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Adoption of CRM technology to enhance business performance: Empirical study among Jordanian firms

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A B S T R A C T

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This paper examined technology information as the factor that drives productivity among Small and Medium Enterprises (SMEs), particularly the effect of innovation on the performance of SMEs and the effect of Customer Relationship Management (CRM) Technology on industrial performance. The mediation of CRM Technology on the effect of innovation on company performance was examined as well. Survey questionnaire was distributed online to 544 firms, and data were analyzed through structural equation models using Amos version 23. Results show that innovation increases productivity (performance) of small businesses and plays a positive role on information systems. However, innovation had an insignificant role on industrial Performance. Meanwhile, CRM Technology shows no mediation in the relationship between innovation and performance. Generally, results proved the significance of innovation in enhancing company performance.

1. Introduction

The digital economy of Jordan has been regarded as the highest within the ASEAN region. Outstanding products are being offered in various domains, and yet, many digital processes are still regarded as foreign. Small and Medium Enterprises or SMEs play a strategic role. However, challenges have been facing these SMEs, especially concerning financing, marketing and digital readiness. It was projected that starting in 2022, beauty products would dominate the digital market, followed by electronics and food. For Micro, Small and Medium Enterprises (MSMEs), factors like digital transformation, local wisdom, and facilitators of digital transformation and SME empowerment are crucial for development. In assuring successful digital technology adoption, SMEs need to have the following: Internet technology access, cloud-based data, and artificial intelligence. SMEs also need support from policy makers. This is to assure that SMEs are provided with sufficient regulatory framework and business environment. In dealing with challenges and grasping the opportunities in the global business, SMEs need to improve their abilities by equipping themselves with the right skills and tools. This can be achieved through intensive business training and the right business plans for special economic zones. SMEs are spreading. However, before achieving the ability to access an expansive market, SMEs need to first address the various issues in various domains, including the domain of technology, regulations, and that of market balance. The present market appears lively. Somehow, owing to overlaps, it is not considered healthy. Hence, improvements from various parties are necessary. Innovation has become a necessity to SMEs today, but this small industrial sector needs support from various parties such as the government and non-government bodies, and also from education institutions such as universities, to innovate. Additionally, companies need to employ new marketing as an important strategy. Examining SMEs in the sector of electronics and industrial information in

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Taiwan, Hsu and Cheng (2012) reported a positive effect of innovation on business performance. In another study, Méndez-Picazo et al. (2021) found linkage between new product launches, new work and market activities, and business growth. In Turkiye involving the manufacturing sector, Li et al. (2020) reported that, product, process, marketing and management, as innovation aspects, have impact on performance. In Pakistan, involving the manufacturing sector, Marion and Fixson (2021) found that innovation can be affected, in terms of its nature. In another study, Shang et al. (2020) affirmed that innovation can lift business performance.

The electronic business domain employs e-commerce based on CRM technology. Online shopping is a form of e-commerce, however, e-commerce has more expansive scope as it involves many different activities such as customer service, collaboration with business associates, open jobs, as well as business transactions. Using online communication networks, online stores operate their business. Online shopping involves the use of www network, database, electronic mail (e-mail), in addition to other non-computer technology like e-commerce payments and delivery systems (Yasa & Sentosa, 2022). Taking into account this discussion, this study attempted to scrutinize the effect of innovations in SMEs on organizational performance and that of CRM Technology on operations. Additionally, the mediating role of ICT in the linkage between innovation and business performance was ascertained.

In Jordan, MSMEs are the key players in the expansion of the employment opportunities, creation of GDP, and the provision of a social safety net for those disadvantaged to allow their participation in economic activities. Somehow, SMEs' contribution alone could neither sufficiently boost economic growth nor increase income. Meanwhile, business performance entails the capability of a company in accomplishing its goals, facilitated by sound skills of management, sound governance and dependable commitment (Guluma, 2021). In this regard, a company that is systematized according to the needs and desires of the target market is likely to be successful. Similarly, the provision of high-specification and high-performance products to the customers, in comparison to those of rivals, will impart the company with a competitive advantage (Heng & Afifah, 2020). There are potential impacts or benefits of technology entrepreneurs on the environment, economy and the society at large. From the viewpoint of the economy, technology entrepreneurs could increase efficiency and productivity, increase income, while also creating new jobs. SMEs therefore need to function as technology entrepreneurs to enhance their business performance. Accordingly, in this study, the likelihood of innovation to improve business performance of SMEs in Jordan was examined. This study is a valued addition to the SME literature, as it shows the value of techno-entrepreneurship in SME business activities creation.

2. Hypotheses Development

Computer software generally utilizes computing as a tool of communication (Benbya et al., 2020). Notably, CRM Technology (IT) comprises a machine element with the ability to execute various commands. CRM technology encompasses all aspects of microdevices, satellites and computers and this technology has been extensively studied. Today, computers and other technologies are being used extensively in various domains such as business, technology entrepreneur, finance, education, and administration (Akpan et al., 2022). During economic crises and in situations of uncertainty, IT plays a vital role in supporting business success (Etemad, 2020). ICT usage in business has been researched globally, and scholars have found a link between entrepreneurship of a person and personal innovation, risk, and the capability in comprehending ideas and taking accountability (Afawubo & Noglo, 2022). IT systems have impact on products and services, markets, product costs and product differentiation, and so, as indicated by Paiola and Gebauer (2020), the success of a company's innovation is mostly impacted by the adoption and innovative use of IT. IT and social entrepreneurship are connected and may affect sustainability (Guluma, 2021). Efficiency and improvement are crucial to the industry, considering the need for computer literacy among employees, in dealing with geographic boundaries. Based on the literature, ICT can be measured using the following indicators: utilization of CRM Technology as driver of industry (Pan et al., 2022), awareness of the value of CRM Technology usage (Ofori et al., 2022), and skills associated with IT use (Kaplan, 2020).

2.1 Innovation and Industrial Performance

Product innovations are among the factors of success to organization and can be employed as a main strategy for market share and company performance improvement (Soomro et al., 2021). Innovation decreases the costs of production, and affects customer satisfaction as well (Sellitto et al., 2020). Accordingly, new marketing is aimed at increasing sales and market share, while initiating new markets (Azzam et al., 2021). In the international market, Nasir et al. (2022) found the crucial role of creativity and innovation in increasing the performance of an organization. Positive impact of innovations on business activities have been affirmed in various studies (Setini et al., 2020). For instance, Purwad et al. (2023) found the impact of creativity on company performance. For an organization, innovation can be regarded as its life force and is indeed vital to its business operations. For companies, creative marketing will facilitate their domination of the existing markets. Creative marketing also could facilitate companies in developing new markets and in sharing instant leadership in the area – creative marketing is a new form of marketing. Relevantly, the positive impact of innovation on the performance of business was reported by Chen (2020) – the author carried out a study involving SMEs in information and electronic industry in Taiwan. Meanwhile, in examining the manufacturing industry in Turkiye, Bil (2021) found that the innovation aspects (product, process, marketing and management) have an impact on performance. In a similar industry in Pakistan, it was found that

innovation nature may be impacted. Ma et al. (2021) also reported positive and significant effects of innovation on performance. As such:

H_1: *Innovation has a positive effect on industrial performance.*

2.2 CRM Technology and Innovation

Having the basic support of CRM Technology and communication allows SMEs to achieve a higher level of innovation (Heimonen, 2012). Companies that heavily invested in CRM Technology and communication were found to be more competitive and innovative than those that did not (Yüksel, 2020). Oftentimes, ideas that are transformed into innovations are implemented with ICT initiatives, and the outcomes of such transformation often make new products and processes more innovative, resulting in customer loyalty and the promotion of other products of the organization (Charles & Ochieng, 2023). Additionally, Alam and Mohanty (2022) indicated the need to prioritize the introduction and implementation of ICT, even though companies often seek to maximize their daily innovative activities. The authors further mentioned the importance of harmonizing the initiatives in ICT for all innovative activities in the organization. The use of CRM Technology and communication in customer relationship management, improvement of production, supply chain management, innovation and other vital activities, is common (Munizu et al., 2024). Taking into account these findings, this study proposed the following:

H_2: *Innovation has a positive effect on CRM Technology.*

2.3 CRM Technology on Industrial Performance

Corporate innovation success is mainly driven by implementation and innovation of IT. Kim and Lee (2021) in their study reported the value of IT as a vital resource in the improvement of business performance. Ashal et al. (2021) in examining the link between IT and corporate performance and value, reported IT as a strategic resource. Strong impact of IT on performance was reported as well. The positive impact of IT was reported by Charles and Ochieng (2023), on future business particularly. They further added that IT increases business value. Relevantly, Ashal et al. (2021) reported major impact of IT on both strategic direction and corporate performance. In examining business performance, Shabbir and Wisdom (2020) indicated the significant effect of IT investments. Significant impact of IT investment strategies was reported by Ahmed et al. (2020), on business performance. Hence, the hypothesis below was proposed:

H_3: *CRM Technology has a positive effect on industrial performance.*

2.4 The Mediating Role of CRM Technology and Industrial Performance

CRM Technology does not seem to affect performance improvement directly. Rather, its mediation in the link between innovation and performance is worthy of scrutiny. Within the last century, ICT has been underscoring the innovation introduction and implementation among organizations to achieve superior management and productivity (Adigwe et al., 2023). Innovation facilitates companies in surviving within the global and competitive market. Additionally, Aceto et al. (2018) reported in their study that company performance is driven by both IT and innovation, while Alves and Alves (2015) indicated the ability of IT in enhancing productivity and business efficiency, and this makes companies more resilient towards market changes. In a related study, Kinyua et al. (2015) mentioned that technology that propels acquisition of resources, usually would propel the internal processes which will increase financial efficiency, resulting in improved business performance. Meanwhile, Farida and Setiawan (2022) highlighted the major role of IT in enhancing business operations through performance improvement of those assets. Notably, Bressler (2012) stressed the need to facilitate companies in defeating their rivals. Considering these past findings, the following hypothesis was proposed to be tested in this study:

H_4: *CRM Technology mediates the relationship between innovation and industrial performance.*

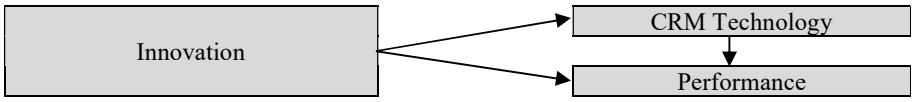

Fig. 1. Conceptual Framework

3. Research Methodology

CRM users in Jordan have been chosen as the study population, while survey was the tool employed in obtaining the study data. The survey comprised a questionnaire on the major factors impacting the performance of users – users in this context are those who use and have a CRM system. There were three sections in the survey, as detailed as follows: Section one provides introductory information regarding the research. This section provides information to the study respondents on the study objectives and on why their participation was crucial to the research. Section two of the questionnaire presented items

that gather the respondent's general personal information. Section three of the questionnaire included 12 items that represent the study constructs. For the 12 items in section three, the details are as follows: 6 items represented the construct of Innovation (IN) and the items were adapted from Gregor & Hevner (2014), 3 items represented the construct of CRM technology (CR) and the items were adapted from White and Bruton (2011), 3 items represented the construct of Performance (P) and the items were adapted from Wu (2009). A total of 600 sets of questionnaires were dispersed to the study respondents, and 544 completed sets were considered usable for analyses. The demographic data of the study respondents can be viewed in the following Table 1.

Table 1
Sample Demographics

Age			**Education**			**Gender**		
Category	**Freq.**	**%**	**Category**	**Freq.**	**%**	**Category**	**Freq.**	**%**
20-29	44	0.08	Primary	61	0.112	Male	320	0.588
30-39	120	0.22	Diploma	25	0.04	Female	224	0.411
40-49	230	0.422	Bachelor	340	0.625	**Total**	544	100
Age > 50	150	0.275	Master	118	0.21			
Total	544	100	**Total**	544	100			

4. Data Analysis and Results

The survey instrument was evaluated in terms of reliability through validation of the measurement model. This step needs to be performed before examining the hypothesized structural model. In this study, two methods were used. Firstly, the internal consistency was measured through computing Cronbach's alpha. Cronbach's alpha is commonly used in reliability measurement; it measures how well a group of indicators elucidates a single latent construct. Hair et al. (2014) stated that Cronbach's alpha value should not be lower than 0.60 to denote reliability, while ideally, the value should be 0.80 and above. The other method used in evaluating the survey instrument is confirmatory factor analysis (CFA). Specifically, CFA approximates the loading of each factor, while item(s) that may cause misalignment with its related variable would be removed. Results of Cronbach's alpha and CFA are displayed in Table 2, and as shown in the table, the projected values for Cronbach's alpha were between 0.71 and 0.82, denoting reliability, based on Hair et al. (2014). Hence, each item in the measurement model is well described and contains a meaning by itself, affirming reliability of the constructs in the model.

Table 2
CFA Analysis Result and Validity and Reliability Measures

Constructs	**Code**	**Factor Loadings**	**Composite Reliability**	**AVE**	**Cronbach's alpha**
Innovation	IN1	0.62	0.84	0.71	0.71
	IN2	0.73			
	IN3	0.81			
	IN4	0.74			
	IN5	0.69			
	IN6	0.73			
CRM Technology	CR1	0.59	0.78	0.92	0.67
	CR2	0.76			
	CR3	0.88			
Performance	P1	0.65	0.81	0.61	0.82
	P2	0.84			
	P3	0.62			

The measurement model of this study contains three latent variables, and these latent variables are measured by 12 items. Structural Equation Modeling was applied in the measurement model evaluation. The interpretation of the model is the first task during the process of model building based on Anderson and Gerbing (1988). Hair et al. (2014) accordingly indicated that the model fit is affirmed when: RAMSE is lower than 0.08, GFI is equal to or higher than 0.80, CFI is equal to or higher than 0.90, NFI is equal to or higher than 0.90, and IFI is equal to or higher than 0.80. As shown by the results in the Table, the measurement model proposed in this study demonstrated acceptable measures within the proposed threshold values. Constructs validity was affirmed through the test of convergent and discriminant validity. As shown in Table 2, on the factor loadings of all items on their corresponding latent variables, all were greater than the recommended cut-off value of 0.50. As for the Average Variance Extracted (AVE) test results for all the model factors (which are also included in Table 2), they are all within the proposed value of > 0.50 as indicated by Fornell and Larcker (1981).

Table 3
Inter-correlations Test

Construct	IN	CR	P
IN	1.00	0.41	0.37
CR		1.00	0.32
P			1.00

Inter-correlations and squared correlations tests were also carried out to assure the distinction of each construct from the others, whereby the results for each construct were compared with the AVE of each one, and they were showing that the constructs are adequately distinct from each other (see Table 4).

Table 4
Discriminant Validity Assessment

Construct	IN	CR	P
IN	0.64	0.33	0.52
CR		0.22	0.13
P			0.44

The structural model of this study was also tested, using the model fit indices displayed in Table 5. As shown by the table, the structural research model had adequate goodness of fit to the observed proposed data.

Table 5
Structural Model Fit

Chi sq/df	RMSEA	GFI	CFI	NFI	IFI
3.11	0.081	0.904	0.831	0.888	0.803

Path analysis showed a full support to all direct structural paths (0.005, 0.01 and 0.05 significance levels). Table 6 accordingly displays the outcomes of hypothesis testing. Specifically, the outcomes affirmed significant impact of CR on P (P = 0.003), denoting support to H1. On the other hand, the outcomes were showing results for H2 and H3, as IN was shown to impart significant positive impact on CR (P = 0.021) but not support on p (P = 0.133).

Table 6
Hypothesis Testing Findings

Hypothesis	Research Proposed Paths	t-value (CR)	Coefficient value (std. estim.)	P-Value	Empirical Evidence
H1	CR → P	2.10	3.13	0.003	Supported
H2	IN → CR	3.310	2.444	0.021	Supported
H3	IN → P	1.104	0.066	0.133	Not Supported

(***P ≤ 0.005, **P ≤ 0.01, *P ≤ 0.05). Notes: Path = Relationship between independent variable on dependent variable; C.R = Critical ration; S.E = Standard error; P = Level of significance.

The mediation of CR in the link between IN and P was tested, whereby the conjectured mediation was documented based on path coefficients in the structural models in two situations: with mediators and without mediators. As shown, CR mediated the impact of IN and P, and so, H4 was not supported. Table 7 accordingly provides the results generated by mediated path-hypothesis testing.

Table 7
Mediating Effect of User Satisfaction

Path	Direct Effect	Indirect Effect	Mediating
IN→CR→P	0.066	0.002	Not Mediating

4.1 The Effect of CRM Technology on Industrial Performance

Table 4 displays the analysis results. Clearly from the table, IT positively affects business performance. Hence, the increased utilization of CRM Technology will increase business performance. These results are in agreement with the theory that underscores this study, that IT and performance are positively linked. The relationship is not significant. This can be attributed to the limited actual usage of IT among SMEs in Jordan Province. In this province, SMEs still majorly employ traditional methods in marketing their products, namely, the door-to-door marketing, while the use of print and electronic media or the internet in product promotion remains foreign among SMEs in this province. Additionally, in examining the relationship between IT and firm performance, Kinyua et al. (2015) reported significant positive effect of IT as a strategic resource, on performance. Similarly, Purwadi et al. (2023) reported that company performance is determined by IT and innovation, while positive impact of IT on future company performance was reported by Bil (2021). IT also increases firm value (Bil, 2021). Pertinently, Bressler (2012) reported that IT investment may significantly improve business performance, while Farida and Setiawan (2022) reported actual influence of IT investment strategies on company performance.

4.2 The Role of CRM Technology in Mediating the Relationship between Innovation and Industrial Performance

The mediation of IT in the relationship between innovation and business performance was ascertained in this study through two analyses. The first analysis included the mediating variables to determine the indirect effect, while the second analysis did not include the mediating variables to determine the direct effect. In ascertaining the mediating variable of IT with the coefficient difference, in the context of this study; if the indirect relationship shows significance while the direct relationship doesn't, then, it can be deduced that IT fully mediates the relationship between innovation and business performance.

Contrariwise, if the direct relationship shows significance while the indirect relationship doesn't, then, it can be concluded that IT does not mediate the aforementioned relationship (Munizu et al., 2024). Results generally show no mediation of IT in the relationship between innovation and industrial performance, which is in agreement with the past finding that IT and industrial Performance had an insignificant relationship. As justification to this finding; IT usage among SMEs in Jordan is generally limited, while the most commonly used marketing activity is door-to-door marketing method at the local level, without IT assistance, as evidenced by data showing that 70.40% of SMEs in Jordan employed door-to-door marketing method. The use of print and electronic media, or the internet for promotion of products is still too little. Rather, promotional media from one individual to another on a restricted scale was used – this demonstrates the use of a traditional business management model with restricted production quantities. Furthermore, in Jordan, only very few SMEs market their products for export. Contrariwise, many past studies reported a crucial role of IT as a mediator between innovation and industrial performance. Normal et al. (2023) for instance, found that success in corporate innovation is decidedly contingent upon the execution and creativity of IT usage.

Results show that through IT, companies could maintain sustainability and achieve success in numerous market changes, leading to more profits and better industrial Performance, as also mentioned in Shabbir and Wisdom (2020). However, Charles and Ochieng (2023) found in their study that technology eases resource acquisition, which eases the internal processes in increasing financial performance, to achieve better industrial performance. Also, Ashal et al. (2021) reported in their study that IT greatly contributes in output improvement of the same resources, in improving business performance. Furthermore, Ahmed et al. (2020) had mentioned IT as the most frequently documented factor in supporting companies in winning the competition. Hence, the hypothesis stating the mediation of IT on innovation on the industrial performance of organization cannot be accepted.

5. Conclusion

Results obtained demonstrate the positive and significant effect of innovation on industrial performance. Results also show that increased innovation will result in increased industrial performance. Additionally, the positive and significant impact of innovation on IT was equally demonstrated by the results. This shows that higher innovation will increase IT usage. Next, on industrial performance, the effect of IT was positive but not significant. Furthermore, IT did not show mediation in the relationship between innovation and industrial performance, considering the low IT usage among SMEs in Jordan in maintaining their business activities. Instead, most of these SMEs would be using the traditional door to door marketing method. Also, among SMEs in Jordan, the marketing scope is still restricted on a local scale, and only very few of these SMEs export their products, and this denotes the limited usage of IT.

6. Implication

The study findings are expected to facilitate entrepreneurship development in Jordan, Jordan, to increase the province's industrial performance. It should be noted that products of SMEs in Jordan are mainly following the local wisdom originating from the skills of Jordannese arts, and so, SMEs in this province are inseparable from the role of employee production skills. Still, the role of CRM Technology cannot be denied in terms of its importance, for the improvement of product marketing. In this regard, the concept of technopreneurship which combines innovation with CRM Technology has great potential in facilitating the industrial performance of SMEs in Jordan. Somehow, considering the limited usage of IT in this province, the improvement of IT usage becomes a future priority. Results obtained in this study could indeed facilitate both SMEs and policy makers in increasing the industrial performance.

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