the fieldwork involved interviews with 57 key informants and archival documents and reports. Suppliers proposed four radical product innovations, the fifth resulted from an internal user innovation project, and the sixth represents a nonwhite goods bottom-up initiative.

3.1. *Water-Saving Washing Machine: Harnessing External Innovation*

This project has its origin in 2011, when Tom Wang had the idea to organize an internal supplier exposition where suppliers could share innovative product, component, or process ideas with Haier product managers. A major chemical company that had been supplying Haier with prepackaged insulation configurations for Haier refrigerators and freezers sought out the washing machine product manager and pitched membrane filtering technology that could enhance dirt removal during the rinse cycle. The supplier approached Haier with the idea of applying the membrane filtering technology to washing machines after having proposed the idea to at least one major white goods manufacturer in the United States (there is some uncertainty as to how many other white goods manufacturers were approached, but there is agreement that the supplier was turned down by more than one manufacturer before approaching Haier).

To the surprise of the chemical company engineers, Haier’s washing machine product manager and chief engineer expressed interest in exploring potential applications. The discussions dragged on for several months, and eventually it became clear that Haier was not interested in improving the washing attributes of Haier washing machines. Haier began to explore the possibility of applying the membrane filtering technology to saving water during the washing and rinse cycle. Moreover, the Haier team challenged the chemical company team to design a new filtering device and to produce or procure prototypes that could be tested. The chemical company initiated what became an 18-month project to design a filtering device that removed dirt released by washing machine detergents as well as worms, bacteria, mold, and other nano-particles. The 18-month process can be described as an interplay between the design teams and Haier washing machine engineers and technicians that, for example, required filtering volumes and rinse cycle times to meet benchmarks, and

physical designs to fit within the space of the standard size of washing machines on the market. The process was also punctuated by false starts, with dead ends that required the team to start “from scratch” on at least one occasion. Eventually, Haier washing machine engineers agreed that the chemical company had designed a device that satisfied the final product criteria. The criteria themselves evolved over time as the design of the membrane filtering device stabilized, and the operating characteristics met standards for water flow, rinse cycle, and wash frequency before replacing or servicing the filter, as well as other criteria related to costs and assembly. The final hurdle required selecting a supplier for this filter. The chemical company recommended two suppliers, one in Thailand and one in Japan. However, to the surprise of the chemical company team, the Haier supply chain organization responsible for selecting and approving vendors did not approve either of the suppliers, as they did not appear on the list of trusted suppliers. It appeared that the entire project was doomed because at Haier there was no formal mechanism for overruling the decisions of the supply chain team. The chemical company team was extremely discouraged and began preparing to shut down the project. However, Dr. Tom Wang and a subgroup of the corporate open innovation coordination committee were able to work out an exception that allowed the Japanese supplier to produce and supply the filter device. In 2014, the new washing machine was introduced to the market as saving 40% water (when compared to the average washing machine on the market), but also—and more importantly—was differentiated in the market by the capability to filter out worms, bacteria, and mold spores. The second-generation high-end washing machine was introduced in 2015.

3.2. No Compressor: Self-Organizing Serendipity

In 2013, a secretary supporting the corporate open innovation group in Qingdao serendipitously sent an e-mail to every director of the Department of Commerce in each of the 50 United States. As the associate director of the North Carolina Department of Commerce scanned the one-page email, the term “no compressor” caught her attention. She immediately called the CEO of Phononics, a local technology startup. Phononics was established in 2008. The company, located in Cary, NC, is focused on developing solid-state technology that replaces compressors in refrigeration applications. Two weeks after the call, a Phononics team under the leadership of the co-founder and CEO, Toni Atti, showed up unannounced at the Qingdao, China, Haier campus and asked to meet with the Haier refrigerator engineers and management.

The Haier team was naturally quite surprised to see the Phononics team. After two weeks of explaining the Phononics goal of revolutionizing refrigeration by exploiting breakthroughs in solid-state thermoelectric dynamics, the Phononics team was under the impression that they were making progress and that the Haier refrigeration team was genuinely interested in this revolutionary refrigeration innovation. On the Saturday of the second week, the Haier chief refrigeration engineer interrupted the morning discussions and abruptly challenged the Phononics team: “I will take out the compressor from this refrigerator and you can install yours”. That was when the Phononics team understood, as the CEO put it, “[the] Haier refrigeration engineering team had no grasp of what we have been sharing with them. They had no conception, no understanding that solid-state thermoelectric was a disruptive, game-changing refrigeration technology”. Refrigerators require high cooling power, as the fridge door is frequently opened; this could not be satisfied by the new technology. The two company teams turned to collaborating on wine coolers instead, as they are less demanding in terms of cooling requirements than are refrigerators. The “no-compressor” wine cooler was released in 2014, with the second-generation model already on the market. The United States is the largest

market for the wine coolers. At the time of this study, Haier was also considering making an investment in Phononics.

3.3. On-Demand Water Heater: Bottom-Up Open Innovation

As is his custom, the Haier product manager made the rounds of the 1200+ manufacturers exhibiting their latest models at the 2013 bi-annual exposition. He knew that all the manufacturers' products used the same basic heat exchanger. However, this time, he came across a manufacturer with an entirely different heat-exchanging technology. All standard technology applies heat to water at the moment the water starts flowing. Hot water is released after a short delay. The new design released hot water instantly. Impressed, the Haier product manager began to negotiate a possible joint venture or perhaps a licensing agreement with the company in question. The technology utilized a ceramic phase material that can store energy to be released as the water flows through the material, not unlike a battery. The product was already commercially proven, and the company was marketing a premium model under the brand name of a major American company. Eventually, the Haier Company entered into a joint venture with the company that owned the new on-demand water-heating technology.

3.4. The Tianzum Air Conditioner: Social Media and User Innovation

Beginning in 2014, Chairman Ruimin Zhang began to discuss in letters to Haier employees the idea of user innovation. A group in the standalone home air conditioning business started using WeChat and other social media platforms to solicit consumer thoughts about standalone room air conditioners. Within a few weeks, Haier received more than 750,000 comments. A team of 25 staffers worked around the clock sending thank you notes. However, the group soon realized that they did not have analytics capabilities and outsourced the analysis of this trove of user comments. The first observation that stood out was that people did not like cold air directly blowing on them. The second dominant suggestion was to integrate air filtering into the air conditioner. Haier engineers designed a new type of air diffuser that did not blow cold air at people in the room. The new Tianzum air conditioner was a success in the market. Haier then decided to build an in-house analytics capability.

3.5. ThundeRobot Professional Gamers Notebook Computer: Skunkworks Innovation

A small group in the orphan Haier PC division bootlegged the development of an application that served professional video gamers. When management learned about the project, which seems to have been developed in skunkworks-style secrecy, the ThundeRobot PC had sold almost 100,000 units and was recognized as the leading professional video notebook on the market. The notebook computer division did not fit with the white goods business and began to develop management presentations about spinning off the division. However, by the end of 2015, Haier management had not decided on whether to spin off the division subject to evolving the new venture capital fund.

3.6. Haier Venture Capital Fund

Towards the end of 2015, Haier announced the establishment of a venture capital strategy. The strategy involved the Haier Capital Fund, which consisted of Haier Angle Hatch, the Haier VC Fund, and the Haier

Industry Fund. By the time this study concluded, no information was available on what differentiates the three funds, the investment goals for the funds, or their performance criteria. However, it transpired that Haier was not investing its own capital. In actuality, it received capital from allocations by the central government under very favorable conditions that only required the return of the capital invested. These details emerged as Haier was contemplating spinning off the ThundeRobot business by acting as a “venture capital fund”. Companies that set up such funds received venture funds from the central government.

3.7. *Haier is the Sea: Origin of Socially Enabling Culture of Innovation*

During the many interviews which traced the beginning and the process of adoption of each radical product innovation, several informants asked the case researchers whether we had heard of, or knew about a speech to Haier employees that Chairman Ruimin Zhang made in 1994. Our notes show that for each product innovation the research team was tracing, at least one informant and sometimes two or three raised the question about the speech titled “Haier is the Sea”. Most of the informants who directed us to the speech were employed at Haier at the time the speech was made. However, at least nine informants had been at Haier less than five years. The research team also interviewed Chairman Ruimin Zhang, who ostensibly wanted to be briefed on the purpose and progress of the case studies. During the interview, which lasted more than three hours, Chairman Ruimin Zhang declared that he is a “deep believer in Daoism” and directed the team to read his speech “Haier is the Sea”. The speech (in English and Chinese) is reprinted and deconstructed by four commentators in *Management and Organization Review* (Issue 12.4, 2016). A second theme that Chairman Zhang pointed to was his obsession with counteracting organizational inertia, which is always poised to calcify organizational routines and resist change. It became clear that Chairman Zhang’s antidote to inertia was periodic strategic initiatives that required organizational reorientations, as summarized in Table 2.

In this speech (sometimes referred to as a letter to Haier employees), Chairmen Ruimin Zhang uses the metaphor “Haier is a Sea” to inspire Haier people to embody the essence of the sea’s characteristics, especially the power of the waves, the ever-presence of uncertainty and ambiguity, and, therefore, the imperative of flexibility, adaptiveness, and openness to change as Haier finds the way to survive and grow.

Born 5 January 1949, in Laizhou, Shandong Province, Chairman Ruimin Zhang is a first-generation Chinese manager born at the time when Mao Zedong founded, in 1949, the People’s Republic of China. He was 35 years old when he received the assignment to shut down the loss-making Qingdao Refrigerator Company, known for the poor quality and unreliability of its products. He is lionized in China because instead of shutting down the factory, he galvanized attention to the imperative of total quality by smashing every refrigerator on the assembly line and then executing a transformation to total quality and lean manufacturing, which culminated in 1991 with renaming the company and creating the Haier brand.

What is unclear is how, as a rising member of the Chinese Communist Party, Chairman Ruimin Zhang became a student of the Tao and how he acquired a deep belief in the Daoist philosophy and values that served to guide his leadership of the company. The metaphor “Haier is the sea” derives from Lao Zi’s Daoist imagery and the intrinsic meanings of water as powerful, forgiving, and neutral as it sustains life. Lao Zi believed in an enlightened leadership that does not manipulate subordinates and instead earns adherents by being humble and accepting bottom-up ideas. Chairman Zhang’s letter “Haier is the sea” expounds on how he expects the qualities of the sea to be reflected in Haier’s business practices and employees’ collective attitudes and behavior. In essence, he emphasizes the imperative of readiness to change and adapt, contribute to the

good of the collective (Haier), counteract any selfish tendencies, and exercise self-organization aligned with company single-mindedness on finding the way (top-down, bottom-up).

It became altogether clear that the speech “Haier is the sea” evolved to become the essence of socially embraced mechanisms for accepting and being open to change and served as an invisible absorptive capacity underlying the company’s successful open innovation journey.

4. Lessons: Effecting an Open Innovation Organization

Open innovation organizations seem rare. In part this is due to the lack of research on implementing open innovation organizations, as noted earlier, but it may also be due in part to the prevalence of innovation barriers in organizations more generally. Radical innovations in particular still seem to be more of an exception than a rule in many companies based on a reading of the current innovation literature.

The prior literature acknowledges a lack of understanding of internal selection regimes (how companies select for or against innovation) as they relate to innovation strategy processes. Canales (2015) suggested a categorization of strategic initiatives based on their origin, whether initiated by the CEO (“cascade”), triggered on the customer front (“spring”), or originated by middle management (“flow”). The origin was proposed to influence whether the initial selection was based on strategic fit or feasibility. Earlier research such as that by Burgelman (1983) has suggested that autonomously developed initiatives challenge the induced strategy and sometimes effect change. The selection environment has been suggested to be culturally determined (Burgelman, 1991) or strategically guided (Lovas & Ghoshal, 2000).

Beyond strategic fit, feasibility, and cultural endowment, the particular criteria for selection and actual decision processes remain surprisingly under-researched. The literature on innovation barriers, as discussed earlier, may offer some insight. Researchers have found formidable barriers to innovation (as documented in Table 1). These barriers can be interpreted as de facto selection criteria that effectively work *against* innovation. As discussed earlier, these barriers against innovation include the difficulties of connecting innovation with routine operations, lack of targeted resources at innovation, insufficient collaborative structures and processes that would coordinate innovative ideas, and no actionable strategy that would value innovation over the current way of doing business (following Dougherty & Hardy, 1996).

Against these typical innovation barriers, we draw some lessons from Haier that seem to suggest a different, enabling selection regime that is more open to innovation.

First, in Table 3, we summarize how the six radical innovation cases illustrate the open innovation organization in action. We will then discuss in turn the effecting mechanisms—a totemic leadership battling routine, opening up to serendipity, and improvisation instead of formalization.

Table 3. Six Radical Innovations and Their Effects

Toward an Open Innovation Organization	Water-Saving Washing Machine	No-Compressor Wine Cooler	On-Demand Water Heater	Tianzum Air Conditioner	ThundeRobot Professional Gamers Notebook Computer	Venture Capital Fund
Connecting innovation with routine operations	Supplier-Initiated idea at a Haier internal expo, of applying membrane technology to improve cleaning function. Haier washing machine engineers and management express interest. Persistence in exploring new membrane filtering technology leads to new water-saving functionality	A staff assistant serendipitously searched (e-mail) for external partners	Serendipitous encounter by Haier product manager at bi-annual product expo rapidly morphs into a negotiation for licensing of new technology and/or a joint venture	Use of social media to solicit customer comments and experiences concerning standalone room air conditioners	A skunkworks operation	Leverage government-provided venture capital for internal venture fund to spin off own entrepreneurial startup initiatives and for external investments in startups
Availability of targeted resources at innovation	Overcame a supplier selection deadlock	Two-week intense explorations of no-compressor refrigeration technology reveal a lack of internal Haier technological comprehension	An instant realization that a novel technology may have disruptive potential. On-demand water heater exhibition	Lack of analytics capability required outsourcing. Build internal data analytics	Created its own resourcing; became a leading video notebook in the market	Networked to central government and China Communist Party
Collaborative structures and processes that coordinate innovative ideas	Collaborative challenge; testable prototypes	Adoption of solid-state cooling technology in a less demanding wine cooler product context	Joint venture	Building of an internal analytics capability	Spin-off as an independent company under discussion with top management	Various funds
Actionable strategy that values innovation over current way of doing business	“No water” as a top-down directive	“No compressor” adopted as an emergent disruptive cooling technology	Serendipitous innovation	Integration of customer ideas into products (e.g., new air diffuser and air filtering)	Venture capital investment	Diversification beyond white goods?

4.1. *The First Effecting Mechanism: Totemic Leadership Battling Routine*

As in the case of most other companies, the leadership of the company influences strategy. Beyond guided leadership or political negotiation between autonomous and induced strategy, Haier seems to have managed to achieve an environment in which all sources of innovation flourish from inside and outside the company. We refer to this all-encompassing leadership style as totemic, as it offers grand frames for transformative action but leaves their interpretation and implementation for each employee to make sense of. The totem has been Haier's journey from the low-quality Qingdao refrigerator factory to a world-class leading manufacturer of appliances and the way the chairman has given impetus to the journey through his symbolic actions and speeches. That he smashed the low-quality refrigerators on the assembly line at the start his tenure is well known. However, the chairman's 1994 letter to Haier employees, "Haier is the sea", and the consequent Haier evolution to imprinting and sustaining an open innovation culture are not widely recognized outside of Haier. Chairman Ruimin Zhang's deep belief in Daosim may be critical to understanding his leadership style (e.g., high tolerance for ambiguity, preference for self-organization), which is consistent with Lewin and Stephens's (1994) analysis of extreme psychological attributes as determinants of CEO leadership style and preference for organizational designs.

The chairman's phobia of inertia has been the primary driver of the company's periodic strategic transformations, and hence innovation selection has been underlying and mediating successive strategic foci that have changed from quality to open innovation and, most recently, a micro-enterprise platform (Caixin: Haier's New Look: "Micro-Enterprise" Platform, 27 August 2014). As the strategic focus has changed about every five to seven years, this has counteracted the hardening of decision processes and organizational routines and has enabled different kinds of innovation ideas to spring up and offer new strategic product opportunities. It has also impacted the kind of people who have chosen to work for Haier—more entrepreneurial, perhaps, and able to cope with the ambiguity implicit in a highly adaptive self-organizing organization.

Beyond selecting innovation for the fit with strategic transformations, the second criterion featured in the studies of selection regimes, feasibility, seems to be less of a decision made at any one point in time and more of an openness to new ideas. This is followed by an iterative development activity at Haier where the problem—such as minimizing water usage during the washing machine cycle—chases the development of a solution (Simon, 1957) such as recycling and filtering water for reuse to minimize total water intake. The feasibility decision is hence postponed until it is sufficiently shaped and prototyped. This is not unlike 3M's maxim, "Thou shalt not kill a new product idea". Postpone until solved. Skunkworks in some organizations work to hide and protect the efforts until the innovation outcome can be brought to critical examination, which was the case with the ThundeRobot professional gamers notebook computer.

Support of such an open selection regime is found in the broad strokes with which the chairman paints the vision for the company. The totemic leadership offers justification for entrepreneurial action-seeking solutions, even when no immediate feasibility is in sight. The maintenance of fluidity in the application of formal management practices may be a contributing factor in that it invites self-organizing behavior by individuals to search for solutions that are available to them using persistence or creativity. Without totemic leadership, however, such a lack of routine might contribute to a loss of strategic focus and a sense of confusion of direction. However, the frequency with which employees refer to the chairman's speeches suggests that the way the chairman directs attention offers deep meaning and helps frame the implementation efforts.

4.2. *The Second Effecting Mechanism: Opening Up to Serendipity*

In all of the innovation cases discussed, serendipity plays an important role. This may be true for innovation more generally, as its source is often difficult to plan in any meaningful way. However, opening up the organization to serendipity is more remarkable in that the Haier executives express interest in the development of unexpected external ideas and that such development is resourced despite its suddenness (Phononics executives arrive unannounced) or fuzzy, hard-to-understand nature (such as a new solid-state technology replacing tried and true compressor technology). Indeed, such harnessing of novel ideas from inside and outside the organization seems like the core capability that an open organization should master. The value of open innovation is not in whether others are motivated to submit ideas but rather whether the organization is capable of absorbing and developing those ideas into offerings in the marketplace. However, assuming the importance and desirability of novelty, it is difficult to implement open innovation without opening up the organization to serendipity.

4.3. *The Third Effecting Mechanism: Improvisation Instead of Formalization*

We suggested in the beginning of the article that many management “best practices” may be to blame for the embedded systemic innovation barriers so well documented in the literature. It appears that the radical innovation breakthroughs at Haier result more from improvisation than from formalization of innovation practices. There are creative actions, clever solutions to problems, persistence in finding a solution, and making an exception to linear rational rules that would have otherwise killed the innovation (e.g., making the exception for a non-approved supplier). Thus, rather than manifesting “functional stupidity” or a lack of reflexivity and initiative (Alvesson & Spicer, 2012), the Haier employees improvise problem-solving intelligence.

The study raises important issues about the functionality of formalization of management practices in terms of innovation. An open innovation coordinating committee existed, but the six radical innovations underlying this paper did not result from a formalized or even common innovation process. Common measures such as KPIs or innovation metrics did not feature in our research discussions. This may be owing to a different management style indigenous to China, or it may suggest that such formalization is counterproductive to innovation in general and is one of the root causes of poor innovation performance. Ambidexterity may currently be in vogue for resolving the organizational tension between exploitation—a formalized activity—and exploration, which requires openness to serendipity and its further evaluation and application.

As one leading mobile phone executive stated tellingly some years ago, “We are not (yet) a normal company”, meaning that management practices dominant elsewhere had not yet been adopted; rather, the company was growing fast and improvising its way to success. (It should be added the company’s fortunes ended sometime after, based on the criteria used by the manager; the company had finally become a normal company with the usual, perhaps inevitable, management linear rational processes.)

5. **Conclusions: From an Innovation Hero to an Everyday Problem Solver**

The art of managing open innovation—interpreted as second-order renewal—is founded on principles that can be derived from complexity science, including the management of internal rates of change, the

enabling of self-organization and emergence, and the synchronization of concurrent exploration and exploitation. The lessons from Haier illustrate one firm's specific example (perhaps an outlier case) of Chairman Ruimin Zhang's approach to managing these principles by articulating strategies and values in his totemic leadership, counteracting structural inertia through regular transformations, and preferring flexible managerial processes that open up the organization to serendipity and the variety of innovation, all of which in terms of complexity science increase the life chances of the firm (Volberda & Lewin, 2003).

However, the extent of individual initiative at Haier is striking in the emergence and adoption of radical innovation cases reported in this study. While prior studies have noted occasional autonomous actions in organizations (Burgelman, 1983), and the studies on innovation-to-organization barriers have celebrated but also noted the shortcomings of a persistent innovation hero (Dougherty & Hardy, 1996), the individual initiatives at Haier are less heroic and more everyday actions, ranging from following up on the discovery of a new technology at an expo to sending letters of inquiry abroad. They also seem to include the ability to get around standard operating barriers such as unapproved suppliers that are needed to proceed and continue problem-solving or capability-building until the innovation target is reached, be it a new compressor-less product or a social media analytics capability.

It is as if openness to innovation is actually part of the job at Haier: the behavioral alignment with the strategic meaning of "Haier is the sea". Such individual initiative-taking may even be surprising in a culture that is often considered collective in its overall tone. However, the chairman's resonant sanction, both legitimizing initiative and requiring selfless action from everyone, may be unique but is also the basis for rethinking how any company can manage self-renewal innovation across technology, product, and business models. In conclusion, Haier may indeed be a unique and, perhaps, outlier case that cannot be generalized. Certainly, Chairman Ruimin Zhang cannot be cloned. It is also not clear whether his successor as CEO will be able to maintain and renew the open innovation culture created and sustained by Chairman Ruimin Zhang. Lastly, a deeper understanding of open innovation organizations requires many more studies of the type represented in this paper.

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