

## Information and Communications Technology Capabilities and Performance of Insurance Companies in Kenya

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### Abstract

*The performance of insurance companies in Kenya is lagging, with insurance penetration below three percent compared to the global average of seven percent. This has led to a decline in net profits and shareholders' returns; there is also fear that the insurance industry may exit the Kenyan market. This study examined the relationship between ICT capabilities and the performance of insurance companies in Kenya. The study revealed that ICT capabilities like IT innovations ( $\beta=0.243$ ,  $p=0.009<0.05$ ) and artificial intelligence ( $\beta=0.558$ ,  $p=0.009<0.05$ ) significantly boosted the performance of insurance companies. However, the impact of big data analytics ( $\beta = 0.014$ ,  $p = 0.748 > 0.05$ ) and digital communications ( $\beta = 0.032$ ,  $p = 0.523 > 0.05$ ) was found to be insignificant. The study concluded that insurance companies in Kenya should consider technological innovations such as InsurTech solutions and incorporate artificial intelligence tools like machine learning, chatbot advisors, and telematics to address their performance challenges. This study's findings provide valuable insights for insurance companies looking to improve their performance by leveraging ICT capabilities.*

*Key Words: ICT capabilities, IT innovations, InsurTech, Artificial Intelligence, Big Data Analytics, Digital Communications, Insurance Performance, Insurance Companies in Kenya.*

### 1. Introduction

Worldwide, the insurance industry experienced strong premium growth. The strongest premium growth was observed in China, the United States, Canada, and other emerging Asian countries. The growth was predominantly in the non-life sector, which was also observed in the past years (Swiss Re Institute, 2019). Gross premiums grew by 2.5 percent in life insurance and 3.5 percent in non-life insurance. Despite global growth in premiums, other developed countries in Europe, like the United Kingdom and Africa, experienced a decline (Organisation for Economic Co-operation and Development [OECD], 2020). In the developed markets, overall insurance penetration, which is the insurance premium divided by GDP, remained stable above seven percent. Insurance penetration declined in the life insurance sector, while in non-life insurance it increased globally (Swiss Re Institute, 2019).

In Africa, the insurance sector remains one of the least penetrated globally, yet it presents excellent growth opportunities. The African region, which consists of several underdeveloped and developing economies, experienced staggering growth in the insurance industry (Businesswire, 2022). In 2019, GDP growth in Africa was 3.4 percent, with a decline in gross insurance premiums, and insurance penetration was 0.3 percent below the threshold (Association of Kenya Insurers [AKI], 2020). East Africa's Gross Domestic Product (GDP) grew by 5 percent in 2019. Kenya had a GDP growth of 5.4 percent. Within East Africa, Kenya experienced the best performance in the insurance sector in 2019 with an insurance penetration of 2.37 percent compared to Rwanda at 1.70 percent, Uganda at 0.84 percent, Tanzania at 0.53 percent, Burundi at 0.77 percent, and Ethiopia at 0.40 percent (AKI, 2020).

The insurance sector is vital to the Kenyan economy by providing financial security, savings, and investments. Despite the insurance sector being an important sector in the Kenyan economy, its penetration decreased in 2019 to 2.37 percent, compared to 2.43 percent in 2018 (AKI, 2020).

The economy values the insurance sector as it offers financial security, encourages direct and indirect investments, and mobilises savings. The low insurance penetration in Kenya has led to a decline in the insurance industry's net profit from Sh9.21 billion to about Sh3.54 billion between 2017 and 2019. The shareholders' returns are eroding, too, and there is fear among the insurance industries that they may soon exit the Kenyan market (AKI, 2020). According to the Insurance Regulatory Authority (2020), investment income from the insurance industry in Kenya

declined because of losses in equity investment, also caused by the COVID-19 pandemic. The investment income decreased to Kenya Shillings 127.08 million in 2020 compared to Kenya Shillings 12.48 billion in 2019.

The insurance sector has been going through significant disruption triggered by digital transformation from ICT capabilities, unrelenting regulatory changes, demographic changes, revolving customer expectations, and rapid urbanization, shaping the industry's future (AKI, 2020).

Mumo (2017) studied the factors affecting the insurance companies in Kenya and found that large firms' average production cost is low, generating more sales because of their stability and maturity. Gongora and Sasaka (2017) found that insurance companies have liquid investments, enabling them to settle claims. Also, every insurance company has a particular source for liquidity management. Gathua (2018) established that insurance companies' process innovation practices are a performance predictor, while product and market innovation practices are not significant.

The study was founded on three theories: diffusion of innovation (DOI), theory of mind (ToM), and utility theory. The DOI informed the study about investigating IT innovations such as insurgency and relative advantage to insurance firms. The ToM underpinned the research about artificial intelligence, in which machines infer the human mind to develop new models in the insurance sector, for example, telematics. The utility theory was the pillar for the dependent variable: performance of insurance in Kenya.

Various studies have been conducted on the performance of insurance companies, but very few have focused on their ICT capabilities, which was identified as a gap in previous research. Therefore, this study added a new dimension by finding the relationship between ICT capabilities and insurance companies' performance within the scope of insurance firms in Kenya. The ICT capability variables considered were information technology innovation, artificial intelligence, big data analytics, and digital communication.

The study sought to:

- i. Determine the relationship between information technology innovation and the performance of insurance companies in Kenya.
- ii. Assess the relationship between artificial intelligence and the performance of insurance companies in Kenya.
- iii. Examine the influence of big data analytics on the performance of insurance companies in Kenya.
- iv. Evaluate how digital communications affect the performance of insurance companies in Kenya.

## 2. Results and Discussions

The study determined how ICT capabilities (information technology innovation, artificial intelligence, big data analytics, and digital communications) related to insurance companies' performance in Kenya. The collected data was analysed using descriptive statistics, which encompasses the different measures of central tendency and regression using charts and frequency tables. The research used multiple regression equation estimations to analyse how independent variables change the dependent variable. The findings were further discussed as both illustrative and inferential data.

### 2.1 Model Summary

**Table 1**

*Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.965 <sup>a</sup>	0.931	0.928	0.423

*Note.* Table 1 shows that 93.1 percent of the variance in the measure of the dependent variable (performance of insurance companies) can be predicted by independent variables (IT innovation, artificial intelligence, big data analytics, digital communication).

<sup>a</sup>Predictors: (Constant), IT innovation, artificial intelligence, big data analytics, digital communication.  
R-Squared ( $R^2$ )

### 2.2 ANOVA

**Table 2**

*Analysis of Variance*

Model	Sum of Squares	DF	Mean Square	F	Sig.
Regression	115.754	2	57.877	323.089	0.0000
Residual	8.599	48	0.179		
<b>Total</b>	<b>124.353</b>	<b>50</b>			

Note. Table 2 illustrates the Analysis of Variance (ANOVA) results, which show the fitness of the model. From the results, the F-value of 323.089 is significant at a p-value of  $0.0000 < 0.05$ . The results indicate the fitness of the model with a p-value less than 0.05.

### 2.3 Coefficients of Determination

**Table 3**  
*Regression Coefficients*

Model	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	2.522	1.184	2.129	0.038
IT innovation	0.243	0.089	2.723	0.009
Artificial intelligence (A.I)	0.558	0.077	7.166	0.000
Big data analytics	0.014	0.045	0.322	0.748
Digital Communications	0.032	0.049	0.642	0.523

Note. The coefficients in Table 3 show that changes in IT innovation and artificial intelligence are significantly associated with changes in insurance companies' performance, with p-values less than 0.05 of 0.009 and 0.000, respectively. However, changes in big data analytics and digital communication are not significantly associated with the performance of insurance companies, with p-values above 0.05 of 0.748 and 0.523, respectively.

As big data analytics and digital communication were not significant, they were removed from the model, and the results are presented in Table 4.

**Table 4**  
*Regression Coefficients for Significant Variables*

Model	Beta	Std. Error	Std. Beta	t value	Sig
(Intercept)	2.846	0.959		2.968	0.005
Artificial Intelligence	0.593	0.056	0.764	10.562	0.000
IT Innovation	0.257	0.082	0.227	3.139	0.003

Note. The model equation ( $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \epsilon$ ) was written as follows:

**Performance of insurance companies (Y) = 2.846 + 0.764 X<sub>1</sub> + 0.227 X<sub>2</sub> + ε** where X<sub>1</sub> is artificial intelligence and X<sub>2</sub> is IT innovation.

From the regression model in Table 4, it is noted that a unit change in artificial intelligence leads to a change in insurance company performance by a factor of 0.764 (76.4 percent), and a unit change in information technology innovation leads to a change in insurance company performance by a factor of 0.227 (22.7 percent). The findings reveal that ICT capabilities have a positive and significant relationship with the insurance companies' performance.

### 2.4 Summary

The study investigated the relationship between ICT capabilities and insurance companies' performance in Kenya. Specifically, the study examined the connection between information technology innovation, artificial intelligence, big data analytics, digital communications, and insurance companies' performance.

#### 2.4.1 Information Technology Innovation and Performance

The first objective was to study the connection between IT innovation and insurance companies' performance in Kenya. It is revealed that insurance companies embrace information technology innovations from the research. The respondents believed that the cost of innovative projects was high. The study further established that insurance companies have integrated and reconfigured their information systems over time. The study revealed that respondents did not believe their IT innovations (ideas and products) were easy to use. Also, most of the insurance companies in Kenya have yet to partner with insurance technology start-ups (Insurtechs). The results from inferential statistics show a significant and positive connection between information technology innovation and the performance of Kenyan insurance firms.

#### 2.4.2 Artificial Intelligence and Performance

The second objective determined the relationship between artificial intelligence and insurance companies' performance in Kenya. The findings revealed that most insurance organisations are not using artificial intelligence capabilities; also, the customer's historical data is not analysed using machine learning to speed up the underwriting process and prediction of claim amounts. The study established that only a few insurance companies had incorporated chatbot advisors to broaden customers' knowledge of products and increase interaction. The study

further revealed that facial recognition tools are not used to help prevent fraud. The regression analysis showed a significant positive connection between artificial intelligence and insurance companies' performance in Kenya.

### **2.4.3 Big Data Analytics and Performance**

The researcher's third study objective was to find a connection between big data analytics and the performance of Kenya's insurance firms. This study revealed that insurance organisations gather customers' data from various sources when underwriting or processing a claim and that the data gathered helps in making strategic decisions, such as whether to process a claim or not. The findings further established that insurance firms have implemented measures to ensure customer data is secure and that the organisations use dashboard reports. From the results of inferential statistics, this objective is non-significant and has weak evidence of this relationship, as shown by a p-value above 0.05. There was not enough evidence from the study to conclude that a connection was found between big data analytics and the productivity of Kenya's insurance firms.

### **2.4.4 Digital Communications and Performance**

The fourth study examined the association between digital communications and insurance companies' performance in Kenya. It has been revealed that most insurance organisations have not developed mobile applications in which their customers can view their details and interact. The study further revealed that insurance companies do digital marketing campaigns for products on social media, for example, Facebook, Twitter, WhatsApp, and LinkedIn, to interact with customers. The study established that insurance firms have secured websites (https) and use search engine optimisation (SEO). It was also established that the respondents send emails to inform customers about the products. The hypothesis test results showed that the fourth objective is statistically non-significant to the insurance companies' performance in Kenya. There was not enough evidence from the study to conclude that there is a connection between digital communications and insurance companies' performance in Kenya.

## **3. Conclusion**

The study's conclusion is based on empirical findings. The research objectives focused on the relationship between ICT capabilities such as IT innovation, artificial intelligence, digital communications, big data analytics, and performance of insurance companies in Kenya. The study concluded that there is a significant positive correlation between IT innovation and the performance of insurance companies in Kenya. Increasing IT innovation, such as embracing new ideas and solutions and partnering with InsurTechs, improves insurance companies' performance. In the second objective, the study concluded that artificial intelligence is significant for the performance of insurance companies. Incorporating machine learning, chatbot advisors would improve performance by speeding up the underwriting process and immediately predicting claim amounts by analysing historical data. Chatbot advisors increase interaction with customers 24/7 and broaden customers' knowledge of insurance products. The study concluded that big data analytics and digital communications do not remarkably affect insurance companies' performance in Kenya.

## **4. Recommendations**

From the findings, there is justification that the role of ICT capabilities in insurance companies' performance in Kenya cannot be overlooked. The study makes the following recommendations:

The management of insurance firms in Kenya should embrace information technology innovations when coming up with new ideas and solutions for products to improve performance. The management of insurance firms should consider partnerships with insurance technology start-up (insurtech) companies to improve performance. Insurtechs provide better customer service and reduce the cost of directly implementing innovative projects.

The study recommends that the management of insurance firms in Kenya use artificial intelligence for better performance. Artificial intelligence components such as machine learning enable insurers to better understand customers' needs and provide customised policies at a fair price. Machine learning will also assist in predicting claim amounts by analysing historical data. The chatbot advisors should be incorporated to increase interaction with customers 24/7 and broaden customers' knowledge of insurance products. Insurance firms should use facial recognition tools to identify customers to mitigate fraud. The study recommends that the management of insurance organisations in Kenya consider telematics technology. Telematics assists in gathering real-time customer data and processing immediate examples in claims cases. Additionally, the study recommended that the management of insurance firms in Kenya develop mobile-based applications so that their customers can access the services on mobile devices. The study recommended that further study be done on the variables found to be non-significant: big data analytics and digital communications.

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