

# Nic de Sousa, M.Sc

Enterprise/Solutions Architecture and Software Engineering



**LinkedIn**

[linkedin.com/in/nicdesousa](https://linkedin.com/in/nicdesousa)



**Telegram**

[t.me/nicdesousa](https://t.me/nicdesousa)



**Email**

[nicdesousa@gmail.com](mailto:nicdesousa@gmail.com)

## Languages

English -  
Afrikaans -

## Citizenship

South Africa -  
Portugal (EU) -

## Certifications & Courses

➡ All of my certifications and courses are listed and maintained on my LinkedIn profile.

## Code of Ethics

➡ ACM and IEEE  
Software Engineering  
Code of Ethics

## Professional affiliations and memberships

➡ South African  
Institute of Computer  
Scientists and  
Information  
Technologists

## Executive Overview

Enterprise/Solutions Architecture and Software Engineering expert with 22 years of professional *hands-on experience*, specialising in cross-domain Architecture, Systems/Software Engineering, DevOps (SRE), Cyber Security, Linux, and Cloud-based solutions with a strong focus on industry-leading technologies.

### Industry Experience:

- Financial Systems:
  - Forex payments, dealing, trading, reporting, and exchange control at FNB,
  - Instalment Finance, Micro-lending, Retail Banking, and Insurance at African Bank, Bayport, Old Mutual, People's Bank (Nedbank), and Mazwe Credit.
- Electronic Commerce Systems:
  - Electronic Auctions and Online Retailing at BidOrBuy and Toys'R'Us UK.
- Medical Instrumentation Systems:
  - Telemedicine, Electrocardiography, and Electrocardiogram (ECG) remote interpretation and cardiologist over-read systems at Schiller AG, CompuMed, and the US Government.
- Healthcare Systems:
  - Medical Aid Schemes & Hospital Administration at AfroCentric Health & Helios ITS.

### Core Competencies:

- Enterprise/Solutions, Application, Technology, Security, and Infrastructure Architecture,
- Systems and Software Engineering with formal and Agile methodologies,
- Linux, Cloud, and Containerisation-based solutions.

### Key Focus Areas:

- Cross-functional IT SME in Solutions Architecture/engineering for:
  - Systems, software, security, infrastructure, networking, and technology,
  - Site Reliability Engineering (DevOps, DevSecOps, etc.) and Automation,
  - Cloud computing with a strong focus on Containerisation,
  - Linux/Unix-based solutions, technologies, and infrastructures,
  - Open Source and industry-leading technologies and solutions.

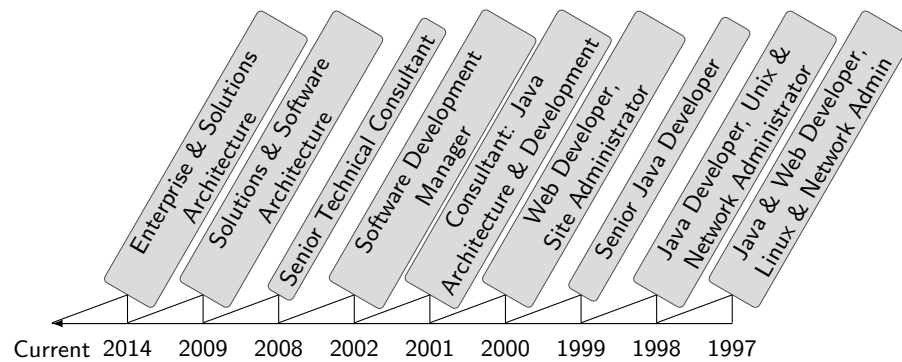
## Postgraduate Education

- |             |   |  |
|-------------|---|--|
| since 2016  | <b>Ph.D Computer Science</b><br><i>Ongoing - Research proposal:</i><br>Automated provisioning of cloud-agnostic containerised software systems that realise well-architected non-functional requirements. | <b>University of Pretoria, South Africa</b>    |
| 2009 → 2012 | <b>M.Sc Computer Science</b><br>Graduated with distinction<br>Specialisation in Software Engineering  | <b>University of Liverpool, United Kingdom</b> |

## Publications

- |             |   |                                |
|-------------|---|--------------------------------|
| 2011 → 2012 | <b>M.Sc Dissertation</b><br>An investigation of a server state-aware task dispatching solution for clustered Java EE Web Applications as a competitive alternative to industry-standard solutions. ➡ Available Online | <b>University of Liverpool</b> |
|-------------|---|--------------------------------|

## Experience



- Java SE/EE, Python, Bash, ...
- Docker, Vagrant, Ansible, VBox
- Jenkins, SonarQube, Nexus,
- GitLab, PostgreSQL, Redis,
- and many other OSS projects.
- RHEL, Atomic Host, CentOS,
- Ubuntu, Fedora, Intel CL, macOS
- PBIS, HEAT, SCCM, BitDefender
- OSQuery, MDM, LanSweeper
- Cisco ISE, custom 802.1X, ...
- CIS Benchmarks, NIST, ...
- Pen-Testing, OpenSCAP, Lynis,
- OpenVAS, Nessus, Kali, ...
- AWS, Azure, Hybrid, VMware

- TOGAF ADM, SOA RA, OSIMM
- Java SE/EE
- SOAP, JPA, ...
- jBoss, jBPM, ActiveMQ
- Docker, Vagrant, Ansible
- Jenkins, SonarQube, Nexus
- DB2, PostgreSQL, ...
- RHEL, Atomic Host, CentOS
- Ubuntu, Fedora
- PBIS, HEAT, SCCM, Cisco ISE
- AWS, Azure, Hybrid, VMware

2018/6 → 2019/10

Contractor at FNB: Group Infrastructure and Security Services - JHB (RSA)

### ❖ Enterprise & Solutions Architecture

- Technical leadership in EA, Solutions Architecture, Technology, Infrastructure, Security, and Compliance activities for the Group's Linux software development platforms.
- *Key focus areas:*
  - Solution Architectures (as a cross-functional IT SME) for the software development teams within the ➡ FirstRand Group to enable the successful adoption, development, and correct implementation of industry-leading Linux-based Open Source Software solutions with a strong focus on containerisation and SRE.
  - Architecture/engineering of a custom ➡ Zero Trust Enterprise Linux software development workstation for the FirstRand Group of banks that is extremely secure (hardened) and compliant to all Group standards.
  - Architecture/engineering of a fully-integrated enterprise endpoint management, security and auditing solution that is very similar to ➡ Google's internal BeyondCorp solution.
  - Continuous innovation, SRE, DevOps, DevSecOps, automation, and security programmes (etc.) to enhance and improve the Group's Linux platforms and to create and promote Group-standardised adoption and use of associated technologies, processes and best-practices.

2015/5 → 2018/5

Contractor at FNB: Premium Forex - JHB (RSA)

### ❖ Enterprise & Solutions Architecture

- Technical leadership in EA, Solutions Architecture, Technology, & SDLC activities,
- Chair of the FNB Premium Forex IT Architecture Board.
- *Key focus areas:*
  - EA Standards, Security, Governance, Reference & Solution Architectures for the FNB Forex systems (Payments, Dealing, Trade, Reporting, etc.).
  - Architecture/engineering of the FirstRand Group's Application Containerisation Architecture, Standards, and Reference Implementation.
  - Architecture/engineering to containerise all of the Forex systems and to implement 'state of the art' DevOps, DevSecOps, etc. (SRE) practices and solutions.
  - Architecture/engineering of an enterprise-grade Linux software development workstation OS.
- *Awards and Accolades:*
  - First National Bank (FNB) and RMB have been recognised as the Best Forex Provider in South Africa at the 17th annual World's Best FX Provider for 2017 hosted by Global Finance Magazine.
  - ➡ <https://www.fnb.co.za/about-fnb/awards-and-accolades.html>

- SOA
- TOGAF ADM
- TOGAF SOA RA
- OSIMM
- Java SE/EE
- SpringBoot, REST, JPA, etc.
- jBoss, Activity, Drools
- Docker, SpaceWalk, SALT,
- CoreOS, RHEL, CentOS
- AWS, Hybrid, VMware

**2014/8 → 2015/4**

**Contractor at Helios ITS (AfroCentric Health) - JHB (RSA)**

#### ❖ Enterprise & Solutions Architecture

- Technical leadership in EA, Solutions Architecture, & SDLC activities.
- Founding member of the AfroCentric Health Enterprise Architecture Forum.
- Founding member of the MedScheme Enterprise Architecture Forum.
- *Key focus areas:*
  - Establishment of the Enterprise Architecture Function.
  - EA Standards, Reference & Solution Architectures.
  - Architecture/engineering of the EA Reference Architectures into a Framework.
  - Research and development of industry-leading technical solutions, including Domain-driven Design (DDD), Event-driven Architectures (EDA), SOA, Workflow, Business Rules, Microservices (Hexagonal architecture, Ports and Adaptors, Life Preserver, etc.), Agile methodologies, TDD, BDD, and Cloud computing technologies and architectures (XaaS, SaaS, PaaS, and IaaS).

- Java SE/EE
- EJB3.x, JSF2
- JPA, Hibernate
- jBPM, BPMN2
- SOA, ESB, WS, MDB
- Tomcat v5, v6, v7
- jBoss AS v5, v7
- jBoss ESB, Switchyard
- jGroups clustering
- AS/400 DB2, MySQL, MSSQL
- LDAP, SNMP
- JobScheduler, Moodle

**2009/2 → 2014/7**

**Bayport Financial Services - JHB (RSA)**

#### ❖ Solutions & Software Architecture

- Technical leadership in Architecture and SDLC activities.
- *Key focus areas:*

Authentication and Authorisation systems, Electronic Document Acquisition systems, Enterprise Job Scheduling systems, Queuing/Messaging Systems, Loan Quotation systems, Telephony (Presence) integration systems, Application performance monitoring & management systems, and E-learning systems.

- Java SE/EE
- Spring, Hibernate
- Spring AOP
- hybris Platform
- jBoss v4/5
- jGroups clustering
- Oracle RAC

**2008/4 → 2009/1**

**Hybris - London (UK), Munich (DE)**

#### ❖ Senior Technical Consultant

- Technical leadership in architecture, development, and e-business (technical) consultation services to ➡ Hybris customers in the United Kingdom.
- Lead technical consultant in the development of the www.ToysRUs.co.uk e-commerce system.
- Architecture and engineering of the www.ToysRUs.co.uk production infrastructure and systems to support 2 million concurrent users.
- SAP SE acquired Hybris on August 1, 2013 for \$1.5 billion and in 2018, Hybris was integrated into the SAP Customer Experience division.

- Java SE/EE
- Xiriuz Framework
- Xiriuz Workflow & Rules Engine
- Exactus Platform
- Tomcat, jBoss, WebSphere
- AS/400 DB2, MySQL, MSSQL

**2002/10 → 2008/3**

**Xiriuz Systems - JHB (RSA)**

#### ❖ Software Development Manager

*Xiriuz Systems (acquired by Old Mutual in 2008), was a bespoke enterprise banking software vendor and produced the Exactus Banking Platform and the Java (web-based) loan quotation systems that are used by several banks in South Africa, including: African Bank, Bayport, Old-Mutual, People's Bank and Mazwe Credit.*

- Please review the Projects section for more detail.

- Java SE/EE
- Exactus Platform
- Tomcat
- jBoss, WebSphere
- AS/400 DB2, MSSQL

**2001/12 → 2002/9**

**African Bank - Midrand (RSA)**

#### ❖ Java Consultant: Architecture and Development

- Software architecture specifications and validations.
- OOAD-based reverse engineering of the Exactus mainframe banking system.
- Development of the XML integration services into Exactus.
- Development of the ABIL Mobile Loan Quotation system.
- Development of the Maximus front-end Loan Quotation system.

- Java SE
- BidOrBuy Platform
- Tomcat
- MySQL

**2000/3 → 2001/12**

**Bid or Buy - JHB (RSA)**

❖ **Web Developer, Site Administrator**

- Implementation of the Bid or Buy Online Auction system in South Africa.
- Design of the Business-to-Business (B2B) Auction system.
- OOAD of the Bid or Buy electronic payment system.

- Java SE/EE
- BOMA Platform
- Tomcat
- MySQL, MSSQL

**1999/8 → 2000/2**

**Software Futures/CCH - JHB (RSA)**

❖ **Senior Java Developer**

- Development of CCH's Johannesburg Stock Exchange (JSE) brokerage system.
- Lead in the conversion of the Software Futures (BOMA) Java development framework to J2EE.

- Java SE
- MS IIS, Apache

**1998/7 → 1999/7**

**Central Information Holdings (CIH) - JHB (RSA)**

❖ **Java Developer, Unix System/Network Administrator**

- Development of the 082-182 call-centre systems.
- Implementation and admin of the Windows and Solaris production systems.

- Java SE

**1997/12 → 1998/6**

**Netgro - JHB (RSA)**

❖ **Java & Web Developer, Linux System/Network Administrator**

- Design and development of e-commerce web sites.
- Linux System/Network Administrator of MWEB's local dial-up POP infrastructure.

# Projects

- TOGAF ADM, etc.
- Java SE/EE, Python, Bash,
- Docker, Vagrant, Ansible, VBox
- Jenkins, SonarQube, Nexus,
- GitLab, PostgreSQL, Redis,
- and many other OSS projects.
- Atomic Host, RHEL, CentOS,
- Ubuntu, Fedora, Intel CL, macOS.
- PBIS, HEAT, SCCM, BitDefender
- OSQuery, MDM, LanSweeper.
- Cisco ISE (etc.), custom 802.1X
- CIS Benchmarks, NIST, etc.
- Pen-Testing, OpenSCAP, Lynis,
- OpenVAS, Nessus, Kali, etc.

- Java SE/EE
- EJB3.1x, JSF2
- RRD4J, JMX, SIGAR
- AspectJ, SNMP4J
- Netty NIO
- GlassFish, Tomcat, jBoss
- Dukascopy Forex Platform

- Java SE/EE
- JSP, Servlets
- RRD4J, JMX, SIGAR
- Netty NIO
- GlassFish, Tomcat, jBoss

## 2015 → Current

### ❖ FirstRand Group - JHB (RSA)

- Architecture/engineering of the FirstRand Group's:
  - Docker/Containerisation Architecture, Standards and Reference implementations.
  - Custom enterprise-grade Linux Workstation OS.
  - Custom enterprise-grade macOS Workstation OS.
  - Custom solutions that enable the Group's Linux and macOS systems to provide the same enterprise-grade features, integrations, auditing, provisioning and management capabilities, etc., that are normally only available on/for Windows systems,
  - Custom fully-integrated enterprise endpoint management, security and auditing solution that is very similar to ➡ Google's internal BeyondCorp solution.
  - Solution Architectures (as a multi-discipline SME) for banks/BU's/teams within the FirstRand Group to adopt, develop, implement and successfully leverage industry-leading Linux-based Open Source systems and solutions, with a strong focus on containerisation.
- Solutions, Security, and Technology Architecture of the FNB Forex:
  - Payments, Dealing, Trade, and Compliance/Regulatory/Reporting systems.
  - Containerisation, DevOps, and Automation technologies and infrastructure.

## 2014 → Current

### ❖ Ph.D Research

- Research Proposal: Automated provisioning of cloud-agnostic containerised software systems that realise well-architected non-functional requirements.
- R&D of Cloud and Containerisation technologies and best-practices.
- R&D of Expert Advisors for automated Forex trading systems.
- R&D of a topic model visualisation system for large-scale systems monitoring.
- R&D of SNMP-based monitoring of Java EE application server sub-systems, and applications.
- R&D of SNMP-based load balancing for Java EE application servers.

## 2011 → 2013

### ❖ M.Sc Research

- M.Sc Dissertation:
  - ➡ An investigation of a server state-aware task dispatching solution for clustered Java EE Web Applications as a competitive alternative to industry-standard solutions.
  - R&D of the jQoStd TCP (OSI Level-4) load balancer.
  - R&D of the jQoStd Application (OSI Layer-7) load balancer for Java EE.
  - R&D of the jQoStd Application Performance Management system.

University of Liverpool

- Java SE/EE
- EJB3.x, JSF2
- JPA, Hibernate
- jBPM, BPEL, Drools
- SOA, ESB, WS, MDB
- Tomcat v5, v6, v7
- jBoss AS v5, v7
- jBoss ESB, Switchyard
- jGroups clustering
- Xiriuz Framework
- Xiriuz Workflow & Rules Engine
- Exactus Platform
- AS/400 DB2, MySQL, MSSQL

## 2009 → 2014

### ❖ Bayport Financial Services - JHB (RSA)

- Architecture/engineering of the:
  - BayFin Loan quotation systems.
  - Document Acquisition system.
  - Presence Voice Integration API.
  - BayFin to Presence call-centre integration system.
  - Voice Recording playback system.
  - SNMP Monitoring API.
  - Enterprise Job-Scheduling system.
  - e-Learning platform.
  - Authentication and authorisation system.
  - Logical Access system.
  - Receipting and reporting systems.
  - Document scanning, indexing, and replication systems.
  - Back-end integration of the multiple products simultaneous offering engine.
  - Back-end integration of the Blaze rules engine.
  - Back-end integration of the XDS system.
  - Linux-based production infrastructure and SRE.
  - Production and branch systems monitoring and APM systems.

- Java SE/EE
- Spring, Hibernate
- Spring AOP
- hybris Platform
- jBoss v5, jGroups clustering
- Apache HTTPD Load balancing
- Oracle RAC

## 2008 → 2009

### ❖ hybris E-business platform (UK, Germany)

- Development of the www.toysrus.co.uk e-commerce system.
- Implementation of the www.toysrus.co.uk production infrastructure.

- Java SE/EE
- JSP & Tag libs, Servlets
- Exactus Platform
- Tomcat
- jBoss, WebSphere
- AS/400 DB2, MySQL, MSSQL

## 2002 → 2008

### ❖ Xiriuz Systems - JHB (RSA)

- Architecture and development of the:
  - Xiriuz J2EE Core Framework.
  - Xiriuz J2EE Workflow and Rules Engine.
  - Xiriuz Banking Platform.
  - Xiriuz Banking Platform Customisation modules.

## Outsourced to Xiriuz Systems

- Java SE/EE
- Xiriuz Framework
- Xiriuz Workflow & Rules Engine
- Xiriuz EDI
- Tomcat
- MVS, MSSQL

### ❖ People's Bank / Nedbank - JHB (RSA)

- Architecture and development of the:
  - Payroll Collections system.
  - Loan Receipting system.
  - EDI to MVS integration system.

## Outsourced to Xiriuz Systems

- Java SE/EE
- Xiriuz Framework
- Xiriuz Workflow & Rules Engine
- Java Applets
- jBoss
- MySQL

### ❖ South African Bookmakers - JHB (RSA)

- R&D of bid for a national bookmakers system.

## Outsourced to Xiriuz Systems

- Java SE/EE
- Xiriuz Framework
- Xiriuz Workflow & Rules Engine
- Tomcat
- InterSystems Caché

### ❖ Schiller (Baar, Switzerland)

- Architecture and development of:
  - SemaNet - an Electro cardiogram (ECG) analysis, real-time diagnoses and reporting system for cardiologists.
  - RescueWeb - a Mobile ECG real-time monitoring system for ambulances and airborne emergency vehicles.

## Outsourced to Xiriuz Systems

- Java SE/EE
- Xiriuz Framework
- Xiriuz Workflow & Rules Engine
- Tomcat
- InterSystems Caché

### ❖ CompuMed & US Federal Government (Los Angeles, USA)

- Architecture and development of CardioGram:
  - An ECG remote diagnostic system for the US Government.
  - "CompuMed has many contracts with state department of corrections, county jails, city jails and leading correctional managed care companies. CompuMed's traditional core business is providing remote ECG interpretation terminals and related services to medical facilities, such as prisons, that may not have access to physicians trained and qualified to interpret ECG results. The system reduces healthcare costs significantly by providing remote cardiac screening at the point-of-care." (➡ Source)

## Outsourced to Xiriuz Systems

- Java SE/EE
- Xiriuz Framework
- Xiriuz Workflow & Rules Engine
- Xiriuz CMS
- Tomcat
- AS/400 DB2, MSSQL

### ❖ South African Mortgage Lending Company - JHB (RSA)

- Architecture and development of the:
  - Mortgage Finance Banking system.
  - Electronic Document Scanning & Indexing system.

## Outsourced to Xiriuz Systems

- Java SE/EE
- Xiriuz Framework
- Xiriuz Workflow & Rules Engine
- Xiriuz SMS Gateway
- Tomcat
- AS/400 DB2, MSSQL

### ❖ Glasstone - JHB (RSA)

- Architecture and development of the:
  - Vodacom SMS Gateway system.
  - SMS Gateway solution for use by 3rd-party billing systems.
  - Web-based SMS payment processing system for 3rd-party systems.

## Outsourced to Xiriuz Systems

- Java SE/EE
- Xiriuz Framework
- Xiriuz Workflow & Rules Engine
- Xiriuz Loan Quotation
- Xiriuz Receipting
- Xiriuz Client Services
- Exactus Platform
- Tomcat
- AS/400 DB2

### ❖ African Bank - JHB (RSA)

- Architecture and development of the:
  - Loan Quotation front-end system (with full Exactus integration).
  - Client Services system.
  - Branch Teller system.

## Outsourced to Xiriuz Systems

- Java SE/EE
- Xiriuz Framework
- Xiriuz Workflow & Rules Engine
- Xiriuz Loan Quotation
- Xiriuz Receipting
- Xiriuz CMS
- Xiriuz Leads Management
- Exactus Platform
- Tomcat
- AS/400 DB2

### ❖ Bayport Financial Services - JHB (RSA)

- Architecture and development of the:
  - Loan Quotation and Retail Banking system.
  - Debt Collection & Payroll Deductions Systems.
  - Electronic Document Management system.
  - Loan Receipting, reconciliation, and analysis systems.
  - Asterisk Call Centre Integration systems.

## Outsourced to Xiriuz Systems

- Java SE/EE
- Xiriuz Framework
- Xiriuz Workflow & Rules Engine
- Xiriuz Loan Quotation
- Xiriuz Receipting
- Exactus Platform
- Tomcat
- AS/400 DB2

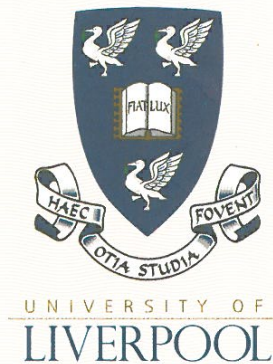
### ❖ Mazwe Credit - JHB (RSA)

- Architecture and development of the:
  - Loan Quotation and Retail Banking systems.
  - Debt Collection & Payroll Deductions Systems.
  - Loan Receipting, reconciliation, and analysis systems.

## References

Professional and academic references are available upon request.





## FACULTY OF SCIENCE AND ENGINEERING

### *Degree of Master of Science*

*We hereby certify that*

Nicola Crisologo De Sousa

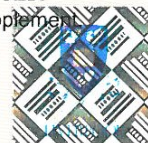
*having satisfied the University requirements was admitted by resolution of  
the Senate to the Degree of Master of Science (Software Engineering) with  
distinction on the twelfth day of December 2012*

EXECUTIVE PRO-VICE-  
CHANCELLOR, FACULTY OF  
SCIENCE AND ENGINEERING

VICE-CHANCELLOR

CHIEF OPERATING OFFICER

Details of the programme of studies completed for the award of this degree are available on the diploma supplement



00037427



Nicola de Sousa

has successfully completed the AWS Certification  
requirements and has achieved their:

AWS Certified Solutions Architect - Associate

**Issue Date**

Dec 02, 2019

**Expiration Date**

Dec 02, 2022

A handwritten signature in black ink, reading "Maureen Lonergan".

Maureen Lonergan  
Director, Training and Certification

Validation Number N9HEV5Q1F2R114KT

Validate at: <http://aws.amazon.com/verification>