

The impact of cognitive integration in improving open Innovation, A study of the opinions of a sample of faculty members at the College of Administration and Economics, Al-Qadisiyah University

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Abstract : The current study aimed to reveal the nature of the role of cognitive integration in improving open Innovation in its dimensions (internal activities of open Innovation, external activities of open Innovation , and dual activities of open Innovation), by adopting the applied approach to measure the level of availability of study variables among faculty members in the College of Administration and Economics, Al-Qadisiyah University, as the study attempts to address a realistic problem reflected in bridging the gap between the topics of cognitive integration and open Innovation among the studied sample, as the researcher distributed (100) questionnaires to various scientific departments in the college, and (87) questionnaires were retrieved, and the number of damaged questionnaires was (5) questionnaires, which means that the number of questionnaires valid for analysis reached (82) questionnaires, and they were analyzed using the advanced statistical program (SPSS.V.27 & AMOS.V.24,) and the current study sheds light on how to improve cognitive integration by the university administration for open Innovation. , and the study reached a set of conclusions and recommendations

Keywords : Cognitive integration, open Innovation ,

Introduction: years Although the few The term open innovation has become very popular in the last expression appeared in 2003 by Chesbrough, However, we have noticed a growing dynamic behind it in our review of understanding this phenomenon better. It also started as a closed the relevant literature, and there is a lot of interest in innovation at first, especially among managers of institutions. This trend towards open innovation was not a iveness of developed countries. coincidence, as innovation in general has become a major factor in the competit cost products, services and prices. At the -Emerging countries are also rapidly becoming strong competitors for low nd same time, competition is becoming increasingly global and intense, leading to shorter product life cycles, a knowledge is becoming more multidisciplinary and more widely available. Innovation has also become more expensive and riskier. To meet these new challenges organizations are adopting new ways of integrating their or partners with complementary expertise to acquire and for rapid access to knowledge and are increasingly looking f different technologies that will allow them to continue.

One of the major trends in knowledge integration in business is that organizations are opening up their innovation s, not only in certain industries, but increasingly in others. Organizations are innovating “explicitly” with processe customers , suppliers , competitors , universities , research institutes, and so on, and they increasingly rely on external ducts and processes. Increased collaboration on technology has thus become an important innovation for new pro means of capturing knowledge in order to generate new ideas and bring them quickly to market. Although this trend happening at a much faster pace today than has been the case for toward more open innovation is not entirely new, it is .using knowledge integration to improve open innovation in the organization

Chapter One: Research Methodology

First: The research problem

OpenInnovation has become an important and inevitable element in all aspects of organizational life, which is a dangerous task at the same time in terms of how to use and apply it, as traditional Innovationsystems are no longer elements of the organization with speed, flexibility and continuous changes, and able to provide all the needs and require for a long period, which required building an integrated and advanced scientific knowledge system capable of created in the field of the organization, and from overcoming the problems and obstacles that traditional systems have **the effect of cognitive integration in improving open** here the current research problem was launched to study

Innovation

:Through the current research problem, a set of questions was constructed as follows

1. What is the degree of suitability of cognitive integration in educational institutions as a studied sample?
2. Is the use of cognitive integration in educational institutions consistent with the efficiency of teaching staff from members the point of view of sample?
3. What is the extent of the contribution of cognitive integration in attracting the attention of the studied sample towards openInnovation?
4. What are the expected (positive and negative) implications of using cognitive integration in educational institutions towards openInnovation?
5. What is the nature and type of the relationship between cognitive integration and openInnovation h in the research sample?

Second: The importance of research

:The current importance of the research lies in the following

1. The importance of the topic in the role of cognitive integration in educational institutions as a studied sample.
2. in educational institutions in Iraq benefiting from the results of this research The possibility of teaching staff through the possibility of using cognitive integration.
3. made tool whose reliability and validity have been confirmed and which can be -This research presents a ready milar studies for other institutions used in si.
4. The research provides feedback to the teaching staff in the college under study in light of the general results that integration in the research will reach, which relate to the possibility of providing the requirements for cognitive educational institutions and classifying them in order to improve openInnovation.

Third: Research objectives

:The current research aims to achieve the following objectives

1. ional institutions as a studied sample Knowing the degree of suitability of cognitive integration in educat.
2. Identifying the use of cognitive integration in educational institutions and the degree of its compatibility with the efficiency of teaching staff from the point of view of sample individuals.
3. he contribution of cognitive integration in attracting the attention of the studied sample To know the extent of t towards openInnovation.
4. Identifying the expected (positive and negative) implications of using cognitive integration in educational institutions towards openInnovation.
5. Measuring the nature and type of the relationship between cognitive integration and openInnovation in the research sample.

Fourth: The hypothetical plan of the research

contributes to clarifying the nature and type The hypothetical diagram for the study was prepared in Figure (1), which :of relationship between the variables of this study, as follows

- 1) dimensional variable-cognitive integration, which is a one : **Independent variable**.
- 2) **Dependent variable**: It includes three sub dimensions of activities which is : (internal activities of open Innovation, outdoor activities of open Innovation, and dual activities of open Innovation).

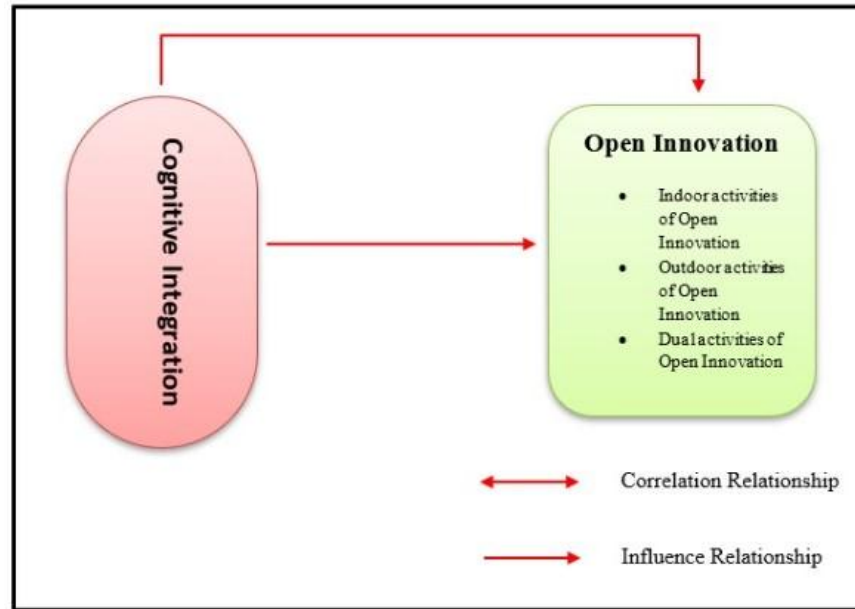


Figure (1) Hypothetical research plan

Fifth: Research hypotheses

The first main hypothesis: There is a statistically significant correlation between cognitive integration and open Innovation: hypotheses branch out from this hypothesis, which are-Three sub .

correlation between cognitive integration and the hypothesis: There is a statistically significant-The first sub dimension of internal activities of openInnovation.

hypothesis: There is a statistically significant correlation between cognitive integration and the dimension -Second sub f openof external activities o Innovation.

hypothesis: There is a statistically significant correlation between cognitive integration and the dual -The third sub activities dimension of open Innovation.

The second main hypothesis: There is a statistically significant effect of cognitive integration on open Innovation Three sub-hypotheses branch out from this hypothesis, which are,

hypothesis: There is a statistically significant effect between cognitive integration in the dimension of -The first sub internal activities of openInnovation.

n in the dimension of hypothesis: There is a statistically significant effect between cognitive integratio-Second sub external activities of openInnovation.

hypothesis: There is a statistically significant effect between cognitive integration in the dual activities -The third sub dimension of openInnovation.

Sixth: Research community and sample

Qadisiyah University, while the -he study community represented the College of Administration and Economics, AIT study sample included faculty members in the College of Administration and Economics. (100) questionnaires were departments in the college, and (87) questionnaires were retrieved , of which only (82) distributed to various scientific .were valid for analysis

Seventh: Measuring tool

This paragraph is concerned with explaining the tool by which the necessary information was collected to measure the research variables. Perhaps the most common tool in the academic community was the questionnaire tool. Table (1) r .shows the axes of the research tool

Table (1) Research tool axes

| Source | Paragraphs | Distance | variable |
|---|------------|---------------------------------------|--|
| Dahiyat, 2015 ; Ghazali et al.,2016; Grant,1996; Bergman et al., 2004 ; Matusik & Heeley, 2005 ; Kenney &Gudergan,2006 | 5 | dimensional-One | Cognitive integration (Knowledge Integration) |
| Cheng & Huizingh , 2014; Tseng&Tseng,2019 | 5 | Indoor activities for openInnovation | OpenInnovation (open innovation) |
| | 4 | Outdoor activities for openInnovation | |
| | 3 | Dual activities for openInnovation | |

Aspect Section Two: The Theoretical

First: Cognitive integration

The concept of cognitive integration

based theory of -integration is derived from Grant's (1996) knowledge Taking a strategic perspective, knowledge organizational capability, which emphasizes the importance of an organization's ability to integrate the diverse renewing the organizational structure. knowledge bases and skills held by its individual members in building and Capability, as this theory emphasizes building this knowledge integration capability from three main aspects, namely: d utilize the integration efficiency, which represents the extent to which the organization is able to access an specialized knowledge held by its members , and the scope of integration Which refers to the ability to integrate and integrate new knowledge with existing knowledge bases, and the flexibility of integration. Which refers to the extent organization's ability to modify existing capabilities and build new capabilities by accessing and integrating of the additional knowledge(Dahiyat, 2015:116).

on associated Firms typically adopt knowledge integration mechanisms to address the increasing amounts of informati functional product innovation activities. Knowledge integration mechanisms include formal processes and -with cross structures that ensure access to and integration of knowledge across different functional units within a firm. Given that functional collaboration into product -ledge integration mechanisms play a pivotal role in translating crossknow innovation performance(Tsai & Hsu, 2014:294).

uilding and Cognitive integration focuses on knowledge building, which is a cognitive activity that involves b integrating an individual's knowledge, by focusing on knowledge sharing and cognitive processes to build this knowledge, and linking new knowledge to actual knowledge to achieve cognitive integration and organizational success(Lee & Turner, 2018: 2).

Knowledge integration contributes to focusing on the accumulation and integration of knowledge in order to improve Innovationin the organization and improve internal learning and outsourcing. Knowledge integration represents the ility to combine different production inputs such as skills, knowledge, software and technology in organization's ab order to achieveInnovation in a specific project (Salunge et al., 2019: 3). Chen & Bradshaw, 2007: 359 claimed that ortant process in teaching the organization new knowledge by monitoring knowledge integration represents an imp .tacit knowledge and motivating individuals who carry it to express, evaluate and modify it

The importance of cognitive integration

rganization's performance by enhancing its capabilities by Knowledge integration contributes to improving the o :focusing on the following points

1. .Balancing leadership styles and the powers granted by the organization in the workplace
2. .performance Focus on implementing standards and guidelines to improve work
3. Focus on achieving organizational success(Ghazali et al., 2016: 499).
4. Linking knowledge to the company's strategic advantage
5. Integrating the organization's knowledge resources and transforming them into a competitive advantage
6. .implementing new and modern solutions and innovations to improve the organization's performance Building and
7. Gain new marketing and competitive advantages
8. Incorporating new knowledge that is difficult to imitate(Saluncke et al., 2019:4).
9. of information and aligning it with organizational goals and functional units Processing large amounts(Amankwah-Amoah & Adomako, 2021:3).

Second: OpenInnovation

OpenInnovationconcept

Open innovation can be considered one of the most relevant concepts in innovation management, having gained prominence since the seminal work ofChesbrough (2003) The main idea of open innovation is to open up the . iduals, research laboratories, universities, customers, suppliers, etc. in order to innovation process to other firms, indiv

facilitate the smooth flow of ideas within and outside the organization. In doing so, the organization derives internal resources. Existing research has focused on advantages from both exploring external resources and exploiting open innovation practices in advanced economies, and has provided only scant evidence on less advanced countries, as models for those in such as former socialist countries . Although Western European companies have served as transition, these economies have faced some difficulties in organizational restructuring due to cultural barriers. For example , processes of openness within organizations, in terms of dialogical leadership, employee interaction , and upward critical communication , are logical extensions of processes of privatization and deregulation and However, these processes are not common for the traditional mentality of closed societies(Rangus et al., 2017:1-2).

process based on knowledge flows that are managed objectively across organizational boundaries using financial and non financial mechanisms in line with the organization's business model (Chesbrough -boundaries using financial and non and Bogers, 2014:17). Open innovation refers to how organizations use internal and external knowledge and organizational innovation marketing pathways or participate in innovation processes between organizations . This is achieved by establishing a partnership relationship between organizations(Öberg & Alexander 2018: 121).

That openInnovationAn input consisting of incoming and outgoing knowledge flows that accelerate the process of developingInnovationAnd market it commercially, Effective open innovation requires a flexible and dynamic . hat relies on collaboration, and Open innovation positively impacts business performance by organizational structure t increasingInnovation and sharing risks and resources (de Oliveira et al., 120: 2017).

The importance of openInnovation

trated by enhancing access to new and heterogeneous knowledge related The importance of open innovation is demons
to customer needs and technological solutions . Likewise, it provides Open innovation provides valuable opportunities
en innovation also It reduces development times for pooling resources and sharing risks . It is worth noting that op
time to market)(and costs (cost to market) . Open innovation also leads to increased profits for those organizations
that seek to lead technology in their industry, and employ a dedicated incentive system for innovation . And maintain
strong internal research capabilities These practices are expected to increase employees' motivation and ability to
realize the potential benefits of external knowledge and overcome the challenges associated with identifying
assimilating, and using these inputs(Salge et al.,2012:1-2) . Some see open learning as a source of competitiveness
(Zhang et al. (2018:78).

Dimensions of openInnovation

Three important dimensions can be focused on to measure openInnovation: follows as ‘

1. Internal innovation requires a set of different inputs and resources with : **Internal activities of open innovation** increased potential for competitive benefits to synthesize knowledge resources based on resource integration, focusing marketing knowledge sources to achieve innovation and on interpreting dynamic environments and technological and market successful performance(Salunge et al., 2019:3) Focused Organizations In previous periods, the focus was mainly on internal ideas for cooperation with on internal ideas for improving production and marketing , largely ignoring opportunities from external parties(Al- Belushi et al: 165 ·2018.)
2. **External activities of** Refers : **open innovation activities** to ideas or technological knowledge that flow from the organization 's innovation system. Outward, as organizations seek to deliberately coordinate the commercialization or marketing benefits . This includes efforts to finance-transfer of their technological knowledge abroad to obtain financial or non-financial intellectual property or license technology by directing ideas or knowledge to the external environment(Chou et al., 2016:41) .
3. **Dual activities of open innovation** involves the combination of This type links the inside and the outside a bidirectional inward and outward knowledge flows between organizations or agents. The inward and outward types are less explored and understood by academic researchers and industry practitioners(Da Silva ·2017:2).

Practical Side Section Three: The

First: Coding the study variables

The paragraph aims to provide a clear picture of the nature of the symbols that will be dealt with in the practical section to the study variables, framework in order to provide the reader with a clear picture of the results and their connection (as in Table (1

Table (1) Coding of study variables

| The symbol | Paragraphs | Dimensions | Variables |
|------------|------------|---------------------------------------|----------------------------|
| KNIN | 5 | dimensional-One | Cognitive integration |
| OPIN | 5 | Indoor activities of open Innovation | OpenInnovation (OPIV) |
| OPEX | 4 | Outdoor activities of open Innovation | |
| OPTO | 3 | Dual activities of open Innovation | |

Second: Data normality test

It deals with This is amazing Paragraph a test distribution Natural For data derived from Phenomena same Relationship Be sample Search Administrative In a way private Sample Search The year And research Scientific Required . that . Data Sample studied Statement Smirnov test for examination -greater From (30) to know Use a test Kolmogorov natural, So He was acceptance or resolution to reject Test Related By Range that It is done Distribute it On it In a way order For levels morale greater From (0.05) and vice versa correct, It is clear Table (2) -acceptance or Acceptance Pre . Test moderation For data Extracted

ity of the drawn dataTable (2) Test of the normal

| Statistical parameter | Kol-Smi | Variables |
|-----------------------|---------|-----------------------|
| P>0.05 | 2.182 | Cognitive integration |
| P>0.05 | 2.190 | OpenInnovation |

It becomes clear from Table (2) that Data Variables Search Subject To distribute natural any that Distribute it Subject .(Which indicates to that Data Subject To distribute natural when level moral greater From (0.05 For sin

Third: Testing the stability of the measuring instrument

Represents this Test Analysis Statistically To level credibility Data that Got it On it researcher from during distribution Questionnaire on Sample (60) of Researchers, And also To reach to a result It is characterized by Method To test stability, because Test same He provides . Cronbach's Alpha) (With stability and use it In conditions Stability . In Data Accuracy, when Be Its value greater Of (70%) , It is clear Table (3) Coefficient research variablesTable (3) Cronbach's alpha coefficients for the r . Cronbach Alpha

| Cronbach's Alpha | Variables |
|------------------|-----------------------|
| 0.938 | Cognitive integration |
| 0.909 | OpenInnovation |

as It becomes clear from Results in Table above, It is characterized by tools measurement Search With stability Relative, where Needs Search Academic And the administrative In a way private to measurement bezel suitability tools this matter shows the stability of the cognitive integration 'eveloper To measure itMeasurement For phenomena D paragraphs with a value of (0.938) and openInnovation.(with a value of (0.909

Fourth : Diagnosis and description of research variables

the individuals of the phenomenon in question, it is noted that the paragraphs of the According to the response of measurement tool had different arithmetic means and standard deviations, as is clear from Table (4), which are as :follows

Table (4) Description of research variables

| relative importance | Standard deviation | Arithmetic mean | Paragraphs | relative importance | Standard deviation | Arithmetic mean | Paragraphs |
|---------------------|--------------------|-----------------|--|---------------------|--------------------|-----------------|---------------------------------------|
| 74% | 1.053 | 3.68 | OPEX1 | 70% | 1.317 | 3.48 | KNIN1 |
| 71% | 1.124 | 3.55 | OPEX2 | 66% | 1.266 | 3.32 | KNIN2 |
| 76% | 1.225 | 3.79 | OPEX3 | 67% | 1.117 | 3.37 | KNIN3 |
| 71% | 1.146 | 3.54 | OPEX4 | 94% | 0.762 | 4.71 | KNIN4 |
| 73% | 1.008 | 3.64 | Outdoor activities for open Innovation | 91% | 0.833 | 4.56 | KNIN5 |
| 74% | 1.041 | 3.68 | OPTO1 | 78% | 0.796 | 3.89 | Cognitive integration |
| 94% | 0.762 | 4.71 | OPTO2 | 87% | 0.807 | 4.35 | OPIN1 |
| 91% | 0.833 | 4.56 | OPTO3 | 81% | 0.597 | 4.04 | OPIN2 |
| 86% | 0.691 | 4.32 | Dual activities for open Innovation | 83% | 1.142 | 4.17 | OPIN3 |
| 80% | 0.702 | 4.00 | Open Innovation | 79% | 1.017 | 3.95 | OPIN4 |
| | | | | 73% | 0.935 | 3.65 | OPIN5 |
| | | | | 81% | 0.595 | 4.03 | Indoor activities for open Innovation |

following The table above shows the

1. Cognitive integration

(The cognitive integration variable obtained a general arithmetic mean of(3.89 with a standard deviation of (0.796) and a relative interest of(78%) while the cognitive integration paragraphs -(KNIN1 - KNIN5)were represented by

different arithmetic means and higher than the hypothetical mean of (3) as the highest arithmetic mean for the fourth paragraph reached Its value is (4.71) with a standard deviation equal to (0.762). (%4 and a relative interest equal to (9 .

2. OpenInnovation

He won The openInnovation variable has a general arithmetic mean of (and a standard deviation of (0.702) and a (4 relative importance of 80%) This is due to the open Innovation dimensions having different arithmetic means (4.03) for the internal activities dimension of openInnovation, (3.64) for the external activities dimension of openInnovation (and (4.32) for the dual activities dimension of openInnovation and deviations of (0.595) for the internal with standar activities dimension. For openInnovation (1.008) for the external activities dimension of openInnovation and (0.691) (for the dual activities dimension. For openInnovation respectively (% 86 , % with a relative interest of (81 %, 73 ,

Fifth : Testing research hypotheses

1. In order to test the correlation between cognitive integration and open : **Correlation hypotheses** Innovation The simple correlation coefficient (Pearson) was adopted , as shown in the following Table (5 (:

Table (5) Correlation matrix between research variables

| | | Indoor activities for openInnovation | Outdoor activities for openInnovation | Dual activities for openInnovation | OpenInnovation |
|-----------------------|---------------------|--------------------------------------|---------------------------------------|------------------------------------|----------------|
| integration Cognitive | Pearson Correlation | 0.732 | 0.751 | 0.746 | 0.811 |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 |
| | N | 186 | 186 | 186 | 186 |

The relationship between cognitive integration and openInnovation had a correlation value of (0.811) , indicating the consistency of the responses of the phenomenon in question. The results also showed the existence of a significant correlation between cognitive integration and the dimensions of openInnovation (0.746 , 0.751 , 32 of (0.7 respectively for internal Innovation activities . Open, outdoor activities for Innovation Open, dual activities for Innovation open, to indicate awareness The college is concerned with the importance of cognitive integration in order o enhance openInnovation.

2. In order to test the impact of cognitive integration on open : **Impact hypotheses** Innovation the researcher used : structural equation modeling as follows

an effect. For cognitive integration in open The results show Innovation which means that the analytical indicators in Figure (2) and Table (6) show the awareness of the phenomenon in question of the importance of cognitive integration , which means that creating an improvement of one standard deviation achieves openInnovation . (by an amount of (0.715) and with a standard error of (0.058

Cognitive integration also contributed to explaining (0.657) of the variance in openInnovation while the remaining . value is: Not included within the scope of the research

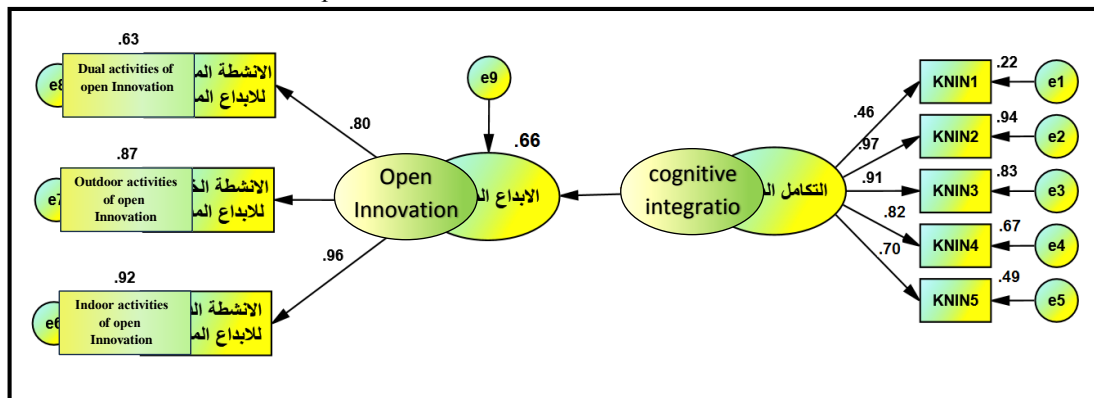


Figure (2) The structural model of the effect of cognitive integration on openInnovation

Table (6) Summary of the results of the impact analysis of cognitive integration in openInnovation

| P | R ² | critical value | Standard error | Estimates | The path | | |
|-------|----------------|----------------|----------------|-----------|----------------|-----|-----------------------|
| 0.001 | 0.657 | 12.328 | 0.058 | 0.715 | OpenInnovation | --- | Cognitive integration |
| | | | | | | < | |

Section Four: Conclusions and Recommendations

First: Conclusions

1. The critical events that contemporary organizations are exposed to due to the rapid changes in the environment require them to adopt a modern behavioral pattern (cognitive integration) capable of keeping pace with those changes

erated by them on the one hand, and working to raise the low levels of performance of and absorbing the events generated by subordinates to a state of challenge, motivation and initiative on the other hand

2. *iate skills with stakeholders* The study results indicate the college's interest in appointing employees with appropriate skills who need specialists in the required field, which enhances its ability to achieve success in its customer marketing activities

3. *ployees from time to time in* The results of the study show that the college is keen to evaluate the capabilities of employees in order to ensure the continuous development of their capabilities

4. The results of the study showed that the college focused on the need to have a variety of sources of its services in order to improve its marketing offers of its services to its customers

5. The results of the study indicate the college's interest in investing in various methods and approaches in order to provide a sufficient amount of excellence in its offerings

Second: Recommendations

1. The college must Creating service methods aimed at fulfilling its customers' requests and maintaining them when a marketing objectives at the level of its situation occurs that causes a delay in the request, which requires it to have its capable of bridging the gap in demand for its services

2. Continuous pursuit of the college In developing the skills of its employees periodically, which requires it to be able to understand the tasks of each other's employees

3. that appropriate consultants are provided to train employees on how to deal and interact The college must To ensure with customers and convince them to purchase and use the services offered, which requires double efforts to obtain the necessary knowledge for this

4. be careful It uses technology to retrieve and acquire relevant knowledge, which requires it to The college must encourage employees to exchange ideas and information and implement basic knowledge management programs

5. at suit the functional capacity of employees in order to ensure college attention By providing the appropriate skills the continuous improvement in openInnovationwhich requires them to use capabilities and strategies to know the ' of the customers' environment in requirements of customers in a way that takes into account the standard of living which the college operates.

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