



Impact of innovation in development of new products to improve organizational performance in Sidal group: Antibiotic Medea –ALGERIA

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Impact of innovation in development of new products to improve organizational performance in Saidal group: Antibiotical Medea –ALGERIA.

أثر الابتكار في تطوير منتجات جديدة لتحسين الأداء التنظيمي في
مجموعة صيدال: المضادات الحيوية - المدينة - الجزائر.

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Abstract :

This study aims to explore the effects of innovations, processes, and products on various aspects of the company's performance in the pharmaceutical sector, including innovation strategies. The study population estimated (153) cadres across the directorates of Saidal Group / Antibiotical -Medea, while the study sample amounted to (71) cadres. This sample was selected by the stratified random sampling method. The results of the study revealed the positive effects of innovations on the performance of companies in the pharmaceutical industries.

Key words: innovation; product development; pharmaceutical industry; Saidal Group / Antibiotical –Medea.

JEL classification: M 31;j53;O39

المخلص: تهدف هذه الدراسة إلى استكشاف آثار الابتكار والعمليات والمنتجات على مختلف جوانب أداء الشركة في قطاع الأدوية، بما في ذلك استراتيجيات الابتكار. قدر مجتمع الدراسة (153) إطار عبر مديريات فرع صيدال بالمدينة، بينما بلغت عينة الدراسة (71) إطار. تم اختيار هذه العينة بطريقة أخذ العينات العشوائية التطبيقية. وتكشف النتائج عن الآثار الإيجابية للابتكارات على تطوير المنتجات في الصناعات الدوائية.

الكلمات المفتاحية: الابتكار، تطوير المنتجات، صناعة الأدوية، مجمع صيدال فرع أنتيبوتيكال بالمدينة.

تصنيف JEL:O39;j53;M31

INTRODUCTION

During the past years, academics have attached great importance to innovation as the main driving force in enterprise productivity. Based on this foundation, small and large enterprises have begun to realize the vital role of innovation and the development of new products for the sustainability and growth of the enterprise. Moreover, innovation is widely seen as an essential component of competitiveness that is implanted in organizational structures, processes, and products within an organization. Innovation is highly complex. In nature due to market lack of clarity, intense competition, and short product life cycle. Thus, innovation has become an essential part of the enterprise's strategy for several reasons such as adopting more productive manufacturing processes, performing well in the market, creating a positive brand image and customer loyalty, thus gaining a sustainable competitive advantage.

- **The problematic:**

It claimed that innovation does a source of competitive advantage for enterprises. Despite this noticeable effect, it has received much less attention from product innovation and, there is still much uncertainty regarding its link to organizational performance. However, unlike previous studies, the focus has been on product innovation.

- **The importance of the study:**

1. Building and maintaining innovation capacity is critical to the continued success of every organization.
2. The development of new products is crucial to increase competitiveness, support the innovation process in enterprises, and help them systematically to meet new market challenges.

- **Objectives of the study:**

1. Discover innovations and their effects on the organization's performance by studying the process of developing new products.
2. Explain how the new product development process improves organizational performance in a highly competitive business environment through the pharmacy of Saidal Group / Antibiotic – Medea.

- **Study hypotheses:**

General hypothesis

HG: There is a positive impact of Innovation Management on product development in the Saidal / Antibiotic at a significance level of 5%.

The following partial hypotheses stem from the general hypothesis of the study:

H₁: There is a positive effect of the innovation strategy on product development in the Saidal / Antibiotic at a significance level of 5%.

H₂: There is a positive effect of the official structure on product development in the Saidal / Antibiotic at a significance level of 5%.

H₃: There is a positive impact of customer and supplier relations on product development in the Saidal / Antibiotic at a significance level of 5%.

H₄: There is a positive effect of the innovation culture on product development in the Saidal / Antibiotical at a significance level of 5%.

H₅: There is a positive effect of the technological capabilities on product development in the Saidal / Antibiotical at a significance level of 5%.

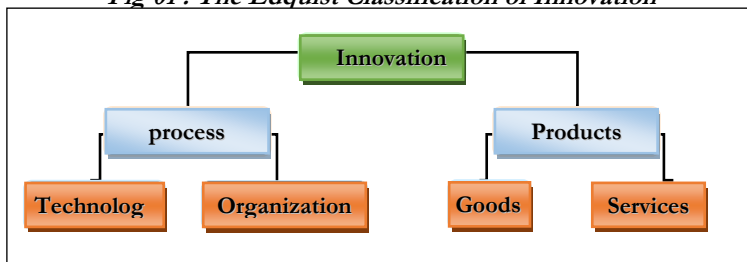
1. Definition of innovation:

Defining this concept is a difficult task due to the variety of criteria used by different authors. However, many authors agree on the fact that innovation has a commercial purpose and is synonymous with everything new. For example, after analyzing the literature (Anders & al, 2020, p03), based on the study of technological innovation, suggested the following definition that allows understanding the general idea of the concept of innovation: "Innovation is an iterative process that begins with the perception of the existence of a new market or service opportunity for a technological innovation that leads to activities. Development, production, and marketing aimed at the commercial success of the invention. (Larsson & al, 2018, p135).

1.1. Innovation Classification:

The parallel and overlapping effort to define innovation is to build a classification of innovations, where the establishment of such a classification is necessary and important, as classification is necessary for progress in identifying the determinants of innovation (Edquist, 2001).

Fig 01 : The Edquist Classification of Innovation



Source: Edquist, Charles (2001) , "The Systems of Innovation Approach and Innovation Policy: An Account of the State of the Art", Lead paper at the DRUID Conference, Aalborg, June, p07.

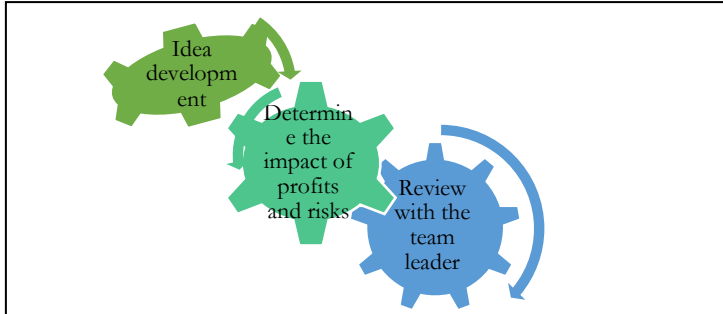
From the above figure, a distinction is made between common classification efforts between technical and organizational innovation.

Technical innovation refers to the development of new products, services, and production processes, while organizational innovation refers to the development of new products, services, and production processes. On the other hand, innovations are related to changes in the structural and administrative procedures of the organization.

Product innovation deals with the production of new products and services to create new markets or satisfy existing customers. The innovation process is reflected in improvements or the introduction of new production technology (Avadikyan & al, 2016, p278).

- **The role of innovation in the organizational life-cycle performance process:** Figure (02) summarizes. Organizational environment:

Fig 2: The role of innovation in the organizational life-cycle performance process



Source: Porter, M , (2007). Competitive advantage, Asse books, Novi Sad, p.51.

Stage 1, Idea Development: Different teams will analyze problems, generate ideas and conduct analyzes.

The second stage, determining the impact of profits and risks: the financial impact of all ideas will be determined in an accurate and standardized manner, all risks associated with an idea will also be examined: operational risks, Risks of implementing information technology, risks of influence of customers and employees, legal, ... etc.

Stage Three, Review with the Team Leader: Different groups discuss their ideas with the executive team who provides feedback and direction.3. First Level Title two.

2.Previous Studies:

There are several previous studies related to the two variables of the study. However, the current study focused only on studies of direct relevance to the topic to understand the problem of the study:

- **Study (Yousef & al, 2017).** A study aimed at identifying critical success factors for developing new products based on the relevant literature and opinions of experts in the Iranian pharmaceutical industry. Priority was given to them using a multi-criteria decision-making methodology by analyzing (50) completed questionnaires. On the (analytical hierarchy process) of the organization, the study concluded that "company capabilities" is the most important factor affecting the success of developing new products in both the generic and general biopharmaceutical industry.
- **Study (Suresh & Basu, 2008).** The aim of study was to find out how to improve the development and manufacture of pharmaceutical products: The effect on the cost of developing medicines and the cost of goods sold of medicines. The study started from the fact that the cost of product

development can represent up to 30% to 35% of the total cost of introducing a new drug to the market. The study concluded that product development and pharmaceutical manufacturing would not only improve the quality of manufactured medicines, as it would help regulators to simplify the regulatory decision-making process, but it would also reduce time to market and reduce manufacturing cost. However, the costs of product development and manufacturing improvement are expected to be very high.

- **Study (Wakelin, 2001).** Investigated the relationship between spending on research and development and productivity growth (TFP) at the enterprise level, using the dashboard data method. Among the findings of a study, the coefficient associated with spending on research and development appears to be positive and statistically significant, indicating its impact on firms' productivity. However, two variables are included: research and development of other companies in the same sector, and spending on research and development are constrained by the costs of innovating industries. As a result, the study showed that the differential technological opportunities in each sector play an important role in the effectiveness of R&D spending.
- **Study (Huelgo & Jaumandreu, 2004).** Examined the effect of age variables and innovation on the growth of total factor productivity. The researchers relied on analyzing the panel data for a sample of 2,300 companies between 1990 and 1998. The results show that upon entering the market, the companies have higher productivity than other companies; However, productivity tends to converge with the industry average. Moreover, the study demonstrates that the process innovations of these companies produce increased productivity that lasts for years.

3. Innovation dimensions:

For the study, the researcher will use the dimensions presented in (Terziovski, 2010), which are as follows:

- **Innovation strategy:**

Institutions with formal strategies perform better than those without strategies. However, small and medium pharmaceutical enterprises usually have informal strategies, largely driven by senior executives, compared to large pharmaceutical institutions, which generally have separate units for strategic planning (Josée & al, 2017, p3019).

- **Formal structure:**

Many formal organizational structures arise as a reflection of the rational institutional rules, and the institutional rules work to acquire resources, stability and enhance the prospects for survival of institutions whose structures become symmetric with the institutional environment, for example, the organic

structure facilitates a high level of response to customer needs and collaborative efforts to develop the team (Daniel & al,2020, p530).

- **Customer and supplier relationships:**

The development of the relationship between customers and suppliers in the field of manufacturing industries allows to maximize the use of their limited resources, and the development of such partnerships would provide them with opportunities to acquire new skills and improve existing skills, and this also allows them to pursue cooperative projects as a way to share risks, however, given their limited resources, they may Institutions do not have the time and experience necessary to establish partnerships and strive for the establishment of cooperative projects(Cavallo1& al, 2020, p05).

- **Innovation culture:**

Culture is one of the most common barriers to the application of innovation, and organizations tend to have flexible innovation cultures, usually characterized by relatively low resistance to change, and tolerance of ambiguity (Keles & Celik,2019, p77).The areas in which the impact of the innovation culture has an impact can be classified into five areas (Shawky and Amin, 2011, p54): strategy, institutional structures, supporting mechanisms, behaviors that stimulate innovation, and the communication system.

- **Technological capabilities:**

The overall technological elements possessed by the institution in which the focus is on information technology, enables organizations to achieve success, competitiveness and enhance levels of performance (Al-Adwan & al, 2015, p04).

4. Success factors for developing new products:

Based on Cooper et al. In 1996, key success factors for developing new products include human capital, intellectual capital, organizational capital, relational capital, and organizational learning potential, as organizational capital includes their capabilities in marketing, appreciation and information gathering in the organization (Andersen, 2021, p02). In another study, organizational capacity for developing new products is classified into learning ability, research and development capability, manufacturing capacity, marketing ability, strategic ability as well as resource allocation, and effective internal and external relationships (networks). (Ko & al, 2018, p11).

5. The pharmaceutical industry:

The medicine industry is : a chemical industry specialized in the manufacture of medicine, and it creates new medicines and sells them in the market and has the right to invent and create them, meaning that no other manufacturer may produce a specific medicine without the approval of the institution that owns the invention. (Munhoz & Tomioka, 2016, p368).The drug factories produce medical drugs called generic drugs, which are medical drugs that have been used for a long time and the period of their retention of

the right to the invention has passed. Thus, other factories can produce and sell them in the market without referring to the owner of the invention. He has the right to the invention (Munhoz & Tomioka, 2016, p368). The following table shows the partnership contracts concluded with the Saidal Group.

Table 1: Mixed partnership contracts for the Saidal Group

Partenariat	Date de création	Capital social	Part de Saidal %	Agrégats financiers	2018	2019
WINTHROP PHARMA Saidal (WPS)	1999	426 200	50%	C.A	2 085 517	2 167 821
				V.A	712 148	850 415
				E.B.E	516 511	458 456
				R. Net	227 595	255 811
				Dividendes	27 287	
				(+) ou (-) value	40	44
				Rentabilité	422%	459%
PFIZER Saidal MANUFAC-TURING (PSM)	1998	912 000	50%	V. mathématique	50	54
				C.A	7 168 562	7 714 471
				V.A	856 657	880 651
				E.B.E	565 094	516 935
				R. Net	-538 666	127 675
				Dividendes	0	0
				(+) ou (-) value	165	177
TAPHCO	1999	1 085 484	44,51%	Rentabilité	165%	177%
				V. mathématique	265	277
				C.A	490 762	422 760
				V.A	52 217	77 440
				E.B.E	-106	-44 554
				R. Net	-252 299	-141 088
				Dividendes	0	0
Saidal NORTH AFRICA (SNM)	2012	150 000	49%	(+) ou (-) value	-5	12
				Rentabilité	-83%	190%
				V. mathématique	1	19
				C.A	0	0
				V.A	-568	-642
				E.B.E	-1 950	-2 287
				R. Net	-5 777	-4 169
				Dividendes	0	0
				(+) ou (-) value	-5	-4
				Rentabilité	-9%	-12%
				V. mathématique	27	26

Source: (based on Rapport 2019)

On the other hand, the strategic alliances enabled the Saidal complex to raise the quality of its products, and thus improve its competitive performance by doing the following:

_ Pharmaceutical innovation by discovering basic research rights in the pharmaceutical industry;

_ Produce high-quality products;

Finally, we must remember that it was Saidal Group that received PAQ for the first time, on 21/12/2003 in Algiers, after evaluating the applications of 23 participating companies.

The second edition of this award held on December 20, 2004, was awarded to the Société des Ciments d'Ain Touta (SCIMAT), after an evaluation of 17 participating companies. The two winning companies were PAQ certified following the requirements of **ISO 9001** Edition 2000.(Boukhari ,2012, p110).

The Medea antibiotic Group contains the necessary facilities and technologies in the field of biotechnology to produce many raw materials by fermentation in terms of their size and technologies, which are considered unique in Africa and the Arab world.

It was built according to GMP standards, and also obtained the **ISO 9002** certificate, which enables him to modernize fixtures with a view to better prospects by signing a contract with a European partner that allows him to obtain high-performance technologies as well as expanding into the market related to selling all production abroad at competitive prices.(SAIDAL,2001,p63)

5.1. Technological Innovation Index in Saidal Group:

The position of R&D as an activity within the Saidal Group appears to correspond to a strong program. Thus, at the level of this group, the R&D structure occupies a high position in the organization chart and enjoys relative support from the top management; Its activities transverse the technical and sometimes even commercial structures of the company. The research and development function operates on par with these structures, which are more robust from the point of view of power relations within the company, giving it a somewhat perceptible level of legitimacy.

This situation is explained by the fact that the company faces direct international competition and belongs to the model of new technologies. Compared to other Algerian public institutions, research and development benefit Saidal from a completely different situation. Its Research and Development Center (CRD) provides the interface and coordination between the overall group management and the structures responsible for production, marketing, and sales functions. In Saidal, the work of the R&D structure is efficient and can be measured every day. As a result, the research and development function appears to be well integrated within this company. Research and development is an essential focus of the group's survival and competitiveness, and a major component of the overall corporate strategy.(Ouchalal & al,2018, p63).

6.Study methodology:

6.1 . Population and study sample:

A study was made by distributing a questionnaire to the cadres in Saidal Group Antibiotical –Medea. Their number is (153), where (153) questionnaires were distributed to all departments, of whom (144) responded, and after reviewing the questionnaires (71) were valid for analysis, which represents (49.30%), from the study population.

Accordingly. This study relied mainly on the results of the questionnaire that was distributed to the sample members.

6.2.Study tool:

The study tool was developed after reviewing the previous study in the field of innovation practices and their impact on product development in application to the pharmaceutical sector. The tool consisted of three parts.

Part One: It includes demographic variables (gender, age, years of service, family status).

The second part: It consists of 33 phrases that measure innovation, and through (05) dimensions, it was mainly based on the scale developed by (Terziovski, 2010), was relied on as follows:

The innovation strategy dimension measured by paragraphs (01-09), the formal structure dimension is measured by paragraphs (10-16), the dimension of customer and supplier relations, as measured by paragraphs (17-21), the Innovation Culture Dimension is measured by paragraphs (22-27), the technological capacity dimension (28-33).

The third part: consists of 09 phrases to measure product development, which was mainly based on the scale developed by (Iwu,2010).

6.3.Stability of the study tool:

The reliability of the tool was also verified by using the Cronbach's alpha coefficient of internal consistency (Cronbach's - Alpha), and this scale indicates the stability of the instrument used in measuring the variables, and it is acceptable if the value of (α) is equal to or greater than (60%), Looking at the results of the statistical test, it was found that the data obtained are suitable for measuring the variables. The stability value (0,917) for (42) items and a sample size of (71) cadres.

Table 2: Shows the Cronbach alpha coefficient

variable	Number of paragraphs	The value of the Cronbach alpha coefficient
the scale	42	0.917

Source: Prepared by the researcher in light of the results of SPSS.23

6.4.Descriptive statistics and frequencies of sample vocabulary:

At this stage, we get to know the characteristics of the study sample through the tabular presentation of the variables related to the personal data, as in the tabular display every characteristic is expressed by frequency and percentage.

Table 3: Distribution of the study sample according to the Demographic characteristics

Demographic characteristics		the number	percentage%
Sex	Male	47	66,2
	female	24	33,8
	Total	71	100
Demographic characteristics		the number	percentage%
Age	20-29 years old	21	29,6
	30-39 years old	30	42,3
	40 years and over	20	28,2
	Total	71	100
Demographic characteristics		the number	percentage%
years of service	Less than 6 years old	31	43,7
	07-13 years old	20	28,2
	14-20 years old	13	18,3

Demographic characteristics	21 years and over	7	9,9
	Total	71	100
		the number	percentage%
	Single	26	36,6
	Married	40	56,3
	absolute	5	7,0
family status	Total	71	100

Source: Prepared by the researcher in light of the results of SPSS.23

Table (03). It appears that 47 of the study sample are male and , 24 are female. It is noted from the above table that these numbers indicate that the number of male employees in the institution under study is greater than the number of females. While the age of the large group of sample 21 of the study sample was 20-29 years, while the age group 30-39 years represented the majority with 30 years, followed by the age group 40 years and over. The age group is 20 years and this is useful for the study to know their impression of the scale questions. The age distribution is proportional to their practical experience, as 31 of the study sample have some years of experience less than 6 years, 20 range from 7 to 13 years, and 13 of the study sample, the number of years of experience they have is between 14-20 years, while the category of 21 years and over Represented 7. It is clear from the table that the few cadres who separated from their families are 5, and it appears that the married are 40, and the single category was 26.

6.5.Hypothesis testing:

In this study, a multiple linear regression test was used to confirm the validity of hypotheses 1, 2, 3, 4, and 5. We will take the first hypothesis as a model in which we show the statistical analysis. As for the rest of the hypotheses, we will summarize the most important statistical values only.

Table 4: Linear Regression Test for First Hypothesis (as a model)

Summary of models ^b				
Model	R	R ²	R ² adjusted	Standard error of estimate
1	,426 ^a	,182	,170	,658
a. Predictors: (Constant), Innovation strategy				
b. Dependent variable: Product development				

Source: Prepared by the researcher in light of the results of SPSS.23

ANOVA ^a					
Modèle	Model	Regression	Medium square	F	Sig.
Total	Total	1	6,638	15,322	,000 ^b
Regression	Regression	69	,433		
Total	Total	70			
a. Dependent variable: Product development					

b. Predictors: (Constant), Innovation strategy

Source: Prepared by the researcher in light of the results of SPSS.23

Coefficients ^a

Model	Model	Constant	Sig.	Corrélations		
	Innovation strategy			Simple correlation	Partial	Partial
Model	Constant	3,591	,001			
	Innovation strategy	,426	3,914	,000	,426	,426

a. Variable dépendante : Product development

Source: Prepared by the researcher in light of the results of SPSS.23

It was found through the statistical test that the hypothesis was fulfilled at the significance level of 0.05 and that the coefficient of determination R^2 equals 18,20%, meaning that the innovation strategy dimension explained 18.2% of the variance found in the product development dimension. Also, we note that the significant values of the regression model are all less than the value of α , and the regression model for it is given in the following formula: $Y = 1,756 + 495X$

So that represents:

Y: product development dimension,

X: the innovation strategy dimension.

While the value (1,756) represents this equation's constant.

Table 5: Summary of the most important statistical test values for hypotheses h2, h3, h4 and h5

	R ²	Sig	Formula of the equation
Hypothesis h2	,220	0.000	Y= 2,017+,470X
Hypothesis h3	,110	0.005	Y= 2,285+,366X
Hypothesis h4	,136	0.02	Y= 2,502+,332X
Hypothesis h5	,230	0.000	Y= 2,133+,440X

Source: Prepared by the researcher in light of the results of SPSS.23

From Table 5. We note that all the model hypotheses are fulfilled at the significance level which is 5%.

Despite the verification of the hypotheses formed for the study model, which means that the general hypothesis HG was realized. However, statistical testing is necessary to verify previous results. Accordingly, we will present the result of the statistical values to test the general hypothesis HG as follows:

Table 6: General Hypothesis Test

General Hypothesis	R ²	Sig	Formula of the equation
	,199	0.000	Y= 2,078+,454X

Source: Prepared by the researcher in light of the results of SPSS.23

However, when conducting a step-by-step test to see which dimensions have the most influence on the productivity of the organization, it was found that the statistical values are poured into a formal structure, where the value of the technology capabilities correlation coefficient with the productivity of the

enterprise was equal to 0.480, while the coefficient of customer and supplier relations correlation with the productivity of the enterprise was less related to 0.332, and the overall determination coefficient of the model was 19.9% represented by the innovation dimensions that explained the change in Enterprise productivity 80.1% due to other variables.

7.Results and discussion.

The results obtained in this study are reinforced by previous findings, as the results of the analysis showed that the innovation strategy had a positive impact on product development. The study (Verhees, 2004) also shows the positive relationship between the activities carried out by the top management in light of the strategy and product development. A study (O'Regan, 2005) showed that the culture of innovation has a positive effect on product development. In other words, it showed that organizations with a regulatory environment that encouraged risk-taking rewarded success, and provided the freedom to experiment were more successful(Cao & al, 2020). According to the results of this study, it is confirmed that there is a statistically significant relationship between the relationship between customers and suppliers on product development, the result is an agreement with study, which emphasized the importance of the relationship between suppliers and customers in terms of the quality of inputs and cost reduction, as well as the importance of customer relations as a source of information (Von Hippel, 2005). The results of the study also agree with the study (Tallon, 2007) that the use of technological capabilities or the introduction of innovative ways to combine information technology resources where the strategic alignment of information technology resources with the business strategy affects profit, productivity, sales growth and reputation (Preston & Karahanna, 2009).

8.Conclusion.

The results of a study are presented based on a dimensionless measurement of innovation at the product level, as researchers systematically look at product innovation as a multi-dimensional structure. The real challenge for an organization is to influence the market's perceptions, needs, and desires so that its products are perceived as having a high value to current and potential consumers. Thus, product innovation in the form of a new product introduction, technological modernity in the product, and product differentiation give superior value and greater impact on enterprise performance indicators compared to innovation processes. Despite the positive impact of innovation, it comes with a certain amount of costs. Innovation is only beneficial when the benefits gained are more than the costs incurred by organizations. Developing innovation requires large capital, high skills, and high risk regardless of the unit of analysis (company, industry, or country), innovation can only be undertaken when resources (especially capital) are sufficient to undertake research and development .

9. Recommendations

- Firms in developing countries should encourage partnering with different stakeholders to enhance their innovative capacity and create more successful products.
- Enhancing employee commitment by developing formal solutions to stimulate and cultivate innovation activities.
- Innovation should become the main theme of employee training and development, with an emphasis on employee creativity and cooperation in addition to enhancing market orientation.
- Effective managers use many internal resources to gain new insights into their business and their environment.
- Developing knowledge by collecting pieces of information obtained from other internal units.
- Providing a competitive advantage and high performance that can help reinvest in innovation to gain a competitive advantage.

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