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Article

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MANAGEMENT | RESEARCH ARTICLE

The validation of the organizational change construct using confirmatory factor analysis

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Abstract: Organizational changes play a vital role in development of organizations. Development can only be possible through change. Numerous researches have been conducted to explore organizational change aspect descriptively but no attempt has been made to validate and develop instrument to measure behaviours and thoughts of employees regarding organizational change. This study identified and used nine dimensions to measure organizational change, and 380 Bank managers were surveyed using a self-administered questionnaire. To conform the dimensions and their contributions towards main construct, first-order and second-order confirmatory factor analysis has been conducted using SEM—AMOS. The result showed that process, strategy, attitude, structure, culture and technology are the main predictors of organizational change.

Subjects: Social Sciences; Behavioral Sciences; Economics, Finance, Business & Industry

Keywords: organizational change; change theory; confirmatory factor analysis

1. Introduction

Organizational change have extensive amount of concepts, constructs and dimensions. There are lot of factors that trigger and accelerate the organizational change and change process like culture, structure, strategy, process, people, values and so on (Alvesson & Sveningsson, 2008). Organizational change is a very broad area. But generally, change is a phenomenon which present doing things in different way (Thomas & Christopher, 2014). Lewin (1951) defined change as “transition of current state of environment to future/desired state”. Organizational change covers different patterns like downsizing, merger, transformations and amalgamations technological improvements (Hamzah, Othman, Hashim, & Abd, 2013; Liviu, 2014; Sugandh & Arti, 2014; Xerri, Nelson, Brunetto, & Reid, 2015). Change theory employed different perspective like change types, change enabler, change methods, change outcomes and change driving forces (Gail, 2015; Lewin, 1947; Loi, Lam, Ngo, & Cheong, 2015). Van der Voet, Groeneveld, and Kuipers (2014) stated that, culture is the communication platform between employees and leaders. So, change is opportunity and threat as the same time.

Guvenç and Alpander (1995) mentioned that organizational change is a process not an outcome however, Carnall (1986) argued that organizational change is a continuous improvement in policies,

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PUBLIC INTEREST STATEMENT

Change is important part of daily life. Change phenomenon has been used to promote new ways and innovations. Individually and collectively change effects the organizational environment therefore, change has to take care with proper procedure and execute. Mostly, organizations have encountered sudden and expected changes therefore, it is important to explore change-related matters.

Table 1. Dimensions of organizational change

Authors	Process	Technology	Culture	Structure	Strategical	Attitude
Lee, Lee, and Lin (2012)	•	•		•		
Zogjani, Shoraj, and Govori (2014)	•					
Yukl (2008)	•					
Schiavone (2012)		•				
Zheng, Yang, and McLean (2010)		•		•	•	
Armbruster, Bikfalvi, Kinkel, and Lay (2008)		•				
Kiboss (2014)	•	•				
Muscalu (2014)			•			
Akgün, Byrne, Lynn, and Keskin (2007)						•
Lines (2005)						•
Santos, Bronzo, De Oliveira, and De Resende (2014)	•				•	

goals and structure. Technological change is undeniable dimension of organizational change as argued by Hadi Razavi (2013) and Sara (2011) that, technological changes updating is crucial for any organization. However, Kranti and Prabhjot (2015) mentioned that conventional banking sector fully reject technological changes. Obenzinger (2005) revealed that structural changes can play an important role to improve organizational performance and organizational effectiveness therefore, changes in organizational structure can form an integral part of organizational change which eventually be a game changer. At the same time, Lewis (2000) opined that, bad attitude of employees towards change can leads process towards failure of process and unsmooth process. Kotter (1995) and Rubenstein (1996) figure out that uncertainty regarding job, anxiety and new job rules can push employees to oppose change. In line with these argument, this paper is focused on validating the organizational change factors which are important in organizational change construct in banks or financial sector. In order to test this objective, the following hypothesis was proposed:

H1: the six dimensions of organizational change (process, strategy, attitude, structure, culture and technology) are significant when regressed against the main organizational change construct.

2. Theoretical development of the organizational change construct

Organizational change is a phenomenon which present new projects for the sake of improving existing or previous projects that are not performing well. Organizational change present different forms within organization but change is compulsory and irreversible thus, it is important to figure out which change will be beneficial to an organization and can get competitive edge. Lewin (1947) propounded a theory called “change theory” which focus on general concept of change occurrence in the universe. Due to its generalizability, there is opportunity to contribute more construct and dimensions in this theory. In relation to business organizations, researcher focused on six change dimensions namely; process, technology, culture, structure, strategical and attitude (see Table 1) which has been discussed in academic and practical literature (Ahmad et al., 2009; Lines, 2005; Mdletye, Coetzee, & Ukpere, 2014; Nicolai & Röbbken, 2005; Schiavone, 2012). In this regard, this study assumed that these six dimensions can determine an organization’s overall organizational change. So, Lewin (1947) defined overall organizational change is “a state of transition between the current state and future one, towards where the organization is directed”.

Process change management is about how employees do things within organization and it refers to any new methods that is used to change any organization which significantly reshape an organization. Therefore, process change management captures the introduction of new change methods and improved process to conduct change projects. Process change management focus on organizational ability to explore their resources and capabilities to conduct smooth change process so that they can meet organizational successful change process. Process is more likely to develop a project to lead the change effort within an organization (Salman, 2004). Change and organizational development agents can help organizations to improve change process before executing change. Change management is about implementation so, process change is all about the process implementation which can leads to smooth change (Hoogendoorn, Jonker, Schut, & Treur, 2007).

Process aspects of the change implicit by that transition from the current to the future state thus, process change management involved learning a new behaviours to sustain the process (Shanley, 2007). Usually, organizations focus on training in change projects and rarely focus on process change management which results to resistance, lack of commitment, and these eventually have significant impact on change process. Organizational change includes processes and tools for managing change within an organization (McGuire, 2003).

Technological change is taking place all over the world in every sector and this change always bring benefits and/or risks. Benefits of using technology can be predicted but, it is difficult to predict risks because of usage of technology which is resistance to change (Zhu, 2015). Technological changes mostly have a positive influence on organizational efficiency and effectiveness. But organizational change due to updated technological changes is really difficult to recognize. In change process, leaders have to focus on upcoming technologies so they can get competitive edge over competitors (Diamond, 1996; Zhang & Zhu, 2012).

Organizational change implementations are highly culturally sensitive. Lewin's change theory's first step is "unfreeze" pointed out that organization need to understand organizational culture first in order to execute any change (Lewin, 1951; Wursten, 2014). Culture provide a platform to continuous smooth changes and role of organizational culture is critically important to manage change.

Changing organizational culture is not an easy task even though sometimes organizational culture is not in managerial control. Studies shows that, organizational culture change means that culture is generally believed as accepting and adopting new ideas. Therefore, organizational culture is the most influential factor to sustain change effort (Cebula et al., 2012). Structural changes allow organization to identify optimal change paths for organizations. Organizational structure also refers to how individual or teamwork coordinated each other with organization (Damanpour & Gopalakrishnan, 1998).

Strategical change management is all about changes in fundamental concept of organization, in which leaders change the way of business. Strategical changes take place when organizations encounter positioning gaps which can leads them to get competitive edge (Chesbrough & Appleyard, 2007). Therefore, strategical change management is required in organizational change when organization wants to create new values for organization. Like any organizational changes, strategical changes also face resistance and risk. Due to resistance therefore, these strategical changes are not an easy task to execute for change agents and leaders (Lennox, 1994).

Attitudes can be defined as a certain feelings and thoughts of individual converted into acts and effect organizational environment (Secord & Backman, 1969). So, attitudes towards change can be defined as effective, cognitive and behavioural responses of employees towards change (Elizur & Guttman, 1976). Responses of employees towards change can be positive or negative. Positive responses can be helpful for effective organizational change while negative attitude can be an obstacle. Attitude towards change can influence organizational change. The second step in Kurt Lewin's change theory is "moving". Leaders of organization inform their employees regarding change so

Table 2. Loadings of the first-order confirmatory factor analysis

Variables	R ²	Process	Standard first-order loading*				
			Strategical	Attitude	Structure	Culture	Technology
Process 1	0.79	0.89					
Process 2	0.85	0.92					
Process 3	0.59	0.77					
Process 4	0.68	0.82					
Process 5	0.70	0.84					
Process 6	0.79	0.89					
Process 7	0.62	0.79					
Process		–	0.61	0.80	0.70	0.69	0.64
Strategical 1	0.67		0.82				
Strategical 2	0.79		0.89				
Strategical 3	0.73		0.85				
Strategical 4	0.49		0.70				
Strategical 5	0.43		0.66				
Strategical 6	0.58		0.76				
Strategical 7	0.51		0.71				
Strategical			–	0.79	0.80	0.83	0.63
Attitude 1	0.68			0.82			
Attitude 2	0.79			0.89			
Attitude 3	0.70			0.83			
Attitude 4	0.64			0.80			
Attitude 5	0.72			0.85			
Attitude 6	0.56			0.75			
Attitude 7	0.64			0.80			
Attitude				–	0.92	0.92	0.80
Structure 1	0.60				0.78		
Structure 2	0.68				0.83		
Structure 3	0.74				0.86		
Structure 4	0.71				0.84		
Structure 5	0.74				0.86		
Structure 6	0.57				0.76		
Structure 7	0.69				0.83		
Structure						0.95	0.78
Culture 1	0.70					0.84	
Culture 2	0.74					0.86	
Culture 3	0.54					0.74	
Culture 4	0.62					0.78	
Culture 5	0.58					0.76	
Culture 6	0.77					0.88	
Culture 7	0.61					0.78	
Culture							0.78
Technology 1	0.68						0.82
Technology 2	0.86						0.92

(Continued)

Table 2. (Continued)

Variables	R ²	Process	Standard first-order loading*				
			Strategical	Attitude	Structure	Culture	Technology
Technology 3	0.24						0.49
Technology 4	0.25						0.50
Technology 5	0.23						0.48
Technology 6	0.17						0.41
Technology 7	0.53						0.72
Technology							–

*Factor loading < 0.50.

that they can change their attitudes towards change. When employees faced change initiatives, then they do not know how to proceed and they are not clear about change. So this time is opportunity for leaders to give directions of employee's attitude in positive way.

3. Research methodology

The population of the study are the employees of Pakistan commercial banks which involved all the categories of employees, such as the presidents, vice presidents, assistant vice presidents, senior managers, branch managers, regional managers, OD managers, HR managers, external change agents, internal change agents, change practitioners and others. Therefore, based on G-Power software 3.1 version and Krejcie and Morgan (1970) sample size criteria, the determined sample size was 380. A stratified simple sampling technique was used to select the sample from the targeted population of 73,714 across the six selected commercial banks in Pakistan, namely Habib Bank Limited (HBL), National Bank of Pakistan (NBP), United Bank Limited (UBL), Muslim Commercial Bank (MCB), Allied Bank Limited (ABL) and Bank Alfalah (BAF) which they are the capital base of more than 600 million Pakistani Rupees (KPMG, 2013–2014). Moreover, the instrument used in this study was adopted from organizational change scale developed by Shepherd (2012). The instrument has 42 items with 6-point Likert scale, ranging from 1 = strongly disagree to 6 = strongly agree.

4. Data analysis

Data analysis were divided into two section, first section consist of first-order CFA to assess the factor loading of all items and estimation among items to dimensions and correlations among all dimensions. Second section consists of second-order CFA of organizational change which shows estimation of every dimension to main construct and overall fitness of complete model.

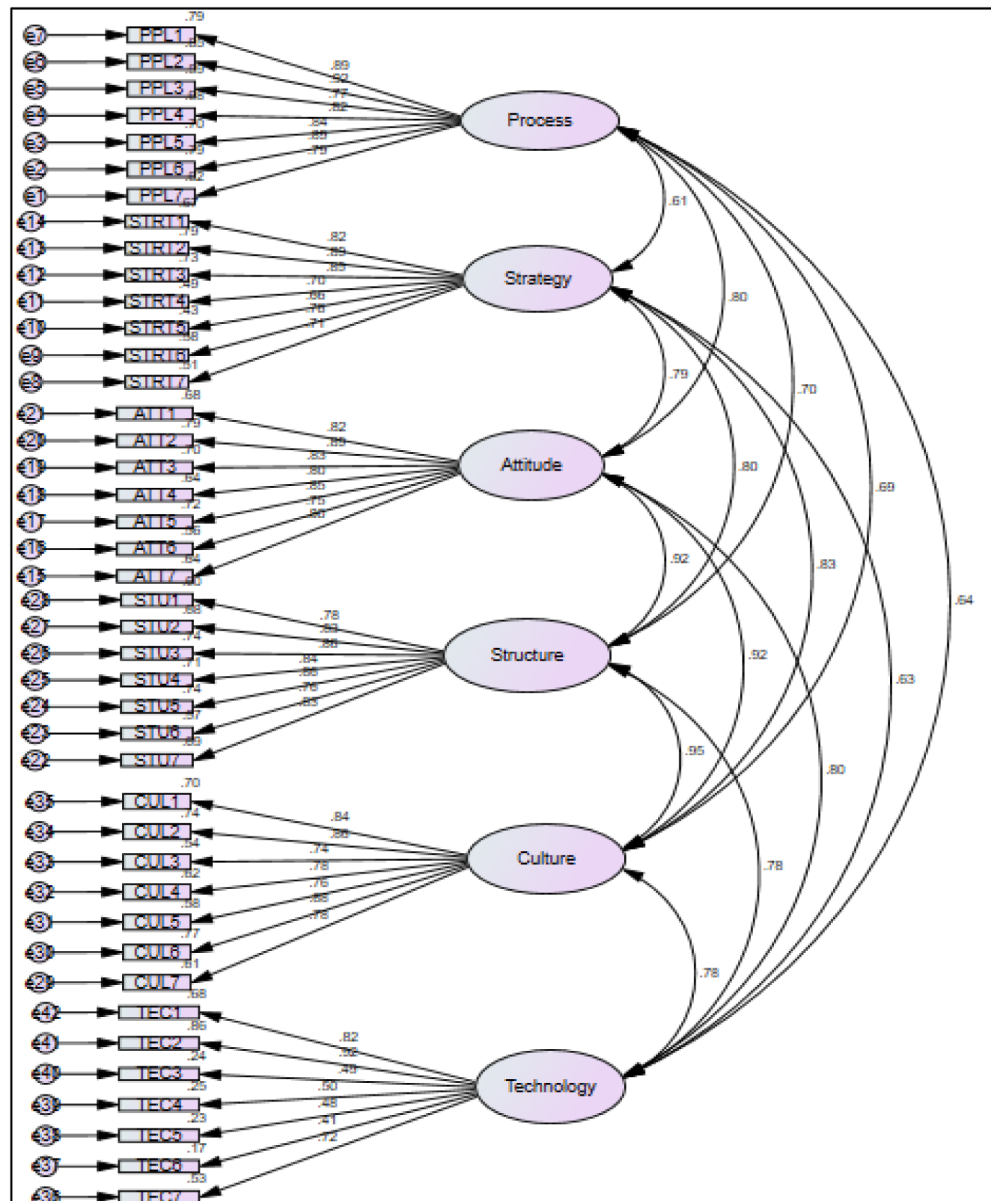
5. First order CFA of organizational change

Confirmatory factor analysis (CFA) is usually based on well-developed measurement theory to confirm the construct (Kline, 2015). This study conducted first-order CFA of organizational change construct to estimate factor loading of each item. The main construct is organizational change which showed connection with sub-constructs to validate the causal effect. Organizational change have six sub dimensions, namely process, attitude, culture, strategical, structure and technology. Each sub dimensions have seven items. Factor loading of each sub-constructs showed standardized regression weights which showed required level has been achieved which is more 0.50 (see Table 2). The result of first-order CFA of 42 items used to measure organizational change revealed that all standardized regression weights are significant for all the 42 items in organizational change scale (see Figure 1).

6. Second-order CFA of organizational change

In the second-order CFA, the causal effects of the organizational change to process, attitude, culture, strategical, structure and technology were estimated. The finding have shown the estimates of the factor loading of organizational change to its dimensions in order to confirm that the hypothesized second-order construct loads with respect to dimensions. Normally, the CFA also showed the estimate of factor loading for every item. After assessing the factor loading of six dimensions of

Figure 1. First-order confirmatory factor analysis of dimensions organizational change.



organizational change in the first-order CFA, then second-order CFA was conducted to assess model fit of organizational change. Factor loading of second construct (standardized regression weights) of all six dimensions (process, attitude, culture, strategical, structure and technology) are given by 0.76, 0.81, 0.96, 0.97, 0.97 and 0.81 respectively, which indicated a strong relation of dimension to organizational change (See Figure 2).

All regression weights were statistically significant at $p < 0.001$ (see Table 3) and factor loading is more the 0.50 thus, the proposed hypothesis (H1) is supported. Although, the results of model fit indices indicate the adequate values shown in Table 4.

7. Validity and reliability

Confirmatory factor analysis verified that all items' loading for every factors were acceptable. To test the validity and reliability of all factors, and Cronbach's α coefficient, construct reliability (CR) and average variance extracted (AVE) tests were performed (see Table 5). The AVEs are greater than 0.5

Figure 2. Second-order confirmatory factor analysis of dimensions organizational change.

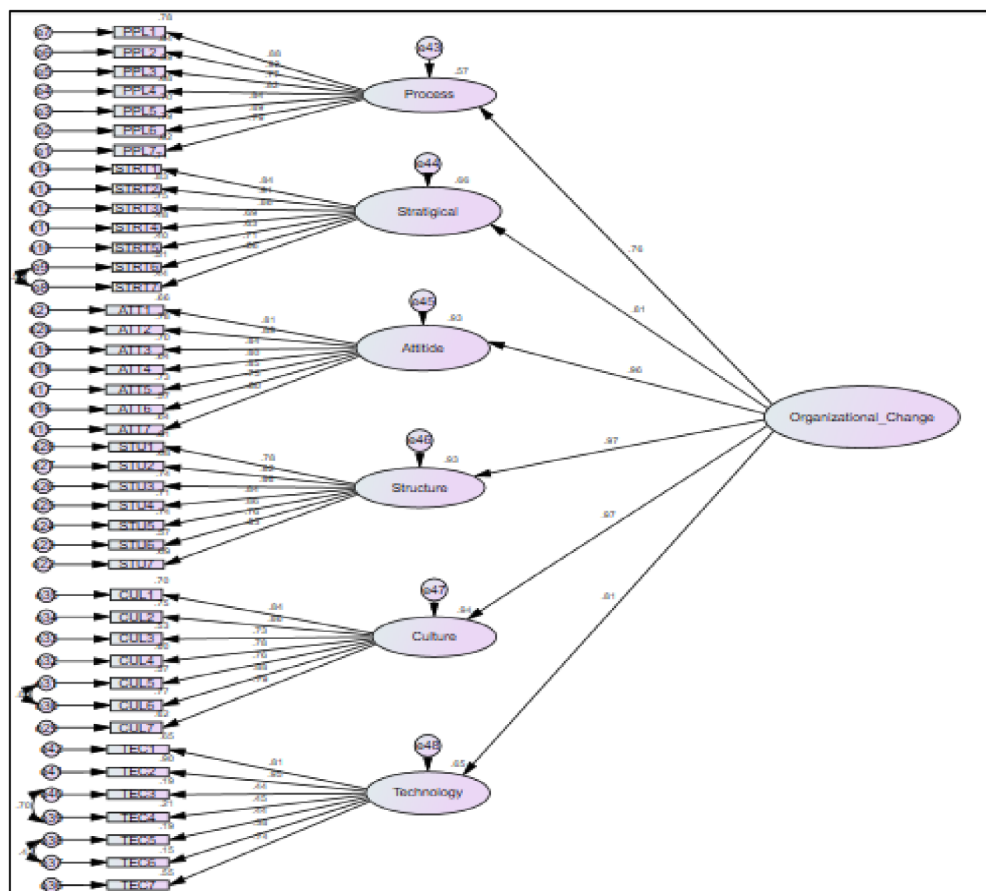


Table 3. Loadings of the second-order confirmatory factor analysis

Factors	R ²	Standard second-order loading organizational change	SE	CR	p-value
Process change	0.59	0.75	0.174	6.517	0.000
Strategical change	0.69	0.83	0.136	6.517	0.000
Attitude towards change	0.92	0.96	0.156	7.699	0.000
Structure change	0.93	0.97	0.159	7.956	0.000
Culture change	0.95	0.97	0.168	7.658	0.000
Technology change	0.66	0.81	0.193	6.387	0.000

Notes: CR: critical ratio and SE: standard error.

Table 4. Model fit indices of organizational culture

Indices	Estimate
CMIN	1,693.926
DF	810
CMIN/DF	2.091
CFI	0.833
SRMR	0.079
RMSEA	0.092

Table 5. Results of the reliability and validity test

Factors	Cronbach's α	AVE	CR
Process change	0.945	0.718	0.947
Strategical change	0.910	0.599	0.912
Attitude towards change	0.933	0.674	0.935
Structure change	0.934	0.678	0.936
Culture change	0.928	0.652	0.929
Technological change	0.840	0.420	0.822

Notes: AVE = Average variance extracted, CR = Construct reliability.

except that of technological change with AVE of 0.42 which can be acceptable. Moreover, the Cronbach's α coefficient and CR values of all factor were greater than 0.70 which showed all measurement scales are reliable. Therefore, over data are reliable and instruments are valid.

8. Discussion and conclusion

The aim of this study is to conduct a construct validity of organizational change dimensions. Thus, the result from the first-order CFA shown that, the factor loading of each dimension indicated a reasonable standardized regression weights > 0.50 . Similarly, the second-order CFA also revealed that, the factor loadings of all the six dimensions (process, attitude, culture, strategical, structure and technology) are given by 0.76, 0.81, 0.96, 0.97, 0.97 and 0.81 respectively, which indicated a strong relation of dimension to organizational change. This finding is in line with Cebula et al. (2012) who found that, organizational culture is the most influential factor to sustain change effort. Moreover, Damanpour and Gopalakrishnan (1998) have established relationship between structural change and optimal change paths for organizations. Chesbrough and Appleyard (2007) on the other hand, argued that, strategical change leads to competitive edge within an organization.

So, based on the significant relationships between the main organizational change construct and its dimensions, the organizational change construct and change dimensions that has been developed and tested in this paper could be used as a valid instrument for measuring organizational change.

9. Theoretical issues, limitation and future researches

Change theory is a general theory which can be used in any filed. Bust more specially, it used in behavioural studies but due to its generalizability even though, the theory does not take dimensions of change into consideration. Therefore, the current study have identified six dimensions of organizational change related to banking sector namely; process, structure, attitude, culture, technology and strategical. Thus, the six dimensions showed statistical significant relationship with the main construct (organizational change). However, this study is limited to banking industry therefore, the authors recommend further studies on the application of dimensions of organizational change to other related sectors of business studies.

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