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Impact of Technological Innovation on Performance of Manufacturing Firms in Switzerland

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Abstract

Innovation is using knowledge to develop something with new economic value. Technological innovation is vital for firms to drive their growth, create value for the firm and its clients, and develop a competitive advantage. Thus, the study sought to examine the impact of technological innovation on the performance of manufacturing firms in Switzerland. The study adopted the descriptive research design. The target population was 658 respondents from Eastman Chemical International GmbH Zoug. The sample size was 249, which was determined using the Yamane formula. The study used questionnaires to collect the data. The analysis of the data was done using inferential statistics. The study found that technological innovation is positively and significantly related to performance (β=0.684, p=0.005). The research concluded that technological innovations influence the performance of Eastman Chemical International GmbH Zoug. Technological innovation brings benefits. It increases productivity and brings better goods and services that improve the overall standard of the goods and services produced by an organization. The power of service innovation in helping the firm to keep and expand its competitive position is indisputable. It is noted that technological innovation technique is vital for firms to drive their growth, create value for the firm and its clients, and develop a competitive advantage. The research recommends that for the firms to realize higher performance, they should adopt technologically innovative strategies. Firms should aim to ensure service range expansion, replacement, enhancement, repositioning and new service introduction to enable the firm to be much more effective, grow quicker, invest more and gain more competitiveness. The aspect of technological innovation should be given an upper hand in any organization if higher performance is to be achieved.

Keywords: *Technological innovation, performance, manufacturing firms, Switzerland.*

1.0 Background of the Study

Innovation is using knowledge to develop something that has new economic value (Ranta, Aarikka-Stenroos & Väisänen, 2021). Innovation describes radical and step-by-step changes in reasoning, things, processes, or services. Innovation involves advancing new products and services to satisfy customers' needs (Lambrecht & Tucker, 2020). Innovation is an essential component of competitiveness embedded in a firm's organizational structures, processes, products and services (Tsang, Ho & Liang, 2019; Weitz & Jap, 2019; Zahirah 2016). The innovative approach is required to define how the benefits of innovation will be communicated to workers to attain their buy-in and should freely show the significance that management places on innovation. Innovation performance is a key factor in competition and organizational progress. An innovation strategy offers direction and concentrates on the effort of the whole firm on a particular innovation end (Yu, Lan & Zhao, 2021). The management of top-performing firms should be tangibly and visibly dedicated to new product creation, formulation and communication of the firm's new product creation strategy (Saji, John, Nair & Houjeir, 2019).

Any firm operating in fast-changing markets with rapidly changing technology should focus on innovation (Lee, Suh, Roy & Baucus, 2019). If it does not concentrate more on innovation, it may become overtaken by its competitors. Occasionally firms undervalue the competitive obstacles it encounters. The risk of this occurring is high when rivals respond to potential obstacles similarly. In the present worldwide and rapidly competitive environment, technological innovation is becoming increasingly pertinent, primarily due to three significant trends: extreme global competition, diverse and demanding markets, and varied and rapidly changing technologies. Rauter, Globocnik, Perl-Vorbach and Baumgartner (2019) argued that companies that offer reliable technology usually satisfy the targeted customers' requirements, make them much more effective than their competitors, and position them in a better position to create a sustainable competitive advantage.

Mousavi, Bossink, and van Vliet (2019) noted that the strategy of innovation might be defined as a strategy of firm activities and growth to motivate, mobilize, inspire, and achieve improvements in technology or service by investing financial and human assets in research and development tasks. The technological innovation method shows the objectives of the firm's innovation activities and assists in concentrating efforts on attaining those objectives. With a strategy in place, diverse groups within a firm will all work towards common goals instead of working on their own private issues. The technological innovation approach strongly favors the firm's performance (Altuntas, Cinar & Kaynak, 2018). It is noted that technological innovation technique is vital for firms to drive their growth, create value for the firm and its clients, and develop a competitive advantage.

Service organizations should play a catalytic role in establishing a technological innovation-driven economy (Khin & Ho, 2018). The developed nations clearly show that a shift of government's policy-making towards a technological innovation-driven economic technique is essential. Supposedly effective regulation is essential in cultivating firms to instill a spirit of innovation and address firms' issues in the realm of technology quests. The technological innovation method shows direction and puts effort into the firm to achieve certain innovation goals (Zhang, Khan, Lee & Salik, 2019). Something more than creating a creative concept or insight is needed for innovation to occur.

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The Swiss technological innovation performance has been really good. Nonetheless, there are other sectors that policy reforms might strengthen innovation further and aid Switzerland in maintaining its top rank in the face of a changing worldwide environment (Choi, Sung & Park, 2020). Improving competition, streamlining management problems and changing the bankruptcy law will go a long way toward promoting the innovativeness of small businesses. Relating to innovation-specific policies, budget spending priorities on education and study should be much better secured and more resources should be committed to bridging the gap between basic study and the market, specifically through the Commission for Technology and Innovation activities. Innovation involves changing how you serve your customers to create more outstanding value for them and obtain more revenue in the organization (Podder & Tanjee, 2021). Process automation is a service offered by institutions in which getting financial assistance is automated so that human intervention is minimized (Kotler, Kartajaya & Setiawan, 2019).

2.0 Literature Review

Che Razali (2018) conducted research to determine various technological innovation influencers (TIIs) in small processing companies. It presents a research structure of technological innovation and analyzes the importance of four TIIs to building and maintaining the competitiveness of Indian companies. The study is anchored on an extensive survey of 51 companies in India's Southern region. Multiple regression evaluation was utilized to examine the association between TIIs and processing companies' performance (MFP) for these companies. The results confirm that entrepreneurial ability, technology infrastructure ability and government initiatives are the most vital TIIs for small companies. The outcomes are also validated using a statistical t-test and canonical correlation evaluation. The research utilizes a single source of information on every company. The research is restricted to small-scale companies in the Southern region of India. Likewise, the research has been performed excluding the service factor. Current researchers have promoted numerous TIIs and analyzed their effect on processing companies' performance. The study analyzes the determinants of technological innovation in small processing companies. It introduces a research framework of technological innovation and investigates the relevance of 4 TIIs to building and maintaining the competitiveness of Indian companies.

Issa and Isaias (2022) argued that managers are required to comprehend how information and communication technologies (ICTs) cause informed decisions about the investment and benefits of those technologies. Nonetheless, at best, the empirical proof on the business value of technology is combined with small companies. A total of 50 companies fulfilled the research's meaning of startups. The final study consisted of 45 questions on accessibility to and usage of ICTs, technology, company features, and the respondents' demographics, of which 9 aspects were examined as part of the research. It is noted that compelling proof to sustain the favorable impacts of ICTs on company-level development and performance is anchored on the main study information of 180 small and medium businesses in an Austria regional area. Furthermore, it has been discovered that ICT techniques and skills are essential aspects that propel innovation and the total performance of SMEs. On top of that, numerous conditions, like agile workplace culture and global trade, may assist companies in enhancing their performance. Young enterprises, especially start-ups with ICT skills, have enhanced innovation capability. Moreover, remoteness was found to affect innovation adversely for most native companies. Therefore, managers should concentrate

on enhancing ICT skills, approaches, and networking that facilitate ICT investments to enhance innovation and development.

Trachuk and Linder (2018) conducted a study to evaluate the association between investment decisions, investment intensity, innovation results and labor productivity for a sample of services and production companies from Paraguay in 2012 based on an adjusted CDM design. The design estimates show that company size was a crucial aspect of the investment decision. Firm size and investment intensity were also crucial determinants in increasing, respectively, the likelihood of generating technological and non-technological innovation outcomes and labor productivity throughout services and manufacturing segments. By comparison, public financial support appeared to have a stronger impact on investment inducement than on investment intensity in services and low-tech production firms. These results suggest that horizontal scientific research, technology and innovation regulations that encourage companies to increase scientific research, technology and innovation investment strength might well produce some gains in the firm's' labor productivity.

Sukumar, Jafari-Sadeghi, Garcia-Perez and Dutta (2020) noted that innovation broadly comprises education and training, formal and informal methods. Technological innovation offers a proper direction and concentrates on the effort of the whole firm on a usual innovation objective. Companies embrace different technological innovations to conduct roles to enhance services. Despite the fact that the energy segment in Pakistan has been influenced detrimentally by the changing working environment requiring the usage of technological innovation approaches to improve a competitive edge on the market, there exists a knowledge void on the connection between technological innovation techniques and organizational competitiveness of Evins Communications Ltd in Pakistan. The primary goal is to evaluate the association between technological innovation techniques and the organizational competitiveness of Evins Communications Ltd. The study was researched by using a descriptive study design. The target participants consisted of 2000 top, middle and low-level workers from the national offices of Evins Communications Ltd. Stratified random sampling method was utilized where a sample of 20% (200 participants) was chosen. The research utilized a questionnaire provided separately to all participants of the research. The research showed a positive relationship between competitiveness and process innovation, technology, item creation and market innovation. The research recommends that the company adopt innovative technological approaches; firms such as Evins Communications ought to make sure new product introduction, decreasing expenses, enhanced innovation processes and correspondence to policies are utilized to affect their competition. The companies likewise ought to make sure that they adjust to the new technology to cope with the quickly changing technology.

Tang, Park, Agarwal and Liu (2020) discovered that SMEs adopt technological innovations to safeguard themselves from intensifying competition, need to minimize expenses and satisfy customer demands. Therefore, SMEs take on technological innovations to enhance their general performance and sustainable competition. Therefore, the primary objective of the research was to explore the impact of technological innovations on the financial performance of SMEs in China. The goals consisted of developing how product/service, process and market innovations impact the financial performance of processing SMEs. The researcher used stratified random sampling to

acquire a sample size of 471 registered processing small and medium ventures in China. Questionnaires were utilized to gather the information evaluated using descriptive and statistical regression instruments and presented using tables. The researchers noted a considerable association between product/service innovation, process innovation and market innovation and the financial performance of processing SMEs in China. The research discovered that processing small and medium enterprises have presented much more innovative services and products, have established and executed new business methods and services that have enhanced the production and delivery of services innovative marketing and promotion projects to locate new markets have had considerable effects on the financial performance of SMEs. The government is required to cultivate technological advancement among SMEs by creating a business environment favorable for entrepreneurship, development of understanding and execution of pertinent regulations. In regards to enhancing process innovation SMEs should concentrate on enhancing their core capabilities. Processing SMEs ought to use a market innovation approach that concentrates on product personalization and client affection in providing their product or services.

Chen, Wang and Huang (2020) argued that technological innovation strategy is the direction and scope of a company over the long run that achieves advantage in a transforming environment through its configuration of resources and abilities to fulfill stakeholders' expectations. Nonetheless, the study on the predictive power of cutting-edge methods on the performance of companies listed in the LSE is inadequate. The research is focused on studying this sector in the hope of offering a key solution to how technology can be utilized to leverage the performance of companies in England. The basic goal of the study was to determine the impacts of different innovation techniques on the performance of companies listed in the LSE. The study embraced a descriptive and inferential research style; the target population for the study was 61 companies, and a sample of 53 participants was chosen using simple random sampling. In order to accumulate pertinent information, a semi-structured survey was utilized. A pilot study was performed to establish the validity and dependability of the questionnaire. The sets of questions were given out to the chosen participants. Statistical evaluations were performed, making use of SPSS to evaluate descriptive data, evaluation and regression. The Model recap of the regression evaluation revealed that all the independent variables accounted for 72.4% of the difference in company performance. Technological approaches, product advancement, market, and process strategies were discovered to have a favorable association with the performance of firms in LSE. The research suggested that firms in service sector might make substantial gains by pursuing item and process advancements. This is because the effect on performance is more significant, provided the nature of the sector. Technological innovations are higher, most likely since the market has grown and therefore cost savings stemmed from cutting-edge processes become much more appealing for development.

Paul, Mondal, Islam and Rakshit (2021) reported that a company's investment in technological innovation strategy is regarded as an essential aspect for tea processing firms in global markets. To sustain its competitiveness in a rapidly changing environment, tea processing firms have used radical technological innovations by developing new procedures and productions, enhancing item quality, providing better services and developing differently from other companies. Despite these initiatives, these industries are at risk due to the ever-escalating manufacturing cost and high operating expenses. The research examines the effect of technological innovation on business performance by using Tea companies in Darjeeling, India. The research used Schumpeter's

Innovation theory. The research structure was tea processing firms in regions 5 and 6. The target population was 1509 participants. The research depended on primary data and sets of questions; the descriptive survey layout was embraced with a response rate of 79.4% and embraced a stratified sampling strategy. The sample size of the research was 403 participants. Data was assessed by making use of descriptive and inferential statistical approaches. The research results show a strong favorable, substantial impact of technological innovation techniques and on organizational performance. It was noted that; product innovation was related to process innovation, implying that tea companies that use process innovation presented new or enhanced products on the market; innovation efficiency is connected to the usage of technology (environmental variables); and sales volume, enhancement in efficiency, expansion and development were the major determinant of company performance. The research concluded that tea firms that had invested in innovation and modern technology and released new or enhanced products/processes to the markets did better than those that did not. The research advises managerial and policy regulations following innovation techniques to boost tea processing companies' performance in India.

3.0 Research Methodology

The study adopted the descriptive research design. The target population was 658 respondents from Eastman Chemical International GmbH Zoug. The sample size was 249, which was determined using the Yamane formula. The study used questionnaires to collect the data. The analysis of the data was done using descriptive and inferential statistics.

4.0 Research Findings and Discussion

The presentation of the findings is summarized in sections.

4.1 Correlation Analysis

The correlation results are presented in table 1

Table 1: Correlation Analysis

		Performance	Technological innovation
Performance	Pearson Correlation	1.000	
	Sig. (2-tailed)		
Technological innovation	Pearson Correlation	.378 **	
	Sig. (2-tailed)	0.000	0.000

The correlation results from Table 1 shows that technological innovation is positively and significantly associated with performance (r=.378, p=.000). This concur with Paul, Mondal, Islam and Rakshit (2021) who articulated that firms should invested in innovation and modern technology, and release new or enhanced products/processes to the markets. Innovation is using knowledge to develop something that has new economic value (Ranta, Aarikka-Stenroos & Väisänen, 2021). Innovation describes radical and step-by-step changes in reasoning, things, processes, or services. Innovation involves advancing new products and services to satisfy customers' needs (Lambrecht & Tucker, 2020). Innovation is an essential component of

competitiveness embedded in a firm's organizational structures, processes, products and services (Tsang, Ho & Liang, 2019; Weitz & Jap, 2019; Zahirah 2016).

4.2 Regression Analysis

The section included model fitness, analysis of variance and regression of coefficient. The results presented in Table 2 show the model fitness

Table 2: Model Fitness

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.378a	0.329	0.304	0.000258

The results from Table 2 show that technological innovation was found to be satisfactory in explaining the performance. This was supported by the coefficient of determination, also known as the R square of 0.329. This indicated that technological innovation strategy explains 32.9% of the variations in performance in Switzerland.

Table 3: Analysis of Variance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22.12	1	22.12	160.64	.000b
	Residual	34.15	248	0.138		
	Total	56.27	249			

The results in Table 3 indicate that the overall model was statistically significant. The findings reveal that technological innovation strategy is good predictor in explaining the performance in Switzerland. This was supported by an F statistic of 160.64 and the reported p-value of 0.000 which was less than the conventional probability significance level of 0.05.

Table 4: Regression of Coefficient

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.921	0.058		15.88	0.019
Technological Strategy	0.684	0.201	0.287	3.403	0.005

Based on the findings in Table 4, it was found that technological innovation is positively and significantly related to performance (β=0.684, p=0.005). This was supported by a calculated t-statistic of 3.403 that is larger than the critical t-statistic of 1.96. The findings indicated that when

the technological innovation improves by one unit, the performance will increase by 0.684 units while holding other factors that influence performance constant. Sukumar, Jafari-Sadeghi, Garcia-Perez and Dutta (2020) reported that firms ought to adopt the fostering of technological innovative approaches, so that they make sure new products are produced, decrease of expenses/costs, enhanced innovation processes and correspondence to policies are utilized to affect their competition and performance. Innovation is an essential component of competitiveness embedded in a firm's organizational structures, processes, products and services (Tsang, Ho & Liang, 2019; Weitz & Jap, 2019; Zahirah 2016). The innovative approach is required to define how the benefits of innovation will be communicated to workers to attain their buy-in and should freely show the significance that management places on innovation. Innovation performance is a key factor in competition and organizational progress. An innovation strategy offers direction and concentrates on the effort of the whole firm on a particular innovation end (Yu, Lan & Zhao, 2021).

5.0 Conclusion

The research concludes that technological innovations influence the performance of manufacturing firms in Switzerland. Technological innovations provide decreased client support costs and earnings development, mobile banking offers the chance to target and get new client sections resulting in increased client development and profits, innovative mobile services also help firms to attract and retain customers and lead to much more satisfied client base thus higher performance and hence more financial returns. Technological innovation brings benefits. It increases productivity and brings better goods and services that improve the overall standard of the goods and services produced by an organization. The power of service innovation in helping the firm to keep and expand its competitive position is indisputable.

6.0 Recommendations

The research recommends that for the firms to realize higher performance, they should adopt technologically innovative strategies. The results suggest that client satisfaction and retention market strategy, aggressive anti-rivals marketing campaigns, access to new markets while considering the availability of resources and capacities as market innovation approaches, environmental analysis and response to changes and development of value via pricing, is key if the objective is to establish the performance of a business. The research suggests that the firms should also aim to ensure service range expansion, replacement, enhancement, repositioning and new service introduction to enable the firm to be much more effective, grow quicker, invest more and gain more competitiveness. Moreover, the research suggests that companies should adopt innovation to cope with the rapidly changing technology. Technology innovation urges simplicity of flow of information and quick delivery to the intended individuals. For reliable adoption of technology innovation approaches, there should be dependable facilities and reliable financial resources; the employees ought to be equipped with proper skills and expertise on the new technology through regular learning and development to ensure that they do not resist embracing new technology in the firm.

REFERENCES

Altuntas, S., Cinar, O., & Kaynak, S. (2018). Relationships among advanced manufacturing technology, innovation, export, and firm performance: Empirical evidence from Turkish

manufacturing companies. Kybernetes. *Journal of Marketing*, 6(2) 19-26. https://doi.org/10.1108/K-10-2017-0380

Chen, Q., Wang, C. H., & Huang, S. Z. (2020). Effects of organizational innovation and technological innovation capabilities on firm performance: evidence from firms in England. *Europe Business Review*, 26(1), 72-96. https://doi.org/10.1080/13602381.2019.1592339

Choi, D. S., Sung, C. S., & Park, J. Y. (2020). How does technology startups increase innovative performance? The study of technology startups on innovation focusing on employment change in Switzerland. *Sustainability*, 12(2), 551. https://doi.org/10.3390/su12020551

Issa, T., & Isaias, P. (2022). *Innovative Technologies: Applications in the Present and Considerations for the Future. In Sustainable Design* (pp. 193-215). Springer, London. https://doi.org/10.1007/978-1-4471-7513-1_8

Khin, S., & Ho, T. C. (2018). Digital technology, digital capability and organizational performance: A mediating role of digital innovation. *International Journal of Innovation Science* 5(2), 17-26. https://doi.org/10.1108/IJIS-08-2018-0083

Kotler, P., Kartajaya, H., & Setiawan, I. (2019). Marketing 3.0: From products to customers to the human spirit. In Marketing wisdom (pp. 139-156). Springer, Singapore. https://doi.org/10.1007/978-981-10-7724-1_10

Lambrecht, A., & Tucker, C. (2020). When does retargeting work? Information specificity in online advertising. *Journal of Marketing research*, 50(5), 51-76. https://doi.org/10.1177/002224371305000508

Lee, J., Suh, T., Roy, D., & Baucus, M. (2019). Emerging technology and business model innovation: The case of artificial intelligence. *Journal of Open Innovation: Technology, Market, and Complexity, 5(3*), 44-51. https://doi.org/10.3390/joitmc5030044

Mousavi, S., Bossink, B., & van Vliet, M. (2019). Micro-foundations of companies' dynamic capabilities for environmentally sustainable innovation: Case study insights from high-tech innovation in science-based companies. *Business Strategy and the Environment*, 28(2), 366-387. https://doi.org/10.1002/bse.2255

Paul, T., Mondal, S., Islam, N., & Rakshit, S. (2021). The impact of blockchain technology on the tea supply chain and its sustainable performance. *Technological Forecasting and Social Chang*e, 17(3), 121-163. https://doi.org/10.1016/j.techfore.2021.121163

Podder, P. S., & Tanjee, K. S. (2021). The Influence of e-WOM through SNS on Brand Perception and Consumer Purchase Intention: Study on Bangladeshi consumers. *Journal of Marketing research*, 10(8), 21-36.

Ranta, V., Aarikka-Stenroos, L., & Väisänen, J. M. (2021). Digital technologies catalyzing business model innovation for circular economy—Multiple case study. *Resources, Conservation and Recycling*, 16(4), 105-121. https://doi.org/10.1016/j.resconrec.2020.105155

Rauter, R., Globocnik, D., Perl-Vorbach, E., & Baumgartner, R. J. (2019). Open innovation and its effects on economic and sustainability innovation performance. *Journal of Innovation & Knowledge*, 4(4), 226-233.

Razali, A. (2018). The Influence of Technological Innovation on Small Manufacturing Firm Performance in Malaysia. The Influence of Technological Innovation on Small Manufacturing Firm Performance in Malaysia. *International Journal of Marketing*, 18(7) 94-102. https://doi.org/10.2139/ssrn.3088086

Saji, B. S., John, R. D., Nair, M., & Houjeir, R. (2019, November). Governance in Advertisement Regulation Process in United Arab Emirates. In European Conference on Management, Leadership & Governance (p. 394). Academic Conferences International Limited.

Sukumar, A., Jafari-Sadeghi, V., Garcia-Perez, A., & Dutta, D. K. (2020). The potential link between corporate innovations and corporate competitiveness: evidence from IT firms in the Pakistan. *Journal of Knowledge Management*, 24(5), 965-983. https://doi.org/10.1108/JKM-10-2019-0590

Tang, G., Park, K., Agarwal, A., & Liu, F. (2020). Impact of innovation culture, organization size and technological capability on the performance of SMEs: The case of China. Sustainability, 12(4), 135-141. https://doi.org/10.3390/su12041355

Trachuk, A., & Linder, N. (2018). Innovation and performance: an empirical study of Russian industrial companies. *International Journal of Innovation and Technology Management, 15(3)*, 185-207. https://doi.org/10.1142/S021987701850027X

Tsang, M. M., Ho, S. C., & Liang, T. P. (2019). Consumer attitudes toward mobile advertising: An empirical study. *International Journal of Electronic Commerce*, 8(3), 65-78. https://doi.org/10.1080/10864415.2004.11044301

Weitz, B. A., & Jap, S. D. (2019). Relationship marketing and distribution channels. *Journal of the academy of Marketing Science*, 23(4), 30-32.

Yu, X., Lan, Y., & Zhao, R. (2021). Strategic green technology innovation in a two-stage alliance: Vertical collaboration or co-development? *Omega*, 9(8), 102-116. https://doi.org/10.1016/j.omega.2019.102116

Zahirah M. (2016). *Performing Consumers: Global capital and its theatrical seductions*. Routledge.

Zhang, Y., Khan, U., Lee, S., & Salik, M. (2019). The influence of management innovation and technological innovation on organization performance. A mediating role of sustainability. Sustainability, 11(2), 495-503. https://doi.org/10.3390/su11020495