

**An exploratory study of business intelligence in
knowledge-based growth small, medium and micro-
enterprises in South Africa**

by

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Thesis

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Abstract

Small, medium and micro-enterprises (SMMEs) play an important part in all economies but particularly in developing economies. Growth SMMEs seek to grow either in size, revenue and/or asset value by reinvesting available resources; these enterprises tend to spend their available resources on operational systems when it comes to information and communication technology (ICT). But these systems, whilst necessary are not sufficient. They are geared toward capturing data but not producing information. Business intelligence (BI) can provide decision-makers, who in SMMEs are predominantly owner-managers, with access to information that enables them to make informed decisions on where to apply limited resources. Because BI requires operational systems to be in place to gather the data it is the logical next step. Despite increasing discussion in the press and amongst BI practitioners, academic research with regard to BI in SMMEs remains sparse. Since the potential contribution of BI to SMMEs can only be assessed by first understanding current information practices and needs in such enterprises, the purpose of this study is to explore the use of use of BI to support strategic, tactical and operational decision-making. This research uses an interpretive approach to collect data using semi-structured interviews from the owner-managers of six knowledge-based growth SMMEs in South Africa selected through purposive sampling. The research results suggest that BI can play an important role in knowledge-based growth SMMEs but that support and guidance is needed to ensure that BI is used appropriately to fully exploit available data for decision-making in addition to expanding available data sources. Future research can adopt a more rigorous positivist approach to confirm the findings of this study, expand the population to other sectors in South Africa and/or SMMEs in other countries. An action research methodology can also be used to apply BI interventions in SMMEs to investigate specific BI solutions in-depth. The research may be of value to participating and other SMME owner-managers, policy makers, government agencies, business advisers, and academic researchers.

Summary

Title: An exploratory study of business intelligence in knowledge-based growth SMMEs in South Africa

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Department: Information Science

School: School of Information Technology

Degree: Philosophiae Doctor (Information Technology)

The thesis explores the use of business intelligence (BI) in knowledge-based growth small, medium and micro-enterprises (SMMEs) in South Africa through interpretive qualitative case studies selected through purposive sampling. The thesis makes a contribution by enabling the improvement of entrepreneurial practice with regard to information for decision-making thus increasing the competitiveness of this vital sector of the South African economy and providing a basis for future research.

Chapter 2 provides an understanding of the role of information in SMMEs as well as the potential for information and communication technology (ICT) in its provision. SMMEs differ from large organisations, which have traditionally adopted BI, and these unique characteristics not only present SMMEs with challenges different to those of large organisations but also affect their investment in and use of ICT.

Chapter 3 presents the descriptive framework that was used to guide data gathering in the empirical study is developed based on a selection of definitions of BI from academics, practitioners and vendors followed by a discussion of the framework's components.

Chapter 4 outlines the research paradigm and design: the underlying epistemology of the qualitative approach used in this thesis followed by the justification for

choosing this approach together with the selected research design, namely the case study method, the unit of analysis and the selection of cases.

Chapter 5 documents the use of semi-structured interviews as data collection method, the process and recording procedures used, and associated ethical considerations. The analysis and interpretation process applied is also outlined together with a discussion of the trustworthiness and limitations of the study arising from the choice of paradigm, design and method.

Chapter 6 presents the findings of the empirical research in the selected SMMEs together with the interpretation thereof within the context of extant literature.

Chapter 7 summarises the findings, presents the implications thereof and concludes with recommendations for further research.

Keywords

The following keywords represent the most important aspects covered in the thesis:

- business intelligence
- competitive intelligence
- decision support
- decision-making
- entrepreneurship
- information and communication technology
- interpretive paradigm/approach
- knowledge-based SMMEs
- knowledge economy
- owner-manager
- qualitative case studies
- small business enterprises

- small, medium and micro-enterprises
- source data
- South Africa

Opsomming

Titel: 'n Verkennde studie van sake-intelligensie in kennis-gebaseerde groei-gedrewe KMMO's in Suid-Afrika

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Graad: Philosophiae Doctor (Inligtingtegnologie)

Die proefskrif ondersoek die gebruik van sake-intelligensie (SI) in kennis-gebaseerde groei-gedrewe klein, medium en mikro-ondernemings (KMMO's) in Suid-Afrika met behulp van interpretatiewe kwalitatiewe gevallestudies gekies deur doelgerigte steekproeftrekking. Die proefskrif poog om 'n bydra te lewer deur verbetering in entrepreneurspraktyk met betrekking tot besluitnemingsinligting moontlik te maak en sodoende die mededingendheid van hierdie belangrike sektor van die Suid-Afrikaanse ekonomie te verbeter en verskaf 'n basis vir toekomstige navorsing.

Hoofstuk 2 verskaf 'n oorsig oor die rol van inligting in KMMO's asook die potensiaal vir inligting- en kommunikasietegnologie (IKT) in die voorsiening van inligting. KMMO's verskil van groot maatskappye wat tradisioneel SI geïmplementeer het en die hulle unieke eienskappe veroorsaak nie net verskillende uitdagings as die van groot maatskappye maar affekteer ook hulle belegging in en gebruik van IKT.

In Hoofstuk 3 word die beskrywende raamwerk, wat gebruik is om die data-insameling in die empiriese studie te struktureer, ontwikkel na aanleiding van 'n aantal definisies van SI deur akademici, praktisyns en sagteware verkopers. Die raamwerk word gevolg deur 'n bespreking van die onderskeie komponente.

Hoofstuk 4 gee 'n oorsig van die navorsingsparadigma en -ontwerp: die onderliggende epistemologie van die kwalitatiewe benadering wat in hierdie proefskrif gebruik is gevolg deur die motivering vir die keuse van hierdie benadering saam met die gekose navorsingsontwerp, die gevallestudie-metode, die eenheid van ontleding en die seleksie van gevallestudies.

Hoofstuk 5 dokumenteer die gebruik van semi-gestruktureerde onderhoude as data-insameling metode, die proses- en opname-prosedures wat gebruik is tesame met verbandhoudende etiese oorwegings. Die prosesse gebruik om die data te analiseer en interpreteer word uiteengesit saam met 'n bespreking van die betroubaarheid en die beperkings wat voortspruit uit die keuse van die paradigma, ontwerp en metode.

In Hoofstuk 6 word die bevindinge van die empiriese navorsing in die geselekteerde KMMO's saam met die interpretasie daarvan binne die konteks van die bestaande literatuur bespreek.

Hoofstuk 7 is 'n opsomming van die bevindinge gevolg deur 'n bespreking van die implikasies daarvan en sluit af met aanbevelings vir verdere navorsing.

Sleutelwoorde

Die volgende sleutelwoorde verteenwoordig die belangrikste aspekte wat in die proefskrif gedek word:

- besluitsteun
- besluitneming
- brondata
- eienaar-bestuurder
- entrepreneurskap
- inligting- en kommunikasietegnologie
- interpretatiewe paradigma / benadering

- kennis-ekonomie
- kennis-gebaseerde KMMO's
- klein sake ondernemings
- klein-, medium-en mikro-ondernemings
- kompeterende intelligensie
- kwalitatiewe gevallestudies
- sake-intelligensie
- Suid-Afrika

Declaration of originality

I understand what plagiarism is and am aware of the University's policy in this regard.

I declare that this thesis is my own original work. Where other people's work has been used (either from a printed source, Internet or any other source), this has been properly acknowledged and referenced in accordance with departmental requirements.

I have not used work previously produced by another student or any other person to hand in as my own.

I have not allowed, and will not allow, anyone to copy my work with the intention of passing it off as his or her own work.

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¹ Ponelis, S.R. and Britz, J.J. 2011. An exploratory study of business intelligence in knowledge-based South African SMEs. *GlobDev 2011 Pre-AMCIS Workshop: ICT in Global Development*, Detroit, MI, August 4, 2011. Paper 201. Available: www.globdev.org/files/AMCIS%20Proceedings%202011/Paper%201.pdf.

² Ponelis, S.R. and Britz, J.J. 2011. The Role of Business Intelligence in Information-Intensive Small Businesses: Initial Results from an Interpretive Study. *MWAIS 2011 Proceedings*, Nebraska, OM, 20-21 May 2011. Paper 23. Available: <http://aisel.aisnet.org/mwais2011/23>.

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List of abbreviations

AsgiSA	Accelerated and Shared Growth Initiative of South Africa
BI	Business intelligence
BSM	Business Sophistication Measure
BUSA	Business Unity South Africa
CC	Close corporation
CEO	Chief Executive Officer
CI	Competitive intelligence
CIO	Chief Information Officer
CIPC	Companies and Intellectual Property Commission
CIPRO	Companies and Intellectual Property Registration Office
COO	Chief Operational Officer
CRM	Customer relationship management
CSF	Critical success factor
DP	Data processing
DSS	Decision support systems
dti	Department of Trade and Industry
DVD	Digital Versatile Disc
DW	Data warehousing
EIS	Executive information system
ERP	Enterprise resource planning
ETL	Extraction, transformation and loading
GCIS	Government Communication and Information System
GDP	Gross Domestic Product
GEM	Global Entrepreneurship Monitor
HR	Human resources
IASB	International Accounting Standards Board
ICT	Information and communication technology
IFC	International Finance Corporation

IFRS	International financial reporting standard
IT	Information technology
KEI	Knowledge Economy Index
KM	Knowledge management
MIS	Management information systems
NAICS	North American Industry Classification System
OECD	Organisation for Economic Co-operation and Development
OLAP	Online analytical processing
SaaS	Software as a service
SADC	Southern African Development Community
SARS	South African Revenue Service
SCIP	Strategic and Competitive Intelligence Professionals
SEDA	Small Enterprise Development Agency
SLA	Service level agreement
SME	Small- and medium-sized enterprise
SMME	Small, medium and micro-enterprise
STP	SEDA Technology Programme
UK	United Kingdom
UNIDO	United Nations Industrial Development Organisation
USA	United States of America