

AREAS INFLUENCING A FIRM'S STRATEGY IN MANAGING DIGITAL INNOVATION AND FIRM'S PERFORMANCE: A CASE OF OMAN

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Abstract

This paper aimed at analysing key areas that influence a firm's strategy in managing digital innovations and its performance. Digital innovation strategy framework has been applied to IT firms to assess whether user experience, value proposition, digital environment scanning, skills and improvisation influence firm's digital innovation strategy. Data from managerial representatives of IT firms was collected through a close ended questionnaire. The statistical analysis reveals that user experience, value proposition and digital environment scanning are positively associated with firm's performance whereas digital innovation skills are negligibly associated with firm's performance on digital innovation. Moreover, improvisation was found to be weakly associated with organisational performance. Future research directions are recommended to expand framework to incorporate political, regulatory and internal organisational factors.

Keywords: Digital innovation, strategy, technology, improvisation, organisational performance

INTRODUCTION

The growing aspects of innovation entrenched within technological and scientific areas have shortened the time to market products and this has also contracted the product lifecycle. This has put organisations into challenging position whereby they need to capitalise resources and knowledge for producing new products and services. Regardless of huge investments and management efforts, digital innovations have been one of exasperating areas in many organisations. Innovation initiatives often fail while others face hard time to get success. The reason behind this has been deeply rooted in lack of appropriate innovation strategy [15]. The pitch for innovation is opened with the increasing digitalisation of information and rifeness of processing power [13] [17]. Over the recent years, studies have confirmed that digital technology has unique characteristics by which new types of innovations have evolved which are peculiarly different from traditional analogue innovation processes [3] [5]. Besides this, the digital technology has also made it difficult for organisations to predict and control innovation processes [5] [15]. As a result traditional innovation strategies do not work properly to sustain in dynamic market [10]. Therefore, organisations need to adopt dynamic tools and strategies for managing digital innovation initiatives in the long run.

Digital technology has become critically significant for organisations to get and sustain competitive advantage. Though, recent studies have identified difficulties in assessing investments made by organisations towards digital innovation initiatives [3]. Additionally, the

role of digital technology has gone beyond the internal organisations' dimensions rooting into products and services of the organisations [4] [13]. Owing to central role of digital technology in restructuring organisations, the extensive interest of managers and practitioners in managing digital innovation is not unexpected. Along with positive aspects, digital technology is also linked with multiple innovation challenges. As studies have reported how firms flop to address digital innovation, the question arises how to manage digital innovation.

Nonetheless, rare evidence is available about key areas that influence digital innovation strategy management and their impact on firm's performance – specifically in case of Oman. Addressing this issue, this article focuses on areas that influence a firm's strategy in managing digital innovation and firm's performance. This study emphasised on two objectives; first to assess critical areas that firms need to consider while managing digital innovations; and second to evaluate impact of firm's digital strategy on its performance.

LITERATURE REVIEW

A wide array of management research is available on evaluating relationship between radical change and technological innovation. For instance, one stream of literature elucidates how firms adapt and evolve that are driven by application of digital technologies and how organisational strategies are tuned in the line of these technologies for delivering higher value to end customers [12]. In this regard, the application of new technologies can be critical challenge for existing markets. Nonetheless, established firms are more likely to stand in the way of innovations. Researchers have also suggested that strategic models at macro-level can assist organisations to overcome this challenge. For instance, it is contended that organisations can learn to bring incremental as well as radical innovations by developing dynamic capabilities and building ambidextrous structures [8] [17].

Although existing strategic models are relevant for organisations regarding innovation management, recent studies have applied digital technologies whose unique characteristics tend to become fade in perspective of existing models [11]. In this regard, the available research on digital technology suffers from two main limitations. First, it is futile to uncover the black box of technology fully. Firms who seek to develop innovative products and services through digital technology, while working for managing digital innovations; need to hire managers who are highly experienced in digital technology. Second, existing research on technological innovations is more oriented towards macro perspective that often results in higher descriptive strategic recommendations. Therefore, it is important to draw attention to key areas that need to be addressed for managing digital innovation.

While digital innovation paves way for new entrants to pull digital innovation for challenging incumbent firms, it also provides opportunities to incumbent firms to expand and enhance their existing portfolio of products and services into new domains, thus cause radical transformation in industry. However, a critical challenge for firms to manage digital innovation is to have

appropriate understanding of digital innovation processes [12] [13]. When dealing digital innovations, both incumbents and new firms face opportunities and challenges that make it an exceptional case. The rapid pace of digital innovation processes is assisted by flexibility of digital technologies as they can be reconfigured easily [9] [13]. Moreover, this rapid pace is also challenging for firms as they continuously engage in designing smart and hybrid products through digital components embedded in analogous or traditional products. For instance, it was very challenging phase for car manufacturers to embed GPS system even through digital and analogue processes extended at different pace simultaneously [5].

Generativity of digital technology is one of the reasons why organisations face difficulties in controlling and predicting digital innovation process [1] [13]. It refers to overall capacity of technology to create unprompted change that is driven by large uncoordinated audience. When users leverage digital technologies for creating new products and services beyond new design, it can lead to new cascades of innovations where each innovation paves way for next flow of innovation [13]. For instance, the proliferation of digital technology has given higher access to customers to communicate with others, thus resulting in loss of organisations' control on customer relationships. They can easily access information from new organisations regarding their products and services, thus making innovations difficult for companies. Besides this, digital technologies also evolve to have higher processing at low cost [2]. Since digital technology has become more affordable and universal, challenges are removed by organisations to engage in digital innovation for generating and developing new products and services.

While pursuing and managing digital innovations, uncertainty is evident across digital environment of firms, its products and organisational properties [11]. In this respect, researchers have presented a holistic framework for enabling organisations to manage digital innovations [9]. This holistic framework enables organisations to navigate the rapidly changing landscape of digital innovation thus empowering them to motivate and track pace of innovation initiatives. This framework encompasses five elements that include user experience, value proposition, digital evolution scanning, skills and improvisation. In context of digital innovation, *user experience* measures aesthetic traits and usability of digital products and services as users are affected by appearance, beauty and emotional aspects of digital products and services [6] [10]. *Value proposition* is assessed through three elements i.e. beginning with customers, bundling digital products, and commissioning innovations [2] [8] [13]. The *digital environment* is assessed digital devices available in market, distribution channels, and users' behaviours. The level of *skills* is assessed through learning capability, roles, and teams employed for managing digital innovations. Finally, the *improvisation* of digital innovations is assessed across space, time and coordination [2]. This study implements this particular framework to evaluate how firms continuously adjust and align their processes for managing digital innovations.

METHODOLOGY

Quantitative methodology aligned with survey technique was applied for evaluating digital innovation strategy of firms. This methodology was appropriate to get empirical evidence of digital innovation strategy framework. Furthermore, statistical analysis becomes more appropriate on the framework for analysing its effectiveness.

For data collection, IT firms were targeted in Oman. 10 small IT firms were selected randomly from Oman. These small firms have not been listed in the stock exchange. The information technology industry of Oman is dominant by small and medium sized firms. As per Business Monitor Report, the IT industry of Oman is going to expand in future, and this growth will be driven by small and medium sized firms [3]. A total of 200 managerial representatives of IT firms were targeted for data collection. In each firm, 20 questionnaires were distributed among staff representatives. Self-administered survey was conducted from managerial staff of firms. Hence, the selected firms are expected to represent the overall characteristics of the industry.

The data was collected through a questionnaire tool. The instrument was adopted from study of Nylen and Holmstrom (2015) who proposed a framework for managing digital innovations. The instrument involved three main dimensions i.e. product, environment and organisation that influence organisation's digital innovation strategy. The product dimension has been measured through user experience and value proposition whereas the environment dimension is measured through digital environment scanning. The organisation dimension is measured through skills and improvisation of digital innovations. Specifically, Likert scale ranging from "strongly agree" to "strongly disagree" is used for instrument development. Besides this, organisational performance dimension has been added in framework to evaluate how digital innovation strategy impacts organisational performance. The financial performance of firms was assessed through response of the participants only.

The adopted instrument has potential to provide adequate understanding of digital innovation strategy and its impact on organisational performance. To check the reliability of instrument, Cronbach alpha has been applied. The instrument has been found statistically reliable with Cronbach alpha score of 0.732. Further, the digital innovation strategy framework has been tested through correlation and regression analysis. SPSS Software was applied for analysing survey data.

DISCUSSION AND ANALYSIS

From a survey of 200 managerial respondents of IT firms in Oman, 76% response rate was achieved. From this sample, 71% of respondents were males while 29% were females.

Table 1 represents correlation matrix among study variables. It is evident from results that user experience, value proposition, and digital environment scanning are highly associated with

organisational performance. This implies that successful digital innovation strategy owes a great deal with consideration of user experience, value proposition, and digital environment scanning. However, a negligible association of 0.241 was found between digital innovation skills and organisational performance. These results are contradictory to prior studies that indicate positive association of digital innovation skills with higher organisational performance [4]. The negligible association indicates that managerial representatives in selected IT firms may lack relevant skills regarding digital innovation that are less likely to influence organisational performance. Furthermore, improvisation of digital innovations was also found to be having weak association of 0.322 with organisational performance. These findings indicate that structures and flexibility in digital innovation strategy are somehow weakly balanced in sample firms. This weak balance and poor coordination of improvising digital innovations may have weak influence organisational performance.

Table 1: Correlations

		User Experience	Value proposition	Digital evolution scanning	Skills	Improvisation	Org Performance
User Experience	Pearson Correlation	1	.919**	.584**	.969**	.678**	.814**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	152	152	152	152	152	152
Value proposition	Pearson Correlation	.919**	1	.836**	.970**	.638**	.962**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	152	152	152	152	152	152
Digital evolution scanning	Pearson Correlation	.584**	.836**	1	.728**	.415**	.865**
	Sig. (2-tailed)	.000	.000		.000	.000	.000

	N	152	152	152	152	152	152
Skills	Pearson Correlation	.969**	.970**	.728**	1	.701**	.241
	Sig. (2-tailed)	.000	.000	.000		.000	.311
	N	152	152	152	152	152	152
Improvisation	Pearson Correlation	.678**	.638**	.415**	.701**	1	.322**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	152	152	152	152	152	152
Org Performance	Pearson Correlation	.814**	.962**	.865**	.241	.322**	1
	Sig. (2-tailed)	.000	.000	.000	.311	.000	
	N	152	152	152	152	152	152

** Correlation is significant at the 0.01 level (2-tailed).

For evaluating the impact of digital innovation strategy on organisational performance, regression analysis was conducting on survey results. Table 2 represents model summary of regression analysis. The model is found to be fit with higher value of R suggesting that the proposed framework fits within sample data.

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.975 ^a	.950	.948	.15938

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.975 ^a	.950	.948	.15938

a. Predictors: (Constant), User Exp, Value Prop, Digital scanning, Skills, Improvisation

The results of ANOVA test reveal that overall model is significant as P-value is less than 0.05. This implies that digital innovation strategy significantly impacts organisational performance within IT firms.

Table 2: ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	70.645	5	14.129	556.180	.000 ^a
	Residual	3.709	146	.025		
	Total	74.354	151			

a. Predictors: (Constant), User Exp, Value Prop, Digital scanning, Skills, Improvisation

b. Dependent Variable: Org Performance

The results of coefficients of regression reveal that user experience, value proposition, digital environment scanning, skills and improvisation of digital technology significantly impact organizational performance. Table 4 represents details of regression coefficients.

Table 3: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.211	.066		3.196	.002

User Exp	2.499	.301	1.901	8.304	.000
Value Prop	1.296	.115	1.058	11.290	.000
Digital scanning	7.221	.622	5.572	11.609	.000
Skills	2.436	.417	1.954	5.835	.000
Improvisation	.093	.043	.058	2.157	.033

a. Dependent Variable: Org Performance

The successful implementation of digital innovation framework enables firms to align and adjust their processes appropriately in order to optimize digital innovations. As each firm is unique in its characteristics, the extent of its effectiveness may differ substantially. A positive user experience with usability, aesthetics and engagement is more effective to gain higher performance [8]. Moreover, it is segmentation, bundling and commissions of newly developed digital products are also critical for positive value propositioning. The critical aspect of digital innovation strategy is to deploy skilled employees, align their roles and provide adequate learning opportunities to them [2]. Finally, results of this study are also aligned with prior studies that emphasised on improvisation of digital innovations for reaping higher performance [8].

CONCLUSION

This study tried to explore critical aspects of digital innovation process. Furthermore, the framework has been implemented to IT firms for evaluating impact of digital innovation strategy on organisational performance. Overall, this study concludes positive association of digital innovation strategy on organisational performance. While implementing digital innovation strategy successfully, one key area is to adjust and align organisational processes. However, as each firm is unique; the implementation of digital innovation framework may have different impacts on organisational performance. The digital technology paves multiple ways to get relevant data for further innovations. For instance, through digital technology; firms can engage with customers to get insights about their priorities and usage patterns. In the same way, firms also need to investigate environment in which they operate to have adequate understanding of digital technology and its development. This process is more likely to be facilitated by digital technology, for instance; via technology blogs. Hence, this framework, when appropriately implemented; can provide valuable insights to firms for managing digital innovations in the long run.

It is concluded that multiple factors influence implementation of digital innovation strategy. One of the limitations of this framework is the ignorance of factors such as political and regulatory

policies that equally influence digital innovation initiatives. Moreover, this framework has also ignored internal organisational factors that may impact organisation's digital innovation strategy. Another limitation of this study is the evaluation of financial performance through participants' perception only. Future researchers may determine influence of firm's digital innovation strategy on firm's performance through financial statements of companies. Future research has been recommended to expand this framework to incorporate regulatory policies, political factors and internal elements of organisations such as role of leadership for managing digital innovations.

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