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Assessing strategic importance of innovation to multinational corporations

A content analysis of corporate annual reports

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Assessing strategic importance of innovation to multinational corporations through content analysis of corporate annual reports

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Abstract - **Innovation is often viewed as a key growth driver in multinational corporations. However, it is difficult to measure the attitudes of company executives towards innovation. Using quantitative content analysis, we analyse annual reports of multinational corporations. We infer the emphasis on innovation within the annual reports and therefore the importance that executives place on innovation. In the study, we find that most annual reports and companies place little emphasis on innovation. Between 2000 and 2012, we do not find clear trends in the emphasis on innovation in annual reports. However, we find a small number of companies systematically emphasising innovation. We highlight initial findings about the relative emphasis placed on innovation by different companies and suggest future research directions.**

Keywords – **Innovation, executive, strategy, content analysis, communication**

I. INTRODUCTION

"Innovation" is a term that is used widely, but seldom precisely defined [1]. Rather than seeking to restrictively classify business activities as innovative or otherwise, this study seeks to explore the usage of the term "innovation" by multinational corporations (MNCs). A significant body of literature exists examining different types of innovation from a variety of academic perspectives. Malerba & Brusoni note that, any piece of innovation research can benefit from recognising "*how rich, diverse, and multiperspective the study of innovation has become*" [2].

It is beyond the scope of this paper to summarise the body of innovation research, however with reference to this study, particularly relevant perspectives are economic [3] [4], managerial & organisational [5] [6], sociological [3], psychological [7] [8] and technological [9]. It is generally recognised that multidisciplinary innovation research can generate new insights that are not possible from any single discipline alone. Richer insights into innovation are likely to yield research that is more relevant to innovation practice within industry.

A. Nature of innovation processes

Innovation processes are heterogeneous and contingent, depending on many factors at the national, sector and firm level. At the firm level, innovation processes vary with the size of a firm, the resources available to a firm, the firm's experience in innovation, the sector in which the firm operates and the country in which a firm is based, among others [9]. Therefore, a multidisciplinary view is often valuable in understanding the effects of these factors on innovation processes.

At the firm level, Kline & Rosenberg's chain-linked model has been extremely influential as an alternative to the "Linear Model", whereby the firm: "*does research, research then leads to development, development to production, and production to marketing*" [10]. Kline & Rosenberg identify many deficiencies in this model, which are now widely accepted [11]. Perhaps most importantly, they argue that innovation is fundamentally not linear, but rather contains many feedback loops, which help to improve the probability that the innovation will be commercially successful [10].

B. Financing innovation & innovative activities

Innovative activities require the securing of financial resources. The source of these financial resources varies by company size and ownership. For publicly-listed multinational corporations, one means of attracting resources is via shareholder capital. In order to attract shareholder capital, multinational corporations are legally required to disclose specific information to potential shareholders, for example financial results. In addition, many multinational corporations elect to communicate additional information to potential shareholders via other channels. Therefore, given that communications plays a key enabling role for innovation in multinational corporations, it is valuable to study the communications of multinational corporations with potential and current shareholders.

C. Corporate communications, identity and reputation

Literature in the field of communications is vast and diverse. This study is specifically interested in corporate communications between multinational corporations and potential shareholders. Such communications have direct strategic importance, potentially affecting the short-term and long-term performance of a firm [12]. Externally facing communications, are defined by Van Riel & Fombrun as either marketing communications - using a variety of media to promote products – or organisational communications – providing information to primarily corporate audiences [13]. These forms of corporate communications can be viewed as developing a "Corporate Identity" and "Corporate Reputation", both of which have been studied for their impact on company performance.

Corporate identity and corporate reputation are widely discussed and debated concepts, lacking universally accepted definitions. Indeed, as Gotsi & Wilson highlight, "*these concepts frequently appear in the literature as identical, as totally separate concepts or as interrelated phenomena depending on the viewpoint adopted*" [14].

Forman & Argenti offer a useful framework for this study, whereby corporate identity includes all corporate communications, branding, websites and any representation of the company to stakeholders [15]. Citing the work of Burke [16], Forman and Argenti argue that when stakeholders perceive a corporate identity, they form perceptions of the underlying company itself. In Forman & Argenti's framework, the combination of all the stakeholders' perceptions forms the corporate reputation. This is consistent with Fombrun & Van Riel's view:

> *"A corporate reputation is a collective representation of a firm's past actions and results that describes the firm's ability to deliver valued outcomes to multiple stakeholders"* [13].

A recent communication by Apple's current CEO Tim Cook is a particularly good example. In a letter to Chinese customers apologising for poor customer service, Tim Cook stated:

> *"We are aware that a lack of communications...led to the perception that Apple is arrogant and doesn't care or attach enough importance to consumer feedback"* [17].

In this letter from Apple's CEO, it is clear that he believes poor corporate communications by Apple employees with its Chinese customers has led to a negative perception and corporate reputation.

The critical importance of corporate reputation lies in its impact on the financial performance of a firm. In a survey of the literature investigating the empirical relationship between corporate reputation and financial performance, Sabate & Puente conclude that the research "*shows empirical support for both directions of the relationship between corporate reputation and financial performance: corporate reputation influences financial performance and vice versa*" [18].

Using an interview-based approach, Greyser summarised interview data from more than 10,000 executives in more than 16 countries to conclude that the benefits of a good corporate reputation include: preference in doing business with a company when offerings are undifferentiated from competitors, support for a company in times of controversy and increased company value in financial markets [19].

Furthermore, Roberts & Dowling used financial data and reputation rankings from the FORTUNE 1000 survey to demonstrate that these effects of positive reputation are long-term and therefore confer long-term strategic advantage [20]. They conclude that "*firms have a greater chance of sustaining superior performance over time if they also possess relatively good reputations*".

In conclusion, several studies have shown that effective corporate communications can help to enhance the financial performance of a firm, specifically by attracting stakeholders to do business with, support or invest in the firm.

Given the potential link between corporate communications of a firm and its ability to attract the resources necessary to innovate, a relatively new body of literature is being developed in "innovation communication".

D. Innovation communication

Innovation communication is defined by Mast, Huck & Zerfass as "*symbolic interactions between organizations and their stakeholders, dealing with new products, services, and technologies*" [21]. The contribution of Mast, Huck, Zerfass, as well as Nordfors has focussed almost exclusively on innovation journalism, sometimes treating "innovation communication" and "innovation journalism" as synonyms.

Mast, Huck & Zerfass investigate the communication strategies of companies disclosing information about technological innovations to journalists and therefore to the wider public [21]. In a similar vein, Nordfors promotes media such as newspapers and industry publications for providing timely information and for "*strengthening the sense of group identity and community within the innovation systems*" [22]. For example, the San Jose Mercury News is cited as performing this role in the growth of Silicon Valley.

Pfefferman, Hülsmann & Scholz-Reiter define innovation communication as "*an important managerial function; understood as a firm's capital that tends to enhance competitive advantage*" [23]. This perspective is notable for its definition of innovation communication as a core management activity, similar to supplier relationship management, human resource management or quality management.

As highlighted above, Pfefferman, Hülsmann & Scholz-Reiter view innovation communication in a more holistic sense. They highlight eight "dimensions" of innovation communication:

1. *Communication*: Aiming to communicate innovations and the company's innovative capability to stakeholders.
2. *Innovation*: Some degree of innovation within a firm is essential in order to necessitate innovation communication.
3. *Timeframe*: Careful consideration of appropriate timing of communication, with regards to historical, current or future events
4. *Interrelation*: Communicating both individual technological innovations as well as technology competencies of a company.
5. *Subject/Information*: Tailoring communications depending on the type of information being delivered and the intended target audience (e.g. an innovation cluster).

6. *Learning*: Helping to communicate concepts by building on the audience's existing knowledge of related subjects, or explaining concepts in a clear and effective manner.
7. *Enhancement of Company Value*: The ability for a company's value to increase with effective innovation communication.
8. *Innovation Reputation*: The stakeholders' collective positive judgements of an organisation's innovativeness over time.

As well as supporting the short term "diffusion of innovations" described by Rogers [24], Pfefferman, Hülsmann & Scholz-Reiter also view innovation communication as performing an essential role in building a positive "innovation reputation" for a firm [23].

E. Innovation communication research gaps

As the field of innovation communication is relatively young, terms such as "innovation reputation" have not been clearly defined or researched. Therefore, this study is inductive in its nature, aiming to explore "innovation communication" as part of MNC's corporate communication activities. The research question aims to explore research gaps in relation to annual reports as a form of corporate communications: How do multinational corporations use annual reports to communicate about innovation and innovative activities?

II. METHODOLOGY

A. Overview of methodology

Quantitative Content Analysis was selected as the most appropriate method due to the advantages it offers including: a non-intrusive research method [25] [26] [27]; longitudinal research designs [28]; suitability to topics which are difficult to study [25] [29] [30]; low cost and ease of scaling up [27] [28].

Quantitative Content Analysis requires a specific type of content to be analysed. For this study, corporate annual reports were chosen because of specific advantages including: importance of annual reports to the target audience [31] [32] [33] [34] [35]; non-intrusiveness of the methods and reliability of results [36]; validity of annual reports as a source of content [32] [37] [38].

Content analysis can be defined briefly as the "*systematic, objective, quantitative analysis of the content of messages*" [39]. This research method relies on the key assumption "*that the analysis of texts lets the researcher understand other people's cognitive schema*" or their organisation of knowledge about a particular concept [29].

In the most basic form, researchers measure the frequencies of specific words within a body of texts. The key assumption used in many of these studies is that word frequency is an indicator of the intensity of executives' attention on the theme indicated by the word [40].

A review of content analysis literature in Organisation Studies by Duriau, Reger & Pfarrer found that 83 out of 98 articles used "*some form of frequency counts*" in their implementation of the research method [29]. Word frequency counts have been used in studies of stylistic elements in annual reports [41], quantifying persuasive elements in CEO letter to shareholders [42], quantifying pessimism in president's letters in annual reports [43], comparing cultural attributes and topical coverage in US and Latin American CEO letters [44], as well as many further studies covering a range of different topics.

B. Prior research on annual reports

Annual reports are documents issued to shareholders and published online by publicly-listed corporations. David notes that "*unlike advertising, in which the purpose is openly persuasive, annual reports contain dual purposes - to deliver information about the company's yearly progress and to convey the company's beliefs and attitudes*" [45].

Duriau, Reger & Pfarrer suggest that annual reports are "*prime materials to study the interaction of firms with their environment*" as they have "*several advantages over other sources of corporate information to study cognitive phenomena*" [29]. For this reason, annual reports have been studied significantly using content analysis.

For example, content analysis has been used on annual reports to: analyse the use of graphs [46] [47]; assess the attitudes and schema of CEOs [42] [43] [48] [49] [50]; analyse accounting statements [51] [52] [53].

However, most of these studies have been conducted by academics in the field of accounting, and there is a lack of research on "*the role of culture in the construction of corporate messages, particularly the annual reports that appear on most organizations' Web sites*" [44]. This is particularly important, given the view that annual reports "*embed cultural beliefs and values that may affect how readers envision the company, the industry, and even the business practices of the culture*" [45].

C. Prior research on annual reports

Annual reports from 2000 to 2012 inclusive were collected for the 100 companies in the S&P100 for each year. In total 33 reports were not available due to the company in question not being publicly listed for the required year; and 119 reports were only published as an accounting document format (10k). Therefore a total of 1,124 annual reports were downloaded successfully for analysis, out of a nominal 1,300.

MAXQDA 11 (VERBI GmbH), a text analysis software tool, was used to search for words containing the word fragment "innovat-" in each document; and to store the total count for each document. Using the word fragment "innovat-" meant that the following words were all included in the search: innovate; innovative; innovativeness; innovating; innovated; innovator; innovators; innovates; innovation; innovations.

III. RESULTS

To present graphical results, all word counts are converted to word frequencies, by dividing the "innovation word count" by the "total word count" for each document. The word frequencies are then presented as "*innovation" words per 10,000 words*.

Systematic analysis of word frequency begins with descriptive univariate analysis, followed by bivariate analysis.

A. Frequency distribution of "innovation" word frequency

Analysing the dependent variable, "*Innovation" words per 10,000 words*, a frequency distribution can be created using "bins" with a width of 2, see **Fig. 1**.

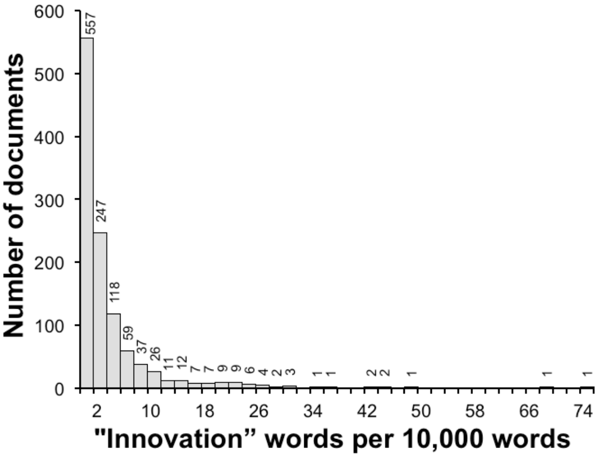

Fig. 1. Histogram showing overall distribution of "innovation" word frequency data

B. Longitudinal analysis of "innovation" word frequency

In order to gain an insight into the longitudinal variations in "innovation" words per 10,000, the word frequency data is plotted against time in Fig. 2.

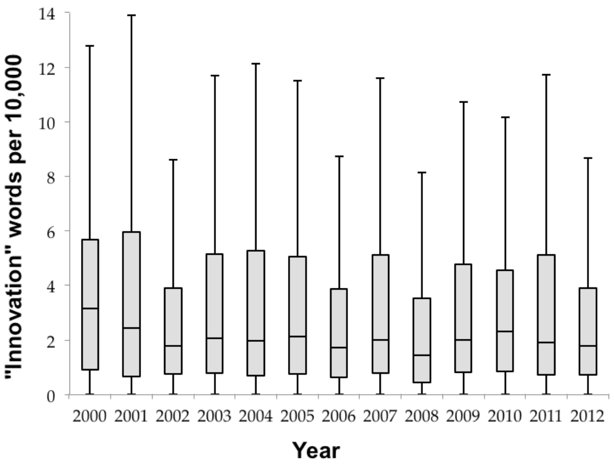

Fig. 2. "Innovation" words per 10,000 in annual reports over time; outliers excluded from plot

Box segments represent first quartile, median and third quartile of data. Minimum whiskers represent the minimum for each year. Outliers were found to exceed the upper fence and were omitted from plots, with "maximum whiskers" plotted as 3rd quartile + (1.5 x interquartile range) [54].

	2000	2001	2002	2003	2004	2005	2006
Total documents (n)	73	85	85	87	91	87	93
Outliers	5	2	4	6	10	8	7
Documents plotted	68	83	81	81	81	79	86
Percentage of documents plotted (%)	93.2	97.6	95.3	93.1	89.0	90.8	92.5

	2007	2008	2009	2010	2011	2012
Total documents (n)	89	90	88	88	85	83
Outliers	9	7	8	7	7	10
Documents plotted	80	83	80	81	78	73
Percentage of documents plotted (%)	89.9	92.2	90.9	92.0	91.8	88.0

Fig. 3. Statistics for outliers omitted from Fig. 2.

C. Average "innovation" word frequency by company

The average of each company's "innovation" word frequency over all available years is shown in Fig. 4 and Fig. 5. Companies are ranked from 1 to 96 in Fig. 4.

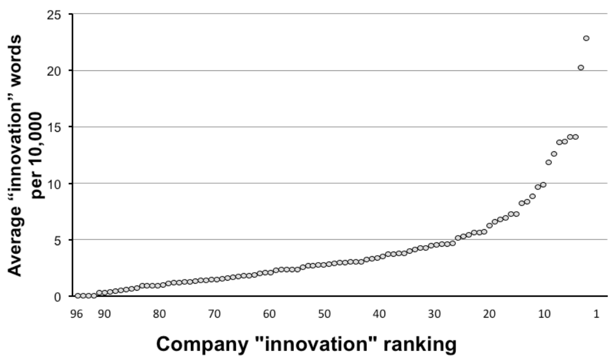

Fig. 4. Average "innovation" words per 10,000 in annual reports for each company (n=96)

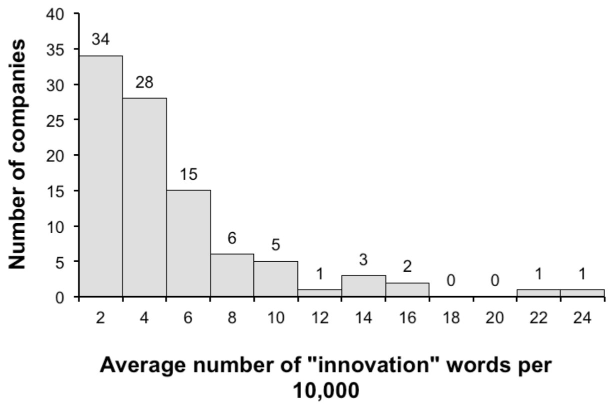

Fig. 5. Frequency distribution of average "innovation" words per 10,000 in annual reports for each company

IV. DISCUSSION

A. Overall emphasis on innovation in annual reports

Fig. 1 shows that 90.7% of the annual reports (n=1018) fall in the first five bins from 0-10 words per 10,000, implying that innovation is not emphasised in these annual reports. This is perhaps surprising considering the emphasis that is placed on innovation within management literature, as discussed earlier. This finding could imply that for the vast majority of reports, executives did not believe it was important to communicate their companies' innovative activities to potential and current shareholders. This could be because innovation is not a core competence of the companies and they were not seeking investment from potential shareholders to support innovative activities. This appears to be contrary to the orthodox view of innovation as central to firm growth.

The remaining 9.3% of annual reports are spread over a very large range, using between 10 and 76 "innovation" words per 10,000. It is clear that there are "outliers", where a company has specifically adopted an innovation-centric approach to the annual report. Executives in MNCs are aware that investors study many annual reports and will be consciously or unconsciously comparing them. Therefore, the executives responsible for the 12 annual reports using "innovation" words more than 30 times per 10,000 words could be attempting to differentiate their corporate communications. Since 90.7% of annual reports do not emphasise innovation, the small number of companies that do focus on innovation are more likely to differentiate themselves. Therefore, this evidence suggests that a very small proportion of executives in MNCs try to differentiate their companies by prioritising innovation highly in annual reports, to attract potential shareholders.

B. Variation over time of emphasis on innovation in annual reports

As Fig. 2 shows, the third quartile of the box plots is below 6 "innovation" words per 10,000 for every year. Given that outliers have been omitted from the plots for clarity, the box plots represent the shifts in "innovation communication" in corporate annual reports of the vast majority of firms for whom "innovation" is not emphasised in annual reports. The firms with an "innovation" focus in their communications are represented in "outliers", which are far beyond the top of the chart. These outliers are possibly MNCs where executives view innovation as a key competitive advantage.

The most notable characteristic in Fig. 2 is the lack of a positive trend. Indeed, the highest annual median is the earliest year: 2000 (2.23 words per 10,000). Overall there is no observable increase in the usage of "innovation" words over the period 2000-2012 as the median of the box plots shows no clear trend.

1) Emphasis on innovation in 2008: The year with the lowest First, Second (median) and Third quartile in this data set was 2008. In other words, companies generally focussed least on innovation in their annual reports in 2008, compared to other years. This covers the period in which the Global Financial Crisis began and worsened. This observation implies that for this year, executives' attention in the annual reports was diverted further away from innovation in the short term, instead focussing on discussing the existing operations of their company, to demonstrate their ability to survive in the long term. Significantly, this implies that innovation may not be viewed as an important way to protect share price or as a means of ensuring the survival of these MNCs, in times of economic crisis.

2) Outliers for each year 2000-2012: It appears that annual reports with an "innovation" focus are relatively rare. For this data set, those focussing on innovation are outliers, most of which are so much higher than the third quartile that they have not been plotted in order to maintain clarity of the plot. Indeed, every year had outliers as shown in Fig. 3. Therefore, it is expected that some firms will consistently use significantly more than 10 "innovation" words per 10,000 words.

C. Average emphasis on innovation in annual reports by company

Fig. 4 should be treated with caution, given that the x-axis is ordinal rather than numeric. However, Fig. 5 is very helpful in confirming the hypothesis that a small number of companies are focussing significantly more on communication about innovation, compared to the majority of companies. 80.2% of companies are in the first three "bins", each using on average fewer than 6 "innovation" words per 10,000.

It is notable that two MNCs are prolific in their usage of "innovation" words, using these words 4 to 10 times more frequently than the vast majority of MNCs.

Clearly, the data set does not approximate well to a normal distribution and has a significant negative skew, with a long tail in the "positive direction" of increasing "innovation" words per 10,000.

Informally, it is interesting to note the companies at the top and bottom of the ranking in Fig. 4.

Highest average "innovation" words per 10,000

1. DuPont
2. Procter & Gamble
3. EMC Corporation
4. Qualcomm
5. Pfizer
6. The Coca-Cola Company
7. Dell
8. MasterCard
9. Colgate-Palmolive Co.
10. Accenture

Lowest average "innovation" words per 10,000

87. American Express Inc.
88. Simon Property Group
89. Time Warner Company
90. Occidental Petroleum Corporation
91. Anadarko Petroleum Corporation
92. Wells Fargo
93. MetLife
94. Williams Companies
95. Freeport McMoran
96. Berkshire Hathaway

Based on this small sample, it appears that the companies using "innovation" words most frequently are likely to be IT, Consumer Staples, Materials or Health Care companies. Companies in these sectors are often referred to as "high tech" companies who invest heavily in innovation. The position of companies from these sectors in this ranking is a promising sign that the methodology used in this study reflects some aspects of reality.

It appears that the companies using "innovation" words least frequently are likely to be Energy, Financials or Consumer Discretionary companies. Anecdotally, Berkshire Hathaway, the multinational conglomerate holding company run by Warren Buffett was ranked 96th out of 96 companies. Given that Warren Buffett is legendary for viewing change "*as more of a threat investment-wise than an opportunity*" [55], it is expected that Berkshire Hathaway's annual reports would not seek to emphasise innovation.

In a further study, a more detailed analysis of the relative position of different companies in this ranking could offer a valuable insight into management attitudes to innovation. In particular, including variables such as "Primary Sector" could be particularly valuable, given the initial findings that companies from certain sectors may use "innovation" words significantly more (IT, Consumer Staples, Materials, Healthcare) or less (Energy, Financials, Consumer Discretionary).

D. Limitations of study

As with any research project, there are limitations to the findings, which arise due the research methods applied. The findings are not easily generalizable to other MNCs or to smaller companies, as the sample of companies in this study was 96 out of 100 of the largest publicly-listed MNCs in the U.S., as defined by the S&P 100 index. The methodology is also limited to publicly-listed companies who publish annual reports; however, executives in privately-held and publicly-held MNCs may differ significantly in their priorities. In particular, the emphasis on year-on-year earnings growth, which is highly-prioritised by publicly-listed MNCs, is likely to be significantly less important in privately-held companies. Therefore, these findings, relating to the assumed link between innovation and growth of MNCs, may not be applicable to privately-held MNCs.

E. Future research directions

Due to the exploratory nature of this project, the findings have highlighted potentially valuable approaches to research in this field. As noted previously, it is potentially valuable to further explore the relative emphasis placed on innovation in annual reports by different companies. In addition, including the "Primary Sector" variable could allow for intra- and inter-sector exploration of the emphasis of innovation in annual reports.

Secondly, this research method could be valuable as a means of systematically and reliably identifying outliers, which are MNCs who use "innovation" words significantly more than the vast majority of MNCs in a sample. These MNCs could then be studied individually to investigate reasons for their executives' high prioritisation of innovation.

A similar research design could be applied to MNCs in different countries. This might provide the opportunity for comparisons between MNCs in different countries over the same period of time, providing insights into the globalisation of certain industries.

A similar longitudinal and cross-sectional research design could be applied to MNCs using other forms of corporate communications, for example Press Releases, Earnings Reports, Social Media (Facebook, Twitter) and recorded interviews. This might allow "triangulation" of the findings.

A similar longitudinal and cross-sectional research design could use any other set of words, rather than "innovation" words, for example "resource scarcity", "talent" or "environment". The impacts of significant global events such as the ratification of the Kyoto Protocol could then be studied in a similar vein.

Quantitative content analysis proved to be a simple, inexpensive and quick way of systematically analysing a large number of documents and inferring their emphasis on innovation. To the author's knowledge, no published studies to date have used quantitative content analysis with such a large number of annual reports (1,124) over such a long period of time (2000-2012) to investigate any phenomena within management. It is therefore a powerful tool that can be used alongside other research methods to generate rich insights into innovation within multinational corporations.

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