SECTION A:	QUALIFICATION DETAILS				
QUALIFICATION DEVELOPER (S)	Limkokwing University of Creative Technology				
TITLE	Bachelor of Science in Information Systems			**NCQF LEVEL**	7
FIELD	Information and Communication Technology	**SUB-FIELD**	Information Systems	**CREDIT VALUE**	530
New Qualification	✓	**Review of Existing Qualification**			
SUB-FRAMEWORK	General Education		TVET		**Higher Education** ✓
QUALIFICATION TYPE	Certificate I / II / III / IV / V		Diploma		Bachelor ✓
	Bachelor Honours		Post Graduate Certificate		Post Graduate Diploma
	Masters		Doctorate/ PhD		

RATIONALE AND PURPOSE OF THE QUALIFICATION

RATIONALE:

The requirement for the development of this qualification emanated from a market need indicating the scarcity of available information technology professionals, able to design and coordinate business solutions. Occupations within areas of business analysis and data management require skilled people to fill the acute shortage of qualified professionals

The specific skills set covered in this qualification were identified by practising industry experts and comply with the need for Information Technology professionals focusing on business systems analysis and data management solutions. Job adverts for business systems analysts and database administrators in Botswana were also used to validate the skills set covered in this qualification. Learners will be well-positioned to add value to the establishment that employs them; to pursue further studies in this field; or enable them to work as entrepreneur business systems analysts, consultants or solutions specialists in the industry.

Information Technology is considered a business enabler and in that context the qualification will produce Information Technology professionals who are equipped to direct technology and Information Systems towards the achievement of organisational goals, such as the design of business Information Systems, adopting new or emerging technologies to improve or support work-flow, production, efficiency and effectiveness. Learners will function in industry as IT professionals who are able to solve business problems using technology.

The BSc in Information Systems rationality is premised on the following documents

- Maitlamo National ICT policy (2007)
- National Development Plan 10 and 11 (2010-2023)
- The Human Resource Development Council Top 20 Occupation report (2016)
- Limkokwing University Faculty of ICT Needs Analysis Document with Stakeholders.
- IS 2010 Curriculum Guidance for Undergraduate Qualification s in Information Technology

A more detailed account is given below for each considered national planning and strategic document used to rationalise the need for information skills sets in Botswana ICT industry.

Botswana National Information and Communication Technology Policy: Maitlamo Policy 2007

The National Information and Communication Technology (ICT) policy, (Maitlamo Policy, 2007) provides Botswana with a clear and compelling roadmap that drives the social, economic, cultural and political transformation through planning and implementation of contextual and effective ICTs in terms of human resource development, infrastructural planning and utilisation. Therefore the National ICT Policy's Vision is: "Botswana will be a globally-competitive, knowledge and information society where lasting improvements in social, economic and cultural development are achieved through effective use of ICT". Current critical ICT infrastructural set ups in execution are e-Government, e-Legislation, e-Education, e-Health, e-Commerce, e-Agriculture and e-Tourism and require mandatory skills and competencies.

The policy informed that human skill development in evolving ICT skills like information systems should be adopted with the intention of producing local ICT skills set in data management and business. This recommendation and specification is noted from current developments and implementation of ICT electronic platforms which have been automated through eGovernment strategy. This initiative has the obvious implications of distributed sources of crucial data for the government and industry players which will needs modern practical data management techniques. All government customers who have been dealing with the government also need to adapt to the e-Government initiative implying there is now a need to analyse their business and come up with innovative solutions to connect to the government services for business. The country now needs more Business Systems Analysts than before.

National Development Plan 10 and 11 (2010-2023)

National Development Plans (NDPs) are series of the nation strategic developments which highlight key strategic goals which should be implemented based on different inputs. In the NDP10, one key strategic plan adopted was to foster ICT as a tool for Botswana's economic diversification from none renewable-resource driven economy to a knowledge driven economy. ICT integrations and adoption was an input from, Maitlamo Policy 2007 which directed on e-governance and eventually creation of an information society.

The NDP10 revealed that the most important critical ICT skills which need to be developed for the Botswana labour market are "…. ICT (software development, hardware development); database administrators, security specialists (ICT), forensic specialists (ICT), software developers, project managers (ICT) and system analysts…"pg34. The report also forecasted on the growing demand for key expertise in ICT such "software engineers and networking engineers" because both the developed and developing nations are driving towards technology driven economies. National Development Plan 11 also prioritised training of ICT personnel in order to enhance the sector's contribution to economic and export diversification, as well as the creation of high quality jobs, for instances in the case diamond industry, set up SMMEs and other diamond support services. Therefore NDP11, emphasis the development of local industry to create local contents and applications that are relevant to the Botswana market through implementation of national programmes such as e-Government, e-Health, e-Education and e-Commerce which have already started to play an important role in creating a momentum for e-services like work permits, vehicle licensing, company registration, tax and bill payment, death and birth registration, health management, eLearning and m-Learning thorough platforms like e-Government, e-Health, e-Education

and e-Commerce. This development again requires a need for data management and data analysis competences to support the eServices

Botswana Human Resource Development Council Skills Development Priority Areas 2016 Report by the (HRDC TOP OCCUPATIONS IN HIGH DEMAND report, December 2016) In tandem with national strategic plan and national ICT policy HRDC's Top 20 occupation report of 2016, identified the sector of ICT in the form of Data management and business analysis skills as needed skills.

BSc in Information Systems, Needs Analysis with Stakeholders

Limkokwing University in consultation with Botswana ICT industry, University alumni and current students of Electronic Commerce conducted a needs analysis assessment on the need and relevance for BSc in Information Systems. Various hard and soft skills needed for such me were specified by the participants. The industry participant overall position was data management competences and ability to analyse business and exploit opportunities offered by emerging technologies is now paramount.

Summary to Rationality and Justification of BSc in Information Systems Qualification in Botswana

(a) There is need for Botswana ICT Industry to adjust its human skills development approach so as to meet the emergent ICT skills needed for the management of data sources created by the Knowledge economy and analysis of business to compete in the global market.

In tandem with National ICT policy and National Development Plan 11 the Human Resource Development Council further confirmed the need for information management as remarked in the HRDC's Top 20 occupation of priority in the sector of ICT by the (HRDC TOP OCCUPATIONS IN HIGH DEMAND report, December 2016) that business analysis and database administration skills are needed in Botswana Industry.

PURPOSE:

The purpose of the qualification is to produce graduates who have advanced knowledge, skills, and competencies to:

- Manage work teams to execute and deliver information system projects within scope of time, cost and scope.
- Research, analyze and infer to understand a phenomenon in their environment then design, develop and draw plausible information system solutions.
- Establish successfully and manage their own information systems establishments.
- Design information technology systems and solutions for business to align the business, organisational and information systems strategies for competitive advantage.

ENTRY REQUIREMENTS (including access and inclusion)

Minimum entry requirements:

- Certificate IV (NCQF Level 4) or equivalent with a pass in Mathematics, English and a Science subject.
- Applicants who do not meet the above criterion but possess relevant industry experience may be considered using RPL and CATS policies for access. This will be done following consideration of the ETP, aligned with BQA policies.

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SECTION B	***QUALIFICATION SPECIFICATION***
GRADUATE PROFILE (LEARNING OUTCOMES)	***ASSESSMENT CRITERIA***
1. Demonstrate advanced knowledge to Identify opportunities for IT-enabled organizational improvement.	1.1 Determine alignment between IT strategy and organizational strategy. 1.2 Improve organizational processes with information systems solutions. 1.3 Illustrate the role of information systems in managing organizational risks and establishing controls. 1.4 Analyse business information requirement needs based on stakeholder specifications. 1.5 Exploit business opportunities created by emerging information technology innovations.
2. Apply specialised skills to compare information system solutions and source alternatives.	2.1 Design high-level information system solution and source options. 2.2 Analyse and document the feasibility of various options 2.3 Compare solution options using multiple decision criteria. 2.4 Create a financial justification for choosing between alternatives 2.5 Evaluate cultural differences for options that cross geographical boundaries
3. Design business information systems solutions.	3.1 Device enterprise architectures to improve organizational productivity, agility, product and service timeliness, revenue growth, and cost reduction. 3.2 Implement a secure information system and data infrastructure necessary to protect the information and system. 3.3 Create data and information models. 3.4 Design applications and application architectures primordial for the understanding, the negotiation, and the communication between all the stakeholders 3.5 Establish integrated systems to facilitate the speed of information flows and reduce operational costs
4. Implement business information systems solutions	4.1 Procure detailed information systems solutions and source options. 4.2 Use tools for testing, integration, and deployment of business information systems. 4.3 Manage information systems development. 4.4 Manage information systems projects for successful completion and closure
5. Demonstrate advance skills to manage ongoing information systems operations within the organization.	5.1 Manage the use of enterprise technology resources in an organization. 5.2 Oversee application performance and scalability of information systems operations within an organization. 5.3 Maintain existing information systems.

SECTION B	***QUALIFICATION SPECIFICATION***
GRADUATE PROFILE (LEARNING OUTCOMES)	***ASSESSMENT CRITERIA***
	5.4 Cultivate relationships with technology service providers. 5.5 Secure data and systems infrastructure for an organization. 5.6 Provide business continuance.
6. Analyse complex business systems and situations and create solutions based on the results of a systematic analysis.	6.1 Evaluate the ethical and legal implications of complex situations in an organization. 6.2 Examine the risks associated with complex business systems. 6.3 Solve complex problems within a working environment. 6.4 Use quantitative analysis techniques appropriately and effectively. 6.5 Enhance innovation and creativity in oneself and others.
7. Support Business Functions integrated within an Enterprise	7.1 Identify general models of business within an organization. 7.2 Classify key business specializations areas. 7.3 Evaluate business performance for an enterprise.
8. Communicate succinctly to a range of audiences about business information systems technical issues and their solutions	8.1 Create documents using relevant tools for communicating in a project environment 8.2 Present and articulate any information system based concept using relevant tools. 8.3 Undertake research in the discipline of information systems to solve problems and create new knowledge 8.4 Communicate verbally and in writing when developing information system project both to clients and technical team 8.5 Utilize information technology and related tools to optimize on leading and disseminating and receiving information related to development of business information systems

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SECTION C	***QUALIFICATION STRUCTURE***					
COMPONENT	***TITLE***	***Credits Per Relevant NCQF Level***				***Total*** ***(Per** Subject/ Course/ Module/ Units)*
		Level [5]	***Level [6]***	***Level [7]***	***Level [8]***	
FUNDAMENTAL COMPONENT *Subjects/ Courses/ Modules/Units*	Financial Information for Decision Making		***10***			***10***
	Introduction to Business Management	***10***				***10***
	e-Commerce			***10***		***10***
	Accounting for Information Systems			***10***		***10***
	Entrepreneurship			***10***		***10***
	Ethics & Professional Conduct			***10***		***10***
	Digital Marketing				***10***	***10***
	Human Resources Management				***10***	***10***
	Concept of Strategic Management				***10***	***10***
	Operations Management				***10***	***10***
CORE COMPONENT *Subjects/Courses / Modules/Units*	Business Communication	***10***				***10***
	Introduction to Computer Skills	***10***				***10***
	Principles of Programming Logic & Design	***10***				***10***
	Computerized Mathematics	***15***				***15***
	Principles of Software Engineering		***10***			***10***
	Database Systems	***10***	***15***			***25***
	Principles of Structured Programming		***15***			***15***
	Foundations of Information systems	***10***				***10***
	Fundamentals of Computer Systems	***10***				***10***
	Web Design	***10***	***15***			***25***
	Object Oriented Programming		***15***	***15***		***30***
	Data Communication & Networking		***10***	***15***		***25***
	System Analysis & Design			***15***		***15***
	IS Strategy, Management and Acquisition			***10***		***10***
	Enterprise Architecture			***15***		***15***
	Information Systems Risk & Security			***10***		***10***
	Cloud Computing			***15***		***15***
	Research Methodology			***10***		***10***
	IS Project Management			***15***		***15***
	Industrial Attachment		***30***			***30***
	Practical Project			***30***		***30***

SECTION C	***QUALIFICATION STRUCTURE***						
COMPONENT	***TITLE***		***Credits Per Relevant NCQF Level***				***Total*** ***(Per** Subject/ Course/ Module/ Units)*
			Level [5]	***Level [6]***	***Level [7]***	***Level [8]***	
ELECTIVE/ OPTIONAL COMPONENT *Subjects/Courses / Modules/Units*	Business Analysis	Software Requirements Engineering			***15***		***15***
		Business Process Management			***15***		***15***
		Enterprise Systems			***15***		***15***
		Business Intelligence			***15***		***15***
		Knowledge Management			***10***		***10***
		Object Oriented Techniques		***15***			***15***
	Data Management	Web Programming Techniques		***15***			***15***
		Data Mining			***15***		***15***
		Information Search & Retrieval			***15***		***15***
		IT Audit & Control			***15***		***15***
		Distributed Database Systems			***15***		***15***
		Knowledge Management			***10***		***10***

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SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL	
TOTAL CREDITS PER NCQF LEVEL	
NCQF Level	***Credit Value***
NCQF Level 5	*95*
NCQF Level 6	*135*
NCQF Level 7	*260*
NCQF Level 8	*40*
TOTAL CREDITS	***530***

Rules of Combination:
(Please Indicate combinations for the different constituent components of the qualification)

For a candidate to graduate with a **Bachelor of Science in Information Systems** they must attain a minimum of **530** credits, inclusive of;

- 100 credits for Fundamental component
- 345 credits for Core components
- 85 credits for electives. A learner shall select and purse components from one (1) of the two (2) desired streams for electives; Business Analysis or Data Management.

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ASSESSMENT ARRANGEMENTS

The qualification will encompass both formative and summative assessment, which will be assessed by assessors who are BQA registered and accredited.
The weightings for the assessments will be as follows;

Assessment Method	Weight (%)
Formative Assessments	60
Summative Assessments	40

MODERATION ARRANGEMENTS

There will be internal and external moderation undertaken by moderators registered and accredited by BQA. All processes and procedures will be in line with NCQF requirements. This will be conducted in reference to the institution's moderation policy and procedures.

RECOGNITION OF PRIOR LEARNING

Provision for **Recognition of Prior Learning (RPL)** will be considered for this qualification. Individual providers will implement RPL and CATS in accordance with relevant policies and procedures, compliant with BQA policies. Prospective candidates will follow the application process set by the providers, and will be subjected to the necessary selection and assessment processes and procedures to determine if they qualify.

CREDIT ACCUMULATION AND TRANSFER

Credit Accumulation and Transfer System (CATS) will be considered for this qualification. Individual providers will implement RPL and CATS in accordance with relevant policies and procedures, compliant with BQA policies. Prospective candidates will follow the application process set by the providers, and will be subjected to the necessary selection and assessment processes and procedures to determine if they qualify.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Learning Pathways:

Horizontal articulation of the BSc Information Systems:

- Bachelor of Science in Information Resources Management
- Bachelor of Science in Information Science
- Bachelor of Science in Computer Information Systems
- Bachelor of Science in Accounting Information systems

Vertical articulation in BSc in Information Systems may also lead to further studies in:

- Master of Science in Information Systems
- Master of Science in Information Science
- Master of Science in Information and Quantitative Science

Employment Pathways
Graduates of the course may find employment in a range of public and private organisations for the following posts.
Typical roles include:

- Business Analyst,
- Database Administrator
- Database Analyst
- Application Developer
- Business Process Analyst

QUALIFICATION AWARD AND CERTIFICATION

QUALIFICATION AWARD:

Minimum standards of achievement for the award of the qualification
To qualify for award and certification of **Bachelor of Science in Information Systems**, a candidate must attain a minimum of **530 credits** overall.

CERTIFICATION:

The successful candidate, upon meeting minimum standards of achievement for the award of the qualification, shall be awarded a **Bachelor of Science in Information Systems.**

REGIONAL AND INTERNATIONAL COMPARABILITY

Summary of Similarities and Differences:

International comparability: Portability and Generalisation

The Qualification is generally compatible with the international qualifications which offer the same in key parameters such as credit value, duration, main exit outcomes and elective areas. The Qualification encourages hands on practice through work placement and an individual Information Systems project. The Qualification also offers electives to enhance specialisation. Botswana is still a developing nation and wants to be at par with developed nations thus electives which deal with business analysis and data management have been included in the qualification. The duration is scoped to 4yrs based on BQA requirements and it's a general degree.

The qualifications compared with were: Bachelor of Science in Information Systems (Carnegie Mellon University, University of Northumbria, Swinburne University of Technology).

Regional comparability: Portability and Generalisation

The Qualification is generally compatible with the international qualifications which offer the same in key parameters such as credit value, duration, main exit outcomes and elective areas. The most significant

variation is on the credits criterion where the Qualification is on the high side. The areas of specialisation offered by the electives category are the same catering for developing nations like Botswana.

The qualifications compared with were: Bachelor of Science in Information Systems (Monash University), Bachelor of Science in Management Information Systems (Midlands State University), Bachelor of Science in Information Systems (University of Venda).

Conclusion:
Based on the above comparison it is evident that the BSc in Information Systems proposed qualification complies with and provides more than is offered by international counterparts in the field of using information technology to advance business systems. The qualification therefore exceeds international standards, ensuring that graduates are indeed prepared to assist businesses to improve systems through effective and efficient IT applications.

REVIEW PERIOD

Every five (5) years.

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