SYNERGIZING THE INTEGRATION PRACTICES FOR ACHIEVING INTERNAL INTEGRATION

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Abstract

This study proposes a synergized model of internal integration and argues that unless integration practices are suitably aligned, they cannot fetch desired results. We examine the antecedents of internal integration in the Petroleum industry by focusing six precursors, i.e. job rotation, inter-de-partmental training, intra-organizational knowledge sharing, management commitment, supportive information technologies, and strategic consensus. A stratified sample comprising 234 managers from the petroleum firms operating in Pakistan participated in the study. Results indicate that, while individually these factors have significant effects on internal integration, jointly they exhibit trivial effects if not aligned. The proposed model is validated through covariance technique, and relevant methodological and theoretical extensions are discussed.

Keywords: Integration, Job Rotation, Knowledge Sharing, Strategic Consensus

JEL Classification: Z 000

Introduction

With the discerning nature of customers and changing market environment, organizations are faced with new challenges that entail a great deal of integrated relationships. Firms largely draw on their core competencies and outsource the non-core activities to other members in the chain who possess superior capabilities in those areas. The success depends on how well an organization integrate its practices, procedures, and behaviors into a collaborative, synchronized and manageable

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process to meet customers' requirements (Ataseven & Nair, 2017; Kim, 2017; Chen & Paulraj, 2004; Kahn & Mentzer, 1996). According to Kahn and Mentzer (1998), the term 'Integration' is defined as, "the process of inter-departmental interaction and collaboration, which brings departments together into a cohesive organization" (p.9). Prior literature has confirmed the importance of integration not only because the whole philosophy of supply chain management (SCM) is founded on it, but also because it is a source of value creation (Yoo, 2017; Pagell, 2004). Predominantly, it comprises inner cross-functional integration, i.e. internal integration, and backward/forward integration among suppliers and customers, i.e. external integration (Ataseven & Nair, 2017; Kim, 2017; Fawcett & Magnan, 2002). Internal Integration (II) implies cross-functional/departmental integration within organization (Fawcett & Magnan, 2002). It stresses harmony among functional units aimed at providing superior customer service and refers to coordinated and collaborated activities within a particular firm (Ataseven & Nair, 2017; Chen et al., 2009; Chen & Paulraj, 2004).

While prior literature extensively proclaims the strategic value of II, limited research has been conducted so far (e.g., Basnet & Wisner, 2012; Pagell, 2004). Notwithstanding its importance for thriving organizational performance, II still lacks clear operational definition (Frohlich & Westbrook, 2001; Rosenzweig et al., 2003) and there is a dearth of research in how it can be methodically achieved (Basnet & Wisner, 2012; Pagell, 2004). This study explores the antecedents of II and links six integration practices to II in the energy sector: i) Job rotation-JR; ii) Inter-departmental training–IDT; iii) Management commitment-MC; iv) Intra-organizational knowledge sharing–IoKS; v) Supportive information technology–SIT; and vi) Strategic consensus–SC. It proposes a synergized model of integration practices, validates it through covariance technique in structural equation modeling, and discourses it's relevant theoretical extensions and practical implications. The study argues that while each of these integration practices alone significantly relates to II, their collective influence cannot be realized unless they are sufficiently aligned with each other.

Literature Review

Internal Integration

The concept of integration can be linked back to 'Esprit de Corps,' a classical management perspective of Fayol (1949). Prior literature is replete with different definitions of integration but indicates a lack of consensus about the construct (Pagell, 2004). One stream of research approaches integration through the 'interaction' philosophy, emphasizing explicit and verbal activities such as exchange of information through documentation, telephone conversations, teleconferencing, regular meetings, etc. (Kim, 2017). The second stream labels integration as 'collaboration' (Kahn, 1996; Tjosvold, 1989) and emphasized intangible activities that are based on trust and willingly working together such as, mutual understanding, teamwork and an establishment of goal congruence among functional units thereby creating strategic alignment. The third stream advocates a 'composite' view, blending both interaction and collaboration (Gupta, Raj & Wilemon, 1985). Another stream (e.g.,-

Johnson & Filippini, 2009; Koufteros et al., 2005), describes internal integration as 'concurrent engineering'. It predominantly draws on the involvement of cross-functional teams in product development process, which is helpful in reducing conflicts among functional units and improves performance (Maltz & Kohli, 2000). This study measures II through three dimensions, i.e. interaction, collaboration, and cross-functional teams.

Factors Affecting Internal Integration

Previous studies (e.g., Ataseven & Nair, 2017; Basnet Wisner, 2012; Bautista et al., 2017; Dougherty, 1992; Kahn & Mentzer, 1996; Kahn, 1996; Kim, 2017; Pagell, 2004; Santos, 2017) uncovered salient factors that can help achieve II, such as job rotation, co-location, strategic consensus, open culture, communication through cross-functional teams, rotation of employees, IT, management support, goal congruence, and reward systems. Review of the literature uncovered six salient factors (discussed below) that can help achieve II.

Job Rotation. Job rotation (JR) is referred to as lateral transfer or movement of an employee from one position to another in the same organization (Campion, Cheraskin & Stevens, 1994; Malins-ki, 2002; Santos, 2017). JR is a career development tool and a strategy of making employees 'journal-ists' by training them for different jobs or functional units (Campion et al., 1994). It enhances employee motivation (i.e., decrease boredom), increases employers' familiarity with staff (which helps in allocating an appropriate job, etc.), employee knowledge (human capital) and interdepartmental cooperation (Bautista et al., 2017; Campion et al., 1994; Wagner et al., 2017). JR is also a useful method for achieving cross-functional harmony, employee orientation, socialization, succession planning and eliminating myopic functional behavior (Bautista et al., 2017; Dougherty, 1992; Santos, 2017).

Inter-Departmental Training. Interdepartmental training (IDT) refers to the formally designed training of employees about working of other functional units within organization. The purpose is to create awareness and knowledge of other functional units. The communication gap and lack of awareness of other functional units in an organization, e.g., lack of marketing people knowledge of engineering and vice versa is found to be a barrier to integration. It can be reduced by educating employees about other functional units (Gupta et al., 1986; Mollenkopf et al., 2000). Prior research has confirmed that IDT has been helpful in ensuring positive interaction, and reducing potential conflicts of interests (Daugherty et al., 1996; Basnet & Wisner, 2012).

Management Commitment. Management commitment (MC) is the degree to which the management is committed to providing the environment and resources that are essential for integration (Song, Xie & Dyer, 2000; Van de Ven & Ferry, 1980). Pagell (2004) argued that without this factor, integration is difficult. Similarly, Basnet and Wisner (2012) allege that management attitude towards II is vital because it diminishes the myopic mindset. Owing to an overarching influence in

functional units, top management plays a major role in achieving integration (Masood & Daugherty et al., 1996).

Intra-organizational Knowledge Sharing. Intra-organizational Knowledge Sharing (IoKS) is aimed at sharing beliefs embedded within organizational units through knowledge sharing among them (Zaltman, Duncan & Holbek, 1973). It includes reviewing the accumulated information, sharing experience, lessons learned from mistakes, and communicating them across different functional units in the organization (Gu, Jitpaipoon & Yang, 2017; Calantone et al., 2002; Hult & Ferrell, 1997; Yoo, 2017). Organizational capabilities can be augmented by coordination among various functional units for future planning and fulfilling the discerning customer needs (Kogut & Zander, 1992; Yoo, 2017).

Strategic Consensus. Strategic consensus (SC) refers to shared perception, mutual understanding of strategic objectives among different management levels within the firm, and their agree-ment towards an overall strategy (Bowman & Ambrosini, 1997). Prior literature predominantly advocates the significance of SC, its positive effects on organizational performance, and informs that its absence can impede system thinking and less integration among functional units (Ansoff, 1965). SC in goals and objectives leads to collective vision (Pagell, 2004) and helps in achieving II (Basnet & Wisner, 2012).

Supportive Information Technology. Supportive information technologies (SIT) refer to technologies (e.g., email, video conferences, intranet, ERP, etc.), that facilitate communication, collaboration, and make the required information available to all internal business functions (Alsene, 2007; Davenport, 1998). It acts as a coordination mechanism and an interface, which facilitates integration among different business areas (Gattiker, 2007; Vanpoucke, Vereecke & Muylle, 2017). Technologies such as the intranet, and video conferencing, etc. improve communication and facilitate teamwork and innovation within the enterprise (Andersen, 2001).

Method

Sample

A total of 234 managers from 60 companies of petroleum sector participated. Stratified random sampling was espoused (Burns & Bush, 2000). The sample adequacy (234 of 700 population frame) was determined using Yamane (1973) method, i.e. $n=N/(1+Ne^2)$ with 95% confidence level. The sample size for each stratum was proportionately stratified (Hair et al., 2006).

Measures

Empirical instruments comprising 33 items were employed in the form of a questionnaire

and all items were scored on a 5-point Likert-type scale.

Internal Integration. A total of ten items measured the II. The 'interaction' aspect (INT) was measured through two items adapted from Van de Ven and Ferry's (1980). The 'collaboration' aspect (COLL) measured through six items adapted from Khan and Mentzer (1998). The use of 'cross-functional teams' (CFT) was measured through two items adapted from Narasimhan and Kim (2002).

Integration Practices. A total of 23 items were employed to measure six determinants of integration practices—Job rotation (JR) was measured through 3 items, i.e. two items were adopted from Song, Xie and Dyer (2000) and one item was newly developed. Intra-organizational Knowledge Sharing (IoKS) was measured through 4 items adopted from Calantone et al. (2002) and Hult and Ferrell (1997). Management commitment (MC) was measured through 4 items adopted from Parry and Song (1993). Inter-departmental training (IDT) was measured through 3 items, i.e. two items adapted from Basnet and Wisner (2012) and one item was newly developed. Strategic consensus (SC) was measured through 4 items, i.e. two items adapted from Basnet and Wisner (2012) and Akhtar (2009) respectively. Supportive information technolo-gy (SIT) was measured through 5 items, i.e. three items adapted from Andersen (2001), and two items adopted from the Chen and Paulraj (2004).

Construct Validity

For content validity, instruments were discussed with three academic professors, and three professionals from petroleum refineries and marketing companies. Accordingly, the necessary changes were made. Confirmatory factor analysis revealed significant factor loadings above 0.50, construct reliability (CR) values above 0.50, and the average variance extracted (AVE) above 0.50, thus confirmed the convergent validity (Hair et al., 2006). Moreover, all correlations among constructs were lower than 0.85, which confirmed discriminant validity of the construct (Harrington, 2009).

Results

Descriptive statistics of all variables are provided in Table 1.

Table 1

Descriptive Statistics, Reliability and Extracted Variance of Study Variables

Variables	Mean	SD	Alpha	Items	1	2	3	4	5	6	7
1.JR	3.549	0.85	0.85	3	(0.18)						
2.IDT	3.66	0.72	0.78	3	0.42**	(0.76)					
3.MC	3.83	0.59	0.81	4	0.59**	0.51**	(0.76)				
4.IoKS	3.66	0.61	0.84	5	0.51**	0.60**	0.592**	(0.76)			
5.SIT	4.16	0.48	0.82	5	0.34**	0.26**	0.49**	0.27**	(0.70)		
6.SC	3.93	0.69	0.89	4	0.47**	0.514**	0.51**	0.54**	0.47**	(0.81)	
7.II	4.05	0.51	0.79	10	0.40**	0.38**	0.54**	0.44**	0.37**	0.59** ((0.81)

Note: *p<,05; **p<,01, Job rotation (JR) Interdepartmental trainings (IDT), Management Commitment (MC), Intraorganizational Knowledge Sharing (IoKS), Supporting information technilogies (SIT), Strategic Consensus (SC), Internal Integration (II), Bold values in parenthesis are the square roots of average varian ce extracted.

First, the individual effects of all exogenous constructs on II were examined. Significant results were obtained as provided in Table 2, indicating that all six antecedents were positively and significantly related to II. Significant path coefficients with p<0.05 indicated that all the factors have significant effects on II. Furthermore, the Chi-square statistics and fit indices for all constructs were found well within the range (Hair et al., 2006).

Table 2

Independent contribution of Integration proctices for Internal Integration

Integration Practices	Beta Value	Critical Value	P value
β_1 (II \leftarrow JR)	0.44	6.35	0.00
β_2 (II \leftarrow IDT)	0.43	6.32	0.00
β_3 (II \leftarrow MC)	0.58	8.86	0.00
β₄ (II ← IoKS)	0.50	7.29	0.00
β_5 (II \leftarrow SIT)	0.39	5.51	0.00
β_6 (II \leftarrow SC)	0.64	9.95	0.00

 $\begin{array}{c} \text{Se } \textit{Note_JR=Job rotation IDT=Interdepartmental Trainings, MC=Management Commitment, IoKS=Intraorganizational } \\ \text{sure 1. The analysis of } \begin{array}{c} \text{sure 1. The strain stra$

Moreover, the results of model fit indices and the Chi-square statistics (Figure 1) exhibits a poor fit with the data, and none of the values attained the standards.



Figure 1: Path Model showing the Combined Effect

Synergized Model

Given the insignificant results of our combined model, we proposed a synergized model by aligning the exogenous factors (Chatzoglou et al., 2011). Prior researchers increasingly embrace synergy among business practices (e.g., Nielsen, 2005; Urde et al., 2013). It articulates the relationship among different paradigms into a cohesive and dynamic view, and paves the way for aligning the strategies that complement each other (Urde et al., 2013). In the secondorder model (Figure 2), all the six exogenous constructs (antecedents of II) were allowed to covary, that help identify the underlying relationships among these practices and achieving a synergized practices and II is 0.72 (R2 = 0.56), which significantly explain 56% variance in II, and all the model fit indices are in the accepted range (Figure 2). These results indicate that integration practices need to be sufficiently aligned if they are to achieve II.



Figure 2: Path Model Showing the Integrated Effect

Validating the Synergized Model

According to Rigdon (1999), contribution to the theory development can be optimized through comparisons with alternate models that can be theoretically validated under similar circumstances. Prior literature provides several ways for model comparison tto best represent the data with improved fit indices. These methods include Chi-square (χ 2) difference test (CDT), Information criteria methodology/indices and significance of the parameters, i.e. original and new (Steiger et al., 1985). First, the fit indices of synergized model (Table 3) are better than the combined model. Second, the χ 2 difference test indicates that with the alignment of integration practices, the synergized model assumes a better fit. Last, the AIC (Akaike Information Criterion), supports the synergized model.

Table 3Model Comparison Statistics

Model Fit	Criteria	Collective Model	Synergized Model
Chi-Square (X ²)	-	587.93	50.41
ΔX^2	-	-	537.52
Df	-	27	21
X^2/Df	≤3	21.78	2.4
Sig.	<.05	0.00	0.00
CFI	>0.90	0.43	0.97
GFI	≥0.90	0.55	0.955
RMSEA	≤0.10	0.29	0.07
CAIC	Minimal	701.13	205.337
AIC		623.93	98.40

First, the positive and significant relationship of JR practices with internal integration is consistent with previous findings (Basnet & Wisner, 2012; Pagell, 2004; Parry & Song, 1993; Santos, 2017; Song, Xie & Dyer, 2000; Wagner et al., 2017). The significant path (β =0.44, p<0.05) between the two constructs signifies that the more job rotation practices, the higher will be the integration within a company. Employee rotation among different functional areas enhances employee motivation, goal congruency, interdepartmental cooperation, and creates socialization which is useful in breaking the silos and enhancing cross-functional harmony (Kusunoki & Numagami, 1998).

Second, the positive and significant relationship between IDT and II support the assertion of Mollenkopf et al. (2000) that to foster connectivity among employees of marketing and logistics units, management should emphasize on cross-functional education and training. These results also corroborate with the previous studies (Basnet & Wisner, 2012; Bautista et al., 2017; Daugherty et al., 1996; Gupta et al., 1986; Mollenkopf et al., 2000). It indicates that employee training of other functional areas enhances harmony among functional areas and helps understand the problems, limitations, and requirements of other departments.

Third, the positive and significant relationship between MC and II strongly supports the assertion of previous researchers (Basnet & Wisner, 2012; Dougherty et al., 1996; Mollenkopf et al., 2000; Song, Xie & Dyer, 2000) that commitment and support of top management enhance integration among functional areas. These results also maintain the notion that management support, positive attitude, and integration help improve communication, collaboration among functional areas, and reduce combative interactions among departments (Pagell, 2004; Masood & Javed, 2016). The leadership role is vital for fostering integration for bringing together people, and curtailing the silos.

Fourth, the positive and significant relation between IoKS and II highlights the need for sharing experiences, and lessons learned from mistakes across different functional units in an organization (Calantone, Cavusgil & Zhao, 2002; Hult & Ferrell, 1997). Organizational capabilities can be amplified by coordination among functional units by sharing experiences and information gathered from the diverse sources that are useful for future planning and fulfilling the discerning customer's needs (Kogut & Zander, 1992; Lukas, Hult & Ferrell, 1996). It not only enhances coordination and collaboration within the functional areas, but also makes use of the experiences, views, and lessons learned in a system thinking approach (Eng, 2006).

Fifth, the positive and significant relation between SIT and II imply the need for information technologies (e.g., ERP, Intranet video conferencing, e-mail, etc.), visibility of information and communicating information within and outside the organization. It supports the notion that information technology leads to better knowledge management, decision-making, andprovides information integration and makes information accessible to all functional units of the organizations (inventory, manufacturing, marketing, etc.) and is a source of firm's integration (Alsene, 2007; Davenport, 1998; Daugherty et al., 1996; Gupta, 2000). Similarly, the use of other technologies e.g. intranet, video

conferencing, etc. facilitate information consistency, internal communication, teamwork, and innovation within the enterprise (Andersen, 2001; Teece et al., 1997).

Last, the positive and significant relation between SC and II elucidates that employees working closely with each other on similar goals and objectives will lead to a collective vision, unity of effort, and integration among all organizational functions. Supporting prior researchers (e.g., Basnet & Wisner, 2012; Pagell, 2004), results indicate a better strategic consensus, i.e. consen-sus among the employees of the organization, will lead to more effective internal integration.

Conclusions

With these results in hand, several theories seem to complement the strategic, economic, and sociological outlook of adopting integrated relationships in the organization. For example, the resource-based view (RBV) of competitive advantage implies the importance of exploiting all resources (inside or outside the organization) through establishing integration or collaborative relationships among all the stakeholders. Given the fast-paced technological advancement, knowledge-based view (an offspring of RBV), has emerged as the only enduring resource for staying competitive in the market (Acedo et al., 2006). It advocates organizational learning through coordination and knowledge sharing among internal functional units that enhance integration (Lane & Lubatkin, 19986). It would entail cohesiveness or integration among all functional units inside the organization. According to the system theory perspective, organizations are 'open' systems and are influenced by the internal and external environment (Bertalanffy, 1968; Miller, 1978). Mentzer et al. (2001) advocated the system approach, i.e. holistic view contrast to the 'reductionism' view for long-term performance and compet-itive edge. Our theoretical perspective elucidates the importance of integrated and collaborative relationships for acquisition and utilization of resources (RBV), organizational learning (Knowledge-based view) and specify the significance of these relationships based on trust, goal congruency, and alignment.

This study explains how each of these six elements is important in itself for II and how such collective interventions for II can be thwarted if they are not suitably aligned with each other. The findings of the current study suggest ways to develop better internal integration. Firstly, the management should give due importance to integration practices (discussed in this study) that enhance internal integration. Secondly, again from the management's point of view, the practices as mentioned above independently contribute to internal integration, however, the contribution of these practices is multiplied when they are aligned. The findings also suggest that managers should emphasize on the company's strategy along with supportive management commitment for integration and harmony within an organization. Thirdly, the II is a precondition for establishing integration with external partners. Therefore, before going for external integration, an organization should first achieve integration within internal functions.

This study has certain limitations, which open new avenues for future studies. First, the data were collected from a single industry (petroleum companies), that limits the generalizability of our study results. Future studies may be extended in other sectors to substantiate the findings further. Second, the empirical analyses in this study are founded on the cross-sectional data, which limits this study to infer causal relationships. For instance, social desirability is open to inverse causality with alternate explanations. Hence, unequivocal elucidation of these results must be treated carefully. Further studies may employ longitudinal design to validate the results. Last, though the proposed synergized model seems to apply across all organizational settings, the robustness and external validity of this technique may be established in future studies.

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