

## RESEARCH ARTICLE

### INFORMATION TECHNOLOGY INFRASTRUCTURE AND INFORMATION TECHNOLOGY APPLICATION STRATEGIES: A CASE OF LICENSED DEPOSIT TAKING SACCOS IN KENYA.

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#### ABSTRACT

SACCOS are user owned and benefiting/ user-controlled organizations. They are strong tool for meeting societal socio-economic needs of Kenya even as the country if focusing on vision 2030. They mobilize savings, providing financial services, encourage investment, and are partners in wealth creation. The future window for innovation in SACCOS is now focused on school savings clubs, inter-SACCOS borrowing, SACCO bond products, health/ insurance product, affordable housing, and share capital redemption. However, the SACCOS are still facing challenges in areas such as technology, low patronage for society products and services, members' dishonesty in many respects, poor saving culture and utilization of loan, unfair competition from other financial players, unsupportive legal framework, and interest rate fluctuation. These challenges require new strategic approaches to survive. The objective of this study is to determine the influence of IT infrastructure on performance of IT application strategies by SACCOS licensed to undertake deposits in Kenya. Specifically, the study will determine the influence of application infrastructure, management infrastructure, architecture and standards, and data management on IT applications. The study employed descriptive survey. The target population was 175 licensed SACCOS to undertake deposit in Kenya by SASRA. The study used census. The study established a significant influence of IT infrastructure on IT application strategies by DT-SACCOS in Kenya. Management infrastructure has negative influence on IT application strategies. The study concluded that SACCOS have not established strategically fitting IT infrastructure that can positively impact significantly on their effectiveness and in extension competitiveness. The IT management support is weakening the IT application effort. This study recommended for the reengineering of IT infrastructure, especially in management infrastructure. The management infrastructure should strategically support management decision framework, hence enhancing efficiency.

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## INTRODUCTION

**Background of the Study:** SACCO industry is a fast evolving technologically driven financial sector in Kenya. The SACCOS leads in providing finances to many in the rural areas (Cental Bank of Kenya, 2020). They are observed as one of the best drivers of development (Maosa, 2020). The total number of members in the DT-SACCO system distributed among the 175-DT-SACCOS was 5.47 million persons in 2020 compared to 4.5 million persons reported in 2019 (SASRA, 2020). However, 25.09% were reportedly inactive during the year 2020. There were also increased withdrawals between 2019 and 2020. The dynamic market trends brought about by globalization, liberalization of financial market, and rapidly changing technologies, among others have created diverse

pressure and challenges on cooperatives in the developing countries (Economic Commission for Latin America and Carbean, 2000). Banks and micro-finance among other financial institutions are also threatening competitors (Wondirad, 2020). Dormant membership in SACCOS also rose to 670,052 (40.1%) (SASRA, 2020).

**Statement of the Problem:** The cooperative sector in Kenya currently worth \$10 billions in asset, employs more than 500,000 directly and another 1.5 million indirectly (SASRA, 2021). SACCOS have played a great role in improving livelihood of many households by grating loans and offering direct and indirect employment opportunities (Onjure, Muia, & Aseka, 2021, SASRA, 2021); a move towards attainment of Kenya vision 2030. However, reports have indicated that SACCOS have not addressed important work engagement for example they failed to fairly remunerate their staff, who become less productive and dissatisfied with time (Muriuki, 2010, SASRA, 2020). Further challenges include poor

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accounting systems and poor record keeping, poor loan recovery due to defaulters caused by state agencies and private companies' failure to remit statutory deduction on time (Cusmano, 2015). Other challenges include weak laws, limited product development, weak controls, and mismanagement (recruitment of staff), poor viability of major projects, member's apathy (dominant members) liquidity problems (capital requirement ratio). Failure by employers to remit deductions (currently to the tune of \$26.7 million) has increasingly become a major threat to the survival of many SACCOs (SASRA, 2021). Corruption, lack of professionalism, non-adherence to cooperative principle (autonomy & independence, member democratic control, and voluntary joining of SACCOs), reckless lending, delays in reimbursement of deposits, inflated charges, competition from financial institutions (banks and mobile banking), and internal politics have also been mentioned as challenges. They also experience ineffectiveness and inefficiency challenges characterized by poor information delivery channels and high operational costs. Due to inadequate information and communication technologies, they face high demands for loans they are unable to meet due to liquidity shortages, hence compromised their profitability (especially given that they cannot seek credit from the Central Bank of Kenya like other commercial banks. The study will determine the influence of IT infrastructure on IT applications strategies in SACCOs licensed to undertake deposit-taking in Kenya.

**Research Objectives:** These include both the general and specific objectives.

**General Objective of the Study:** The general objective of the study will be to determine the influence of IT infrastructure on IT application strategies in SACCOs licensed to undertake deposit-taking in Kenya.

**Specific Objectives:** The study will be guided by the following specific objectives.

- To examine the influence application infrastructure on IT application strategies in SACCOs licensed to undertake deposit-taking in Kenya.
- To evaluate the influence of management infrastructure on IT application strategies in SACCOs licensed to undertake deposit-taking in Kenya.
- To determine the influence of architecture and standards on IT application strategies in SACCOs licensed to undertake deposit-taking in Kenya.
- To assess the influence of data management on IT application strategies in SACCOs licensed to undertake deposit-taking in Kenya.

**Research Hypotheses**

The following hypotheses will be tested at the 0.05 level of significance:

**H<sub>01</sub>:** There is no statistically significant relationship between application infrastructure and IT application strategies in SACCOs licensed to undertake deposit-taking in Kenya.

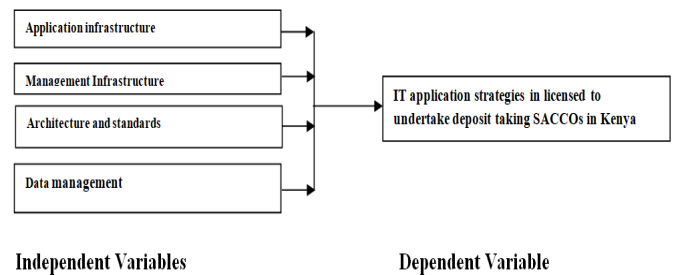
**H<sub>02</sub>:** There is no statistically significant relationship between management infrastructure and IT application strategies in SACCOs licensed to undertake deposit-taking in Kenya.

**H<sub>03</sub>:** There is no statistically significant relationship between architecture and standards and IT application strategies in SACCOs licensed to undertake deposit-taking in Kenya.

**H<sub>04</sub>:** There is no statistically significant relationship between data management and IT application strategies in SACCOs licensed to undertake deposit-taking in Kenya.

**Theories reviewed:** Innovation adoption theory, theory of technology acceptance model

**Conceptual Framework**



**Figure 2.1. Conceptual Framework**

**Research Design:** The study employed a descriptive survey research design. This is it describes, interprets, classify, compares, contrast, analyze entities and event that constitute the various field of inquiry (Cohen, Manion, & Morrison, 2007)

**Target Population:** Target population was all 175 DT-SACCO societies licensed to undertake deposit-taking SACCO SASRA Annual Supervisory Report, 2020. 175 senior managers one from every DT-SACCO was targeted. The target population was stratified as shown in Table 3.1.

**Table 3.1. Target Population**

Cadre of SACCO	Population
Farmers based DT-SACCOs	49
Teachers based DT-SACCOs	43
Community based DT-SACCOs	22
Government based DT-SACCOs	37
Private sector-based DT-SACCOs	24
Total	175

Source: SASRA Annual Supervisory Report, 2020.

**Sample Size and Sampling Technique**

**Sample Size:** The sample size of the study was 175. Therefore only 175 questionnaires were released for data collection.

**Sampling Technique:** The study conducted a census survey on all the 175 DT-SACCOs as in the SASRA report 2020.

**Data Collection Instruments:** The study used a questionnaire for data collection. Questionnaires were used to obtain quantitative data for analysis. The research employed Likert (1932) scale type of questions.

## Data Analysis

### Descriptive Analysis

**Application Infrastructure:** From Table 4.1, the study established that hardware/software is easily and quickly adapted for changing needs and standards, and it is the most visible part of the information system. It enables the SACCOs to enhance her efficiency and competitiveness through better selection and management of the hardware and software technology. The infrastructure boosts the SACCO's flexibility and supports meeting current and future business needs. In addition, the study found out that personnel in charge of IT are quickly learning and applying the new technologies. Further, the study established that SACCOs needs to innovate or risk falling becoming uncompetitive (Andriotis, 2017). From the finding, IT infrastructures have failed to provide adequately reduce storage costs, manage information, increase flexibility, and provide near-certain backup. The infrastructure provides platforms inadequate support for all information systems in the SACCO business. The study has established data storage area networks to reduce storage costs, managing information, increasing flexibility, and provide near-certain backup.

From the findings, SACCOs are making efforts to make redundant copies of digital information, and placing them on separate secure servers, even remote servers in separate facilities. The management recognizes that choosing an IT model for their businesses is very important. The SACCO customers use IT infrastructure and programming tools hosted by the service provider to develop own applications. The cloud services provider hosts, manages and maintains all the hardware and software included in the platform servers. They implement hardware/software that is reputable and based on current technological trends. The development of data management and analysis systems largely benefits from the advancement of the hardware and software technologies. The design principles, architecture selection, core functions, strategy mode, and optimization techniques of the upper software system that largely depend on the computer hardware (Pan, Li, Zhang, & Weng, 2018). From the findings, SACCOs have created electronic linkages among departments and branches as well as external parties. Digital innovation is also being positioned to drive a range of organization outcomes. The data across applications and operating systems have consistency and integrity and can be shared across applications and operating systems. Digital financial services (DFS) are positioned for consumers' services. The systems enhance performance, reduce power consumption, and more efficient simultaneous processing of multiple tasks. More processors have also been attached for enhanced performance, reduced power consumption and more efficient simultaneous processing of multiple tasks.

**Management Infrastructure:** From Table 4.2 the SACCOs performs dismally in areas such as the use of computer to analyze direct and indirect costs that helps determine the actual cost of owning a specific technology. The study established lack of accurate information on costs for information and communications technologies hampers effective decision making on ICT proposals. Further, the study found that, SACCOs have not attained sufficient relevant costing data that required identifying main cost drivers of ICT activities,

determining system component costs, and using appropriate methodologies to establish total cost of relevant ICT initiatives. More advanced computers systems are not properly utilized for tasks requiring extremely rapid and complex operations with volumes of variables and statistics. SACCOs also have insufficient computer processing, storage, and network resources for handling growing volumes of digital transactions and making such data readily available. Study further established that SACCOs have not achieved enough computing power for current and future needs. Extraordinary efforts are not taken to make redundant copies of digital information, and placing it on separate secure servers, even remote servers in separate facilities. From the findings, infrastructure should therefore receive adequate attention and recognition at the time of decision-making and in the planning and implementation of business strategic and structural changes. The technologies have changed SACCO processes, and the aging services are not excepted. The strategic IT planning forms an integral component of SACCO's strategic planning and governance. Strategic thinking about technology is more critical for SACCOs that are looking forward to defining their role in the face of changing business landscape, increasing demand for efficiency and effectiveness, rising consumer expectations for quality in different dimensions, and an increasing desire to achieve excellence via objective data. The IT infrastructure also consists of all elements that support the management and usability of data and information. These include the physical computer hardware and facilities, data storage and retrieval, network systems, legacy interfaces, and software to support the business goals of an enterprise.

**Architecture and Standards:** From Table 4.3, the study establishes that SACCOs have efficient network structure in which more than one organizational system combine to provide online services. This enables them to improve their internal network structure on the fundamental premise that if internal units are exposed to the harshness of market competitiveness, they will remain innovative and rise to capture entrepreneurial and market benefits without having the whole organization engage in much outsourcing, stable network structure to increase flexibility in the value chain, and dynamic network structures. From the finding, the SACCO application infrastructure is for the delivery of various strategic business applications. From this finding, SACCO have systems that takes care of security risk including those of cyber security. This is because the major threat to most organizations is from within (Witts, 2021). The SACCOs have facility management which encompasses multiple functions to ensure comfort, efficiency, functionality, safety, and focused on the efficient and effective delivery of logistics and necessary support services. From the finding, IT research and design also involve overall strategy for integrating the different components of the study in a coherent and logical way is poorly carried out. IT education is dismally carried out in areas such as software engineering, development and applications including but not limited to, software application, software development, software testing, software project management, software systems integration, software system maintenance), network engineering, design and applications (network design, network security, building network environments, network system integration, network system configuration and maintenance, network technology applications, network service maintenance and construction of websites), and hardware

**Table 4.1. Application Infrastructure**

	N	Minimum	Maximum	Mean	Std. Deviation
Hardware/software are easily and quickly adapted for changing needs and standards	145	1.00	5.00	3.9394	1.17099
IT personnel quickly learn and apply new technologies	145	2.00	5.00	4.0000	.82916
IT infrastructures reduce storage costs, manage information, increase flexibility, and provide near-certain backup.	145	2.00	5.00	4.2727	.83937
Customers use infrastructure and programming tools hosted by the service provider to develop own applications.	145	1.00	5.00	3.7576	1.00095
Implementing hardware/software that are reputable or based on current technological trends	145	1.00	5.00	3.8788	1.08275
Create electronic linkages among departments and branches as well as external parties (e.g., customers, suppliers)	145	2.00	5.00	4.1212	.92728
Data across applications and operating systems has consistency and integrity, and can be shared across applications and operating systems	145	1.00	5.00	3.5152	1.14895
Development of systems that can configure themselves, heal themselves	145	2.00	5.00	3.3636	1.02525
Enhanced performance, reduced power consumption, and more efficient simultaneous processing of multiple tasks	145	1.00	5.00	4.0606	1.05887

**Table 4.2 Management Infrastructure**

	N	Minimum	Maximum	Mean	Std. Deviation
Used to analyze direct and indirect costs to help determine the actual cost of owning a specific technology	145	1.00	5.00	3.8788	.96039
More sophisticated computers used for tasks requiring extremely rapid and complex calculations with thousands of variables, millions of measurements	145	1.00	5.00	3.7273	1.15306
We have sufficient computer processing, storage, and network resources to handle surging volumes of digital transactions and to make such data immediately available online.	145	1.00	5.00	3.9091	1.01130
Company has enough computing power for current and future needs	145	1.00	5.00	3.4242	1.22552
Extraordinary efforts are taken to make redundant copies of digital information, and placing it on separate secure servers, even remote servers in separate facilities.	145	1.00	5.00	3.7879	1.19262
IT infrastructure should receive adequate attention and recognition at the time of decision-making and in the planning and implementation of business strategic and structural changes.	145	1.00	5.00	4.3030	1.04537

**Table 4.3 Architecture and Standards**

	N	Minimum	Maximum	Mean	Std. Deviation
Network Structure	145	2.00	5.00	4.0606	.70442
Application infrastructure	145	3.00	5.00	4.0303	.68396
Security risk	145	1.00	5.00	4.1515	.93946
Facility management	145	2.00	5.00	4.0303	.72822
IT Research and Design	145	1.00	5.00	3.9394	.89928
IT education	145	2.00	5.00	3.9394	.89928
IT management	145	1.00	5.00	4.0000	.90139
Communication protocol and management	145	3.00	5.00	3.9697	.68396
Web standards	145	2.00	5.00	4.0606	.74747
Security system	145	2.00	5.00	4.1515	.83371

**Table 4.4 Data Management**

	N	Minimum	Maximum	Mean	Std. Deviation
Online customer support	145	2.00	5.00	4.1515	.87039
Market intelligence	145	2.00	5.00	4.1212	.96039
Market management	145	2.00	5.00	3.9394	.99810
Real time transaction flow	145	1.00	5.00	4.1818	1.07397
Real time fraud analytics	145	1.00	5.00	3.9697	1.10354
Faster payment	145	2.00	5.00	4.2121	.78093
Reduced time to market products	145	1.00	5.00	4.0909	.97991
Enhancement of customer experience	145	2.00	5.00	4.2424	.79177
Enhanced operational efficiency	145	2.00	5.00	4.0606	.93339
Online sales force automation	145	1.00	5.00	4.1515	.90558

**Table 4.5 IT Application Strategies**

	N	Minimum	Maximum	Mean	Std. Deviation
IT Transformational Application	145	3.00	5.00	4.0000	.55902
IT Analytical Application	145	2.00	5.00	4.2121	.64988
IT Transactional Processing Application	145	4.00	5.00	4.3939	.49620

**Table 4.6 Regression**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.536(a)	.287	.185	.45817

a Predictors: (Constant), data management, application infrastructure, management infrastructure, architecture, and standards

(computer and electronic equipment manufacturing, hardware maintenance, hardware assembly, hardware debugging and testing).

From the findings, SACCO IT management involves monitoring and administration organization's information technology systems. Further, the architecture and standards provide context, and web standards are used well to build necessary websites. Security systems are put in place for overall system safety. The purpose of overall enterprise architecture is focused on optimization across the enterprise. Architecture standard provides strategic context for the use of innovation in response to the dynamic business environment. Standard therefore aide in the management of technology portfolio with a focus. The alignment of resources to strategic SACCO goals and business mission, ensures reduction of costs, optimization of assets, maximization of service, risk management improvement and mitigation, integration and improvement of technology capabilities and capacity. From the findings, SACCOs have adopted an architecture that defines user requirements, and the scope for IT deployment and the options, significant requirements and the division of roles and responsibilities, technical performance requirements, and developing of (Witts, 2021) (Witts, 2021) prioritized IT user services.

**Data Management:** From the findings as in Table 4.4, data management ensures data integration and quality. With digital transformation SACCOs must address a variety of challenges coming with rising data volumes, data pervasiveness and user demands for data to become the data-driven enterprises they need to be. This ensures trustworthy, secure data they can use for decision support and analysis, with self-service access to both data and easy-to-use analytics (Sullivan, 2021). Online customer support is established by SACCOs and that helps customers to solves their challenges online. The SACCOs have embraced market intelligence to help determine metrics, opportunities, segmentation, and penetration of the market. From the findings, market management poorly executed, and therefore controlling marketing aspects, setting the goals, organizing the plans, taking decisions, and executing them to get the maximum turn over by meeting the consumers' demands is in doubt. There is good real time transaction flow to identify the necessary, specific information for updating organizations data. The real-time processing system is efficiently carried out, and transactions are processed immediately as they occur, this therefore causes no delay in accumulating transactions. According to the findings, real time fraud analytics is poorly carried out. Faster payment to reduce payment times between different customers is carried out, and reduced time to market products through well-defined workflows is achieved though not to perfection. The SACCOs have also adopted appropriate methodologies, and automated processes, to boost customer experience and enhance business growth.

Online sales force automation through automating workflows is also put in place to create a streamlined sales process.

**Descriptive Statistics:** From Table 4.5 the SACCOs have adopted IT transformational applications systems to take accountability for the complete applications lifecycle. IT analytical application, which are pre-packaged business intelligence (BI) capabilities, to help end-users measure and improve operational performance, within the transactional systems people use for their daily work. Finally, they have also adopted IT transaction processing application for mapping and designing business processes.

**Regression Analysis:** From Table 4.6, shows, R-Square is 0.287, which indicates that the model explains the 28.7% of IT application strategies in DT-SACCOs in Kenya. Table 4.7 presents the analysis of variance (ANOVA) of the model. The ANOVA test examines the significance of the relationship between the independent variables and dependent variable by comparing the predicting of the model with that of the intercept only model. The regression model in the ANOVA table 4.7 predicts the dependent variables significantly well. The statistical significance of regression model run is 0.044 which is lower than the study level of significance 0.05. This implies that the overall regression model statistically significantly predicts the outcome variable IT applications strategies by DT-SACCOs in Kenya. Table 4.8 presents the Analysis of Variances (ANOVA) of the model. Based on Table 4.8, the estimated regression equation was: Information technology application strategies by DT-SACCOs in Kenya (Y)

$$(Y) = 2.103 + 0.192X_1 - 0.088X_2 + 0.384X_3 + 0.027X_4 \text{ Model 1}$$

The first objective of the study was to examine the influence application infrastructure on IT application strategies by SACCOs licensed to undertake deposit-taking in Kenya. As shown in Table 4.8 shows the t-statistics for application infrastructure yielded a p-value of 0.177. Since this p-value is greater than 0.05, we fail to reject the null hypothesis and affirm that there is statistically no significant relationship between application infrastructure and IT application strategies by SACCOs licensed to undertake deposit-taking in Kenya. The second objective of the study was to evaluate the influence of management infrastructure on IT application strategies in SACCOs licensed to undertake deposit-taking in Kenya. As shown in Table 4.8, the t-statistics for management infrastructure yielded a p-value of 0.520. Since this p-value is greater than 0.05, we fail to reject the null hypothesis and affirm that there is statistically no significant relationship between the management infrastructure and IT application strategies in SACCOs licensed to undertake deposit-taking in Kenya. The third objective of the study was to determine the influence of architecture and standards on IT applications in SACCOs licensed to undertake deposit-taking in Kenya. As shown in Table 4.8, the t-statistics for architecture and standards yielded a p-value of 0.138. Since this p-value is greater than 0.05, we fail to reject the null hypothesis and affirm that there is statistically no significant relationship between architecture and standards and IT application strategies by SACCOs licensed to undertake deposit-taking in Kenya. The third objective of the study was to assess the influence of data management on IT application strategies in SACCOs licensed to undertake deposit-taking in Kenya.

Table 4.7. ANOVA for Model 1

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.365	18	.591	2.816	.044(a)
	Residual	5.878	126	.210		
	Total	8.242	144			

a Predictors: (Constant), data management, application infrastructure, management infrastructure, architecture, and standards

b Dependent Variable: IT applications

Table 4.8. Regression Coefficient for Model 1

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.103	.631		3.332	.002
	application infrastructure	.192	.139	.283	1.384	.177
	management infrastructure	-.088	.136	-.150	-.652	.520
	architecture and standards	.384	.252	.401	1.525	.138
	data management	.027	.150	.041	.181	.858

a Dependent Variable: IT applications

As shown in Table 4.8, the t-statistics for data management yielded a p-value of 0.858. Since this p-value is greater than 0.05, we fail to reject the null hypothesis and affirm that there is statistically no significant relationship between data management and IT application strategies by SACCOs licensed to undertake deposit-taking in Kenya.

**Summary of Findings:** The findings established need management infrastructure to receive adequate attention and recognition at decision-making and in planning, and implementation of business strategies and structural changes. The Information technology infrastructure has significant influence on IT application strategies though only explains 28.7% of IT application strategies.

The study established a lack of development of systems that can self-configure automatically heal themselves. No adequate hardware/ software that are reputable or based on current technological trends. The study further established inadequate customer infrastructure and programming tools hosted by service providers to develop own applications. The SACCOs have no adequate hardware and software that are easy and quickly adaptable for changing need and standards. The study further established laxity in real time fraud analysis and market management. IT education, communication protocols and web management are carried out dismally.

## Conclusion

From the findings, the study concluded that DT-SACCOs suffer lack of efficiency, competitiveness, and flexible IT infrastructure. They have a digressive management infrastructure and cannot efficiently meet her future needs efficiently. The storage cost for information is likely high due to lack of efficient near data backups.

There is high cost of power consumption and inefficient processing of multiple tasks. Adaptability to changing needs is difficult and no proper customer asset management due to inadequate customer infrastructure in place. The established lack of timely fraud analysis and market management, points to high risks, and lack of competitiveness.

## Recommendations

The conclusions, the study recommend reengineering management infrastructure to enable decision-making, planning, and efficient implementation of business strategies and structural changes. The study recommends for advanced information technology infrastructure that has the capacity to impact much more positively on IT application strategies. The study further recommends establishment systems that are self-configure and automatically can heal themselves. The SACCOs should have in place hardware/ software that are reputable and based on current technological trends. The study recommends establishment of customer infrastructure and programming tools that are easy and quickly adaptable for changing need and standards. The SACCOs need to invest on real time fraud analysis and market management. Finally, the study recommends for more IT education among SACCO staff, proper IT aided communication protocols and web management.

## REFERENCES

- AmericA Financial Crisis inquiry Commission. (2011, February 25). The Financial Crisis Inquiry Report. *Final Report of the National Commission on the Causes of the Financial and Economic Crisis in the United States*.
- Andriotis, N. (2021). The shock of the new: Helping employees adapt to new technologies. *e-learning*. Retrieved October 15, 2021
- Cohen, L., Manion, L., & Morrison, K. (2007). *Research methods in education*. New York: Routledge.
- Cusmano, L. (2015). *New Approaches to SME and Entrepreneurship Financing: Broadening the Range of Instruments*. OECD.
- Economic Commission for Latin America and Carbean. (2000). *Financial Globalization and the Emerging Economies*. CEPAL ECLAC.
- KCB. (2020). *The Kenya Financial Stability Report*. Financial Sector Regulators. Retrieved October 22, 2021
- Maosa, A. O. (2020). *contributions of SACCOs in ehancing household livelihoods among Members in in Bungoma County, western kenya*. University of Nairobi.

- Muriuki, M. (2010). Factors affecting SACCO performance in meru southdistrict: A case of tharaka nithi teachers SACCO. *Unpublished thesis*.
- Nyatichi, J. M. (2015). Co-operatives and employment creation: the kenyan case. *Paper Presented To the International Co-operative Alliance Seminar in Antalya Turkey from 8th to 13th November 2015*.
- Onjure, C. O., Muia, F. M., & Aseka, E. (2021). Influence of information capital readiness on implementation of customer asset management by saccos licensed to undertake deposit-taking in kenya. *International Journal of Business Management and Economic Review*, 4(5).
- Pan, W., Li, Z., Zhang, Y., & Weng, C. (2018). The New Hardware Development Trend and the Challenges in Data Management and Analysis. *Data Science and Engineering*, 263–276.
- SASRA. (2020). The SACCO supervision annual report, 2020. *The Annual Statutory Report on the operations and performance of SACCO*.
- SASRA. (2021). The SACCO supervision annual report, 2020. *The Annual Statutory Report on the operations and performance of SACCO*.
- Sullivan, R. (2021, June 15). How to Build a Self-Service Power BI Data Governance Strategy. *Data Governance, Power BI*.
- Witts, J. (2021, July 20th). The Top 5 Biggest Cyber Security Threats That Small Businesses Face And How To Stop Them. *The biggest cyber security threats that small businesses face, and how you can protect yourself against them*.
- Wondirad, H. A. (2020, october 24). Competition and microfinance institutions' performance: evidence from India. *International Journal of Corporate Social Responsibility*.

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