Analyzing the impact of Organizational change in promoting Process Innovation using PLS-SEM -Case study: Algerian Telecom Laghouat

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Received: 01/05/20201 **Accepted**: 5/13/2021 **Published**: 6/3/2021

Abstract:

This study aims to show the impact of the organizational change on the process innovation of Algerian Telecom company in Laghouat. We took a sample of 56 individuals who are distributed on different professional categories. After treating data of a sample of 56 individuals using SmartPLS3, the results show the following: there is a positive impact of the individuals change on the process innovation of the company when the significance level is 5 %. Moreover, there is a positive impact of structure change on the process innovation of the company when the significance level is 5 %. Finally, there is a positive impact of change in technology on the process innovation of the company when the significance level is 5%.

Keywords: change, Process innovation, structure change, individuals change, change in technology.

JEL Classification Codes : M00 ؛ O31؛ Q55

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1. INTRODUCTION

Companies always militate to outperform its competitors by gain a competitive advantage. Therefore, they are obliged to follow new in production methods, or providing new ideas in the form of products or services. The accelerating development in technology plays a key role in innovation within the company, Winston Churchill said “To improve is to change; to be perfect is to change often”. this quotation hint, change is often considered as a sign of improvement and progress. In many times companies are more than required to make some sorts of change. Dynamics that surround the company’s internal and external environment, force them to adopt an organizational way to be adapted these changes. This research takes its importance from the technological innovation especially (process innovation) in ICT sector in Algeria that is characterized by technological acceleration, and seeks to transfer individuals or institutions from an information to a knowledge society through providing services to customers. The importance also lies in adopting an organizational change that ensures an easy adaptation with the external and internal environment variables at Algerian Telcom.

Algerian Telecom of Laghouat Company was chosen to study the impact of organizational change in the development of process innovation, which calls for answering the following research question:

-Is there an impact of organizational change on the development of process innovation in Algeria Telecom-Laghouat?

In the light of the research question, it is necessary to ask the following sub-questions:

-Is there an impact of the change in individuals on enhancing the process innovation of Algerian Telecom -Laghouat company?

-Is there an impact of the structure change on enhancing the process innovation of the Algerian Telecom -Laghouat company?

-Is there an impact of the change in technology on enhancing the process innovation of Algerian Telecom -Laghouat?

Study hypotheses:

In order to answer the research questions, we hypothesize:

H_1: There is an impact of individuals change on the development of technological innovation of Algerian Telecom Laghouat at the level of significance of 5%.

H_2: There is an impact of a change in the organizational structure on the development of process innovation of Algerian Telecom Laghouat at the level of significance of 5%.

H_3: There is an impact of a change in technology on developing the process innovation of Algerian Telecom Laghouat at the level of significance of 5%.

Objective of the study:

The aim of this study is to highlight the effect of organizational change (change in individuals, change in technology and change in structure) on process innovation.

Research method:

In order to reach the research objective, we have used an analytical approach to clarify the various concepts and variables under study in addition to the survey method represented by questionnaire whose results were analyzed by using SmartPls.

Previous Studies:

- (Soraya, 2018) her study focused on the importance of technological change and its impact on the other types of change of, the researcher reached a number of results, The Naftal company is working to make many changes in various areas within the organization, especially those covered by the research: Change of the individuals, change of culture. The company has brought about a series of structural changes in close periods of time, which have affected the stability of the institution. Technological change is related to organizational change within the organization, in response to the requirements of the external environment and the scientific and technological acceleration**.**

- (Latrech, 2018)This study aimed to find out the effect of organizational change on the workers performance in the Siijico company in Skikda, a sample of 31 individuals was chosen, and the results of the study concluded that there is a correlation between organizational change and the workers performance, and the organizational change (change in people, change in organizational structure and change in technology) effects on the performance.

- (Christos Tsinopoulos, Carlos M. P. Sousa, & Ji Yan, 2017)This study aimed to address how engagement in open innovation supports process innovation in the enterprise and how the drive to achieve legitimacy affects the relationship between engagement in open innovation and process creativity. The conceptual model was tested using data from the European Community Innovation Survey run by the UK government. Our findings and theoretical development support the idea that engagement with open innovation will increase the likelihood of introducing new processes and that the drive to achieve legitimacy will influence this relationship. Consequently, these results contributed to an understanding of the relationship between open innovation and process creativity.

2. THEORETICAL FRAMEWORK:

2.1. Organizational Change:

Change is necessary for the organization to survive. That's why organizations have to adjust their operations according to the changing environment, and their organizational structures according to new operational models (Král & Králová, 2016, p. 5169). (Shin, Taylor, & Seo, 2012, pp. 727–748) consider that "organizational change refers to the alternations of existing work routines and strategies that affect a whole organization". (Agote, Aramburu, & Lines, 2016, pp. 35-63) see that organizational change as "the process by which organizations move from their present state to some desired future state in order to foster the achievement of one or more organizational objectives".

2.1.1. Individuals change:

Many researchers focus on the importance that individuals or employees could occur in change management, according to (Oreg, Vakola, & Armenakis, 2011, pp. 461-524) research examining employees' reactions to change has been steadily growing since employees are identified as the key role in determining the change success. Employee-centered change management research is built on the premise that employees during the change; their change-related attitudes and behaviors based on actual evidence have been linked to the success or failure of change in organizations (Herold, 2008, pp. 346–357; Van Knippenberg, 2006, pp. 685–704).

2.1.2. Structure change:

Organizational structure is a key component, some models treat organizational structure as a central or an ultimate component of organizational design (Král & Králová, 2016). (Daft, 2015) described organizational structure effected by numerous contingencies, such as strategy, culture, environment, technology, and size.

2.1.3. Change in technology:

(Bouterfa, 2018, p. 220) see that technological change is not limited to changing the production technology only, but also extends to the technology of the entire organization, whether administrative information technology, productivity, marketing, financial ...etc. Technology changes include information technology. Therefore, the rate of organizational change is increasing and fast and continual innovation in digital technologies is driving changes to organizational systems and processes. Digital transformation is a continuous innovation that requires rapid response to change, challenges and, opportunities in the business world (Mohsen Attaran, 2020). From the previous definition we could conclude that change in technology involves the applied technology in production, marketing, financial and ICT.

2.2. Process Innovation

According to (Kotler, 1991) "an innovation refers to any good, service, or idea that is perceived by someone as new. The idea may have a long history, but it is an innovation to the person who sees it as new". Process innovation is as important as innovation product, (J. Tidd, 2018) confirmed that by saying "Whilst new products are often seen as the cutting edge of innovation in the marketplace, process innovation plays just as important a strategic role. Being able to make something no one else can, or to do so in ways which are better than anyone else is a powerful source of advantage".

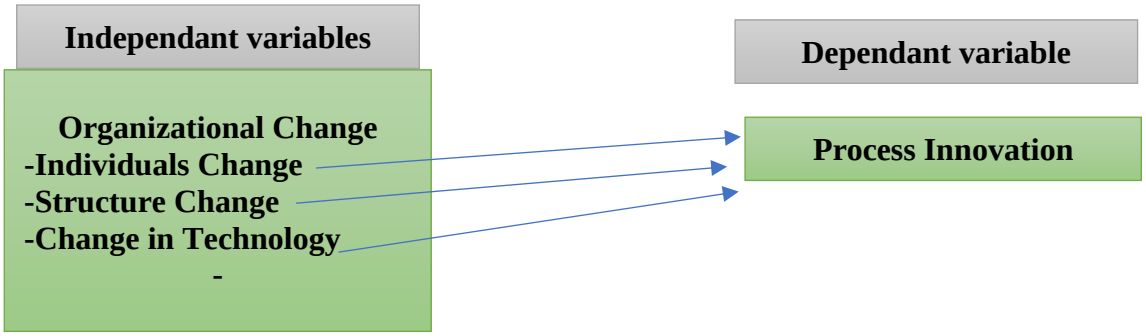
The innovation process is defined as the development and selection of ideas for innovation and the transformation of these ideas into the innovation (Jacobs, 2008).

3. METHOD AND PROCEDURES:

3.1. Research model:

The answer to the problem and the questions necessitated the construction of a study model based on previous studies, as shown in Figure N° 1:

Fig.1.
Research model



Source: by researchers based on theoretical framework and previous studies.

3.2. Population and sample of the study:

We took a sample of 70 employees from the population presented by 248 employees, 56 of them who completely answered the questionnaires. However, (04) questionnaires were canceled because the respondents did not fully answer them.

3.3. Data collection method:

We used the questionnaire as a tool to collect information and data. It consists of two sections: the first section contains data of gender, age, educational qualification, years of experience, and professional level. The second section consists of 16 items which are distributed to 3 blocks. A Likert scale of 1 (strongly disagree) to 5 (strongly agree) is utilized to measure the responses. The first block contains 04 items "**INNO_PROC1** to **INNOV_PROC4**" tackling the variable of process innovation. As for the second block, it addresses change in the structure and contains 05 items "**STRUCT_CHANGE1** to **STRUCT_CHANGE5**". While the third block (change in technology) includes 04 items "**TECHNO_CHANGE1** to **TECHNO _CHANGE4**", and the fourth block that concerns change in individuals contains 04 items "**INDV_CHANGE1** to **INDV_CHANGE4**".

3.4. Analysis Tools:

In order to make data analysis and test the hypotheses, it is necessary to use SmartPLS3. The following statistical methods have been implemented:

- Assessment of the measurement model:
  - Construct Reliability and Validity;
  - Fornell-Larcker Criterion;
  - Heterotrait-Monotrait Ratio (HTMT).
- Assessment of the structural model:
  - Coefficient of Determination – R^2;
  - Effect size -f^2;

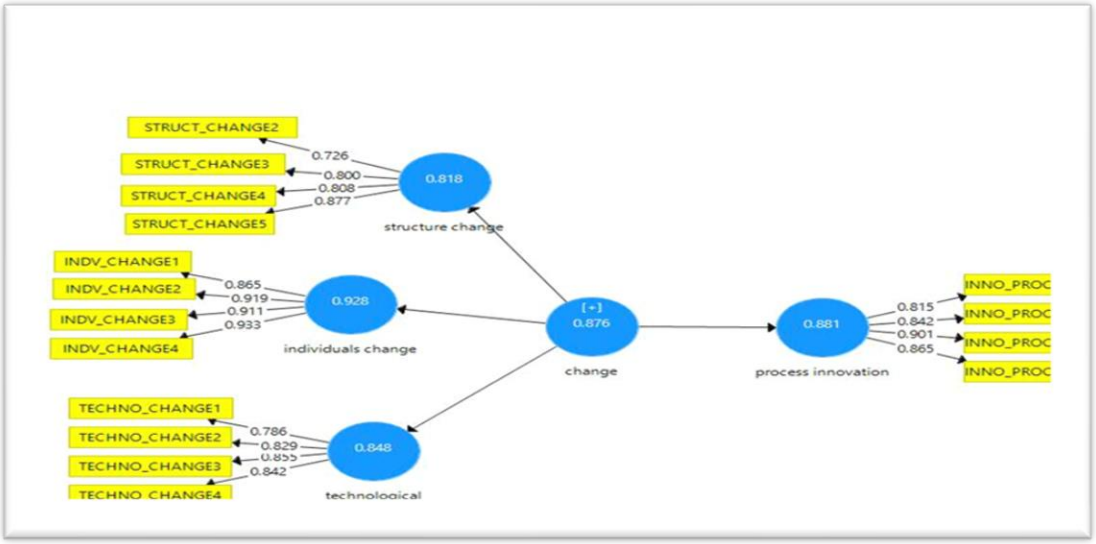
- Predictive relevance Q^2;
- Hypotheses Testing (Path Coefficient).

4. STUDY RESULTS (ANALYSIS AND DISCUSSION):

4.1. Assessment of the measurement model:

Reflective measurement model assessment involves examining the indicator loadings which recommended above 0.708.

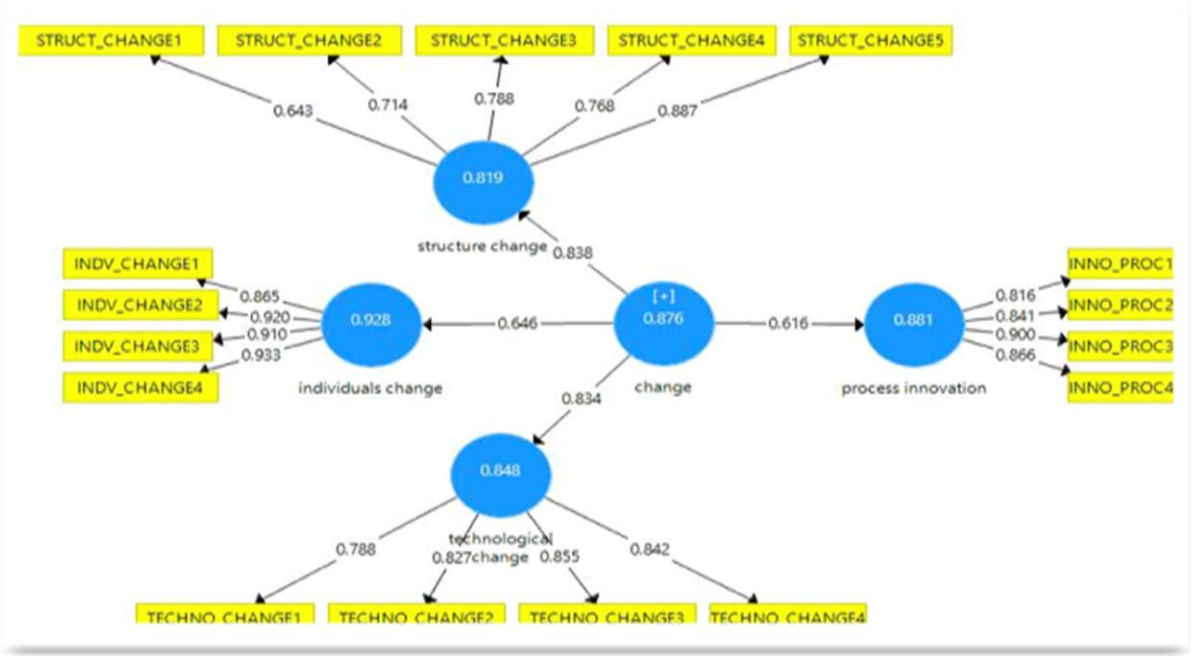
Fig.2. Items Factor loadings



Source: By Authors based on SmartPLS3 output.

The figure above shows all items factor loading, it is noticeable that all values are superior to 0.7 except the item **STRUCT CHANGE1** that belongs to **structure change** variable. Reliability for research that depends on established measures should be 0.70 or higher. After deleting the STRUCT CHANGE1 item we get the results shown an in the figure below.

Fig.3. Items Factor loadings after editing



Source: By Authors based on SmartPLS3 output.

Table N°1 indicate Cronbach's Alpha values which range from 0818 to 0.928, (Diamantopoulos, 2012, pp. 434-449; Drolet, 2001, pp. 196-204) consider that the reliability values between 0.70 and 0.90 range from "satisfactory to good".

Table 1.
Construct Reliability and Validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Individuals change	0,928	0,935	0,949	0,823
Process innovation	0,881	0,926	0,917	0,733
Structure change	0,818	0,833	0,880	0,647
Technological change	0,848	0,853	0,897	0,686

Source: By Authors based on SmartPLS3 output.

Convergent validity is the extent to which the construct converges to explain the variance of its items. All variables have an Average Variance Extracted AVE higher than 0.50 which is considered acceptable, it indicates that the construct explains at least 50 per cent of the variance of its items. Besides, Composite Reliability values range from 0.880 to 0.949 which prove the internal consistency reliability.

4.1.1 Discriminant Validity

Fornell-Larcker Criterion

In the structural model, Construct is empirically distinct from other constructs. (Fornell, 1981, pp. 39-50) proposed the traditional metric and suggested that each construct's AVE should be compared to the squared inter-construct correlation of that

same construct and all other reflectively measured constructs in the structural model. The Table **N°2** showing that the value of each variable with itself is superior to the value of the same variable with the others.

Table 2.

Fornell-Larcker Criterion

	Individuals change	**Process innovation**	**Structure change**	**Technological change**
Individuals change	**0,907**			
Process innovation	0,531	**0,856**		
Structure change	0,257	0,451	**0,804**	
Technological change	0,284	0,430	0,666	**0,829**

Source: By Authors based on SmartPLS3 output.

Heterotrait-Monotrait Ratio (HTMT)

The results in the Table N°3 shows that all values of HTMT are lower than 0.90. When HTMT value below 0.90 would suggest the existence of discriminant validity (Henseler, 2015, pp. 115-135).

Table 3.

Heterotrait-Monotrait Ratio (HTMT)

	Individuals change	**Process innovation**	**Structure change**	**Technological change**
Individuals change				
Process innovation	0,597			
Structure change	0,275	0,484		
Technological change	0,310	0,454	0,795	

Source: By Authors based on SmartPLS3 output.

4.2. Assessment of the structural model:

4.2.1. Coefficient of Determination – R^2

(Chin, 1998, p. 8) suggested that the values of R^2 that above 0.67 considered high, while values ranging from 0.33 to 0.67 are moderate. But (Hair, 2011, pp. 139-151) sees that R^2 values of 0.75 and 0.50 and can be considered respectively substantial and moderate The Table N°4 shows the both R^2 values and variable explanation strength**.** The dependent variable Process innovation is explained 71.7%, 68.3% and 42.7% by the independent variables Technological change, Structure change and Individual change respectively**.**

Table 4.

Coefficient of Determination

	R Square	**R Square Adjusted**	**Result**
Individuals change	0,427	0,416	Moderate
Structure change	0,683	0,677	High
Technological change	0,717	0,712	High

Source: By Authors based on SmartPLS3 output.

4.2.2. Tests Hypotheses and Path Coefficients

Table 5.

Tests Hypotheses and Path Coefficients

Hypo		Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Decision
H_1	**Individuals change -> Process innovation**	0,653	0,628	0,197	3,321	**0,001**	**Supported****
H_2	**Structure change-> Process innovation**	0,826	0,833	0,053	15,466	**0,000**	**Supported****
H_3	**Technological Change-> Process Innovation**	0,847	0,845	0,060	14,012	**0,000**	**Supported****

Source: By Authors based on SmartPLS3 output.

From the table, and according to the P-values which are less than 0.05 and the T Statistics values that superior to the T value Table (2.042), there is a strong significant relationship between independent variables "change of individuals, change of the organizational structure and change of technology" and process innovation.

4.2.3. Effect size -f^2

This metric is the f^2 effect size and is somewhat redundant to the size of the path coefficients.

Table 6.

Effect size -f^2

	Change	Individuals change	Process innovation	Structure change	Technological change
Change		0,744	0,586	2,154	2,535
Result	Large effect sizes				

Source: By Authors based on SmartPLS3 output.

(Cohen, 1988) see that values higher than 0.35 depict large f2 effect sizes.

4.2.4. Predictive relevance Q^2

In order to assess the PLS path model's predictive accuracy, and according to (Geisser, 1974, pp. 101-107; Stone, 1974, pp. 111-147) the calculation of Q^2 is more than necessary. As shown in the table N°6, Q^2 values higher than 0.25 and less than 0.50 depict medium predictive relevance of the PLS-path model.

Table7.

Predictive relevance Q^2

	SSO	SSE	Q^2 (=1-SSE/SSO)
Change	672,000	672,000	
Individuals change	224,000	148,659	0,336
Process innovation	224,000	169,499	0,243
Structure change	224,000	131,591	0,413
Technological change	224,000	119,484	0,467

Source: By Authors based on SmartPLS3 output.

5. CONCLUSION

The Algerian Telecom company, as most institutions, always seeks to increase its innovative capabilities in various operations by encouraging its employees to suggest new ideas about current services and ways to improve them. also allocates significant financial budget to the R&D in accordance with modern scientific methods, which necessitated for changes process, in addition the update of new designs for various jobs. Technology has a significant share of this change in order to keep pace with company development.

-There is a positive impact of organizational change on the increase of process innovation for Algerian Telecom-Laghouat;

-There is a positive impact of a change in the organizational structure on the increase of process innovation for Algerian Telecom-Laghouat;

-There is a positive impact of the change in the technology structure on increasing the process innovation of the Algerian Telecom -Laghouat;

-There is a positive impact of change in individuals on increasing the process innovation of Algerian Telecom -Laghouat.

Through the previous results of our study, we develop a set of recommendations and suggestions for this company:

-Spreading the spirit of creativity among employees.

-Encouraging the use of modern technology.

-Adapting the organizational structure and making it flexible to suit the change process.

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