Towards an ICT Framework for MSME Sector in Malawi - 2022

Sponsored by ILO and PAPA

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3/15/22

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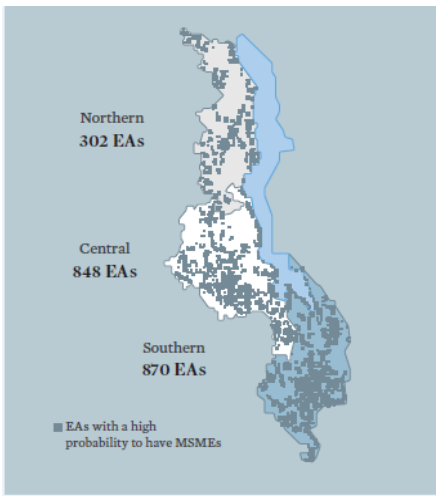
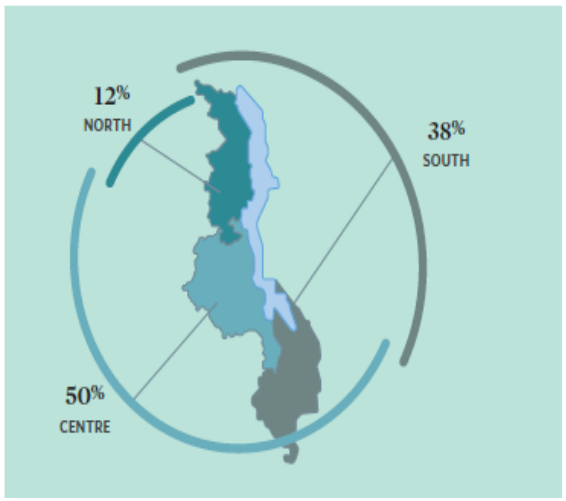
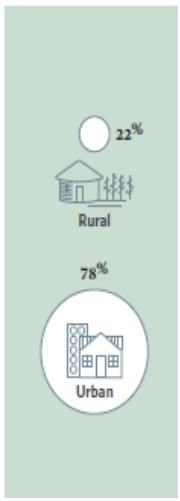






Source: Finscope MSME 2019 Survey

Abbreviations

ADSL	Asymmetric Digital Subscriber Line
AI/ML	Artificial Intelligence/ Machine Learning
AP	Access Point
API	Application Programming Interface
AU	African Union
AUC	African Union Commission
B2B	Business to Business
B2C	Business to Consumers (Customers)
BCP/DR	Business Continuity Planning / Disaster Recovery
BPR	Business Process Re-engineering
CIO	Chief Information Officer
CMMI	Capability Maturity Model Integration
COBIT	Control Objectives for Information and Related Technologies
DAI	Digital Adoption Index
DFS	Digital Financial Services
DOI	Department of Information
e-Govt.	e-Government
EGP	Electronic Government Procurement
EMIS	Education Management Information System
EAF	Enterprise Architecture Framework
ERP	Enterprise Resource Planning (Platform)
ESCOM	Electricity Supply Cooperation of Malawi
4IR	Fourth Industrial Revolution
G2C	Government to Citizens
G2G	Government to Government
GDS	Government Digital Strategy
GoM	Government of Malawi
GWAN	Government Wide Area Network

HISP	Health Information System Program
HQ	Head Quarters
HRMIS	Human Resource Management Information System
KPIs	Key Performance Indicators
ICT	Information and Communication Technologies
ICTAM	Information, Communication Technologies Association of Malawi
IFMIS	Integrated Financial Management Information System
IaaS	Infrastructure as a Service
ISP	Internet Service Provider
ISO	International Standards Organization
ICT	Information Communication Technology
ILO	International Labour Organisation
IP Address	Internet Protocol Address
IT	Information Technology
ITIL	Information Technology Infrastructure Library
ITSM	Information Technology Service Management
ITU	International Telecommunication Union
IXP	Internet Exchange Point
LAN	Local Area Network
MACRA	Malawi Communications Regulatory Authority
MALTIS	Malawi Traffic Information System
Mbps	Megabits per second
MCCCI	Malawi Confederation Chamber of Commerce and Industries
MDA	Ministry, Department or Agency
MDM	Master Data Management
M&E	Monitoring and Evaluation
MoICECT	Ministry of Information, Civic Education Communications and Technology
MIDAS	Malawi Integrated Digital Agenda for e-Services
MNOs	Malawi Network Operators
MoU	Memorandum of Understanding
MSME	Micro, Small & Medium Enterprises

MS	Microsoft
NACIT	National College of Information Technology
NCHE	National Council for Higher Education
NIA	National Information society Agency
NIAT	National Institute of Advanced Technology
NICTWG	National ICT Working Group
NOC	Network Operations Center
NRB	National Registration Bureau
OPC	Office of the President and Cabinet
OS	Operating System
PAPA	Pan African Productivity Association
PPP	Public Private Partnerships
QA	Quality Assurance
SaaS	Software as a Service
SDG	Sustainable Development Goals
SLA	Service Level Agreement
SMEDI	Small and Medium Enterprises Development Institute
SDA	Systems Development Approach
SI	System Integration
TEVETA	Technical, Entrepreneurial, Vocational Education and Training Authority
TOGAF	The Open Group Architecture Framework
UN EGDI	United Nations E-Government Development Index
VOIP	Voice Over Internet Protocol
VPN	Virtual Private Network
WAN	Wide Area Network
WEF	World Economic Forum

Preface

The AUC-ILO adopted a joint programme on **Decent Work for the Transformation of the Informal Economy in Africa (2020-2024)**, aimed at providing guidance and a framework for enhancing transformation in the informal Economy in Africa, underpinned by the agenda of Decent Work.

The Pan African Productivity Association (PAPA) is tasked with monitoring and evaluation of implementation of *Output 3.2: Integrated productivity growth framework to enhance the transition of informal to the formal economy* of the Joint Programme. The activities under this output, focus on both internal or within-enterprise factors that relate to the decisions made to manage and allocate available resources for production aimed at improving technical efficiency (also known as productive efficiency) and on factors external to enterprises relating to a conducive business environment. This project **"Towards an ICT Framework for MSMEs in Malawi"** therefore a response to *Activity 3.2.3 Support technology (including digital devices) development and use in MSME's*, in terms of how ICTs can be leveraged to improve productive efficiencies in MSMEs and as such achieve sustainable economic growth in Africa and particularly in Malawi

This document is geared towards MSMEs harnessing the opportunities presented by the digital economy and as such continue making a meaningful contribution to the economy of Malawi. This initiative seeks to raise awareness on the importance of defining a sectoral ICT framework or blueprint for MSMEs, which would help to guide the systemic implementation of ICT solutions that specifically address the challenges facing the MSME sector in Malawi. Secondly, it also seeks to get a buy-in, to the Digital Transformation Framework concept from the Malawi authorities, to adopt the process and scale it up in order to mitigate intractable operational difficulties in the MSME sector, which has an immense share of contribution to the DGP of Malawi. Thirdly, it also seeks to define and provide a roadmap for the development of a Digital Transformation Framework relevant to the MSME sector in Malawi.

The framework has been developed based on the following thematic areas; MSME Enterprise Architecture, ICT Infrastructure and Access, Digital Transformation and Capacity building relating to sustainability in the digital economy. This document serves as a valuable input to both the AUC-ILO joint programme on Decent Work for Transformation of the Informal Economy in Africa and the Malawi's Vision 2063, whilst landing support to the 2030 Agenda for Sustainable Development.

Through this framework, the adoption of various digital technological innovations aimed at improving the well-being of the MSME sector will as a result be expediently understood and facilitated as a public service delivery good by the Government of Malawi. Fortunately, the Malawi 2063 Vision recognizes the fundamental importance of ICT as a cross-cutting enabler in the delivery of services and a proven accelerator to growth and development in all sectors. It is therefore, our belief that this roadmap will assist in mainstreaming ICT platforms and digital transformation agenda at the core of developmental initiatives in all the spheres of the Malawi economy.

TEVETA's significant contribution and role it played in the making of this project possible deserves praise and gratitude. And of course, the Ministries, the institutions and individuals who also availed themselves to be interviewed, are as much, owed equal gratitude for their valuable time and contribution. It is hoped that this document will resonate with the relevant authorities of Malawi and as such form the foundation for a digital transformation project in Malawi.

Finally, funding for this project was kindly provided by ILO through a partnership with PAPA.

1. Introduction

Micro, Small and Informal Business make up most of the businesses in Africa. These are technically known as Micro Small Medium Enterprises (MSMEs), operating formally or informally in the economy. Malawi, is not any different, in fact, it is understood that, by and large Malawi is an Agricultural Economy, dependent on small scale farming by individuals or households, who essentially form the bulk of MSMEs in Malawi. The objective of this document is intended to focus on all economic sub-sectors of the MSME sector in Malawi. The Agricultural sector may from time to time, be referenced for illustration purposes as we expound on the developing this MSME ICT Framework or Blue Print. Essentially, this document is about developing a digitalisation framework for MSMEs in Malawi.

Globally, Small Businesses employ a substantial proportion of the total working population and when properly harnessed, they innovate and potentially able to bring new products and new production processes, resulting in increased contribution to exports, national wealth, and vibrant competitiveness. In Africa, there is a plethora of advocacy initiatives on intervention programmes designed to support MSMEs, besides training, capacity building and so on, the common nuance of these initiatives is the lack of understanding of how to practically integrate the use ICTs to support and inoculate MSMEs so that they to flourish in this 'pandemic' digital age. The development of such a Framework therefore presents us with a profound opportunity to realistically begin the process of integrating ICTs in the intervening operational model for MSMEs. So far, AU member countries bear the ultimate responsibility of championing the MSMEs causes in their respective countries, although most, if not all these member countries practically lack the underlying ICT Road Map or ICT Blue Print to guide implementation for MSMEs, while they concomitantly also lack the budget for the development and implementation of such digital transformation initiatives. This document attempts to detail the conceptual framework of Information & Communications Technology (ICT) models and decisions that Malawi may need to adopt within the developmental context of its unique environment. This ICT framework therefore seeks to put forward an ICT Enterprise Architectural framework specifically targeted at the MSME sector, which will facilitate the establishment a sound foundation for an implementation of an integrated support ICT support system for MSMEs in Malawi. In developing such a framework, following are some of the issues and factors that were broadly reviewed in relation to the MSME sectoral cohorts:

- ICT Infrastructure of Malawi,
- eCommerce readiness assessment,
- Complementary, supplementary and logistical support services,
- Policy and Regulatory framework,
- The skills development factor,
- Broadband penetration,
- The availability and access to computers and other smart mobile gadgets in Malawi, etc.

2. Background

As alluded to in the preface, the African Union Commission (AUC) and International Labour Organisation (ILO) have developed and adopted a joint programme called ***Decent Work for Transformation of Informal Economy in Africa,*** aimed at facilitating development processes in the informal economy and transformation of informal employment to sustainable, productive formal employment. Pan African Productivity Association (PAPA) as an implementing agency, saw a need to integrate a digitalisation framework in MSMEs intervention programmes, and Malawi was thus identified as one of the countries to jolt the process of initiating the development of **ICT Framework for MSMEs** to support and enhance the realisation of the objectives of this joint programme.

There are many initiatives and programmes that positively support MSMEs to be sustainable and productive, with a prayer to grow domestic economies of countries in Africa. Astonishingly though, while ICTs are at the centre of success for big business and government alike globally, sadly, it is appallingly not the case for MSMEs, especially in Africa. Invariably, this begs the question as to why are initiatives and programmes relating to the provision of support to MSMEs are so silently nuanced on ICT, especially in Africa and yet the world is getting digitised at such a rapid rate, living the MSMEs to fend for themselves in this ever-digitising economies. Big Business does not simply make arbitrary statements such as "**we need ICT to support our business**", contrary to such, they put together a well thought out plan, in a fashion of an ICT Enterprise Architecture or ICT master plan to determine how ICT should be structured and implemented to support and as such impact their businesses. Failure to recognise the need to have such a guiding ICT roadmap towards supporting MSMEs, is akin to failure to see the forest through the trees. The absence of ICT Framework for MSMEs in most counties in Africa, if not all, is egregiously jarring, and herein lies the explanation of why we do not have successful case studies ICT support foe MSMEs in Africa.

Fortunately, PAPA and ILO, among others have decided to walk the talk, through this project, they not only advocate for African Governments to begin to implement and use eGovernment initiatives to provide incentives for SMEs to go on-line, but by also putting money into developing an ICT framework for MSMEs that will begin to simplify administrative procedures, reducing costs of broadband and thus allowing them to access new markets (e.g., e-procurement), etc., for MSMEs in Africa.

Among others, ICT benefits are summarised as follows:

- To facilitate eCommerce in the MSME sector;
- To facilitate **social commerce** in the MSME sector;
- Enable effective stakeholder management;
- Facilitate the service elements necessary to deliver on the strategic objectives of MSMEs;
- Provide appropriate tools for MSMES/ Proprietors to be efficient, productive, profitable and sustainable in their businesses;
- Deploy technology to automate and integrate business processes for MSMEs and authorities;
- Empower MSMEs' leaders to professionally run their businesses and have a seamless co-operative vision with authorities;
- To enable country authorities to seamlessly offer support, assistance, monitor and appropriately incentivize MSMEs, etc.

3. Objectives

The **Rapid eTrade Readiness Assessment** report by UNCTAD, contends that the Current Malawian National Development Plan recognizes ICT's role in accelerating growth of other sectors as enabler for poverty reduction and wealth creation. However, it does not explore specific contribution of eCommerce and the digital economy as key drivers to sustain the Malawian developing economy, and neither has the country adopted a focused stand-alone eCommerce Policy and Strategy.

The purpose of this document is to create a digitalization framework for MSMEs of Malawi, that will facilitate communication, enhance interaction and improve commerce among all role players from government to buyers and sellers of goods and services in the MSME sector. To create a one stop shop digital platform for MSMEs in Malawi and other member countries in terms of access to information, markets, collaboration, transactions, capacity building, etc.

To enable authorities to seamlessly provide services to MSMEs, to monitor performance of MSMEs, gather information and analyse the requirements of MSMEs to develop insightful interventions and support programmes. Essentially, this document seeks to develop an ICT template that is relevant for the MSME sector, especially for the country of Malawi.

4. The Malawi Landscape

According to a World Bank report on Financial Inclusion and Entrepreneurship Scaling Project of 2019, the Malawi's gross domestic product per capita is estimated at USD 383.3. The Agricultural Sector at 22.66% is said to be the highest contributor to GDP, while the wholesale and retail sector contributes 17%, the manufacturing contributes 10%, real estate activities contribute 8%, the financial and insurance services sector contributes 6% and the construction sector contributes 3%. The Agricultural sector is therefore the backbone of the economy, accounting for over 60% of the national exports and is the largest provider of employment.

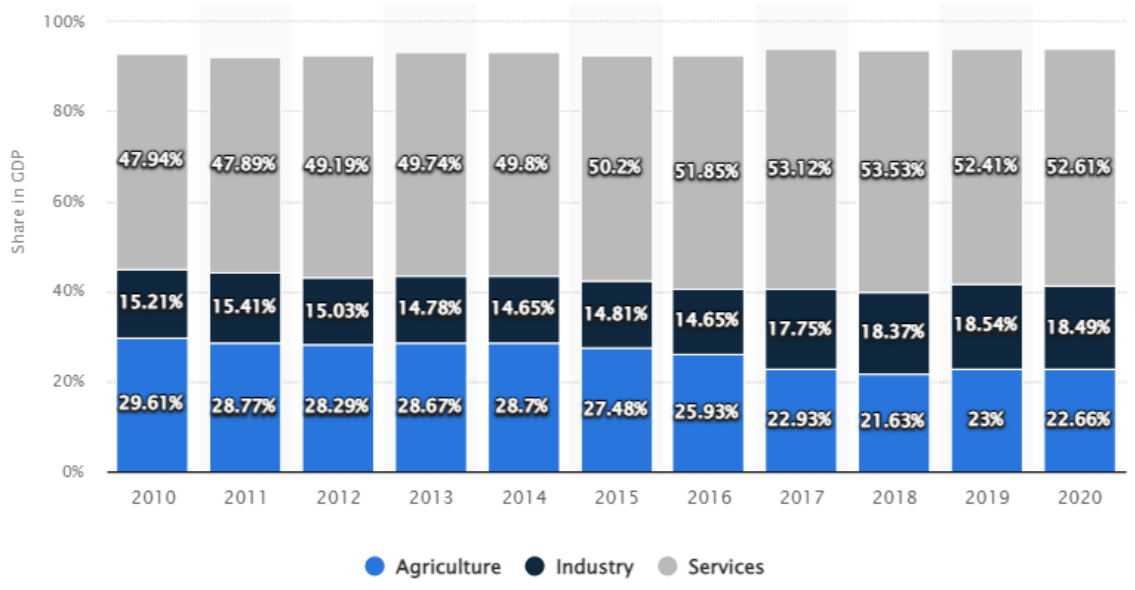


Fig 1 Source: Statista 2022

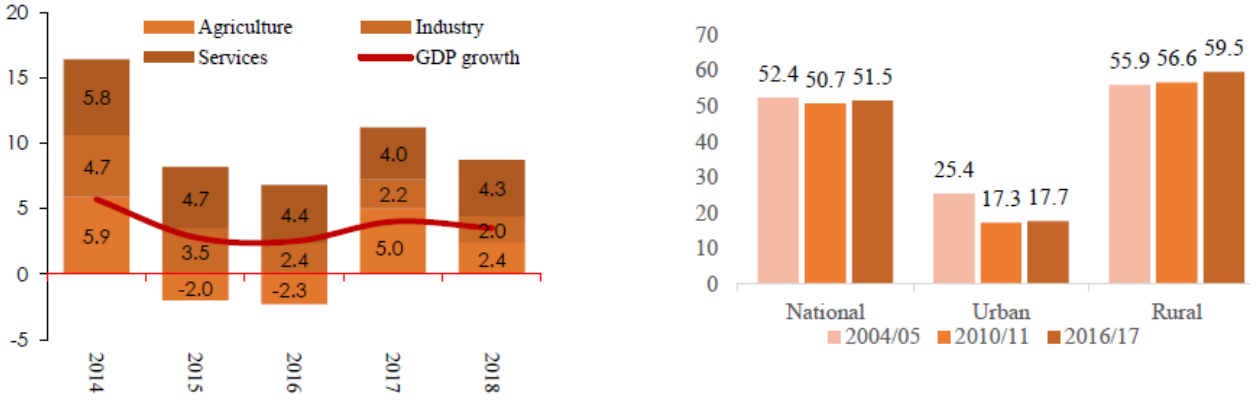


Fig 2. Source: *Malawi 2012 MSME and 2014 FinScope Survey*

Like numerous other African countries, Malawi's overall eCommerce enabling environment is faced with challenges that arrests and hamper its economic development, some of these pertain to low internet access by the populace, low technology adoption by Government institutions and Industry in general, and inherent weak ICT skills by the populace. According to the Rapid eTrade Readiness Assessment report, the Malawi Government's capacity to develop a strategy and implement a **digital economic developmental agenda** are weak, and eCommerce stakeholders including consumers are neither visible nor structured in their advocacy efforts. The eCommerce ecosystem is thus emasculated due to inadequate policy dialogue resulting in deficient growth spurts in the digital transformation initiatives of the socio-economic institutional structures of Malawi and by extension, ominously afflicting the MSME sector as well.

MSMEs play a significant role in global economies, particularly in ensuring inclusive growth and development. In Africa, MSMEs tend to mostly operate informally in traditional sectors and as small-scale ventures, their central role in the socio-economic development of a country may nevertheless be underestimated**.** Peterholf, Romeo and Calvey (2014), found out that small and medium enterprises account for 90 percent of all businesses globally, generate 60 percent of employment worldwide, and provide jobs to roughly 80 percent of workforce in the developed world. The 2012 FinScope MSME survey emphasizes the important role that the MSME sector plays in an economy, including boosting government revenue through taxation, providing goods and services to the public, creating employment and reducing poverty. In Malawi, the MSME sector employs over a million people and contributes over 30 percent to the national economy.

While MSME sector remains an important part of the economy…they are largely financially excluded, and have low capability

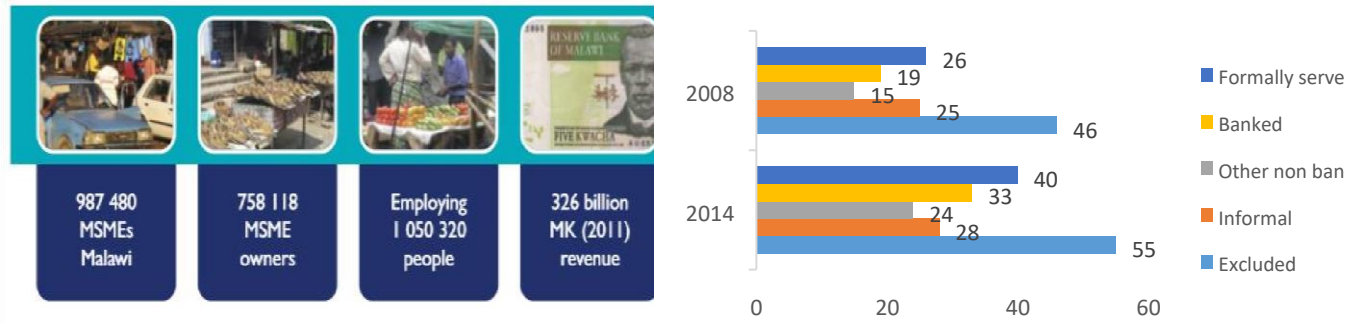


Fig 3. Source *Malawi 2012 MSME and 2014 FinScope Survey*

Malawi's Rapid eTrade Readiness Assessment report summarises the Malawi landscape in terms of the following 7 policy areas;

- eCommerce readiness assessment and strategy formulation
- ICT Infrastructure and services
- Trade logistics and trade facilitation
- Payment solutions
- Legal and regulatory framework
- Skills development for eCommerce
- Access to financing

Following hereunder is the summary of the main findings and main recommendation in relation to the above policy areas.

MAIN FINDINGS	MAIN RECOMMENDATIONS
e-Commerce Readiness Assessment and Strategy Formulation	
No stand-alone policy and strategy tackling the digital economy and e-commerce exist, only some scattered related policies covering ICT, trade, e-health, e-government. Their level of implementation remains below target. There is no coherent governance framework to steer e-commerce development agenda and no formal dialogue with private sector and civil society organizations on the matter. The sector is generally fragmented and weakly articulated, challenged by the population's lack of trust in online systems and the digital divide. Lack of data on the sector does not support policymaking and monitoring trends.	Draft and approve a national policy for the digital economy and implement a strategy for e-commerce. Clarify GoM e-commerce policy attributions and identify "champions" across the Government departments. Strengthen the capacities of main lobbying organizations and put in place a stable multi-stakeholder dialogue covering e-commerce. Launch a public communication campaign to build public trust about "going digital" and sensitise Malawians about the benefits of e-commerce and how it works. Envisage the set-up of a Digital Observatory, jointly managed by the National Statistics Office and the telecom regulator (MACRA).
ICT Infrastructure and Services	
Only 13.8 per cent of the Malawian population uses the Internet. There have been positive developments recently with the extension of fibre-optic backbone and cross-border interconnections, the launch of 4G, the establishment of the Universal Service Fund, but affordability of Internet, coverage and QoS and the last mile connectivity remain critical concerns. Policy and regulatory factors make the ICT highly concentrated, with only two main mobile operators and few Internet service providers. E-government services roll-out lags behind plans and e-commerce market is underdeveloped. Social media marketing and personal contact are more culturally accepted given the low level of knowledge and trust in digital solutions.	Expand mobile broadband infrastructure and services (3G/4G) to the wider population via Public-Private Partnerships (PPP). Enforce regulations for a more competitive and transparent market environment for telecom and ICT, review taxation affecting the ICT sector development. Monitor and evaluate the role of the USF and its investment plans. Enforce QoS obligations and update MACRA's survey tools and practices. Adopt the Digital Government Strategy to expand the automation of e-government services, establish a centralised e-government portal and ensure that there is an implementation plan for each GoM institution involved. Establish a Directory/Registry of e-commerce companies for statistics, monitoring and quality assurance.
Trade Logistics and Trade Facilitation	
Malawi's transport infrastructure is poorly maintained and weakly integrated. E-commerce is not well serviced by current postal and logistics operators. Investments are hindered by lack of addressing and small market size. The Malawi Post Corporation (MPC) has not yet credibly embarked upon digitalization and modernisation of processes beyond its universal service mandate. Malawi is implementing the WTO Trade Facilitation Agreement and is on the way towards setting-up a National Single Window to foster paperless trade and e-payments.	Rehabilitate major transport infrastructure, build functional inter-modal platforms and air transport services suitable for e-commerce. Strengthen the operational capability of MPC and its network, via a digital transformation program, and foster innovation in the e-commerce logistics sector. Accelerate the implementation of ongoing postal addressing project. Implement the National Trade Facilitation Action plan and prioritise the establishment of the National Single Window connecting all government agencies including MPC. Consider establishing a de minimis regime for low-value tradable goods and small-parcels.

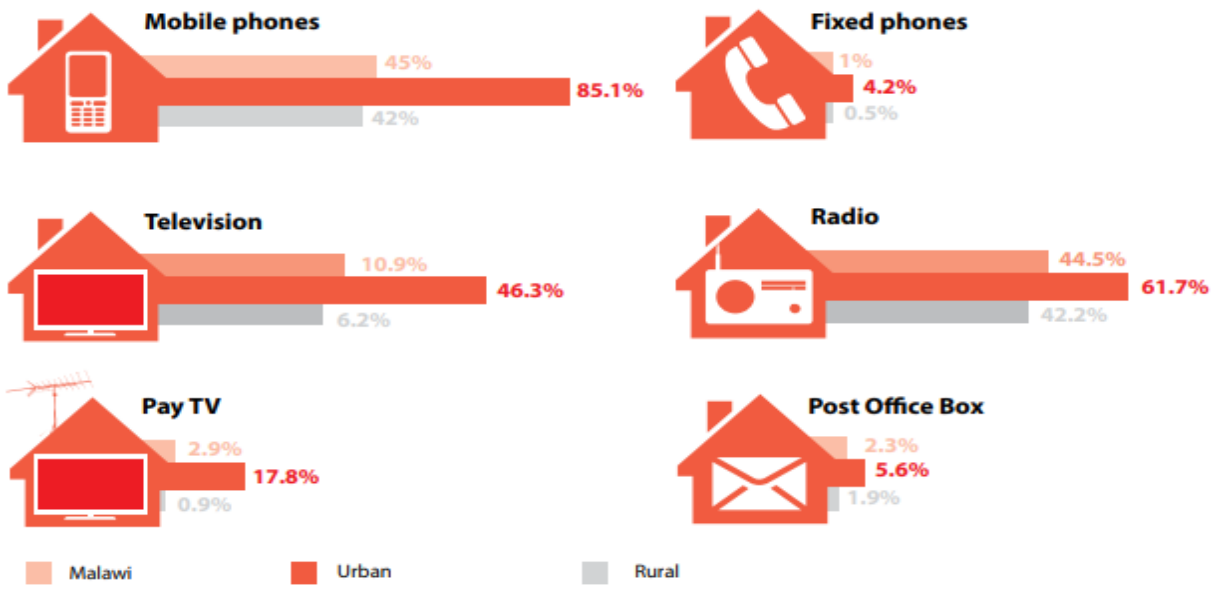
MAIN FINDINGS	MAIN RECOMMENDATIONS
Payment Solutions	
Mobile money from two mobile operators, Airtel Money and TNM Mpamba, has gained significant momentum. Interoperability between them and banks has been recently achieved thanks to regulatory and infrastructural initiatives (National Switch). Banks are pushing their own online banking platforms, APIs from fintechs are not yet widely available and have challenges integrating with incumbent banks and telecom operators. Cash on delivery remains the main payment system for e-commerce operators in Malawi as trust of digital payments is very low.	Fully implement the GoM Payments Roadmap for large-scale digitalization of government payments. Provide incentives to adopt up-to-date security protocols and standards by e-payments service providers. Reduce entry barriers (technical, financial, regulatory) for third-party financial service providers and start-ups to develop and customise multi-channel payments applications. Increase presence of agents and financial services outlets in rural areas. Carry out dedicated training across MSMEs and a nation-wide awareness-raising campaign to increase the knowledge of digital payment solutions and their benefits.
Legal and Regulatory Framework	
The legal and regulatory framework necessary for e-commerce to thrive relies on a broad piece of legislation, namely the Electronic Transactions and Cyber Security Act, 2016. Some key enforcement regulations and other important pieces of legislations are missing. There is also a very low awareness of the existence of the said law and applicable provisions, and a costly and burdensome environment that is slowing down e-commerce uptake.	Carry out a legal and regulatory gap analysis and prepare missing enforcement regulations and laws covering e-commerce terms and conditions, e-signature and digital signatures certification and consumer protection for e-transactions. Sensitise and train regarding the provisions of the existing legal framework and stimulate public-private dialogue on key issues arising from digital economy new trends. Strengthen the institutional cybersecurity and consumers' protection framework.
e-Commerce Skills Development	
Despite efforts in spreading access to ICT, digital adoption is still low, resulting in lack of knowledge and trust across ICT and potential e-commerce users. Curricula in universities and training institutions are not well versed about developing skills for the needs of e-commerce businesses, policymakers and government officials, mostly focused on ICT hard skills or traditional business administration courses. MSMEs intermediary organizations have not yet embraced digital transformation and updated their services, while some well-respected incubators and accelerators exist (e.g., mHub). However, their support does not prevent high start-up mortality and unprofitability of new ventures.	Provide ICT equipment, promote digital alphabetisation and awareness campaign in educational establishments and MPC offices. Assess the skills gap and upgrade education and training programs in line with e-commerce industry's needs. In partnership with incubators and innovation centres, support intermediary organizations in providing a wide range of business and management skills for e-commerce. Increase support for innovation hubs and incubators and provide incentives to expand the range and quality of services provided. Assess the feasibility of establishing a Sandbox for tech developers.

MAIN FINDINGS	MAIN RECOMMENDATIONS
Access to Financing	
Traditional financial institutions (banks and MFIs) credit to MSMEs is very limited and relatively costly, and in general do not provide products aligned to the business models of e-commerce business. There are no public guarantee schemes, grants or subsidised loans available for venturing e-commerce businesses. A few financial support schemes supported by donors, local and regional incubators/accelerators and partner financial institutions, do bode well for the inclusion of potential e-commerce projects. Venture capital and other forms of alternative financing are not widely available, with the exception of a few innovation prizes, thus most often self-funding or informal channels are the only viable options.	Mainstream ICT and e-commerce in financial inclusion strategies through dialogue and raising awareness of financial institutions of the opportunities offered by e-commerce and explore the financial schemes most appropriate to their needs. Establish a public financial support scheme, e.g., matching grants, subsidised loans or public guarantee scheme. Support business organizations in building start-ups and MSMEs capacity to develop bankable business projects. Undertake a study to determine strategies to attract alternative forms to fund innovative businesses and e-commerce platforms. Expand knowledge of existing programs, such as incubators, business accelerators and venture capitals, prizes and competitions, and engage in digital entrepreneurship outreach in rural areas.

Table 1 Source: *Rapid eTrade Readiness Assessment 2019*

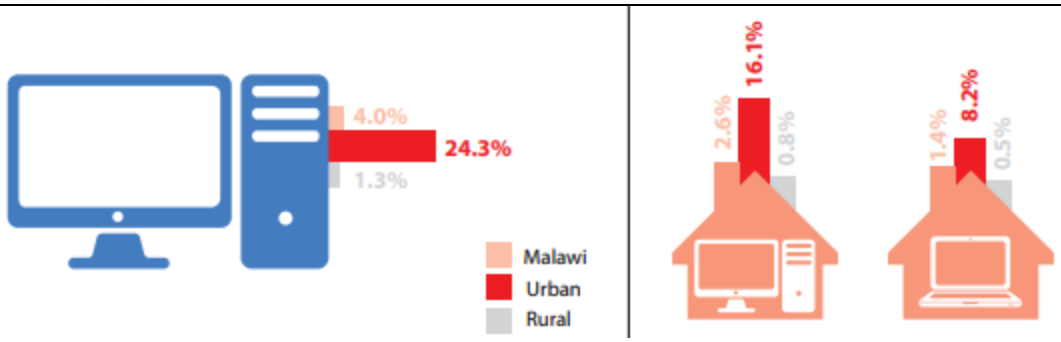
Despite all these challenges, the Malawi government has made significant efforts towards advocating for the utilisation of ICT within the overall national development policy framework, albeit with no stand-alone digital transformation framework and a comprehensive eCommerce strategy. As a result, this ILO/PAPA project presents the MSME sector of Malawi with an opportunity to raise its hands by beginning to develop and proclaim a digital architectural framework for MSMEs that can be integrated into the current and future initiative aimed at forging Malawi's integrated digital economy.

Hereunder, is a MACRA's survey of individuals and households' access and usage of ICT services in Malawi.



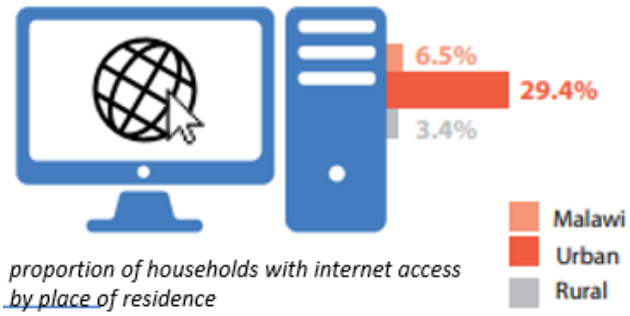
Proportion of households with mobile phones, fixed phones, television and post box by place of residence

Fig 4: Source: *MACRA Household survey of Access and Usage ICT in Malawi 2015 and 2019*



proportion of households with a computer by type of computer and by place of residence

Fig 5: Source: MACRA Household survey of Access and Usage ICT in Malawi 2015 and 2019



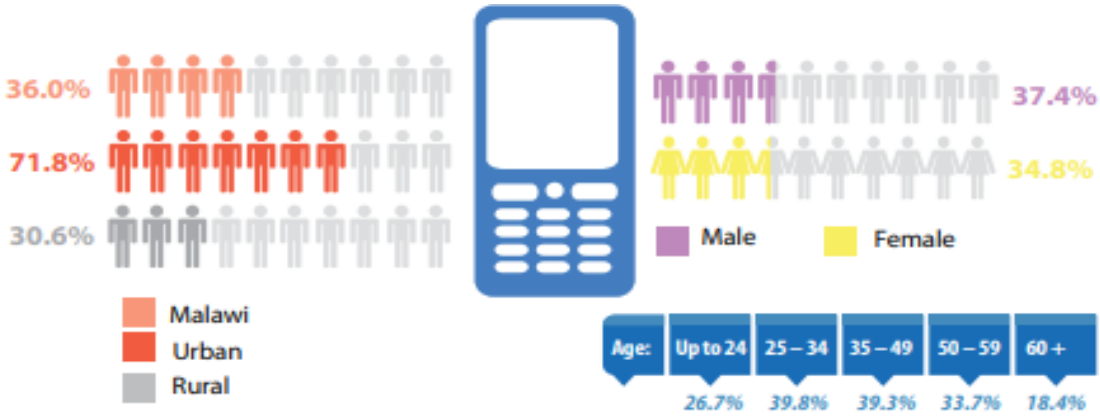
proportion of households with internet access by place of residence

proportion of households with internet access by type of connection and geographical location

Type of connection	Malawi	Urban	Rural
Mobile broadband	79.3%	69.4%	90.7%
Wireless broadband	1.1%	1.7%	0.5%
Modem	1.8%	1.9%	1.6%
ADSL	0.5%	0.5%	0.5%
Dongle	17.2%	26.6%	6.6%

Fig 6. Source: MACRA Household survey of Access and Usage ICT in Malawi 2015 and 2019

Micro perspective



proportion of individuals owning mobile phones by geographical location, sex and age

Fig 7. Source: MACRA Household survey of Access and Usage ICT in Malawi 2015 and 2019

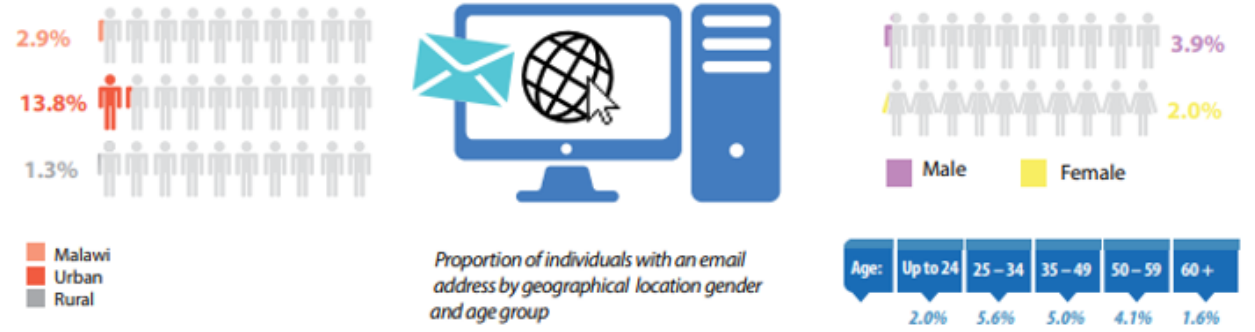


Fig 8: Source: MACRA Household survey of Access and Usage ICT in Malawi 2015 and 2019

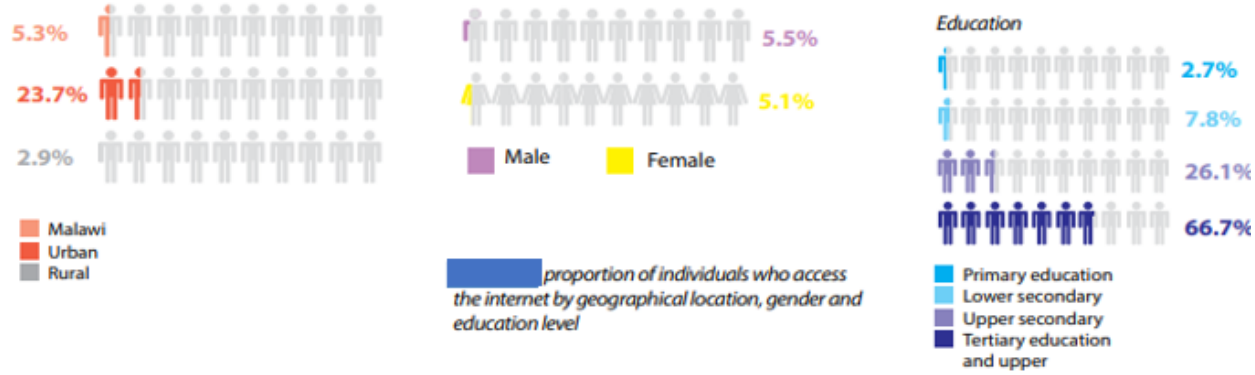


Fig 9. Source: MACRA Household survey of Access and Usage ICT in Malawi 2015 and 2019

From the statistical figures above broadband, mobile phones and computers penetration is still a big challenge, albeit, the situation is steadily improving year on year, and as such this situation still presents Malawi, with a huge opportunity to adopt established modern digital technologies based on proposition advocated by such ICT framework documents and others that seek to put a digital economic development strategy for a country like Malawi.

5. Methodology

As alluded, the objective of this document is to develop an ICT Framework for MSMEs in Malawi. In undertaking this exercise, interviews and meetings were held with various stake holders to get a sense of what is really pertaining on the ground in terms of broad access and usage of ICT in Malawi in general, but specifically how ICTs can also positively impact the MSME sector of Malawi. This was followed by reviewing official strategy documents and other country surveys by institutions such as MACRA, to ensure that the literature used in developing this framework is wide ranging from different sources and up-to-date as well. Of course, one had to troll and surf the internet for any other additional or supplementary information, especially on technical information and ICT Enterprise Architecture information to systemically try and dovetail the MSME landscape in Malawi, with a Systems Development Approach (SDA) to come up with an ICT Framework or roadmap for MSMEs in Malawi. It should be borne in mind that framework documents such as this one, are merely guidelines to assist in implementation but are not prescriptive given that parts of the road map may be implemented peace-meal or in chunks depending on the budget and the realities on the ground.

6. Conceptual ICT Strategy for MSMEs

In 2019, Malawi finally developed and adopted a Government Digital Strategy (GDS), aimed at expediting and improving public service delivery. Among others, the eGovernment strategy outlines the Government of Malawi`s commitment to build capacity in the IT sector and subsequently to overcome the continued dependency on outside experts as well as other external institutions for development and implementation of complex ICT initiatives. The eGovernment Department, believes that this strategy is the first comprehensive forward-looking national strategy for development of Digital Government agenda in Malawi.

This DGS is based on the Malawi Integrated Digital Agenda for e-Services (MIDAS) framework. The MIDAS framework has five strategic pillars of focus and four shared services or enablers as foundations. Furthermore, the top cone lays down the national vision, in alignment to Malawi's country goals.

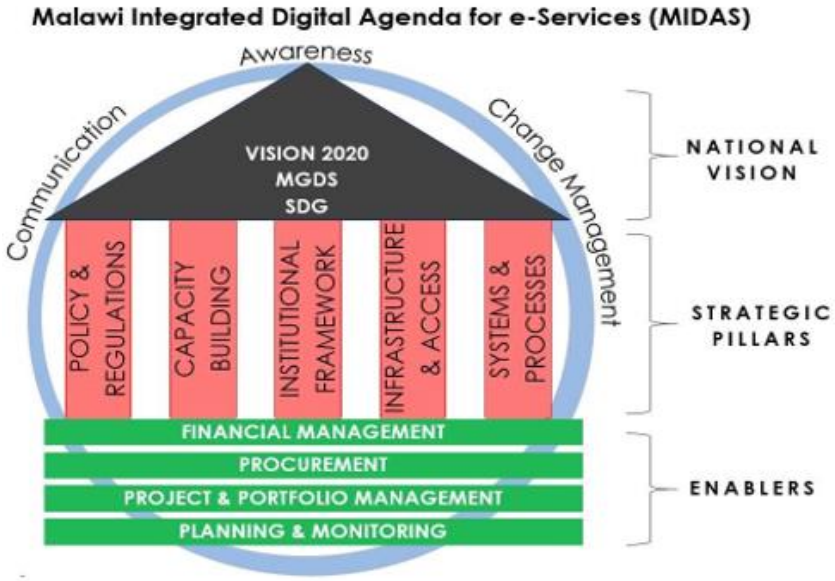


Fig 10. Source: Malawi Vision 2063

This Strategy is geared at addressing the challenges that encumbers the automation of government processes and the utilisation of ICTs in conducting day to day, Government to Government (G2G), Government to Business (B2G) as well as Government to Citizens (G2C) business, whilst facilitating and enabling online Business to Business (B2B) environment for the private sector and, to seamlessly improve the commercial engagements of the MSME sector. Although, it is incumbent upon all stakeholders to participate in the digital transformation agenda of Malawi, the championing and implementation of such an ambitious strategy is still the responsibility of the Malawi Government and designated authorities. The Department of eGovernment is therefore appropriately entrusted with the custody of the GDS and to provide leadership in the implementation of the MIDAS framework to ensure adherence to world class industry standards for Integrated Systems Development and Engineering. As a matter of urgency, the eGovernment department should be a ground zero for developing a Government Wide Enterprise Architecture that will provide a virtuous roadmap and framework in which to build good Government Wide Integrated ICT systems and a robust digital culture informed by the 4th Industrial Revolution (4IR) advancements.

7. Towards ICT Systems Architecture/Enterprise Architecture for MSMEs

In this era of rapid technological advances, increasing automated computer driven systems and ever ubiquitous big data, the risks of institutional failure, especially owing to absence or lack of planning for critical systems is very high and requires consistent critical attention. This framework for automated systems, such as the one under scrutiny, need to be analyzed and crafted not only in terms of their integrated technical requirements and components but also in terms of the sociological context of their design, production, ownership, and end user environments. For example, different considerations are applied when developing an Enterprise Architecture in different environments, i.e., for an entity or sector in a developing world viz-a-viz the developed world. Issues already alluded to in this document, such as literacy levels, cultural and socio-economic factors must come into the mix when developing ICT Architectures, especially for such a critical sector in Malawi.

Failure can occur not only from technical issues but also from emergent cultural issues at any point or in cascading sequences in the process of design, where both technical, organizational and socio-cultural issues were ignored. ICT systems architecture need to be considered as sociotechnical systems, not just engineered systems and the scope of analysis in this instance, should be widened to include all the characteristics and elements of all organizations which constitute the MSME sector.

Another issue with sociotechnical systems is that, while the technical parts of the system are engineered to requirements and assumptions that are based on the cultural context in which they are intended to operate. This cultural context is constantly undergoing change in ways that are hard to predict. In some cases, the very existence of the technical system impacts or changes the expectations and behavior of the users. Further, if one examines some of the MSME's sociotechnical systems requirements, such as the enterprise's objective, the need for ensuring optimal facilitation of commerce, capacity building interventions and support for MSME in Malawi, are also constantly changing as well. The relationships among the multiple, yet independent commercial eco-systems within and between various MSMEs, with different sectoral requirements, it is critically important that they be considered, first and foremost common sociotechnical attributes be identified, defined and assembled for a primary system, owing to the need to address divergent multiple requirements of MSMEs from various sectors.

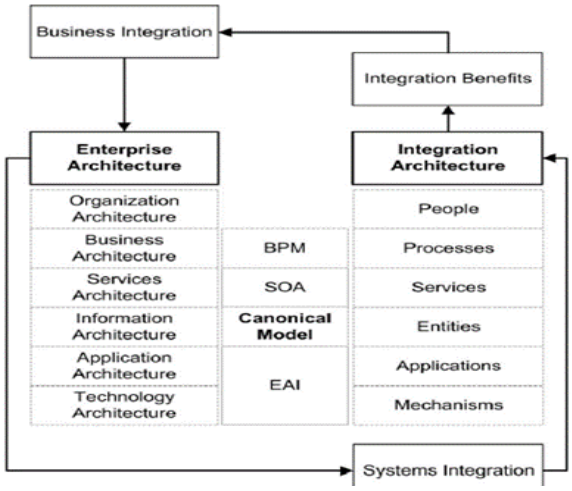


Fig11. Source: Conceptual Model for EA/IA Relationship

The discipline of enterprise architecture includes a set of frameworks that provide formalized, structured ways of representing a view of technical systems, their integration, and their business context. This business context of MSMEs in Malawi would usually include the environment within which the systems operate, i.e., the regulatory framework, the stakeholders such as the eCommerce Department of the Ministry of Information, SMEDI, Ministry of trade and Industry, ICT Association of Malawi, NEEF, etc., to harmonise their digitalisation effort under a single unified framework. A careful analysis of external relationships and the organizational components that use and operate these systems to process event cycles in the proposed MSME ICT ecosystems should be made. At the very least, it will be required in this framework, that business rules and all aspect aspects of the MSME ICT system be also documented as well. This framework will provide a variety of ways that the MSME sector can be analyzed to identify potential problem areas, estimate the impact of proposed or planned changes, and identify missing or conflicting information. A well-defined **Theory of Change** should also be developed to assist in the development and implementation of such and ICT framework for MSMEs.

This is going to be a multi-disciplinary framework initiative, which proposes very rigorous analysis of systems and sub-systems, steeped on thorough mining of information and massive cultural change undertaking. The objective challenge of this framework is the lowering of costs of doing business for MSMEs, facilitating commerce by providing more for less, introducing and supporting new business models, adapting to rapidly changing environments, providing value added services and complying with all kinds of rules and regulations. The fact that there are currently no monolithic legacy systems for MSMEs in Malawi to deal with, present us with a clean canvas to paint a new way forward for implementation of a contemporary ICT vision for the MSME Sector in Malawi. ICT, among others, is identified as one of the enablers of Malawi vision 2063, in which Malawi is desirous and committed to having a competitive digital economy and as such willing to make appropriate investment in this arena. Although the implementation of this proposed framework is the responsibility of various ministries and agencies, it critically important that a single authority is assigned with the responsibility for coordinating the development, implementation and roll-out of such a framework.

This MSME eBussiness Framework, should speak of the digitalisation of the entire MSME ecosystem, i.e., from registration, access to services and transaction, ecommerce applications, capacity building, relevant statistical information, etc., enabled by a harmonic regulatory framework.

As mentioned already, many information intensive organisations, are confronted with unfavorable ratio of addressing cumbersome legacy ICT systems and an opportunity for new ICT systems. Given that old ICT systems tend to be monolithic, unwieldy and inflexible in nature, most organisations find maintenance of the legacy systems to overly expensive to maintain and painfully difficult or implausible to modernize them to meet new business demands. Some organizations spend up to 90% of their IT budget on maintaining the existing IT landscape, leaving only 10% for innovation. Once more, Malawi is fortunate, in that there are no legacy MSME ICT systems to contend with, and as a result Malawi is presented with a massive opportunity to innovate from the architectural foundation of these MSME ICT systems.

As we attempt to develop and craft this ICT framework, it is important to look at trends and best practices around the world. For example, looking at some highly information-intensive sectors, we can identify a few common trends, i.e., their well-crafted enterprise architectures. In general, we also see that organisations focus increasingly on their core competencies, outsourcing non-core activities. Organisations are increasingly also using cloud computing as opposed to on premise solutions.

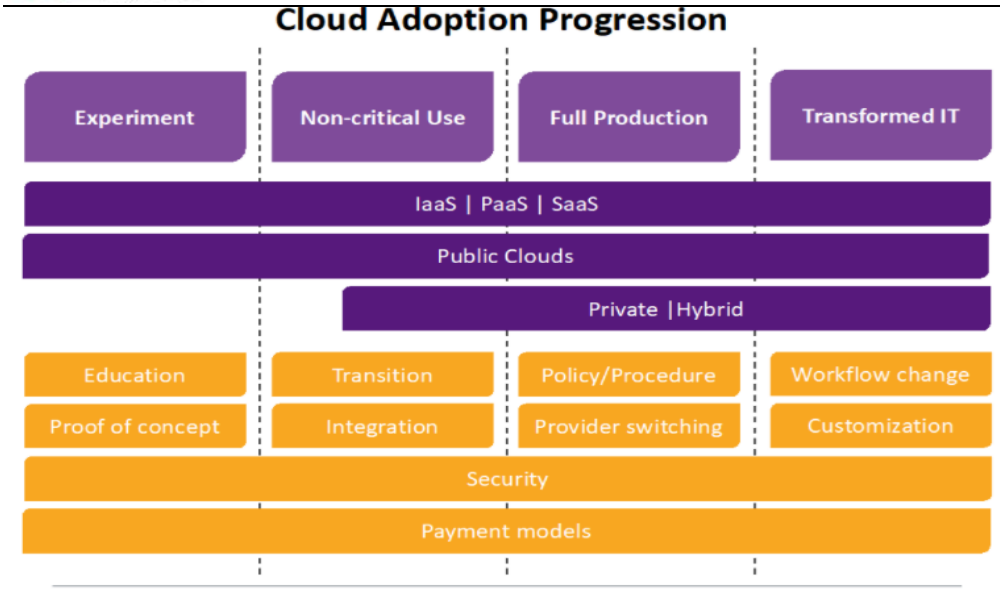


Fig 12. Source: Internet

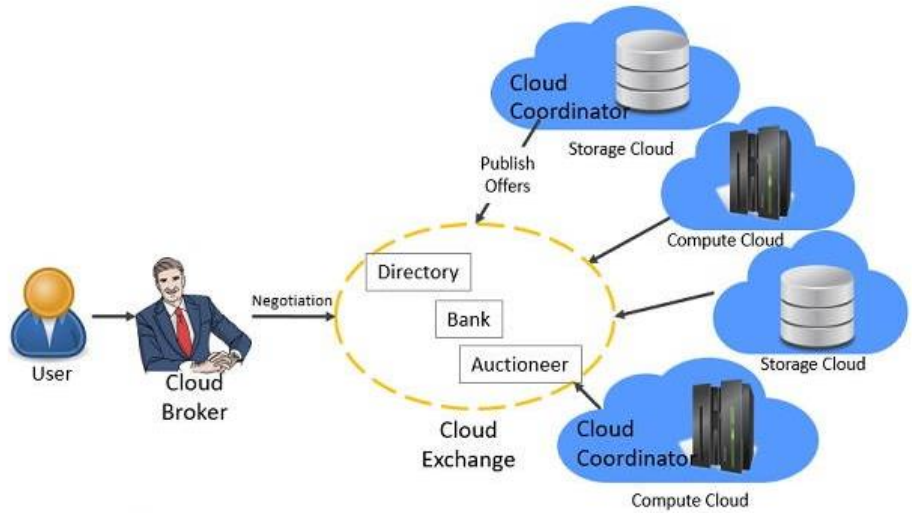


Fig 13. Source: Internet

This is critical, because as Malawi develops its MSME ICT roadmap, it has useful information available to make low and cost-effective socio-technical choices at their disposal.

It is also very important to note that business transformation has immense potential benefits and as such the transformation of the MSMEs' business landscape is at the center of this eBusiness framework. According to Venkatraman (1995), ICT-enabled business transformation can take place at different levels, ranging from local optimizations to radical business change or even business network redefinition aided by digital or computer infrastructure that is owned and managed by 3rd parties.

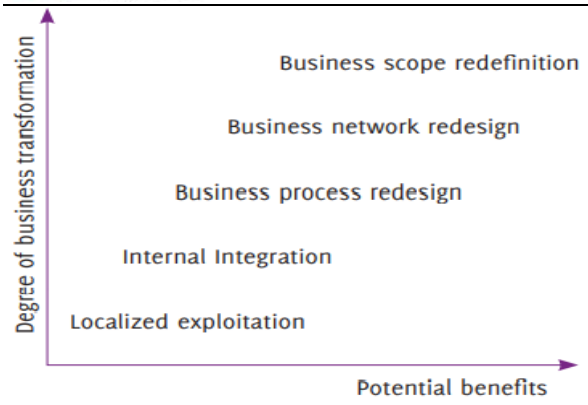


Fig 14. Source: Mastering the Information Factory 2010

E-Business has changed our view of organizations and have also seen eGovernment initiatives increasingly paying more attention to cross-organizational cooperation in recent years, to lowering the administrative burden on citizens and organisations, and to improve the provision of integrated service delivery to end users, with rich user experience or customer experience. This MSME ICT framework is in many ways part of eGovernment services or a sub-system of a federated eGovernment Systems. As a result of intense competition, increasing complexity of business processes and changing sectoral expectations and demands, MSMEs should demand flexible support from the authorities of their business processes by means of ICT platforms, and this framework proposition recognizes that ICT solutions demands are shifting towards fulfillment of specific needs of the MSMEs, instead of imposing of generic ICT solutions, in a top-down manner.

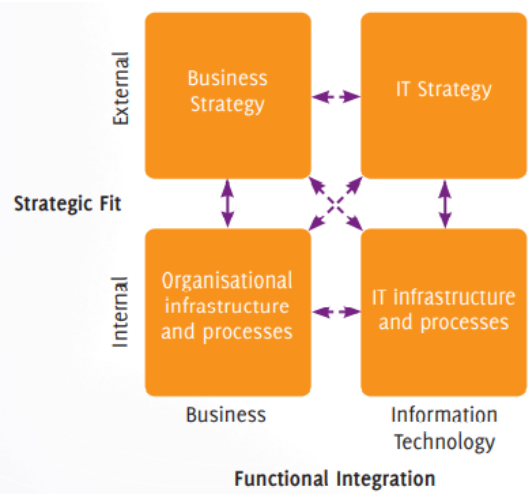


Fig 15. Source: Mastering the Information Factory 2010

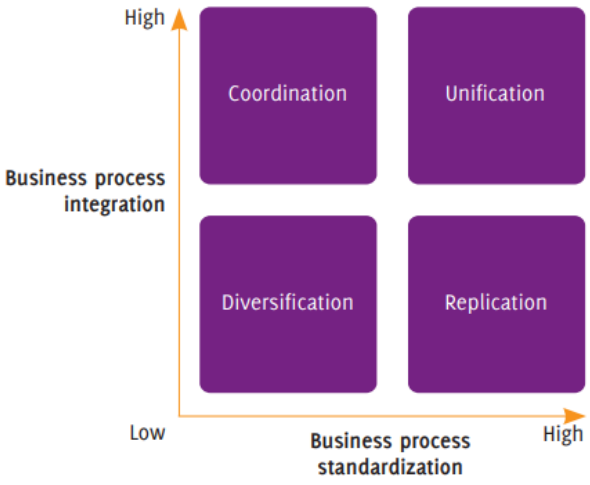


Fig 16. Source: Same as in Fig 14.

Figures 15 and 16, illustrates a very critical aspect of the framework, and it relates to Business and IT alignment intended to increase efficiencies and effectiveness in the MSME sector. Such effectiveness is not obtained by local optimizations, but is realized by well-orchestrated interaction of agency and organizational components. Effectiveness is driven by the relationships between components rather than by the detailed specification of each individual component. This strategic alignment should attempt to define and align the business strategy of MSMEs and the infrastructure of MSMEs, which would translate

to aligning ICT strategy and ICT infrastructure defined to serve the needs of MSMEs in Malawi, whilst empowering MSMEs to accordingly streamline their businesses.

Figure 14, speaks of translating business strategy to operations. Next to the business strategy that is chosen for the MSME sector, would also need to consider the tactical business aspects of the sector and collaborating organization in defining a coherent business and ICT approach. For example, if we look at the small-scale farmers, they currently operate in silos, the proposed system would be able to intelligently harmonise, consolidate and automate supply chain system for the export market of their yield. Successful enterprises employ an '**operating model**' with clear choices on the levels of integration and standardization of business processes across the enterprise, and consequently, of the necessary IT support. This initiative therefore also proposes a similar approach, where an appropriate "**operating model**" for MSMEs with clear choices of levels of integration and standardisation are adopted to ensure that the sector achieves appropriate levels of governance and support. The operating model should fit both the diverse sectoral areas of business offerings of divergent MSMEs as well relate to the developmental stage of organisational maturity of these MSMEs in the continuum. To develop this operating model, the question needs to framed with the end goal in mind but also cognisant of the socio-cultural environment as well.

In essence, the challenge of delivering the operational IT services for MSMEs is proverbially where the rubber meets the road, in terms of this framework. There are many ICT frameworks to look at and at the disposal of Malawi, i.e., COBIT, ITIL, etc. The IT Infrastructure Library (ITIL) (Hanna et al., 2008) is the most widely accepted set of best practices in the IT service delivery domain, and as such, if chosen may form part and parcel of this proposed ICT framework for MSMEs, or at least the equivalent thereof. Of course, there a number of standards that Malawi authorities can utilise that provides organizations with 'best practices' that help in implementing an IT governance structure throughout the enterprise. Their aims are to bridge the gaps between business risks, control needs, and technical issues during implementation and maintenance of systems.

7.1. Context for Systems Architecture/Enterprise Architecture

Architecture relates to the structure of components, their relationships to each other and to the environment, and the principles guiding the design and evolution of the entity they describe, whether that entity is a cluster (e.g., MSMEs or association), an organization (e.g., government department or agency), a system (e.g., ERP System), or a functional or mission area (e.g., financial management, information security). Architecture products and artifacts can take a variety of forms, including models of structured data stored in an architecture tool or database repository, graphical depictions of the information in hard copy or electronic format, or unstructured data or text.

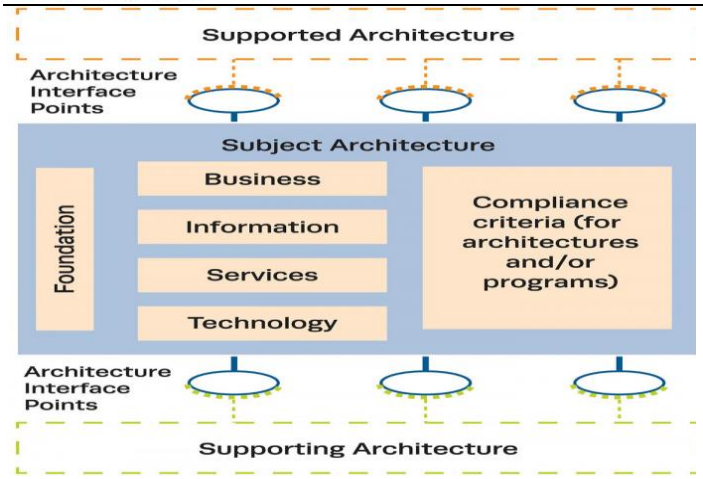


Fig 17: Source: Conceptual Modelling in Information Systems, John Krogstie, et al, 2007

The configuration of Malawi's ICT system for MSMEs, requires that in line with the eGovernment strategy and Malawi Vision 63, be a sub-system or 'systems of systems' (Architectures Federation) engineering, which entails a paradigm shift by developing a framework of several containerized micro-services within the Malawi ICT framework for MSMEs. Architectures federation is therefore a framework for enterprise architecture development, maintenance, and use that aligns, locates, and links separate but related architectures and architecture information to deliver a seamless outward appearance and or services to a sector or users. A single architecture may not be able to address the entire MSMEs enterprises sufficiently to support the kind of analysis needed in a large conglomeration of divergent MSMEs with varied business offerings, unique complex challenges and diversity of missions. The ability to federate multiple architectures leads to a more robust construct for understanding the enterprise in smaller, bite-sized chunks with the following attributes;

- To operate collaboratively, where governance is divided between a central authority and constituent units, balancing organizational autonomy with enterprise needs.
- The central authority's architecture can focus on the dynamics of economies of scale, standards, and the well-being of the organisation.
- Constituent units' architectures have the flexibility to pursue autonomous strategies and independent processes.

In this proposed MSME ICT system there will be a need to re-use component architectures by "snapping them together" like LEGO® bricks to build complex architectures of wider scope and applicability as required for the MSME sector of Malawi.

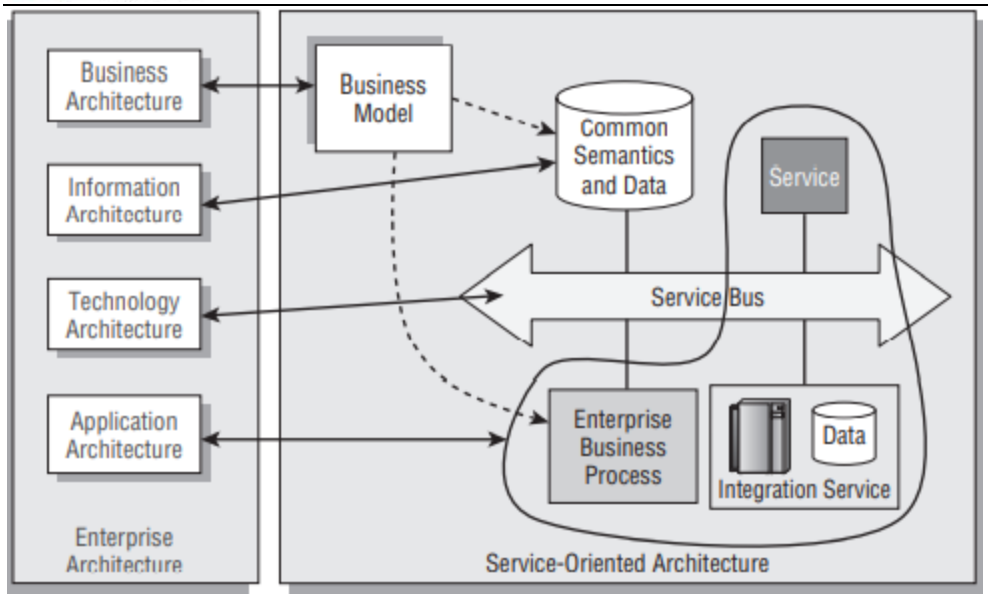


Fig 18. Source: Applied SOA for SMEs

These federated architectures are therefore better geared to developing robust ICT systems and as such be suited to automate the commercial ecosystems of divergent MSMEs, improving business and operational capabilities of MSMEs by enhancing the interoperability and integration with Government Ministries, relevant SOEs and other associated Agencies. Federated architectures would therefore support decision making by linking architectures across the MSME sector and the relevant Malawi Authorities, providing a holistic cross sectoral/organizational view that allows for the identification of such matters as interoperability, duplication and gaps, to determination of re-usability of systems.

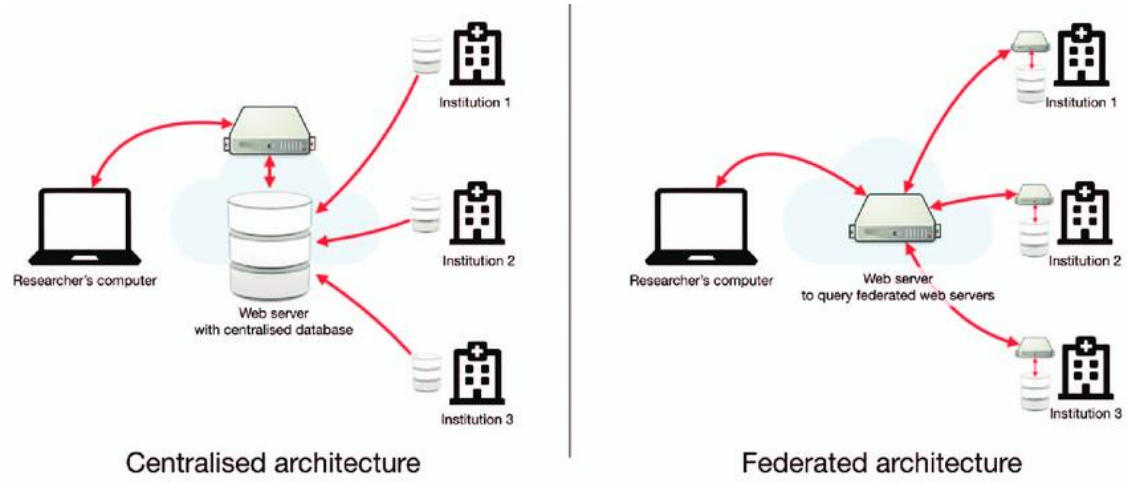


Fig 19. Source: Internet

This framework will enable a complex architecture to be built in a piecemeal fashion from component architectures. In this way, a proposed federated architecture approach which recognizes the uniqueness and specific purpose of individual architectures, would allow for their autonomy and local governance, while enabling the MSME Enterprise system to benefit from the collective ubiquitous data and content.

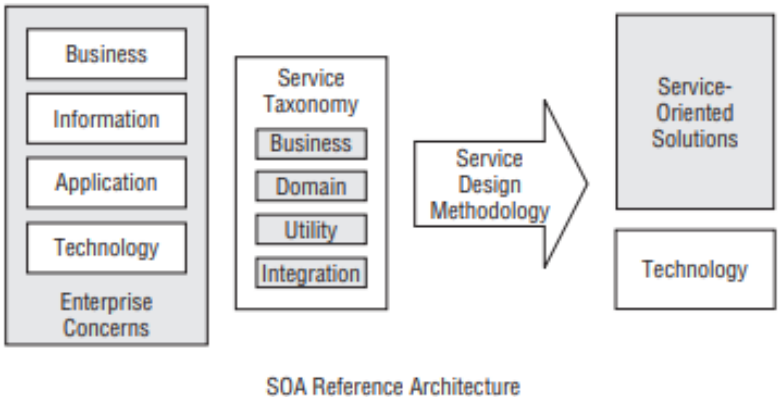


Fig 20. Source: Applied SOA for SMEs

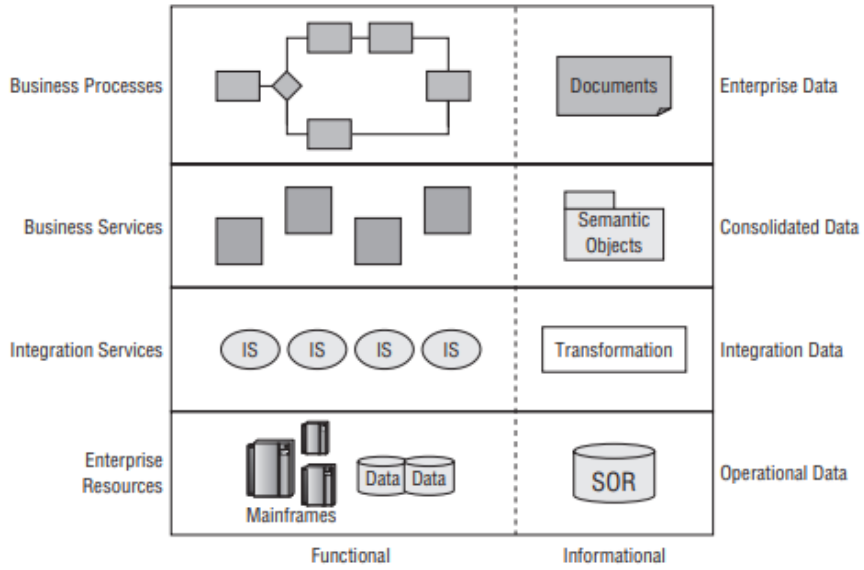


Fig 21. Source: Applied SOA for SMEs

Figure 22, hereunder shows a typical layered perspective of SOA that addresses the composition and integration requirements of SOA and business processes, but not so much the run-time, governance, organizational, or enterprise requirements.

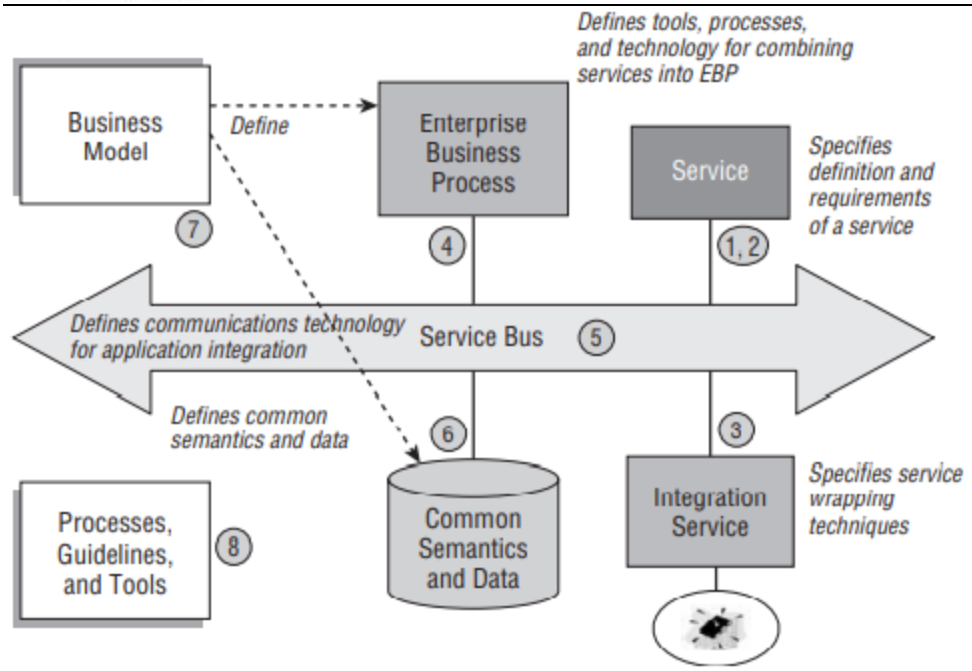


Fig 22. Source: Enterprise Interoperability: New Challenges and Approaches

Figure 22, illustrates a different perspective on SOA, which needs to describe the following aspects of services within an enterprise:

1. A definition of services, the granularity, and types of services
2. How services are constructed and used
3. How existing packaged and legacy systems are integrated into the service environment
4. How services are combined into processes
5. How services communicate at a technical level (i.e., how they connect to each other and pass information)
6. How services interoperate at a semantic level (i.e., how they share common meanings for that information)
7. How services align with the business' strategy and goals
8. How to use the architecture

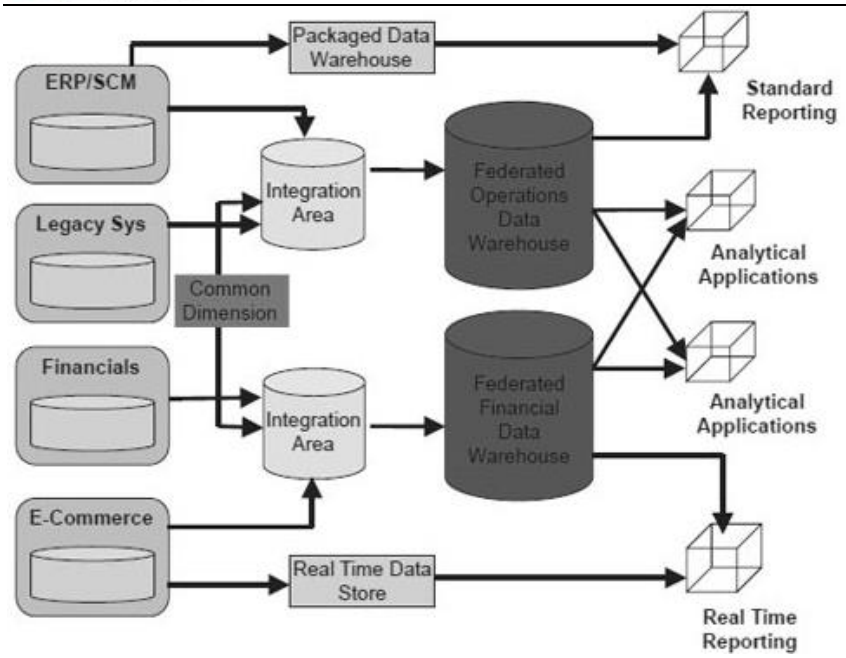


Fig 23. Source: Enterprise Interoperability: New Challenges and Approaches

The key constructs for architectures federation, graphically depicted above, show each construct comprising of a collection of architecture products of interest to a particular group of stakeholders, while addressing all the business, information, business services, and technology components needed to deliver capabilities with supporting and supported architectures. The architectures of those solutions upon which the subject architecture relies are called supporting architectures, whereas the architectures of those solutions that rely on the subject architecture are called supported architectures.

Each architecture interface point must be well defined to ensure integration and seamless hand shake between various architectures to construct a holistic MSME Enterprise System for Malawi. In simple terms, the interface points are the places where architectures can be joined into a larger federated architecture, from an operational perspective.

In this federated approach, responsibility for architecture development shall be shared by different authorities with an interest in the MSME sector. To bring these separate but related efforts together requires:

- **Tiered accountability:** Establish a hierarchy of architectures whereby architectures lower in the hierarchy inherit characteristics from higher-level architectures. Use touch points to relate architectures across the levels or tiers.
- **Categorization:** Relate and group “like” architectures and artifacts.
- **Semantic alignment:** Use common vocabulary and mapping relationships to establish shared understanding. Adhering to a common framework, which includes the use of common data element definitions, semantics, and data structures for all architecture description entities or objects, Using enterprise taxonomies and authoritative reference data
- **Reference architectures:** Provide parent taxonomies for other architectures to use.
- **Search and discovery:** Allow authorized users to find and access relevant architecture for information and reuse

Conform to standards. In general, conforming to common or shared architecture standards increases interoperability and would make it easier to federate. The Authorities tasked with the development of this system, would have to choose appropriate standards that are fit for purpose and help establish the means to enforce compliance. For example, agreed enterprise taxonomies, establish the context for aligning mission area activities and associated reference models, and for categorizing and organizing component architectures, thereby facilitating semantic understanding across the various architectures in the federation.

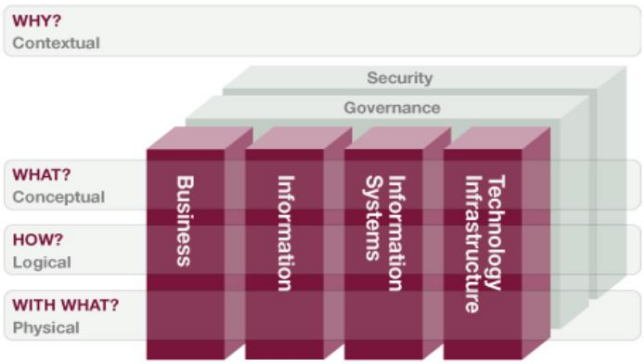


Fig 24. Source: An EAF for Large Integrated Complex Information Systems

Enable information sharing. The federation of architectures is facilitated by an environment that enables information sharing.

- **Ensure sound governance and enterprise architecture services:** Firstly, the Malawi Authority concerned must recognize that an architecture-sharing environment requires sound governance and enterprise architecture integration service points. A technical team should be assembled to assist Malawi to establish sound governance structures to apply accountability to the development and maintenance of architectures toward set objectives, which will ultimately facilitate their ability to federate. This approach places responsibility around processes such as configuration management and quality assurance to the technical team. It is also advised that the Authorities should sponsor the establishment of enterprise architecture services team to allow architecture information to be visible, accessible, and understood consistently and efficiently.

- **Expose architectures and their metadata:** The success of a federation effort also depends on exposing architectures and architecture metadata for potential linkage and reuse by analysts, strategic planners, and decision makers at every level. Sharing architectures and services that already exist will help the Authorities expedite architecture development and as a result a robust enterprise system development. The implementing authority must keep registry capabilities to provide for registration and linking of architecture metadata to enable the creation of navigable and searchable federated enterprise architectures. Enterprise enforcement policies and governance for architectures reinforce robust interfaces and data relationships. The technical team must assist the implementing Authority and the stakeholders to actively engage in these architecture-sharing discourse by reusing artifacts before reinventing them and by posting own metadata and products for others to reuse, for example the alignment of semantics and structural data across stakeholder boundaries. This would also facilitate the seamless flow information among stakeholder nodes and decision makers.

Following are the advocated outputs, wherein experts can be contracted to assist in designing and developing the MSME Systems architectures in greater detail;

- System Architecture Design
  - External systems diagram
  - Functional/Logical diagrams
- Hardware architecture design
  - Security hardware architecture
  - Performance hardware architecture
- Software Architecture Design
  - Security software architecture
  - Performance software architecture
- Information architecture
- Internal communications architecture
- Security architecture
- Performance architecture,
- System Development and System Implementation

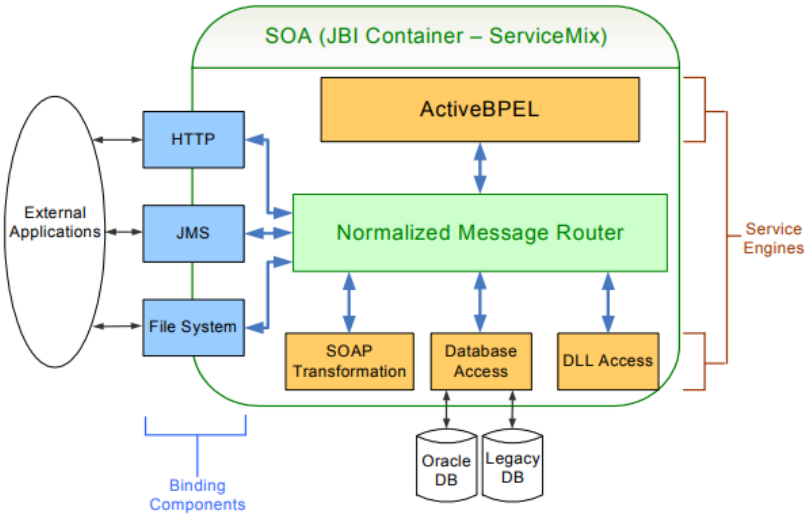


Fig 25: General Overview of the Proposed SOA:Pascal Bauler, Fernand Feltz, Nicolas Biri, Philippe Pinheiro: 2006

7.2. Bringing Enterprise Architecture to MSMEs

According to the Technology Acceptance Model (TAM, Davis 1989) and the Method Evaluation Model (MEM, Moody 2003), three actions can be defined in order to enhance the adoption of EA techniques in MSMEs.

First, the perceived usefulness has to be increased. Second, the perceived ease of use has to be increased. Third, the actual efficacy has to influence the perceived efficacy.

Increase the Perceived Usefulness

Usefulness can be related to the advantages of EA techniques for SMEs. However, perceived usefulness is influenced by actual effectiveness. To increase the actual effectiveness of EA techniques for SMEs, the

techniques have to be implemented in practice (e.g., case studies, testing companies, ...) and feedback from the MSMEs has to help developing EA techniques that bring more advantages for MSMEs.

Increase the Perceived Ease of Use

Ease of use is related to the effort that has to be spent to implement an EA technique. Complexity, defined by Rogers and Shoemaker (Rogers and Shoemaker 1971), as "the degree to which an innovation is perceived as relatively difficult to understand and use", parallels perceived ease of use quite closely. As MSMEs have rather limited free time to work on strategic issues, limited IT knowledge, and limited resources to spend, a special effort has to be made to adapt EA techniques to an SME context. As Lankhorst (Lankhorst 2009) mentioned, it is necessary to use an approach that is understood by all those involved from the different domains. Perceived ease of use is influenced by the actual efficiency, so these techniques have to be implemented and tested in practice.

From Actual to Perceived Efficacy

To get a positive influence of the actual on the perceived efficacy, EA techniques have to be implemented in MSMEs. The advantage is twofold. First, feedback can be used to adapt the EA techniques and enhance the perceived ease of use and usefulness. Second, by implementing EA techniques in practice, EA can get better known in MSMEs and especially the advantages can get widespread. Positive testimonials and word of mouth can generate a higher perceived efficacy.

7.3. A Starting Point for Enterprise Architecture for MSMEs

Bharati and Chaudhury (Bharati and Chaudhury 2006) noted that simpler technologies and software packages have a much wider application in SMEs than more complex ones. It is always a good idea to make an initial approach using Einstein's principle: "Everything should be made as simple as possible, but not simpler". In order to keep the approach as simple as possible, while mitigating the risk of making it too simple and loosing advantages of EA, every part of the metamodel later on has to be carefully discussed with experts (e.g., SME experts, practitioners, and academics) and tested in case studies to get a balanced result. A good starting point should be to make an EA approach, based on the core elements of existing EA techniques, to make the approach as simple as possible, but not simpler. A strategic dimension (why), an active actor dimension (who), an operation dimension (how), and an object dimension (what) can form the highest and most important layer, the business architecture layer, of the EA model. To get a holistic overview, these four dimensions should be interrelated. An example of this proposed business architecture layer (Bernaert and Poels 2011b) is given in Fig. 15.

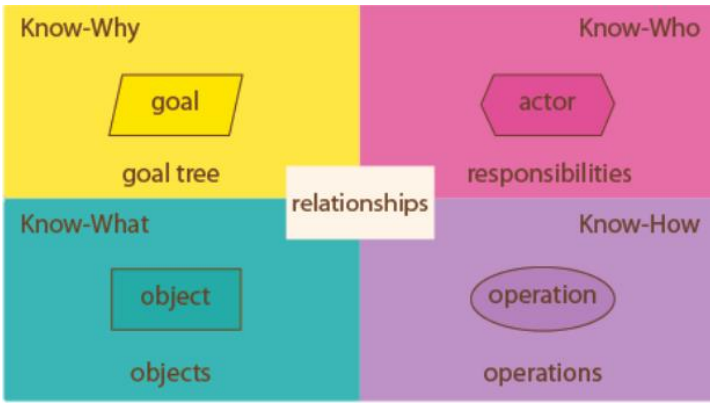


Fig 26. Enterprise Architecture for MSMEs, 2013

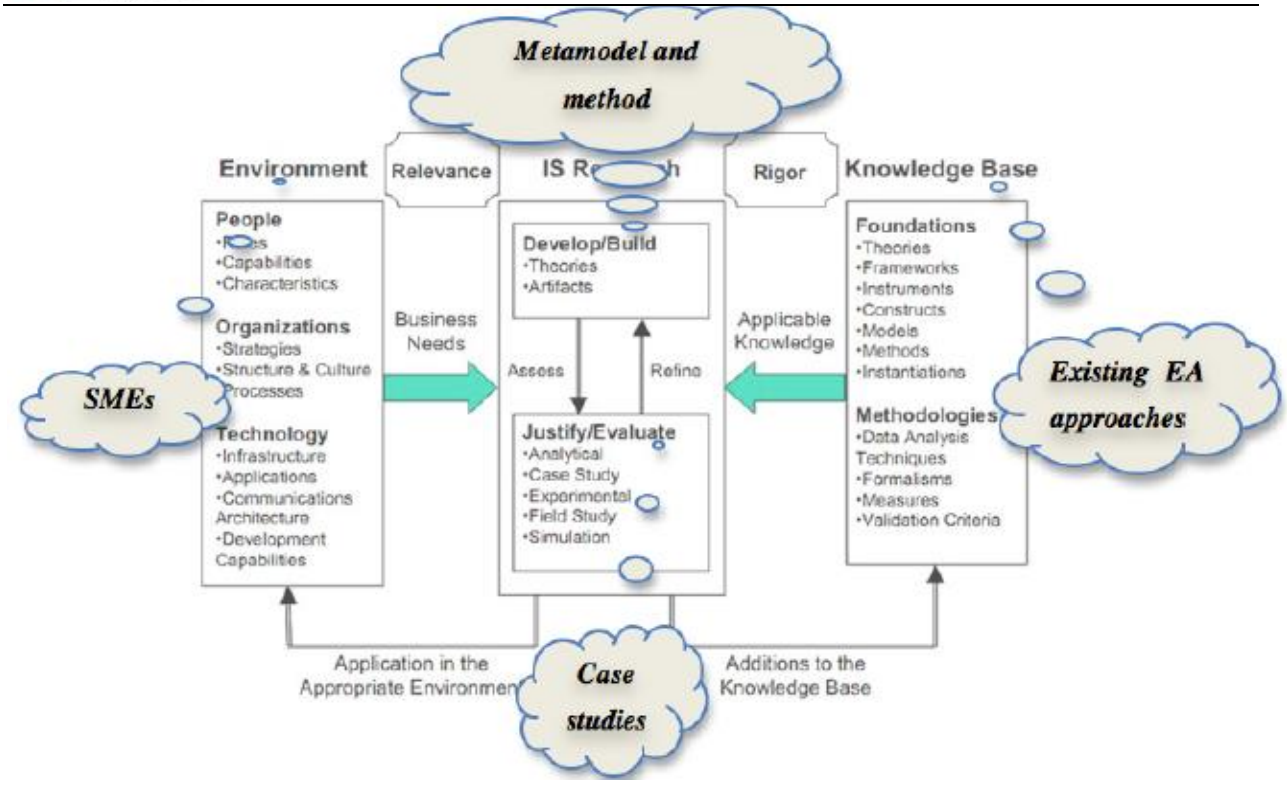


Fig 27. Enterprise Architecture for MSMEs, 2013

This business architecture layer has to be supported by an application layer, which has to be supported by a technology layer.

The initial metamodel should be developed according to the criteria of both MSMEs and EA techniques, and more important, it should be tested extensively in real MSMEs. Regardless of the potential benefits of EA approaches published, unless they are used in practice, these benefits cannot be realized

Finally, given that this is a new proposition, Malawi has an opportunity to have a world class MSME Enterprise ICT solution with all the new technological bells and whistles of a modern MSME Enterprise System using cutting edge mobile, web-based, cloud and application technological stack consistent with the socio-technical context of Malawi, and based on robust contemporary Enterprise Architecture development practices Systems Development Life Cycle (SDLF) methodologies.

8. Digital Transformation Framework for MSMEs in Malawi

Like most countries in Africa, Malawi has numerous intervention initiatives to address the development of the economy, and in this instance, to address the plight and sustainability of MSMEs. However, these interventions tend to be elementary and often seem to be focusing on run of the mill standard advocacy interventions such as, training, capacity building, advocacy on policy or regulatory alignment, etc. Having interviewed numerous stakeholders and having reviewed several of documents pertaining to both MSME and the ICT sector in Malawi, it became abundantly clear that the reach and depth of the existing ICT infrastructure, gravely emasculates the commercial development of the MSME sector, which in turn also potentially encumbers the unlocking of the economic development pathway of Malawi. The fact that Malawi, has an ICT infrastructure deficit, consequently an under-developed eCommerce environment, this may well be a blessing in disguise because this may present Malawi with an opportunity of implementing a comprehensive pre-defined digitalisation roadmap, premised and guided by a comprehensive integrated ICT master plan. Again, this digital transformation should be informed by the existing situation on the ground, also by the advent of modern and contemporary digital technologies, coupled with carefully designed complementary capacity building interventions.

First and foremost, this framework seeks to address the obvious, which is this that, ICT strategies should form an integral part of the current MSMEs interventions in Malawi, sponsored or otherwise, secondly the MSME sectoral environment or landscape should embark on a well-defined digitalisation regiment. For example, interventions such as training and capacity building, and so on, should be digitized as well, e-training platforms should be utilised as tools for change management, interactions and engagements. For example, the utilisation of communication applications such as emails should thus be promoted to become the de facto communication standard for the Malawi Government with its people and stakeholders, in terms of B2G, G2C and B2B. If implemented well, this email strategy would usher in a new trajectory which will also bring to bear quick benefits in the digital transformation agenda and deliberately inculcate a new digital culture in the MSME sector of Malawi. Today, email addresses are free, and as such all MSMEs could as a norm be encouraged or required to have one in order to instill official communication with the authorities and vice-versa. The number of individuals and households with smart phones is increasing year on year and besides a quick ROI on a smartphone may be realized especially when these smartphones are fully utilised as business tools. Malawi authorities should take a deliberate position to promote the proliferation of smartphone in order to harness the digital transformation curve much sooner in the MSME sector. The economic benefits and the multiplier effect as a result of digital economy are not in question, Big Business and Governments, the world over, are largely dependent on ICTs to innovate, improve productivity, increase efficiencies and soundly manage their businesses. Equally, MSMEs should therefore be implored and assisted to join the information highway and to utilise ICTs in their commercial ecosystems, just like their mature counterparts, in order to achieve economic stability and continuous growth trajectory. As a point of departure, it should be borne in mind that the policy and implementation of the digitalisation framework remains responsibility of the Government of Malawi or relevant designated authorities. This document is therefore intended to assist the Government of Malawi in accelerating the development and implementation of a digitalisation roadmap for the utilisation of ICT platforms to facilitate commerce in the MSME sector.

Secondly, having understood the broadband penetration, related spread of mobile technologies, and personal computers in Malawi, it therefore becomes critical for the authorities to peg a digitalisation strategy on the ground, underpinned by a sound Enterprise Architecture for MSME Trading Management System or Commercial system.

Thirdly, after the adoption of the Enterprise Architecture for MSME Systems, authorities should begin with the process of development and implementation of systems, databases, applications and platforms geared at MSMEs. Systems integration (SI) with existing systems should also be done in accordance with the adopted Enterprise Architecture Framework. The development of such systems needs to be done after a careful analysis of the MSME business and commercial environment, and with integration and scale in mind. The system must able to provide loose coupling, be platform independent, and language independent architecture, to ensure agility and flexibility. It is important that the system should be portable and web based for both personal and mobile computing environments. As mentioned already, the system should also be USSD compatible and flexible enough to cater for people who are not using smart gadgets to be able to access and use services as well.

The proposed framework is largely premised on the following areas;

- ICT Systems Architecture,
- Digital Transformation framework initiative and
- Capacity building,

9. Digitalisation Models

Year on year, day by day, the world is getting digital in many, if not in all aspects of our socio-economic lives, the home, organisations, sport, education, governments, etc., are all impacted by this phenomenon and so should the MSME sector too. MSMEs should also be digitalised to harvest the benefit of a digital economy as well, else the sector will be left high and dry to wither and stagnate. Fortunately, the Malawi Government acknowledges this, in its Vision 2063, Malawi aspires to have an inclusive world class digital economy that is globally competitive. But, to have such an economy requires more than a mere mention in a vision and/or strategy document, it requires a transformation commitment, especially by Government, big corporates, telecoms companies and a whole lot of other role players, if not all, including individual members of the society. In other words, Malawi needs a deliberate and purposeful embrace of a comprehensive **Digital Transformation Framework** that will help to catapult the digitalisation of the socio-economic structure of Malawi, and in particular including that of the MSMEs to give the economy a proverbial shot in the arm.

As a point of departure, a clear understanding of what digitalisation transformation entails needs to be established, to ensure a common understanding. But, in order to have that common point of departure there are a few concepts that also need to be understood as well, i.e.:

- **What is digitization?** It is a conversion of data and processes from analog into a digital format, e.g., to scan a physical document into a soft copy or electronic format.
- **What is digitalization?** Digitalization is a transformation. More than just making existing data digital, digitalization embraces the ability of digital technology to collect data, process the data, establish trends and enable better business decision making
- **What is digital economy?** It is the creation and capturing of value using computer technologies and computer networks, e.g., eCommerce, Internet of Things (IoT), crypto currency, digital social platforms such as Facebook, payment using smart phones, etc.
- **What is Digital convergence?** It is the tendency of different technologies, applications, processes, media, applications, etc, towards becoming more similar with time, e.g., TV, Cell Phone, PC had

different and distinct use back in the day, but today u can practically own only one of the 3 and still get the benefit of all 3 at a go.

- **What is digital divide?** It is difference in access to digital technologies between countries, regions, a group of people based on demographics such as income, age, race, etc.

This chapter therefore seeks to further provide a perspective on ICT framework by advocating for adoption of a digital transformation framework that will begin to address how the MSME sector can benefit from such an ICT framework.

9.1. The Building Blocks of Digital Transformation Framework

Before we define a digital transformation framework, we should first establish what digital transformation is. Digital transformation is the use of the latest computer technologies to enhance existing processes and offer new and improved services and products to customers or public. It aims to create value by changing how businesses operate and how they deliver value to customers. Digital Transformation uses the latest technologies to improve and enhance current processes and provide new, improved products and services. Digital transformation creates value by altering how a business operates and delivers value to its customers.

Digital transformation also represents a shift in business culture, requiring businesses to experiment often, challenge the established way of doing things, and in the process accept occasional failure. This change in philosophy includes shedding procedures that have been around forever because "we've always done it that way."

Digital transformation is a critical process for any company, organisation, sector or industry regardless of size or industry. This equally applies to MSMEs, failure to embrace the digital transformation phenomenon will lead to intractable economic woes for Malawi, which severely depends on the MSME sector for its economic development. With the global economy increasingly getting digital by the day, it is imperative that the authorities in Malawi, should avoid at all costs, the consequences of a digital divide that may be brought to bear by failure to adopt a digital transformation framework that will as such, prepare the MSME sector to be globally competitive, especially in this digital economic environment.

So, with that definition in mind, what's a **digital transformation framework**? Digital transformation framework is therefore a roadmap of digital strategies to guide businesses in an evolving competitive business landscape. It is a reference point and a template of implementing digital transformation projects. It aims to improve business' digitization processes by identifying the goals of digitization. Simply put, it is a system of rules, a long-term strategy used to guide businesses through the tricky landscape of digitalising of business processes, relationships with customers and suppliers and to use technologies to transform how the individuals communicate in relation to each other, with their socio-economic structures and with institutions. It relates to defining engagements at both micro and macro level. It's a process of putting ICT infrastructure and ensuring the optimal usage of that ICT Infrastructure and other related technologies by individuals and societal institutions to attain heightened local and global socio-economic returns.
There are many different types of frameworks to choose from, each offering a unique digital transformation approach. Hereunder is a list of eleven features that an excellent framework should include:

- A set of goals for the transformation strategy. These goals are both long and short-term. There is a lot to do, so a step-by-step approach works best. Each completed step represents an achieved goal.

- A digital transformation team. Digital transformation is a huge undertaking, so it's best to have a team dedicated to the work. This team is a cross-functional body that guides the organisation or project through the digitization process and adopts new operating models. The transformation team can be drawn from in-house personnel or outsourced.
- Dissect current operating models. The best way to understand how digitization can help MSMEs in Malawi is by becoming familiar with the current methods of doing things. Break down the current workflow into steps, then see how software and digitization can improve the trading landscape for MSMEs.
- Incorporate a customer enhancement strategy. Organisations undergo a digital transformation for numerous reasons, among others, to streamline operations into a more cost-effective unit and improve customer expansion and customer retention. MSMEs should therefore take advantage of these computer technologies and increase their mobile and web presence, building stronger customer connections and encourage feedback.
- Explore growth opportunities. It's time to brainstorm ideas for how to advance the business. With this step, anything goes. Are there new market opportunities or ways of reaching customers? Can any internal processes be reimagined?
- Create a step-by-step guide for changing the business environment for MSMEs. Massive undertakings need structure. Develop a highly detailed plan to show how customer interactions and MSMEs workflows can be accomplished using appropriate software or other technical solutions.
- Create a process improvement analysis. This step involves researching the current tech market and software offerings and seeing how they can enhance specific in-house tasks for MSMEs. Do the MSMEs' workflows need tinkering, possibly removing unnecessary steps and automating tasks?
- Define the business' required technology. Browse through the many forms of current technology and see which ones are the best fit. These include:
    - Big Data
    - Cloud Computing
    - Mobile technology
    - The Internet of Things
    - Machine Learning/Artificial intelligence
    - Robotics
    - Additive manufacturing
    - Web technology, etc.
- Create a timesheet and roadmap with key performance indicators (KPI). This step requires a clear timeline filled with specifics. Use KPIs to keep track of performance. This roadmap also covers what software the company will need and what departments get it, how the applications are interconnected, how the new data structure will look, etc.
- Transformation plan execution. Time to get to work. You have your roadmap and your marching orders. However, be prepared for possible changes and course corrections.
- Perpetual analysis going forward. Use data-driven insights to see how the transformation is progressing. This analysis is essential to keep the company growing.

Traditional consulting firms such as KPMG, PWC, McKensey, etc., they all have developed different approaches or methodologies to implementation of digital transformation frameworks., As part of capacity building, it would be useful to expose these various methodologies to the benefit MSMEs as well, so that they can be empowered to grow their business and move the Informal Economy (IE) towards a Formal Economy (FE) in Malawi. For example, the IBM methodology hereunder purports that, after deciding on the business' digital transformation objectives, it is time to plan the business' path to achieve those goals. Digital transformation projects should aim end-to-end transformation, that's why digital maturity of businesses decides on the next move in the digital transformation journey.

As seen on IBM's figure below, there are three paths that organisations or MSMEs can choose to achieve digital transformation and the best path for the MSMEs depends on digital maturity, objectives, industry and competitive pressure of the company.

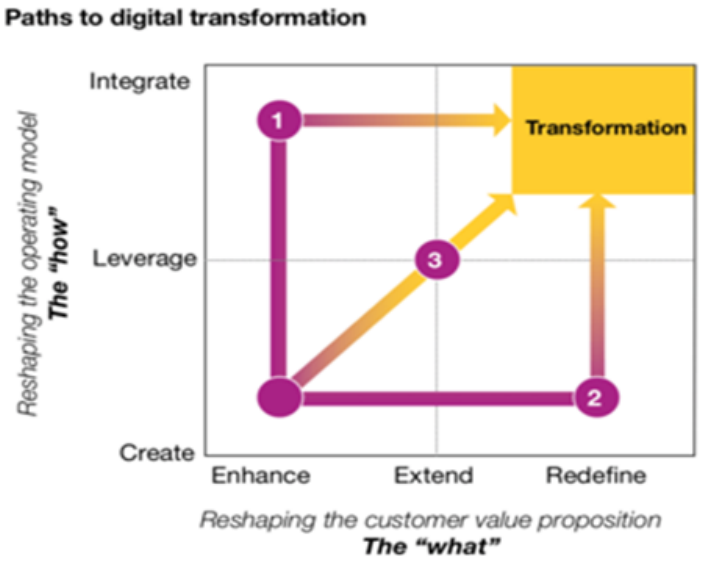


Fig 28. Source: IBM

Path 1:
Create and integrate digital operations first. Then enhance the customer value proposition based on new processes. For industries such as B2B manufacturing, mining, government, where customer expectations are more modest and the product is either a physical asset or well-established services, changing the way your organization operates is the most suitable strategy for digital transformation.
Automating some operations and processes can help you reduce costs along with shifting your workforce's focus on more value-added tasks.

Path 2:
Improve customer value proposition with digital content, insight and engagement. Then focus on integrating digital operations. Industries such as financial services, insurance and retail, where new revenue-based services can be offered via online and mobile devices, should focus on improving the value they propose to customers. Key questions should be:

- How can we make the life of customers easier?
    - Digital platforms and omnichannel technology can help create a frictionless conversation between customers and the company.
- What can your company do to better serve customer needs?
    - Capturing feedback from customers
    - Emotionally engaging with customers
    - Personalized products and services
    - Service speed

Path 3:
Build a new set of capabilities around the transformed customer value proposition and operation model in lock-step. If you have enough resources and both objectives are equivalently important, you can handle the transformation of operations and customer value proposition simultaneously.

10. Human Capital Development

Chapter four of Malawi's vision 2063, identifies a few enablers, i.e.,

- Mindset Change,
- Effective Governance Systems and Institutions,
- Enhanced Public Sector Performance,
- Private Sector Dynamism,
- Human Capital Development,
- Economic Infrastructure and
- Environmental Sustainability

These enablers are in many ways intricately linked to the success of this ICT framework for MSMEs in that, if this framework was to have a meaningful impact, it needs to be wrapped and supported by these enablers. However, what is particularly interesting for this framework is the Human Capital Development enabler.

The economic prosperity of any country is dependent on a sound Human Capital Development Index. It is therefore of critical importance that, when Malawi interrogates and adopt such a digitalisation framework for MSMEs, she must combine the ICT infrastructure roll-out with the roll-out of relevant skills development strategies to ensure optimal ICT infrastructure usage that will unlock potential economic benefits in the MSME sector. Time and money should therefore be invested in developing and skilling the sector with digital skills. The proposed skills development programmes should therefore underpin the ICT framework and accelerate the digital transformation of the MSME sector to yield tangible economic gains for the sector and the broader economy in general. Aspects such as awareness campaigns, change management, continuous improvement, business turn-around interventions, monitoring and evaluation initiatives should be part and parcel of this digital transformation framework, firmly rooted in the **Theory of Change** as well.

11. Conclusion

According to McKinsey and Company research, 70 percent of large-scale transformation programs fail. Common pitfalls are resistance to changing culture, lack of leadership, poor cross-functional collaboration. Equally, having a good framework without leadership to ensure its implementation, means nothing and is surely a recipe of failure. A good framework and good leadership can help organizations and in particular the MSME sector to avoid these pitfalls by demonstrating a commitment towards this roadmap to success. A buy-in by all would provide an agreed business-wide approach so that MSMEs and the authorities don't stray away from goals during the period of evolving business conditions.

If you like, a "long story short" option, is that the framework should contain three elements:

- Define/explain the nature of the challenge
- Create a guiding policy to address the challenge
- Put actions into effect to carry out the policy

Digital transformation frameworks are essential not only for Malawi's MSME sector but for the MSMEs in the African continent as well, so that, in today's commercial environment, MSMEs can be gas-lighted with the strategic and tactical plans to help themselves to survive the imminent digital disruption. MSEs should therefore be empowered and capacitated to adapt to current and future environments, influenced by the rapid technological advancements, otherwise these MSMEs will face digital exclusion resulting in digital economic divide with adverse economic consequences for the country. Disruption refers to the rapid technological developments that keep changing the way industries work and the way in which business is conducted. For instance, the advent of the automobile resulted in serious disruption of the horse and cart industry, the development of long-haul trucks disrupted the railroad industry, video streaming has disrupted the TV and movie theater industry. Soon, Artificial Intelligence (AI) and Machine Learning (Robotics) will be pervasive technologies with unprecedented consequences to many economies, especially in Africa, due to the massive risk and threat it poses to employment opportunities and commercial opportunities to the MSME sector. If authorities fail to develop appropriate digital transformation frameworks, to counter balance these imminent disruptions, it will result in intractable economic Problems not only in Malawi, but the entire African continent. For example, the digital transformation framework should among others speak to the micro and macro intervention strategies by the authorities and other players in the continuum. In other words, these are the go-to resource for protecting businesses from digital disruption. Big business is also not unaffected by these technological developments' disruptions, safe to say, that they are also forever playing catch-up and continuous alignment to these technological disruption to either survive or to innovate. As far as MSMEs are concerned, unlike Big Business, they lack the resources and the wherewithal to swiftly adjust to these disruptions and as such require the authorities to provide such digital frameworks to empower and enable them to participate in these digital economies of today. The Government of Malawi should therefore make investments in the digitalisation of MSMEs' commerce and develop an empowering policy and legislative framework to ensure optimal digital inclusion by all players in the local and global economy. Strange enough even digital companies are sometimes overwhelmed and die, case in point is Nokia and Blackberry, this is a topic for another day

12. Recommendations

1. Develop and adopt a digitalisation strategy for MSMEs
2. Appoint a technical team to drive the process of Digital Transformation.
3. Allocate resources for the development and implementation of a Pilot ICT systems for MSMEs.
4. Strengthen and capacitate the Association of MSMEs in Malawi to be crusaders of digital culture in the MSME sector.
5. Advocate for the develop an on-line Government wide MSME procurement policies.
6. Advocate for the elevation and appointment of CIO in all Ministries of Government.
7. Take advantage of the scalable, reliable, available and secure cloud computing infrastructure.

Credit: Comic House / EHFG 2018

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