Presenting a Pattern of Transition to Open Services Innovation by Using “Networking” Managerial Lever
Case study: A Service Company in Helicopter Industry

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Abstract

Open innovation approach, which has been replaced with a closed innovation in recent decades, is built on a new knowledge vision and has a different view to the origins and application of ideas. Most Organizations and Companies in transition to open innovation are function of environment and they have followed this change in unscheduled. Consequently existing researches are based on this lack of planning and have results for product-based companies and not service-based companies. In our research in order to implement the planned change and the transition to open innovation, we’ve developed a matrix model that made from a four-step process of change (Columns: Needfulness of Change, Planning for change, Implementing of Change, Institutionalizing and Evaluating) and one managerial lever (Row: Networking) and then the company's status in this model is evaluated with statistical tests. At the end of this research we found the company has more favorable situation in the first step of this process and the research hypothesis was rejected. One of important result of this study is developing 15 principles of transition to open innovation in this company which can apply to similar companies.

Keywords: Closed Innovation, Open services Innovation, Four-Step Process of Change, “Networking” Managerial Lever

1- Introduction

All the organizations to survive in today's competitive environment require a detailed understanding of their customers and their demands are. Quality is the most important factor in global competition and any organization that wishes to identify customers and forgave them more attention, certainly products and services of that will be more acceptable to customers (Djellal, Gallouj & Miles, 2013). Providing high quality services causes to enhance customer satisfaction and increases market share and the profitability of services (Verma & Jayasimha, 2014). Closed innovation paradigm and the way it organizes research and industrial development, until just before the 80s, has been accompanied with many achievements and significant commercial prosperity (Chesbrough, 2011). But in the current period, it is the open innovation seeking to bring both better products for customers and improves business economy (Mina, A. Bascavusoglu-Moreau1 & Hughes, 2013). It is the path to escape the pressures of commoditization that are hitting so many product businesses and, increasingly, services businesses too. This same path will propel advanced economies, which drive all others throughout the world, forward in this century (Chesbrough, 2006 & 2011).

Companies by implementing open innovation approach in presenting their products and services, start value creator motorcycle, but taking over a part of that, is another story needing to internal research and development. They can understand complex interdependence of new technologies by their internal research and development and then use it in their architectures and improve these architectures (Vardaxoglou & Baralou, 2012). It is company's business model determining what parts of the value chain they supply from inside and how linking them to surrounding networks of value, that are value creator for customers (Mabinya, 2011).

The present study has been done to provide a model for shifting from closed innovation to open services innovation by using a networking managerial lever, and in the case of a company in the field of helicopter services and related to Iran Aviation Industries Organization. Thus, the concepts of closed and open innovation, transition to open innovation, change and change models, managerial Levers and particularly networking managerial Lever will be presented. Considered cases in this context, Expected to place In order to develop new literature in the field of open innovation and pave the continuance of the way for reasearchers.
2- Literature Review

As mentioned, Closed innovation paradigm and the way it organizes research and industrial development, until before the 80s, has been accompanied with many achievements and significant commercial prosperity. In fact, that success of this approach is the secret of it's survival in the face of vision changes (Chesbrough, Vanhaverbeke & West, 2006). Looking in this approach is Inward that had Full compatibility with the knowledge at the beginning of the twenty-first century. But it's incompatible of approach with the beginning of the twenty-first century knowledge vision, is increasingly occurring (Chesbrough, 2011). However, the brilliant period of closed innovation has continued in some industries and internal centered approach to research and develop is still the right approach to managing innovation. In such industries, either strictly protect the intellectual property or there are serious legal constraints (or both); Young companies rarely rise and it's adventurous investment is negligible (imanipour, mofidi & barahimi, 2010). companies can keep their technology so on the shelf that will ready to go to market and there is no fear In this way from technology leakage to outside, companies, and other competitor companies (Herzog, 2011). But in many industries, infrastructure of the closed innovation paradigm is crumbled. Several factors have caused the collapse of this paradigm include: 1- Increasing access to skilled labor and more displacements of them, 2- risk taking market of Investment, 3- External options for ideas remained on the shelf, and 4- increasing power of external suppliers (Chesbrough, 2006).

Open innovation approach, which has been replaced with a closed innovation in recent decades, is built on a new knowledge vision and has a different view to the origins and application of ideas. Valuable ideas in this approach can come from inside or outside the company and also their going to market can from inside or outside the company (Sigismund Huff, Möslein, & Eichwald, 2013). Importance of ideas and external paths to market in this approach is the same as importance of ideas and internal paths to market during the closed Innovation. Today a lot of good ideas are both inside and outside the companies. These ideas can be applied and also the creators of them can be hired. This availability and good quality of outside ideas caused the formation defaults of centralized silos in closed innovation paradigm to lose color (Hanna, & Walsh, 2002). Figures 1 and 2 respectively show closed and open innovation paradigms in the R&D management. Bold lines show the boundaries of A and B Firms. Ideas flow from the left into company and go to the market from the right. These ideas have studied and selected in reasearch path of process and remained ideas entered development step and taken to market in the last step.

2-2- Transition to OI

Nowadays internal and centralized research and development have ended in many industries. Useful knowledge is pervasive in many industries and ideas should be used early to avoid loss of them (Veugelers, Bury & Viaene, 2014). But the emerging open innovation approach beside the internal research and development is looking for new knowledge and ideas and it also opens the new ways of value creation and receives some of the value from a business model (Sigismund Huff, Möslein, & Eichwald, 2013).
2-2-1- Change; Scheduled Looking to Transition

Change in dictionary have meanevd reverting from one state to another or revertin something to another form and state. The world is constantly changing and transformation and continuance of existence life depends on these changes. Change flows in all events of the world and it is not only limited to a certain range (Alvani, 2006).

Dimensions of change are different in organizations. Organizations with minor changes try to improve processes and Organizations that overall fundamentally changed (Desler, 1995). For the change, Scientists have been defined various models that we refere two main samples of them in Table 1 as needed have been came:

<table>
<thead>
<tr>
<th>Table 1: Change Models</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
</tr>
<tr>
<td>Kurt Lewin Three-stages (Nikoo eghbal, 2007)</td>
</tr>
<tr>
<td>Seven-stages (Rezaetian, 2007)</td>
</tr>
</tbody>
</table>

2-2-2- Managerial Lever

Any change in an organization requires practical guidance on the top management of organization. Transition to open innovation also is no exception. with literature review, four key levers that a manager to lead the effort to implement open innovation have been identified to take. With literature review, four key levers that manager to lead change, to implement open innovation have been identified to take. These levers include networking, organizing, evaluation processes and knowledge management systems (Chiaroni, Chiesa & Frattini, 2011). In this study, first lever because of great importance to implement changes have been elaborate.

**Networking:** To implement open innovation and facilitate the entry and exit flows of innovation, companies need to existence of inter-organizational networks. In fact dimensions of open innovation, means outside open innovation and inside open innovation require a loop of suppliers, customers, external companies in the same industry and etc. The formation of this loop, especially for companies that are in the beginning of implementing open innovation process, needs special attention from senior executives of organizations (Chiaroni, Chiesa & Frattini, 2011).

2-3- Research Framework

The most important variable and in terms of managerial leverage for transition to open innovation in the case company of studying and exter-organizational dimension, is a networking that needs to be created. Another important issue is timeframe of change and transition to open services innovation that is specific to each process or planned change. Hence in the present investigation in order to explain the process and how to create networks to implement open innovation, an adapted four-step process that has its roots in Lewin's three-step process is used. Steps and related Indicators in this process are:

1. **Log in to of change / need for change:** Make necessary change, formating Navigator and committed coalition, and Drawing and Notification of the change Vision

2. **Planning for change:** Problem Proposal and problems diagnosis, schedule table of change axes
3. **Implementation:** Implementing new procedures and patterns, empowering individuals in line with Vision

4. **Stabilization and Evaluation:** Integrating improvements resulting from change, reinforce change

Considering the four-step process during the transition to open services innovation in determining the related activities of networking Variable can be a new field of the research literature of Open innovation. So facing with a matrix model consisting of one row and four columns Shown in Figure 3.

Figure3: Conceptual model of transition to open innovation using "networking" managerial lever

Of the secondary objectives of the study are based on the main research objective, the following can be cited: Determining transition principles from closed innovation to open services innovation of the point of view of networking managerial lever, in the case company of studying. In order to achieve the aforementioned objectives and using a conceptual model, the most important initial step is to identify the current status of studied company, further is matching foreign similar cases to fill the model blocks that represent the company activities of key, regarding two change process and managerial lever dimensions. Therefore, the research hypothesis to determine the current status of the company is as follows:

**Hypothesis:** The studied company's status in terms of networking managerial lever, in the third step from four-step process of change in order to Implement open innovation, is more desirable.

3- Research Method

In the present investigation, regarding to the related indicators of each step, networking lever during the change four-step process, is measured through designing a questionnaire. In continuation, both face and content validity is used so that for confirming face and content validity of questionnaire, we use comments of the university teachers and administrators in this field. Questionnaire items and their arrangement were amended after examining the comments.

To measure the reliability of the study questionnaire, the Cronbach's alpha coefficient was used. According to this method, with a preliminary study on 25 subjects from statistical society, the questionnaire amount of reliability 0/896 obtained that is sign of good reliability for research tool. After validity and reliability of gathering tool of research data, finally a questionnaire consisted of 18 questions was distributed among statistical society including current executives and employees in company deputy of research and technology and other employees who were eligible (n = 50). Eventually 41 analyzable questionnaires received after a week. It should be noted in this study to investigate the research hypothesis, after investigating the data normality assumption by using Kolomogrov – Smirnov test, also one-sample T test and paired-sample T test were used.
One-sample T-test for examining utility level of variable and paired-sample T test for paired comparison of each variable to each other were used.

4-results

Before examining the hypothesis, normal distribution of variables must be ensured. To investigate research component, Kolmogorov-Smirnov test of normality was used. The results indicate that the assumption of normality for all variables be confirmed (P> 0.05). The results of this test are presented in Table 2.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Kolmogorov-Smirnov Z</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Networking lever- Need To Change</td>
<td>1/06</td>
<td>0/183</td>
</tr>
<tr>
<td>Networking lever- Planning For Change</td>
<td>1/19</td>
<td>0/105</td>
</tr>
<tr>
<td>Networking lever- Implementation of change</td>
<td>1/08</td>
<td>0/206</td>
</tr>
<tr>
<td>Networking lever- Stabilization and Evaluation</td>
<td>0/54</td>
<td>0/941</td>
</tr>
</tbody>
</table>

After ensuring normality of data distribution, we examined the hypothesis.

**Hypothesis:** The studied company's status in terms of networking managerial lever, in the third step from four-step process of change in order to Implement open innovation, is more desirable.

**One-Sample T test for Networking in each step of the change process**

This test, have been applied to test this hypothesis that the organization in terms of the networking leve in each of the four steps of the change process is in average condition. Because the average value can be a number between 1 and 5 (Likert), therefore we considered 3 value for average value (H₀: μ=3; Networking Variable is in average level in each steps, H₁≠3; Networking Variable is not in average level in each steps). This results of this test are presented in Table 3.

<table>
<thead>
<tr>
<th>Variables  (Bloks)</th>
<th>95% Confidence Interval of the Difference</th>
<th>Mean Difference</th>
<th>Sig.</th>
<th>SD</th>
<th>M</th>
<th>N</th>
<th>Utility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Upper</td>
<td>Lower</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-1</td>
<td>0/63</td>
<td>0/28</td>
<td>0/45</td>
<td>0/000</td>
<td>0/54</td>
<td>3/45</td>
<td>41</td>
</tr>
<tr>
<td>1-2</td>
<td>0/75</td>
<td>0/46</td>
<td>0/61</td>
<td>0/000</td>
<td>0/45</td>
<td>3/61</td>
<td>41</td>
</tr>
<tr>
<td>1-3</td>
<td>0/87</td>
<td>0/54</td>
<td>0/71</td>
<td>0/000</td>
<td>0/52</td>
<td>3/71</td>
<td>41</td>
</tr>
<tr>
<td>1-4</td>
<td>0/68</td>
<td>0/25</td>
<td>0/46</td>
<td>0/000</td>
<td>0/68</td>
<td>3/46</td>
<td>41</td>
</tr>
</tbody>
</table>

According to Table 3, by performing T-test in the confidence level of 95 percent, for the entire steps Sig < 0/05, so H₀ is rejected. That means in the confidence level of 95 percent, society average is different from 3, and because the lower and upper limits are both positive, means that organizations In terms of networking variable in all steps is desirable. Although so far, the proposed hypothesis has not been challenged, the mean similarity of networking managerial lever in second and third steps of the change process in the conceptual model, Put through us to use paired-sample T test for understanding This difference. On the other hand, to understand and more using, five other paired comparisons were performed between the steps of the process shown in Table 4.
Table 4. Results of paired-Sample T test for Networking in each step of the change process

<table>
<thead>
<tr>
<th>Pairs</th>
<th>95% Confidence Interval of the Difference</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Networking lever-Planning For Change</td>
<td>Networking lever- Need To Change</td>
<td>-0/27 -0/03 0/013</td>
</tr>
<tr>
<td>Networking lever-Implementation of change</td>
<td>Networking lever- Need To Change</td>
<td>-0/38 -0/12 0/000</td>
</tr>
<tr>
<td>Networking lever-Stabilization and Evaluation</td>
<td>Networking lever- Need To Change</td>
<td>-0/18 0/16 0/912</td>
</tr>
<tr>
<td>Networking lever-Implementation of change</td>
<td>Networking lever- Planning For Change</td>
<td>-0/24 0/04 0/189</td>
</tr>
<tr>
<td>Networking lever-Stabilization and Evaluation</td>
<td>Networking lever- Planning For Change</td>
<td>-0/01 0/30 0/067</td>
</tr>
<tr>
<td>Networking lever-Stabilization and Evaluation</td>
<td>Networking lever- Implementation of change</td>
<td>0/07 0/41 0/006</td>
</tr>
</tbody>
</table>

According to table 4 and the fourth row, the value of Sig. is more than 0/05 and it means that there is no significant difference between the means of two variables, networking in "planning for change" step and in "implementing change", and Because of positive upper (0/01) and negative Lower (-0/24), it can be concluded that these two variables are fairly similar status. Thaus utility of the networking variable in the planning step is similar to the implementation step. Finally, by examining the results of one-sample and paired-sample T-test, regarding the hypothesis, it can be classified networking-related variables that are in four steps as follows:

Need to Change < Stabilization and Evaluation < planning < implementation

According to the above research hypothesis is confirmed. But in order to formulate the principles of transition to open innovation through networking managerial lever, according to the results of the questionnaire and score of each item is determined by the respondents, we attempted to develop complementary models coming in Table 5.
Table 5. Suggested principles of the transition to open services innovation by using networking managerial lever

<table>
<thead>
<tr>
<th>Need To Change</th>
<th>Planning For Change</th>
<th>Implementation</th>
<th>Stabilization and Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>- induction the importance of internal and external networking</td>
<td>- Special attention to the customers, suppliers, rival enterprises, associates, etc. in Transition Program</td>
<td>- special conclusion of collaboration contracts with the civil sector in the field of flying services</td>
<td>- Long-term conclusion of collaboration contracts with universities and research centers, etc.</td>
</tr>
<tr>
<td>- more attention to the opportunities and external resources</td>
<td>- Consideration of dedicated partnership opportunities for users</td>
<td>- allocating a place to collect customer feedback</td>
<td>- Providing services beyond national borders in military and civilian sectors</td>
</tr>
<tr>
<td>- Applying special Networking approaches in transition Program</td>
<td></td>
<td>- Explore and absorb external innovation by networking in the enterprise level</td>
<td></td>
</tr>
</tbody>
</table>

It should be noted in the table above, regarding to the studied company's activities in recent years in context of open innovation, only those principles coming that are required to comply again. For example, there was no filling for menting top commitment of management again obtaining the highest score in the first step.

5- Conclusions

Recent study in literature sector is limited to three basic issues in transition to the closed and open innovation including related concepts to the closed and open innovation, change of change models and managerial lever, that each of them detailed in the first parts. After completing library studies we have attempted to extract a conceptual model for transition to open innovation through a managerial lever and in the form of planning perspective as a four-step change process from closed to open innovation approach. Preparation and standardization of questionnaire, distribution among the society, extracting data, analysis of results, hypothesis testing, the survey of achievement of objectives and formulation questioned principles of transition were next important actions in this study. At the end found that case study in middle steps and particularly the third step of implementing change process, in terms of the networking managerial lever of and in have more desirable status. Extending managerial levers from one to two, three and four, or change process with more steps, can be be considered as the main suggestions for future studies by researchers in the related field.

References


