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Exploring the Key Drivers of Radical and Incremental Innovation in Moroccan SMEs: A Principal Component Analysis Approach

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Abstract. *Innovation is a critical driver of business success, and firms must develop effective innovation practices to stay competitive. This study aimed to identify the key drivers of innovation within Moroccan SMEs companies and explore how they can improve their innovation performance. Using the Principal Component Analysis (PCA) framework, the study identified six groups of questions related to different aspects of innovation, including investment in R&D, embracing new ideas, formal processes, fostering a culture of learning and improvement, having a clear vision and strategy, and collaboration with external partners. The findings suggest that firms that have a strong culture of innovation tend to invest more in R&D, track innovation using specific KPIs, and prioritize long-term growth over short-term gains. Additionally, collaboration with external partners and having a dedicated team for driving innovation efforts are also critical factors for innovation success. The study concludes that firm's creativity and lance between radical and incremental innovation, have the necessary resources and capabilities, create an organizational culture that encourages risk-taking and creativity, and have effective innovation management processes in place. Consequently, firms can gain a competitive advantage and thrive in today's dynamic business environment.*

Keywords: Innovation, Moroccan Organizational culture, R&D investment, Incremental and radical innovation, Principal Component Analysis

JEL Codes: L11, L25, M21, 031

1. Introduction

According to Kim and Mauborgne (2015), innovation is a crucial driver of firm performance, as it enables firms to stay competitive and meet the changing demands of customers and markets. Innovation can take two main forms: radical and incremental. Radical innovation refers to the creation of entirely new products, services, or business models that fundamentally change the way customers interact with a firm. Incremental innovation, on the other hand, refers to the continuous improvement of existing products, services, or processes.

Radical Innovation as stated by Christensen and Raynor (2003), involves significant changes to a firm's existing products, services, or business models. This type of innovation can create entirely new markets, disrupt existing ones, and provide a competitive advantage to firms that are successful in implementing it. Radical innovation is typically associated with high levels of risk and uncertainty, as firms must invest significant

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resources in developing and commercializing new products or services that may not be successful in the market.

Despite the risks associated with radical innovation, firms that engage in this type of innovation can achieve significant benefits in terms of firm performance. As stated by Damanpour and Aravind (2012), radical innovation can lead to higher profits, increased market share, and improved brand image. By introducing new and innovative products or services, firms can differentiate themselves from their competitors and establish themselves as market leaders.

Incremental Innovation according to Rothwell (1994), involves making small, continuous improvements to a firm's existing products, services, or processes. This type of innovation is less risky than radical innovation but can still have a significant impact on a firm's performance. Incremental innovation can help firms to reduce costs, improve efficiency, and enhance the quality of their products or services. Incremental innovation is also easier to implement than radical innovation, as it typically requires less investment and can be implemented more quickly.

However, as noted by Tushman and O'Reilly (1996), incremental innovation alone may not be enough to sustain a firm's competitive advantage. Firms that rely solely on incremental innovation may find themselves falling behind their competitors who are engaging in radical innovation. Therefore, firms must strike a balance between radical and incremental innovation to achieve optimal firm performance.

According to Teece (2010), several factors affect a firm's ability to engage in radical or incremental innovation. These include the firm's resources, capabilities, and organizational culture. Firms with greater resources and capabilities are more likely to engage in radical innovation, as they have the financial and human capital to support risky innovation projects. Additionally, firms with an innovative culture that encourages risk-taking and experimentation are more likely to engage in radical innovation.

As noted by Hitt et al. (2018), despite the potential benefits of radical and incremental innovation, firms face several challenges when pursuing these strategies. These challenges include the high costs and risks associated with radical innovation, the difficulty of balancing radical and incremental innovation, and the need to manage innovation projects effectively. Firms must develop strategies to overcome these challenges if they are to succeed in implementing innovative products, services, or business models.

Regardless of the potential benefits of both radical and incremental innovation, it is unclear how Moroccan firms can effectively balance these two types of innovation to achieve optimal performance, so "to what extent do Moroccan firms rely on radical versus incremental innovation to enhance their performance, and what are the factors that influence their choice of innovation strategy?"

We can suggest as hypotheses:

- **H1:** Companies that invest more in R&D and track innovation using specific KPIs are more likely to pursue radical innovation and have a strong culture of innovation.
- **H2:** Companies that prioritize embracing new and innovative ideas, managing risks, and being an industry shaper or fast follower tend to have a higher level of innovation success.
- **H3:** Companies that foster a culture of continuous learning and improvement, innovation creativity, and risk-taking tend to have a higher level of innovation success and a stronger culture of innovation.

2. Review of literature

Innovation is a crucial strategic decision for many organizations as it offers a significant way to adapt to changes in markets, technology, and competition (Dougherty & Hardy, 1996). It is necessary for companies that compete in environments where change is pervasive, unpredictable, and continuous (Brown & Eisenhardt,

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1997). Over the past 20 years, innovation has been the focus of much research in strategy and related fields (Drazin & Schoonhoven, 1996; Fiol, 1996; Glynn, 1996; Ibarra, 1993; Shane & Venkataraman, 2000; Van de Ven, Polley, Garud, & Venkataraman, 1999; Walsh & Linton, 2000), and it is likely to impact and be influenced by a company's strategic initiatives, processes, and organizational structure. Successful implementation of an innovation strategy requires significant systemic changes in a company to promote risk-taking as innovation entails considerable risk-taking (Edgett, Shipley, & Forbes, 1992).

Although, there is a considerable amount of research on what strategies and structures make a company innovative, there is less evidence on the processes (e.g., improvisation, experimentation, and transitioning from one project to the next) that enable a company to be continuous or more innovative (Brown & Eisenhardt, 1998). Furthermore, studies rarely differentiate among types of innovation (Damanpour, 1992; Drazin & Schoonhoven, 1996; Klein & Sorra, 1996).

Research on innovation has progressed along various courses rather than a single one, encompassing diverse types varying in scope, depth, and objective. Researchers have identified various types of innovation, including administrative and technical, product and process, technological and architectural, and incremental and radical (Chiesa, Coughian, & Voss, 1996). Distinguishing between incremental and radical innovation is not always clear (Henderson & Clark, 1990). While most innovations build on what already exists, requiring modifications to existing functions and practices, some innovations change the entire order of things, making old ways obsolete (Van de Ven et al., 1999). Tushman and Romanelli (1985) and other researchers (e.g., Gersick, 1991) broadly distinguish between two types of organizational change: incremental and radical.

2.1. Empirical review

2.1.1. Radical innovation and incremental innovation

The literature indicates that a firm's ability to achieve economic success and longevity is dependent on its capacity for both incremental and radical innovation. It is important to strike a balance between the two (Farjoun, 2010; He & Wong, 2004; March, 1991; Probst & Raisch, 2005). While incremental innovation can lead to greater efficiency, radical innovation is necessary to avoid competence traps (Levinthal & March, 1993). To thrive, firms must constantly develop and improve their products and processes to stay ahead of competitors and avoid technological obsolescence (Teece, 2007; Teece et al., 2007). This study distinguishes between incremental and radical innovation based on the changes made by the firm in its technological and organizational path (Cooper & de Brentani, 1991; Damanpour, 1991). Radical innovation involves fundamental changes in a firm's products, processes, technologies, and organizational structure and methods (Dewar & Dutton, 1986; Meyers & Tucker, 1989; OECD, 2005; Song & Montoya-Weiss, 1998), leading to new technology implementation and a change in strategy.

Incremental innovation involves refining and reinforcing existing products, processes, technologies, organizational structure, and methods (Chandy & Tellis, 1998; OECD, 2005), improving organizational products, enhancing operations, quality, and reducing costs in stable environments (Bierly & Chakrabarti, 1996; Dewar & Dutton, 1986). Radical innovation involves creating new markets and products, broad search, effectiveness, discovery, learning by doing, variance-increasing, flexibility, and revolutionary change, while incremental innovation involves efficiency, routinization, variance-decreasing local search, and evolutionary change. Although the radical/incremental dimension is well-established, the unit of analysis to which it has been applied has not been clear, and measures have not been well-specified. The analysis of the effects of incremental/radical innovation has typically been at the product level (Ehrnberg, 1995). For example, Myers and Marquis' (1969) work defined incremental and radical at the product level (e.g., printers). More recently, Green et al. (1995) developed multiple dimensions for radical/incremental but applied them to product

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characteristics. Innovation capability fully mediates the relationship between radical innovation and business performance, while construction companies with low innovation capability exhibit a strong influence on incremental innovation and business performance connections (Kamal et al., 2023). For Al-Khatib the significance of radical and incremental innovation in enhancing competitive advantage, with the moderating role of technological intensity playing a crucial role in increasing innovative capabilities and overall competitive advantage in industrial companies (Al-Khatib et al., 2022). This article focuses on the impact of radical/incremental innovation on the performance of SMEs in Morocco. Radical innovation is defined as the fundamental or revolutionary changes in existing products, services, or processes, while incremental innovation is defined as minor improvements or simple adjustments in existing products, services, or processes.

2.1.2. Firm Performance

Firm performance is a key concern for managers and researchers alike. It is widely acknowledged that innovation is one of the main drivers of firm performance, particularly in dynamic and competitive environments (Damanpour & Wischnevsky, 2006; Jansen, Van den Bosch, & Volberda, 2005; Laursen & Salter, 2006; Love & Roper, 2009; Tidd, Bessant, & Pavitt, 2005). Innovation can improve a firm's financial performance through increased sales, reduced costs, and enhanced market share (Damanpour & Aravind, 2012; Gupta, Malhotra, & Czinkota, 2019; Li & Atuahene-Gima, 2001; Love & Roper, 2009). Furthermore, innovation can lead to improved non-financial performance, such as increased customer satisfaction, employee motivation, and reputation (García-Muiña & Castro, 2019; Kessler & Bierly, 2002; Laursen & Salter, 2006).

Studies have also examined the relationship between different types of innovation and firm performance. Some studies have found that radical innovation has a stronger positive impact on firm performance than incremental innovation (Damanpour & Wischnevsky, 2006; Lee & Kim, 2011; Zeng, Xie, & Tam, 2010).

Inter-firm cooperation and conflicts, including constructive and destructive aspects, significantly influence new product development (NPD) performance, with innovation capability acting as a mediating factor. Xu et al., 2023, conduct a study, based on data from 181 industrial cluster firms, reveals that cooperation and constructive conflict positively impact both incremental and radical innovation capability, while destructive conflict negatively affects incremental innovation capability. The findings have implications for firm managers and policymakers interested in regional development through industrial clusters. Radical innovation can lead to new market opportunities, competitive advantage, and superior performance (Damanpour & Wischnevsky, 2006; Hitt, Ireland, & Lee, 2000). Other studies have found that incremental innovation is more important for maintaining a firm's competitiveness and improving its financial performance (Belderbos & Carree, 2002; Hagedoorn & Cloodt, 2003; Roper & Love, 2002).

2.1.3. Moderating factors

The impact of incremental and radical innovation on firm performance is influenced by various internal and external factors. Internal factors include the firm's resources, capabilities, and organizational structure (Damanpour, 1991; García-Muiña & Castro, 2019; Jansen et al., 2005; Kessler & Bierly, 2002). For instance, firms with greater financial resources and R&D capabilities may be better equipped to pursue radical innovations, while firms with a more centralized organizational structure may struggle to implement new ideas.

External factors include market conditions, competition, and regulatory environment (Damanpour & Wischnevsky, 2006; Laursen & Salter, 2006; Love & Roper, 2009). For example, in highly competitive markets, firms may need to innovate more frequently and pursue radical innovations to gain an edge over their rivals. On the other hand, in more stable and regulated environments, incremental innovation may be more

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appropriate for improving firm performance0. The impact of innovation on firm performance may vary depending on the industry and the stage of the firm's life cycle (Damanpour & Aravind, 2012; Love & Roper, 2009; Tidd et al., 2005). Leadership and management support play a crucial role in promoting radical and incremental innovation by mediating and moderating the effects of knowledge acquisition and absorptive capacity, as highlighted in this research based on Resource Based View theory (Idrees et al., 2023).

For instance, radical innovation may be more beneficial for firms in emerging industries, where there are fewer established competitors, while incremental innovation may be more important for firms in mature industries, where competition is intense and margins are thin.

3. Methodology

The selection of sample and sample size is crucial in any scientific research as it ensures that the obtained results are representative of the target population. In our study, we targeted SMEs, and it is important to select a sample of businesses that reflects the diversity of this population. To ensure a detailed procedure of our survey methodology Uchida et al. (2018a).

Determining the necessary sample size is also critical to obtain significant results, and this depends on several factors, such as the variability of the target population, the desired level of precision, and the desired confidence level. For this study, we used statistical techniques to calculate the required sample size based on these factors. In our study, we utilized the formula described by Fortin and Gagnon (2016).

$$\frac{t^2 \times p(1-p)}{1+\left(\frac{t^2 \times p(1-p)}{e^2 \times N}\right)} \quad (1)$$

N is the desired theoretical sample size (N= 769010 of SMEs in Morocco until 2022) , α (s) is the confidence level (or significance level) that we wish to ensure for the measurement, tα is the margin of error coefficient derived from the confidence level (e.g., 1.96 when α = 95%), e(m) is the margin of error that we allow for the estimated quantity (e.g., we want to know the actual proportion within 5%), p is the expected proportion of the characteristic of interest (i.e., the responses of respondents to certain questions) that we want to control the margin of error for. Usually, the maximum proportion, which is 0.5, is taken, 1-p is 1 minus the proportion p.

To further enhance the scientific rigor of our study, we employed stratified random sampling to ensure that our sample is representative of the entire population of SMEs.

The coding phase consists of transforming raw data into usable data for analysis. For Yes and No type questions, we used a binary coding, assigning a value of 1 to "Yes" responses and a value of 0 to "No" responses. For Likert scale questions, we used an ordinal coding, assigning increasing numerical values to the different possible responses.

For the empirical part, we used a Principal Component Analysis method. PCA is a statistical technique used to reduce the complexity of high-dimensional datasets while retaining as much of the original information as possible. The method works by identifying the underlying patterns or structure in the data and projecting it onto a smaller number of dimensions, known as principal components.

In PCA, the data is first standardized to account for differences in scale and variance across variables. A correlation matrix is then constructed to measure the degree of association between the variables. Next, the

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eigenvalues and eigenvectors of the correlation matrix are computed, and the eigenvectors are used to transform the data onto a new set of orthogonal axes, representing the principal components.

The principal components are arranged in order of their corresponding eigenvalues, which represent the amount of variation in the data accounted for by each component. The first principal component explains the largest amount of variance, and each subsequent component explains a decreasing amount of variance. PCA is often used in survey analysis to identify underlying dimensions or constructs that are not directly observable. For example, in a survey of job satisfaction, the responses to multiple questions related to job satisfaction could be combined using PCA to create a composite measure of overall job satisfaction. PCA can also be used to identify potential outliers or influential data points that may be affecting the results.

PCA is a powerful tool for analysing survey data and can provide valuable insights into the underlying patterns and relationships in the data. By reducing the complexity of the data and identifying the key dimensions or constructs driving the result.

The first step in PCA is to standardize the data, which involves scaling the variables so that they have the same mean and variance. This is important to ensure that all variables are on the same scale and to prevent variables with large variances from dominating the analysis.

The information from observations/individuals is grouped into axes. The processing of these factors is called an information hierarchization.

The 1st factorial axis concentrates the maximum amount of information: it is the best summary in a 1-dimensional space, but it leaves residues (of information).

The 2nd factorial axis concentrates the maximum amount of remaining information: it is orthogonal to the first (by construction). It represents the axis of the largest residual dimension of the point cloud associated with the 1st axis, and is the best summary in a 2-dimensional space, but it also leaves residues.

The next step is to compute the correlation matrix, which measures the degree of association between the variables. This matrix is used to calculate the eigenvalues and eigenvectors, which represent the amount of variation in the data accounted for by each principal component.

The principal components are then computed by transforming the data onto a new set of orthogonal axes that represent the underlying structure of the data. These components are arranged in order of their corresponding eigenvalues, with the first component explaining the largest amount of variance in the data.

After the principal components have been computed, they are typically rotated to increase their interpretability, and the factor loadings are examined to determine which variables are most strongly associated with each component.

Finally, the congruence between the extracted components and a set of predefined criteria is evaluated to determine the performance of the model.

The validity of Principal Component Analysis is crucial for the interpretation of the results. Two main tests are commonly used to assess the adequacy of the data for PCA: the Kaiser-Meyer-Olkin (KMO) index and Bartlett's sphericity test. The KMO index measures the quality of correlations between variables and ranges from 0 to 1, with higher values indicating better data suitability for PCA. The interpretation of the KMO index considers values above 0.80 as excellent, between 0.70 and 0.80 as good, between 0.60 and 0.70 as mediocre, between 0.50 and 0.60 as poor, and below 0.50 as unacceptable. A significant Bartlett's sphericity test, with a p-value below 0.05, indicates that the correlation matrix is not an identity matrix, and the variables are not independent. Thus, the data are adequate for PCA. Conversely, a non-significant test implies that the data are not suitable for PCA, and other methods may be more appropriate.

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4. Results and discussion:

4.1. Descriptive statistics:

Based on the table of descriptive statistics provided, it appears that the questions were coded and then analysed using mean and standard deviation. The mean represents the average response to the question on a scale of 1 to 5, with 1 indicating a negative response and 5 indicating a positive response. The standard deviation provides a measure of the variation or dispersion of the responses around the mean.

In general, the mean values for all the questions are higher than their corresponding standard deviations, indicating that the responses tend to cluster around the mean with relatively low variation. This suggests that the questions are valid and that respondents provided consistent and reliable answers.

Looking at the individual questions, it can be seen that some questions received higher mean scores than others. For example, questions related to fostering a culture of innovation, collaboration with external partners, and having a clear vision for long-term growth received relatively high mean scores (above 3.5), indicating that respondents viewed these as important aspects of innovation management. On the other hand, questions related to having a budget for research and development and prioritizing long-term gains received slightly lower mean scores (around 1.5), suggesting that respondents may not view these as high priorities.

Table 1: Descriptive statistics

	Mean	Standard deviation
Do you Continuously create new processes for manufacturing?	1,52	0,500
To what extent do you agree that your company effectively tracks innovation through the use of specific KPIs?	3,66	1,125
Does your company foster a culture of innovation creativity and risk-taking within the organization?	3,80	1,162
Does your company seek to foster a culture of continuous learning and improvement in order to drive innovation?	3,84	1,030
Does your company have any formal processes or programs in place to support employee innovation	2,52	1,109
Does your company have a dedicated team or department responsible for driving innovation efforts?"	1,55	0,499
Does your company collaborate with external partners (e.g. suppliers, customers, research institutions) in its innovation efforts?	1,50	0,501
Does your company have a budget allocated for incremental improvement and enhancement of existing products and services?	1,53	0,500
Does the company have a budget set aside specifically for research and development activities?	1,20	0,404
Does the company have a clear vision and strategy for long-term growth?	1,58	0,494
Does the company actively seek out and embrace new and innovative ideas, even if they may be risky or disruptive to the current business model?	3,03	1,380
Does the company's leadership prioritize long-term or short-term gains?	1,61	0,489
Are you an industry shaper or a fast follower? Or both ?	1,67	0,841

(Source: Author, by SPSS)

4.2. Validity of the survey:

The KMO index is used to measure the adequacy of the sample size for conducting a factor analysis. It ranges from 0 to 1, with higher values indicating better sampling quality. In this case, the KMO index is 0.675, which suggests that the sample size may be acceptable for factor analysis, but the quality could be improved.

Bartlett's sphericity test is used to determine whether there is a significant correlation among the variables included in the factor analysis. The test compares the observed correlation matrix with the identity matrix (in which all variables are uncorrelated). The result is a chi-square value and associated degrees of freedom (df) and p-value. In this case, the chi-square value is 1646.884 with 78 degrees of freedom and a p-value of 0.000.

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This suggests that there is a significant correlation among the variables, and the factor analysis may be appropriate for this dataset.

Table 2: KMO index and Bartlett's test

Kaiser-Meyer-Olkin index for measuring sampling quality		0,675
Bartlett's sphericity test	Chi-square approx.	1646,884
	ddl	78
	Meaning	0,000

(Source: Author, by SPSS)

4.3. Variance Explained by Factor Analysis:

The table shows the variance explained by each factor extracted from the dataset, as well as the cumulative variance explained by each factor. The "Initial eigenvalues" column represents the total variance in the dataset before the factor analysis was conducted. The "Sums extracted from the load square" column shows the amount of variance explained by each factor after extraction, while the "Rotational sums of the load square" column shows the amount of variance explained by each factor after rotation.

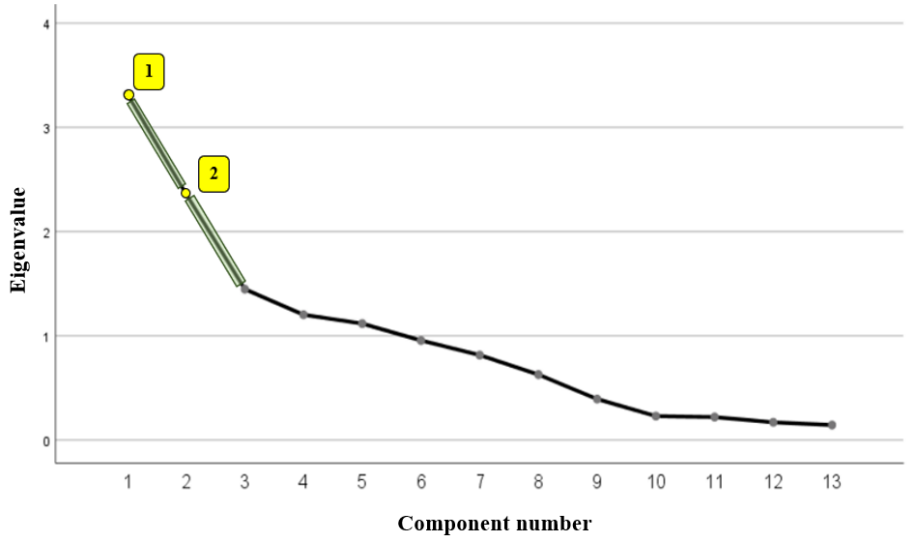
Based on the information presented in this table, we can conclude that the first factor explains 25,528% of the variance in the dataset, while the second factor explains 18.16% of the variance. Cumulatively, the first two factors explain 43.688% of the total variance in the dataset.

Table 3: Total variance explained

Component	Initial eigenvalues			Sums extracted from the load square			Rotational sums of the load square		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	3,319	25,528	25,528	3,319	25,528	25,528	3,315	25,498	25,498
2	2,361	18,16	43,688	2,361	18,16	43,688	2,365	18,19	43,688

(Source: Author, by SPSS)

The scree plot typically shows a rapid decline in the eigenvalues of the first few principal components followed by a slower decline for the remaining components. The point at which the decline in the eigenvalues levels off can be used as a cut-off point for retaining the principal components. This is known as the "elbow point" or the "knee point" and is generally considered as the optimal number of principal components to retain.



Graph 1: Scree test
(Source: Author, by SPSS)

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Thus, when interpreting the scree plot, the analyst should look for the point at which the eigenvalues start to level off and retain the number of principal components up to that point. Retaining too few principal components may result in loss of important information, while retaining too many may lead to overfitting and noise.

The table represents the results of a survey that was conducted to assess the representation qualities of a company's innovation practices. The survey consists of 13 questions that focus on various aspects of innovation, such as the company's culture of innovation, its processes for fostering innovation, its budget allocation for innovation-related activities, and its long-term growth strategy.

The table displays the two components that were extracted using Principal Component Analysis (PCA), which is a statistical technique used to identify patterns and relationships within data. The two components are represented as "Initiales" and "Extraction" in the table.

The "Initiales" column shows the initial values of each question in the survey, which range from 0 to 1. The "Extraction" column shows the weights assigned to each question by the PCA algorithm, which helps to identify the underlying factors that explain the common variance in the data.

The weights in the "Extraction" column represent the contribution of each question to the two components that were extracted. A higher weight indicates that a question has a stronger relationship with the component. The first component seems to be related to the company's long-term growth strategy, as several questions related to this factor have high weights, such as "Does the company have a clear vision and strategy for long-term growth?" and "Does the company's leadership prioritize long-term or short-term gains?".

The second component seems to be related to the company's innovation culture and processes, as questions related to these factors have high weights, such as "Does your company foster a culture of innovation creativity and risk-taking within the organization?" and "Does your company have a dedicated team or department responsible for driving innovation efforts?".

Table 4: Representation qualities

	Initiales	Extraction
Do you Continuously create new processes for manufacturing?	1,000	0,002
To what extent do you agree that your company effectively tracks innovation through the use of specific KPIs?	1,000	0,645
Does your company foster a culture of innovation creativity and risk-taking within the organization?	1,000	0,553
Does your company seek to foster a culture of continuous learning and improvement in order to drive innovation?	1,000	0,173
Does your company have any formal processes or programs in place to support employee innovation	1,000	0,020
Does your company have a dedicated team or department responsible for driving innovation efforts?"	1,000	0,568
Does your company collaborate with external partners (e.g. suppliers, customers, research institutions) in its innovation efforts?	1,000	0,537
Does your company have a budget allocated for incremental improvement and enhancement of existing products and services?	1,000	0,255
Does the company have a budget set aside specifically for research and development activities?	1,000	0,009
Does the company have a clear vision and strategy for long-term growth?	1,000	0,834
Does the company actively seek out and embrace new and innovative ideas, even if they may be risky or disruptive to the current business model?	1,000	0,522
Does the company's leadership prioritize long-term or short-term gains?	1,000	0,735
Are you an industry shaper or a fast follower? Or both ?	1,000	0,826
Extraction method: Principal component analysis.		

(Source: Author, by SPSS)

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This table presents the results of a principal component analysis (PCA) with varimax rotation on a set of survey questions related to innovation within a company. The table provides two matrices: the component matrix and the rotated component matrix.

The component matrix shows the correlations between each survey question and the extracted principal components. The first column lists the questions, and the following columns show the correlation coefficients between each question and the two extracted components.

The rotated component matrix is the same as the component matrix, but the correlations have been adjusted through the varimax rotation method to simplify the interpretation of the components.

The varimax rotation method is a commonly used technique in factor analysis that aims to simplify the interpretation of the extracted components. It maximizes the variance of the squared loadings of each variable on each component, resulting in components with high loadings on a small number of variables and low loadings on the rest. This makes it easier to interpret the meaning of each component and its relationship to the variables.

In summary, the table provides insights into the underlying structure of the survey questions related to innovation within a company. The varimax rotation has been used to simplify the interpretation of the extracted components, making it easier to understand the relationship between the variables and the components. The results can be used to identify key factors related to innovation and to develop strategies to promote innovation within the company.

Table 5: Component matrix and rotation of the Component matrix

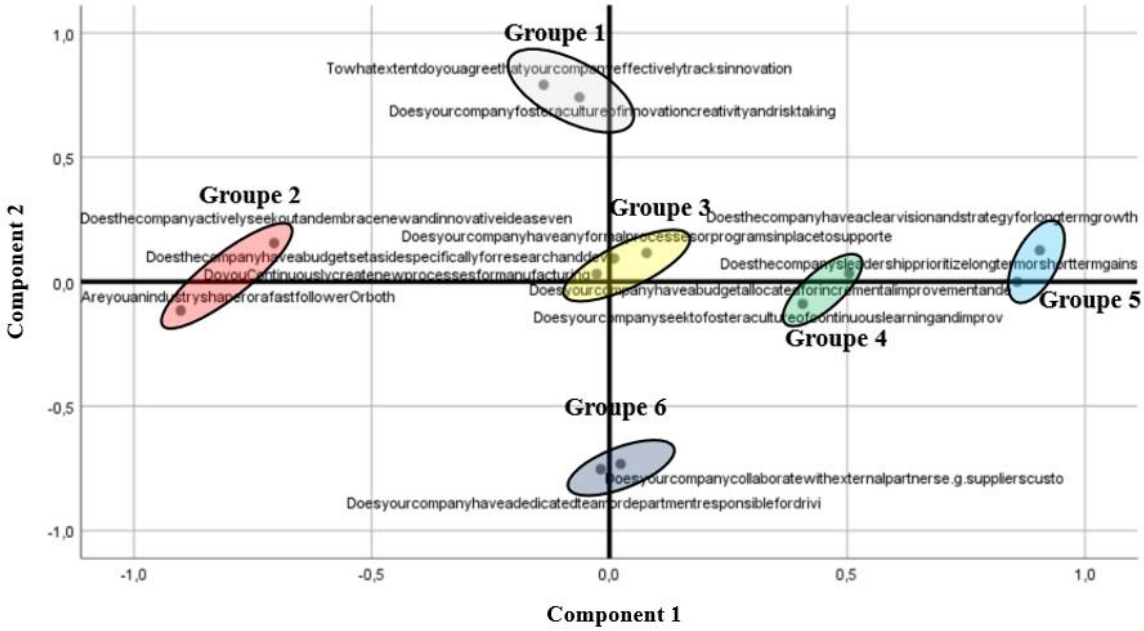
	Component matrix[a]		**Rotation of the components matrix[b]**	
	1	2	1	2
Do you Continuously create new processes for manufacturing?	-0,029	0,030	-0,027	0,031
To what extent do you agree that your company effectively tracks innovation through the use of specific KPIs?	-0,189	0,780	-0,138	0,791
Does your company foster a culture of innovation creativity and risk-taking within the organization?	-0,111	0,735	-0,063	0,741
Does your company seek to foster a culture of continuous learning and improvement in order to drive innovation?	0,411	-0,063	0,406	-0,089
Does your company have any formal processes or programs in place to support employee innovation	0,071	0,121	0,078	0,116
Does your company have a dedicated team or department responsible for driving innovation efforts?"	0,030	-0,753	-0,018	-0,753
Does your company collaborate with external partners (e.g. suppliers, customers, research institutions) in its innovation efforts?	0,070	-0,729	0,023	-0,733
Does your company have a budget allocated for incremental improvement and enhancement of existing products and services?	0,501	0,066	0,504	0,034
Does the company have a budget set aside specifically for research and development activities?	0,004	0,094	0,010	0,094
Does the company have a clear vision and strategy for long-term growth?	0,895	0,184	0,905	0,126
Does the company actively seek out and embrace new and innovative ideas, even if they may be risky or disruptive to the current business model?	-0,714	0,110	-0,705	0,155
Does the company's leadership prioritize long-term or short-term gains?	0,856	0,054	0,858	-0,001
Are you an industry shaper or a fast follower? Or both ?	-0,892	-0,173	-0,902	-0,116
Extraction method: Principal component analysis				
a. 2 extracted components.				
Extraction method: Principal component analysis. Rotation method: Varimax with Kaiser normalization.				
b. Convergence de la rotation dans 3 itérations.				

(Source: Author, by SPSS)

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This analysis suggests that there are distinct groups of innovation management practices within companies, and that these practices may be related to different aspects of innovation such as investment in R&D, culture of risk-taking, and collaboration with external partners.

The results of the study suggest that there are distinct groups of innovation management practices that may be related to different aspects of innovation, such as investment in R&D, culture of risk-taking, and collaboration with external partners.



Graph 2: Principal Component Analysis mapping

(Source: Author, by SPSS)

The plot displays six clusters of data points, each representing a different aspect of innovation practices within a company. These groups of questions can be related to both incremental and radical innovation efforts.

- The first group, situated in the top-left of the first component, indicates a company's focus on innovation through research and development activities. This group prioritizes investment in R&D and measures success through specific key performance indicators (KPIs). This suggests that companies in this group may be pursuing radical innovation.
- The second group, located in the top-left and middle of the second component, represents a company's willingness to take risks in pursuit of innovation. These companies are more likely to embrace new and potentially disruptive ideas, positioning themselves as industry shapers or fast followers. This group may also include companies pursuing radical innovation.
- The third group, situated at the center of both components, relates to a company's processes and programs for supporting employee innovation, as well as its budget for incremental improvements to existing products and services. Companies in this group prioritize continuous improvement and may have a culture that encourages and rewards innovation at all levels of the organization.
- The fourth group, located in the top-left of the first component, emphasizes a company's culture of continuous learning and improvement, as well as its willingness to take risks in pursuit of innovation.

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Companies in this group prioritize innovation and have a culture that encourages experimentation and learning from failure. This group may be pursuing radical innovation.

- The fifth group, situated in the middle and far right of the second component, relates to a company's long-term growth strategy and leadership priorities. Companies in this group have a clear vision for long-term growth and prioritize this over short-term gains. This group may be focused on incremental innovation.
- Finally, the sixth group, located at the bottom center of the first component, emphasizes a company's collaboration with external partners and the presence of a dedicated team or department responsible for driving innovation efforts. Companies in this group prioritize external partnerships and may have a well-defined organizational structure for managing innovation activities, which can help support both incremental and radical innovation.

By analyzing their alignment with these six groups of innovation practices, companies can develop targeted strategies to improve their innovation performance, whether they are focused on incremental or radical innovation.

4.4. Discussion:

The results of this study provide valuable insights into innovation practices within companies. The findings are based on a Principal Component Analysis (PCA) that identified six groups of questions related to different aspects of innovation.

The first group focuses on investment in research and development (R&D) and tracking innovation progress. The second group relates to embracing new ideas, managing risks, and positioning the company as an industry shaper or fast follower. The third group addresses formal processes, programs, and budget allocation for employee innovation, continuous improvement in manufacturing processes, and enhancing existing products and services.

The fourth group emphasizes fostering a culture of continuous learning, creativity, and risk-taking. The fifth group highlights the importance of having a clear vision, long-term growth strategy, and prioritizing long-term gains over short-term benefits. Finally, the sixth group examines collaboration with external partners and the presence of a dedicated team or department responsible for driving innovation efforts.

These findings have implications for companies aiming to improve their innovation performance. Recommendations include investing in R&D and utilizing specific key performance indicators (KPIs) to measure innovation effectiveness. Companies should also focus on embracing new ideas, managing risks, and staying competitive in the industry. Creating formal processes, programs, and allocating budgets for innovation activities are essential.

Furthermore, fostering a culture of continuous learning, innovation, and risk-taking is crucial for internal innovation. Establishing a clear vision and long-term growth strategy while collaborating with external partners and having a dedicated innovation team are also significant factors for success.

To enhance the applicability of the findings, the study examines practical examples of successful innovation practices in Morocco. For example, the textile industry collaborates with research institutions to develop eco-friendly and technologically advanced fabrics, aligning with global sustainability trends. By analyzing these examples, the study provides tangible insights and actionable guidance for companies operating in the Moroccan market. The research explores the intersection of these findings with the unique challenges and opportunities faced by Moroccan companies, contributing to a comprehensive understanding of the innovation landscape in the country.

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The study also introduces a comprehensive framework derived from extensive research and analysis, capturing various dimensions of innovation. This framework serves as a practical tool for Moroccan companies to assess and strengthen their innovation capabilities. Additionally, it establishes a foundation for future research and facilitates a standardized approach to measuring and assessing innovation performance in Morocco's business landscape.

Beyond its implications for companies, the study holds significance for policymakers, industry associations, and other stakeholders invested in promoting innovation in Morocco. The findings inform policy formulation, program design, and support mechanisms. Concrete guidance is provided on critical factors for innovation success, such as investment in R&D, fostering a culture of continuous learning, and collaboration with external partners. The study emphasizes the importance of collective efforts in creating an ecosystem that fosters innovation-driven development and sustainable economic growth.

Future research could delve deeper into understanding the drivers and enablers of innovation within each identified group and explore potential variations across industries and company sizes. Additionally, investigating the impact of these practices on innovation project success and overall company performance would be valuable. Lastly, the study's results can be used to develop a comprehensive framework for measuring innovation performance and identifying areas for improvement.

5. Conclusion

Innovation can take many forms, and firms must choose the type of innovation that best suits their goals and objectives. Radical innovation is a high-risk, high-reward strategy that involves developing entirely new products, services, or business models. This type of innovation can lead to significant breakthroughs and can help firms establish a dominant position in the market. However, it also requires a substantial investment in time, resources, and effort, and the success rate for radical innovation is relatively low.

Incremental innovation, on the other hand, is a lower-risk, lower-reward strategy that involves improving existing products, services, or processes. This type of innovation can help firms stay competitive and maintain market share. It requires less investment than radical innovation, and the success rate is typically higher. However, incremental innovation may not yield significant breakthroughs, and it may not be enough to keep pace with rapidly changing market conditions.

To achieve optimal performance, firms must strike a balance between these two types of innovation. They must decide how much resources they want to allocate to each type of innovation and how to manage the risks associated with each approach. This requires careful planning and execution, as well as a deep understanding of the firm's goals and objectives.

Another critical factor that affects the success of innovation projects is the firm's resources and capabilities. Innovation requires significant investment in time, money, and talent. Firms must have the necessary resources, such as R&D budgets, to fund innovation projects. They must also have the necessary capabilities, such as R&D expertise and project management skills, to execute these projects effectively. Without these resources and capabilities, innovation projects are likely to fail.

In addition to resources and capabilities, organizational culture also plays a crucial role in fostering innovation. Firms must create a culture that encourages risk-taking, experimentation, and creativity. They must provide an environment where employees feel empowered to propose new ideas and challenge the status quo. This requires leadership and a commitment to innovation at all levels of the organization.

However, to achieve optimal results, it is crucial to anchor the conclusion in concrete realities. Businesses must be keenly aware of the ever-evolving commercial landscape, marked by shifting demands and intense

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competition. By understanding and embracing these tangible realities, companies can strategically position their innovation efforts and make well-informed decisions.

Furthermore, the availability of resources and capabilities within the organization is a critical aspect that needs to be taken into account. Businesses must invest in adequate resources, such as research and development budgets, to support innovation projects. Moreover, they must develop the necessary competencies in research and development, project management, and execution to enhance their chances of success.

Finally, firms must have effective innovation management processes in place to ensure that innovation projects are executed successfully. This includes identifying and prioritizing innovation projects, allocating resources, and managing risk. It also involves measuring and evaluating the success of innovation projects and making adjustments as needed. The implementation of robust innovation management processes is essential for ensuring the success of innovation projects. This involves the identification and prioritization of projects, appropriate allocation of resources, risk management, and regular evaluation of progress. By integrating these processes into the daily management of the business, companies can establish a culture of excellence and continuous innovation.

In conclusion, innovation is critical for firms to achieve optimal performance. However, firms must strike a balance between radical and incremental innovation and overcome the challenges associated with innovation. They must have the necessary resources, capabilities, and organizational culture to innovate successfully and manage innovation projects effectively. By doing so, firms can gain a competitive advantage and thrive in today's dynamic business environment.

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