

Volume 13 Number 1

Spring 2017

ISSN: 1553-5495



Journal of Global Business and Technology

SELECTED CONTENTS

DETECTING CONTEMPORARY ISSUES OF THE ELECTRIC BUS INDUSTRY

Grace T. R. Lin, Yen-Chun Lee, Pang-Hsiang His, and Wu-Chi Ho

RELATIONSHIP INTENTION AND CUSTOMER SATISFACTION AS PREDICTORS OF SOUTH AFRICAN SEMS' LOYALTY TOWARDS A RISK FINANCIER

P.G. (Pierre) Mostert, T.F.J. (Derik) Steyn, and M. H. (Retha) Mentz

AN ENTREPRENEURIAL ENTITY'S EXPERIENCE WITH OPPORTUNITY REALISATION

Le-Roi Nel and Geoff Goldman

INVENTORIES CONTROL, THE INVENTORY MANAGER AND MATRIXES OF WITHING WITH MULTIPLICATIVE FACTORS (MOWwMf)

Maria J. Garcia G., Lucia M. Schwarz I., Trina M. Schwarz I., Gilberto J. Hernández G., and José G. Hernández R.

THE RELEVANCE OF SOCIAL MEDIA AS INFORMATION SOURCE WHEN SELECTING PRIVATE SCHOOLS IN SOUTH AFRICA

Mornay Roberts-Lombard and Reaan Immelman

*In Cooperation with
Global Business and Technology Association*



Journal of Global Business and Technology *Volume 13, Number 1, Spring 2017*

The Journal of Global Business and Technology

Volume 13, Number 1, Spring 2017

Publication Details

Two issues per volume

ISSN: 1553-5495

© Copyright

The copyright of all material published in the journal is held by the Global Business and Technology Association, Inc.

Website

Further information, including subscription details, are available on the Global Business and Technology Association website at: www.gbata.org

The Journal of Global Business and Technology, in cooperation with the Global Business and Technology Association is listed with [1] Cabell's Directory, [2] EBSCO's Academic Search and [3] ProQuest's database including the International Bibliography of Social Sciences (IBSS)

TABLE OF CONTENTS

<i>N. Delener</i>	Editorial	..... iii
<i>N. Delener</i> <i>Dana Lascu</i>	Notes from the Editor	..... vii
	Editorial Board and Reviewers	..... viii
<i>Grace T. R. Lin</i> <i>Yen-Chun Lee</i> <i>Pang-Hsiang His</i> <i>Wu-Chi Ho</i>	DETECTING CONTEMPORARY ISSUES OF THE ELECTRIC BUS INDUSTRY	..... 1
<p><i>Abstract: For sustainable development of a green Earth, electric buses (e-buses) can save the planet from public transportation pollution. However, various issues affect the proliferation of e-buses. This study aimed to detect, analyse, and discuss contemporary issues in the global e-bus industry, as well as to investigate recent developments. Through the in-depth interview method, twelve experts were interviewed to ascertain deeper insights into contemporary issues in the e-bus industry. Power electronic systems and government policy are the two most critical issues. Two cases were also explored to see whether there are perspectives from which e-bus manufacturers can learn and issues to avoid. The results of this analysis may assist industry practitioners and government policymakers in directing R&D investments and allocating resources more strategically.</i></p>		
<i>P. G. (Pierre) Mostert</i> <i>T. F. J. (Derik) Steyn</i> <i>M. H. (Retha) Mentz</i>	RELATIONSHIP INTENTION AND CUSTOMER SATISFACTION AS PREDICTORS OF SOUTH AFRICAN SMES' LOYALTY TOWARDS A RISK FINANCIER	..... 11
<p><i>Abstract: Despite organisations' efforts to build and maintain mutually beneficial long-term relationships with customers, not all customers want to reciprocate such relationship building efforts with supplier organisations. It is thus essential that organisations focus their relationship marketing efforts on those customers displaying the intention to build relationships. Organisations must also realise the importance of ensuring customer satisfaction, as there is a positive relationship between customer satisfaction and customer loyalty. The purpose of this study was to determine the extent to which SMEs' relationship intentions and customer satisfaction predict their loyalty to a South African risk financier. Results from hierarchical multiple regression indicate that SMEs' relationship intentions and their satisfaction predict their loyalty towards their risk financier. It was also established that SME customers' satisfaction fulfilled a mediating role between their relationship intentions and loyalty towards the risk financier. This study broadens the current understanding of customer loyalty, especially in B2B settings.</i></p>		

TABLE OF CONTENTS

Le-Roi Nel Geoff Goldman	AN ENTREPRENEURIAL ENTITY'S EXPERIENCE WITH OPPORTUNITY REALISATION	..... 25
<p><i>Abstract: Entrepreneurial activity is widely recognised as being a catalyst for booting economic growth. Prudence in recognising and successful pursuit of business opportunities that present themselves is a crucial part of the entrepreneurial endeavour. The formation of the Saxum Group is used in this paper as a qualitative case study to illustrate how an entrepreneurial entity engages with opportunity realisation. Data were collected through semi-structured interviews with key role players of the Saxum Group as an entrepreneurial entity, and analysed using Grounded Theory coding principles. Findings revealed that opportunity realisation is strongly linked to the prevailing market conditions as well as how the entrepreneurial entity is formed and behaves. Practical recommendations are presented to aspiring entrepreneurs that could be useful in the pursuit of new opportunities.</i></p>		
María J. García G. Lucía M. Schwarz I. Trina M. Schwarz I. Gilberto J. Hernández G. José G. Hernández R.	INVENTORIES CONTROL, THE INVENOTRY MANAGER AND MATRIXES OF WEIGHING WTIH MULTIPLICATIVE FACTORS (MOWwMf)	..... 40
<p><i>Abstract: In this paper were presented solutions to the negative influence on inventory control (IC), by externals interventions, particularly on the part of the state. A logistics vision was followed, from the Inventory manager (IM) of the Logistic Model Based on Positions (MoLoBaC) and the situation was analyzed with a Matrix Of Weighing with Multiplicative factors (MOWwMf). It has already been studied the influence that, restrictions on the inventories on the part of the state cause in society, for this has been used the MoLoBaC. In this work, the MoLoBaC was also used, through its IM and actions to take by organizations to alleviate this intervention of the state were studied. To analyze the alternatives a MOWwMf was used. From the above emerges the objective: Analyze through a Matrix Of Weighing with Multiplicative factors, the alternative that can take an Inventory manager and the organization as a whole, if it is subject to state restrictions, that affecting its control of inventories.</i></p>		
Mornay Roberts-Lombard Reaan Immelman	THE RELEVANCE OF SOCIAL MEDIA AS INFORMATION SOURCE WHEN SELECTING PRIVATE SCHOOLS IN SOUTH AFRICA	..... 57
<p><i>Abstract: Parents are considering many sources of information when selecting a private school in South Africa. The aim of this paper is to determine these sources of information and the relevant importance thereof. The research methodology was exploratory and quantitative in nature with respondents from thirty private schools surveyed in the study with a total of six hundred and sixty nine respondents. The analysis used was descriptive statistics as well as factor analysis. Nineteen (19) information sources were identified with social media indicated as a less preferred choice of information source. The opportunity however for private schools lies in social media as marketing tool.</i></p>		
	Manuscript Guidelines	..... 67
	JGBAT Subscription Forms	..... 70

EDITORIAL

The potential for greening urban mobility and the associated benefits is enormous. The use of electric buses (e-buses) has become one of the most popular ways to save the planet from the effects of pollution. For sustainable development of a green Earth, e-buses can save the planet from public transportation pollution. For this market to expand, much work must be done by bus manufacturers, bus operators, and most importantly, local governments. However, various issues affect the proliferation of e-buses. For example, these issues include battery technologies, battery management system (BMS), power electronic systems, power supply grids, charging tower types, charging voltage and current, parts and accessories, government regulations, and so on.

Based on these themes the first study by **Grace T.R. Lin, Yen-Chun Lee, Pang-Hsiang Hsi & Wu-Chi Ho** aimed to detect, analyze and discuss contemporary issues in the global e-bus industry, as well as to investigate recent developments. Through the in-depth interview method, twelve experts were interviewed to ascertain deeper insights into contemporary issues in the e-bus industry. Two cases were also explored to see whether there are perspectives from which e-bus manufacturers can learn and issues to avoid. The e-bus market is still in its nascent phase and requires further development for the increased adoption of e-buses. Based on the in-depth interviews and the two real cases, we did identify the major two critical issues that affect the proliferation of e-buses, that is, the performance of power electronic systems and the support of government policy.

The power electronic system is the most valuable asset for protecting costly batteries in an e-bus, and government policy represents the local regulations with which e-bus manufacturers must comply. The performance is not e-bus manufacturers' goal; protecting a battery's life cycle is. A good BMS can save the battery a bit, and a well-designed and well-put-together power electronic system is a must. Policies that help boost e-bus sales will foster large-scale commercialization of electric vehicles. In particular, policies should more broadly distribute tax incentives for purchasing these vehicles, and federal electric-vehicle programs should be extended and expanded to provide direct financial incentives to e-bus manufacturers. The federal government should target e-bus policies in regions where cleaner, renewable electricity is already being generated. Utility providers must be also encouraged to revisit their electricity rate designs, invest strategically in recharging infrastructure, and investigate the effectiveness of decoupling regulations.

The results of Lin, Lee Hsi & Ho's study may assist industry practitioners and government policymakers in directing R&D investments and allocating resources more strategically. For anyone involved in the research of competitive advantages and those seeking strategies to enter the global e-bus markets, this paper should offer some necessary fundamentals in terms of theoretical analysis and problem resolution. Future research may further apply fuzzy multiple criteria decision-making (MCDM) methods to different contexts. For example, researchers may use fuzzy Delphi method to explore and screen the critical influence factors of e-bus industry and/or fuzzy decision-making trial and evaluation laboratory (fuzzy DEMATEL) method to analyze the causal relationships of these factors.

The purpose of the second study by **Pierre Mostert, Derik Steyn & Retha Mentz** was to determine the extent to which SMEs' relationship intention and customer satisfaction predict their loyalty to a South African risk financier. The study population comprised the SME customers of Business Partners Limited (BPL), a leading South African and African risk financier that offers debt and equity financing to 380 businesses with investments valued in excess of R 1.1 billion. Exploratory factor analyses, using principal axis factoring and Varimax rotation, were performed to reduce the dimensionality of the data and to evaluate the construct validity of the measurement scales used in the study. With the reliability and validity of the measuring instrument confirmed, a hierarchical multiple regression analysis was conducted.

Results from the hierarchical multiple regression indicated that SME customers' relationship intention as well as their satisfaction, as two independent variables, significantly predict their loyalty towards their risk financier. Finally, from the results it could be established that customers' relationship intention and

satisfaction, in combination, predict their loyalty towards their risk financier. In fact, it was determined that customers' satisfaction fulfilled a mediating role between their relationship intention and their loyalty towards the risk financier. This implies that, despite the direct relationship between relationship intention and customer loyalty, customers' satisfaction with the risk financier plays an additional indirect complementary role in this relationship.

Based on the Mostert, Styen & Mentz study's findings it is recommended that B2B risk financiers, and financial service providers in similar industries such as banking and insurance, identify customers with relationship intention and make additional investments to ensure these customers' satisfaction. The combination of customer relationship intention and satisfaction should result in increased customer loyalty. This study contributes to literature by broadening the current understanding of customer loyalty, especially in B2B settings, by considering business customers' (SMEs') relationship intention as predictor of customer loyalty. It is suggested that future research replicate this study in other industries to determine the generalizability of the findings in other contexts. Future research could also consider determining the antecedents that lead to customers forming relationship intention.

The South African insurance community has been presented with significant risk and opportunity over the past two decades with the withdrawal of multinational insurance firms. This has paved the way for increased entrepreneurial behavior. The Saxum Group of Companies was one such company which was able to exploit prevailing market opportunities, particularly with the withdrawal from the South African market of German insurance company Gerling Global. The purpose of the third article by **LeRoi Nel & Geoff A. Goldman** is thus to understand how an entrepreneurial entity realized opportunities within the South African insurance industry as a result of the withdrawal of an international company.

An Interpretive research paradigm was employed in the study, and a case study design was followed. Qualitative, semi-structured interviews were conducted as primary means of data collection. The study employed purposeful sampling, and twelve research subjects were selected for interviewing purposes. From the findings, it is apparent that the formation of the entrepreneurial entity consists of two distinct parts: informal formation and formal formation. Informal formation seems to begin with the initiative of an individual and over time other members are co-opted based on the need for additional skill and experience. The informal group interaction needs to be dynamic, confident, and focused on problem solving. It is advantageous if entity members are acquainted through work experience and industry reputation, as this would help in solidifying roles and responsibilities in the formal entrepreneurial entity. The formation of the entrepreneurial entity can thus be seen as the starting point of the dynamic of opportunity realization, as the character of this entrepreneurial entity will set the tone for this dynamic.

Opportunity identification is highly dependent on the insurance market conditions, the abilities of individual entrepreneurial entity members, and the entrepreneurial entity. Therefore, opportunity identification is the interaction between the entrepreneur and the environment, manifested in evolving business models. Although evolving business models allow the entrepreneurial entity to be adaptive to change within the environments, organizational stress arises due to uncertainties. Opportunity realization for an entrepreneurial entity within the South African insurance market appears to be influenced by strategic development activities. Acquisitions are popular for market growth by entrepreneurial entities within the South African insurance industry, requiring strong negotiation and financial skills. Although competitive advantages can be found in employee skills, organizational technology platforms and organizational infrastructure, a sustained competitive advantage is to be found in strategic entrepreneurial development activities that allow for specialized and rare skills to emerge.

The interaction between the entrepreneur and the environment is of vital importance for successful entrepreneurial activity. Aspiring entrepreneurs could enhance their entrepreneurial skills by developing effective communications techniques, financial skills and negotiations skills. Market scanning and knowledge should be imbedded within an entrepreneur. Aspiring entrepreneurs should: (a) consider new and emerging trends in consumer markets, (b) apply planned networking with industry stakeholders in order to be up to date with possible opportunities, and (c) establish an understanding of how business modes adapt to changing environments.

The fourth article by **Maria J. Garcia, Lucia M. Schwarz I., Trina M. Schwarz I., Gilberto J. Hernandez G., & Jose G. Hernandez R.** addresses mathematical models and business logistics, especially the control of inventories. Making use of them, possible solutions to the negative influence they can have on the inventory control (IC), external measures, in particular the imposed by the state are presented. This search for possible solutions is made with a vision of the logistics. In particular, the Inventory manager (IM) of the Logistic Model Based on Positions (MoLoBaC) and a quantitative analysis is performed with a multicriteria model, the Matrix Of Weighing with Multiplicative factors (MOWwMf).

In order to achieve the general objective and its specific objectives, use will be made of the Integrated-Adaptable Methodology for the development of Decision Support System (IAMDSS), which emerged to create support systems, but because of its flexibility adapts to different types of research and approaches the investigations without going through the hypothesis approach. It follows a set of steps which, due to the flexibility of the methodology, can be adapted to each situation in particular.

Following this methodology the work was divided into three major sections, the first dedicated to presenting the General manager of inventories or simply Inventory manager (IM), who in the Logistics Model Based on Positions (MoLoBaC), is responsible for establishing all the parameters and rules of control of all inventories, without this means the physical handling of the same, which correspond to the Stores manager (SM). Of the IM are presented ninety eight of its most relevant functions. In the second section were presented the Matrix Of Weighing (MOW) that is one of the multicriteria models simplest to implement. It was the extension of the same to Matrix Of Weighing with Multiplicative factors (MOWwMf). After showing some of its variations and some of its characteristics, the multilayer MOWwMf were presented, which have varied business applications. The third section was devoted to making use of a multilayer MOWwMf, to evaluate possible actions to be taken to confront with the negative interventions of the state. To this purpose, it defined a scenario and actions were presented, which in turn coincided with the criteria and were used as alternatives some of the functions of the IM.

In terms of managerial implications, starting with multicriteria models, they allow the manager to analyze different business situations with a more open approach. In particular a very simple model is presented, to implement and use the MOWwMf, which are characterized by contributing to decision making taking into account only two basic aspects: the alternatives and the criteria.

The MOWwMf can offer a great contribution to the managers, since in constructing them, the criteria and their relevance in the decision will be defined very clearly, as well as the alternatives, which can be managed by the organization. On the other hand, the managerial implications of business logistics are much clearer, since it relates to practically all areas of an organization. In this case, when using MoLoBaC, it allows the decision maker to analyze, in greater detail, all these relations. If in addition when a company is subject to external controls particularly of the state which affect its performance, the society as a whole will be affected and the managers have the responsibility to give answers to these situations. From this work, managers can extract scenarios to manage as well as some actions to follow and can even know how through the functions of the IM can implement these alternatives. Although each organization must do the analysis for its particular situation, in this work some macro parameters are offered which can be followed.

Parents are considering many sources of information when selecting a private school in South Africa. The aim of the fifth paper by **Mornay Roberts-Lombard and Reaan Immelman** is to determine these sources of information and the relevant importance thereof. The majority of South Africa private schools apply marketing principles and the Independent Schools Marketing Association (ISMA) is well established with the objective to promote marketing efficiency in these schools. The need for private schools in South Africa is illustrated by JSE-listed Advtech and Curro Holdings and these JSE-listed companies all have marketing departments and therefore the marketing of private schools are a management function which is imperative for every private school. Private schools need to understand the need of prospective parents and how these parents make their decisions when considering a school.

Limited research is available with regards to information sources in the private schools sector. International research includes the Independent Schools Queensland Survey (ISQ), 2011, the Independent Schools Council of Australia (ISC), 2008 and Gorard, 1999. According to ISQ (2011), recommendations from

friends, colleagues and current parents with children registered at the school, as the favored information source. Other information sources identified are the school website, brochures, open days and school expos. The identified information sources of ISQ (2011) correspond with ISC (2008), which include word-of-mouth and personal engagement with teachers and staff at school open days as the most important information sources. The reputation of the school promoted by their current parent community, community activities, open days and an interview with the school principal are cited by parents as important sources of information when selecting a school. In a South African context, Roberts-Lombard and Immelman identify open days at schools and the school website as the two most important information sources.

The research methodology was exploratory and quantitative in nature with respondents from thirty private schools surveyed in the study with a total of six hundred and sixty nine respondents. The self-administered questionnaire technique was used to obtain data from parents through the application of a five-point Likert scale questionnaire. The questionnaire contained self-developed items considering reliability and validity

From the respondents, a total of forty three percent reported that they speak English at home and fifty three percent of those who responded has a monthly income of R45 000 (US\$3500) per month. Interesting to note is that eighty four percent of respondents have a post-school qualification, seventy seven percent were female and a total of eighty four percent were married. The analysis used was descriptive statistics as well as factor analysis. Nineteen (19) information sources were identified with social media indicated as a less preferred choice of information source. The opportunity however for private schools lies in social media as marketing tool. Recommendations focused specifically on word-of-mouth, and more specifically social media, to demonstrate the opportunity of this medium in school marketing.

Marketing research in the form of focus groups with parents and guardians as well as questionnaires is recommended for private schools to establish what is currently said about the specific school. In addition, the parents of children at the school can also be requested to bring friends and family to the open days of private schools and current parents can be encouraged to be brand ambassadors for their school. Social media such as Facebook, Twitter, YouTube and LinkedIn is of less concern to parents when choosing private schools, but the recommendation is that schools integrate social media such as Facebook into their marketing efforts. A recommendation for schools is to establish their own School Facebook page, additional to their current school website. Another recommendation for schools are to have their own social media policy while administrator rights are necessary to be assigned to a staff member such as the school's marketing manager, who will be responsible for collecting and posting content. The school can also share its calendar with parents and prospective parents, share positive stories of the school, post photos of school events and congratulate students and staff who excel. Private schools are advised to create their own YouTube video and promote the school through its own YouTube Channel. YouTube videos must be embedded in the school's website with different content on a regular basis. The Schools Twitter account needs to be mentioned in its newsletter and any other communication sent to parents. It is also recommended that school staff, and especially the school marketer, have a personal Twitter account sharing tweet information and starting promoting the school. Another recommendation is that the school create links to the school's Twitter account on the school's website and Facebook account. Schools are also advised to utilise LinkedIn to advertise vacant positions to recruit educators and other vacant academic positions. In this way, private schools can reach more job applicants and can choose the best educators.

Nejdet Delener, Ph.D.
Editor-in-Chief

NOTE FROM THE EDITORS

As an interdisciplinary indexed journal, *The Journal of Global Business and Technology* (JGBAT) serves academicians and practitioners in the fields of global business and technology management and their related areas. JGBAT is also an appropriate outlet for manuscripts designed to be of interest, concern, and applied value to its audience of professionals and scholars.

Readers will note that our attempt to bridge the gap between theory and practice has been successful. We cannot thank our reviewers enough for having been so professional and effective in reiterating to contributors the need to provide managerial applications of their research. As is now obvious, the majority of the articles include a section on managerial implications of research. We wish to reiterate once again our sincere thanks to JGBAT reviewers for having induced contributors to answer the “so what?” question that every *Journal of Global Business and Technology* article is required to address.

Thank you for your interest in the journal and we are looking forward to receiving your submissions. For submissions guidelines and requirements, please refer to the Manuscript Guidelines at the end of this publication.

Nejdet Delener, Ph.D., Editor-in-Chief
Dana Lascu, Ph.D., Managing Editor

REGIONAL EDITORS

Shaukat Ali, Ph.D.
Pawan K. Chugan, Ph.D.
Johan de Jager, Ph.D.
T. Diana L. v. A. de Macedo-Soares, Ph.D.
Leon de Wet Fourie, Ph.D.
Gerald Ledlow, Ph.D.
Pat Obi, Ph.D.
Anna Putnova, Ph.D.
Luis Eduardo Rivera-Solis, Ph.D.
Susana Rodrigues, Ph.D.
Che-Jen Su, Ph.D.
Attila Yaprak, Ph.D.

Journal of Global Business and Technology
EDITORIAL BOARD

EDITOR-IN-CHIEF

Nejdet Delener, Ph.D.
GBATA, USA

MANAGING EDITOR

Dana Lascu, Ph.D.
University of Richmond, USA

REGIONAL EDITORS

AFRICA	Johan de Jager, Ph.D. Tshwane University of Technology, South Africa
ASIA	Che-Jen Su, Ph.D. Fu-Jen Catholic University, Taiwan R.O.C. Pawan K. Chugan, Ph.D. Nirma University, India
AUSTRALIA/NEW ZEALAND	Leon de Wet Fourie, Ph.D. Unitec, New Zealand Bruno Mascitelli, Ph.D. Swinburne University of Technology, Australia
EUROPE	Shaukat Ali, Ph.D. The University of Wolverhampton, UK Anna Putnova, Ph.D. Brno University of Technology, Czech Republic Susana Rodrigues, Ph.D. Polytechnic Institute of Leiria, Portugal
NORTH AMERICA	Gerald Ledlow, Ph.D. University of Texas Health Northeast, USA Pat Obi, Ph.D. Purdue University Calumet, USA Luis Eduardo Rivera Solis, Ph.D. Capella University, USA Attila Yaprak, Ph.D. Wayne State University, USA
SOUTH AMERICA	T. Diana L.v.A. de Macedo-Soares, Ph.D. Pontifical Catholic University of Rio de Janeiro, Brazil

REVIEWERS

<i>Dr. Davood Askarany</i>	University of Auckland, New Zealand
<i>Dr. Erhan Aslanoglu</i>	Marmara University, Turkey
<i>Dr. Homer T. Bonitsis</i>	New Jersey Institute of Technology, USA
<i>Dr. Vida Lucia Botes</i>	University of Waikato, New Zealand
<i>Dr. Jui-Kuei Chen</i>	Tamkang University, Taiwan, R.O.C.
<i>Dr. Koen Dittrich</i>	Erasmus University of Rotterdam, The Netherlands
<i>Dr. Nikolay Filinov</i>	National Research University– Higher School of Economics, Russia
<i>Dr. Leonora Fuxman</i>	St. John's University, USA
<i>Dr. Abdel Halabi</i>	Federation University, Australia
<i>Dr. Stephen J. Havlovic</i>	Alfred State College, USA
<i>Dr. Frederic Jallat</i>	ESCP Europe - European School of Management, France
<i>Dr. Rim Jallouli</i>	Manouba University, Tunisia
<i>Dr. Ali Kara</i>	The Pennsylvania State University-York, USA
<i>Dr. Fahri Karakaya</i>	University of Massachusetts - Dartmouth, USA
<i>Dr. Halil Kiyamaz</i>	Rollins College, USA
<i>Dr. Stephen Ko</i>	The Hong Kong Polytechnic University, Hong Kong R.O.C.
<i>Dr. Samad Kolahi</i>	UNITEC Institute of Technology, New Zealand
<i>Dr. Daniel Koys</i>	DePaul University, USA
<i>Dr. Keun S. Lee</i>	Hofstra University, USA
<i>Dr. Tatiana Leonova</i>	State University of Management, Russia
<i>Dr. Grace TR Lin</i>	National Chiao Tung University, Taiwan, R.O.C.
<i>Dr. Victor Lu</i>	St. John's University, USA
<i>Dr. Miguel Martins</i>	University for the Creative Arts, UK
<i>Dr. Ajay K. Manrai</i>	University of Delaware, USA
<i>Prof. Roger Mason</i>	Durban University of Technology, South Africa
<i>Dr. Douglas McCabe</i>	Georgetown University, USA
<i>Dr. Samir R. Moussalli</i>	Huntingdon College, USA
<i>Dr. Juergen Muehlbacher</i>	WU Vienna University of Economics & Business, Austria
<i>Dr. Mathilda van Niekerk</i>	University of Central Florida, USA
<i>Dr. Marina Novelli</i>	University of Brighton, UK
<i>Dr. Wilson Ozuem</i>	University of Gloucestershire, UK
<i>Dr. Kathleen Park</i>	Massachusetts Institute of Technology, USA
<i>Dr. Ian Phau</i>	Curtin University, Australia
<i>Dr. Nathalie Prime</i>	ESCP Europe-European School of Management, France
<i>Dr. George Priovolos</i>	Iona College, USA
<i>Dr. Tribhuvan N. Puri</i>	University of Massachusetts Dartmouth, USA
<i>Dr. Mornay Roberts-Lombard</i>	University of Johannesburg, South Africa
<i>Dr. Leonel Cezar Rodrigues</i>	University Nove de Julho, Brazil
<i>Dr. Christina Schweikert</i>	St. John's University, USA
<i>Dr. Klaus Solberg Soilen</i>	Blekinge Institute of Technology, Sweden
<i>Prof. Christian L. van Tonder</i>	University of Johannesburg, South Africa
<i>Dr. Robert G. Vambery</i>	Pace University, USA
<i>Dr. Clare Weeden</i>	University of Brighton, UK
<i>Dr. Meng-Wen Wu</i>	Ming Chuan University, Taiwan, R.O.C
<i>Dr. Ayse Yuce</i>	Ryerson University, Canada
<i>Dr. Anna Zhilkina</i>	State University of Management, Russia
<i>Prof. Anne Marie Zwerg-Villegas</i>	Universidad de la Sabana, Colombia

DETECTING CONTEMPORARY ISSUES OF THE ELECTRIC BUS INDUSTRY

Grace T. R. Lin, Yen-Chun Lee, Pang-Hsiang His, and Wu-Chi Ho

ABSTRACT

For sustainable development of a green Earth, electric buses (e-buses) can save the planet from public transportation pollution. However, various issues affect the proliferation of e-buses. This study aimed to detect, analyze and discuss contemporary issues in the global e-bus industry, as well as to investigate recent developments. Through the in-depth interview method, twelve experts were interviewed to ascertain deeper insights into contemporary issues in the e-bus industry. Power electronic systems and government policy are the two most critical issues. Two cases were also explored to see whether there are perspectives from which e-bus manufacturers can learn and issues to avoid. The results of this analysis may assist industry practitioners and government policymakers in directing R&D investments and allocating resources more strategically.

Keywords: electric bus (e-bus), in-depth interview, power electronic system, government policy

INTRODUCTION

In the past few decades, the use of electric buses (e-buses) has become one of the most popular ways to save the planet from the effects of pollution. For this market to expand, much work must be done by bus manufacturers, bus operators, and most importantly, local governments. For example, batteries are a major issue for e-bus manufacturers, and the power electronic system overall is an even more important (Ostadi, Kazerani & Chen, 2013). Although batteries are an important component of an e-bus, during the past decade, few advances were made in battery efficiency, cycle life, and size improvement. A good battery management system (BMS) can protect batteries from degrading too quickly while maintaining efficiency (Dan, Dan & Binggang, 2013). Moreover, there are two major types of e-buses: charging and swapping.

Grace T. R. Lin is a Full Professor in the Institute of Management of Technology, National Chiao Tung University, Taiwan. Her research is in industrial marketing, high-tech management, and policy innovation.

Yen-Chun Lee is an Assistant Professor in the Department of Business Administration and Graduate School Service and Business Management, Chihlee University of Technology, Taiwan. His research focuses on the assessment and management of interdisciplinary science and technology.

Pang-Hsiang His is currently a PhD candidate in the Institute of Technology Management, National Chiao Tung University, Taiwan. His research interests involve technology management and industrial analysis.

Wu-Chi Ho is an Associate Professor in the Institute of Management of Technology, National Chiao Tung University, Taiwan. His research domains include green energy development and policy, machine learning modelling, and system engineering management.

Most e-bus manufacturers must follow government regulations. For example, some parts have to be manufactured locally, and some components have to come from certain sources. In some countries, bus operators are reimbursed. Despite this, compared to diesel buses, the initial cost of e-buses remains high. As new e-buses are introduced in cities, the infrastructure must be improved. The power grids, charging tower types, charging voltage, and current are always problems for e-bus operators (Burmeister, Schnieder & Kurczveil, 2015).

Based on these themes, this study aimed to investigate contemporary issues in the e-bus industry through in-depth interviews and analyze directions for future developments. Two case studies were also explored to examine perspectives from which e-bus manufacturers could learn and issues to avoid. This study also examined government policy, and a conclusion was drawn.

METHODS

In-depth interviews

In-depth interviews are a useful qualitative data collection technique for various purposes, including needs assessment, program refinement, issue identification, and strategic planning (Lucas, 2014). An in-depth interview is appropriate for asking open-ended questions that elicit deep information from only a few people (Stiehler & Tinson, 2015). Although the term is used to refer to many various techniques and methods, there are at least two invariable characteristics: (1) face-to-face discussion and questioning between two or more people and (2) an attempt upon the part of one or more persons to appraise (DiCicco-Bloom & Crabtree, 2006). In addition, researchers typically employed triangulation technique by using three methods of data collection—interviews, observations and documents to facilitate validation of data through cross verification from two or more sources (Moraes, 2013). To increase the credibility and validity of the analysis results, we used multiple sources of interview data collected from experts with different perspectives. In this study, twelve professionals in the bus and battery industries were interviewed to discuss what issues e-bus manufacturers face and how they deal with or solve the problems.

Case study

The term “case study” is a definitional morass. Yin (2013) defined a case study as a research strategy, developed a typology of case study designs, and described the replication logic essential for multiple case analyses. In the social science literature, most case studies feature the following: descriptions that are complex and holistic and involve many not highly isolated variables; data that are likely to be gathered at least partly by personal observation; and a writing style that is informal, perhaps a narrative, possibly with verbatim quotations, illustrations, and even allusion and metaphor (Stake, 1983). In this study, two e-bus manufacturers were investigated as case studies, which had much deeper details about the important issues and government policy regarding the e-bus industry.

PERSPECTIVES ON E-BUS INDUSTRY DEVELOPMENTS

The global e-bus market yielded volume sales of 19,059 units in 2015, according to a P&S market research report (P&S Market Research, 2016). It is expected to witness growth at a CAGR of 20.9% in terms of volume during the period 2016-2025. The e-bus market is still in its nascent phase, and requires further development for the increased adoption of e-buses. Perspectives on e-bus industry developments were explored in in-depth interviews, such as global developments, vendors’ engagements, and developments in Taiwan.

Global developments

Siemens offers public utilities, operators, and municipalities a highly efficient complete solution that has been specially developed for inner-city line services using e-buses. The solution includes the drive motors and power converters for the vehicles, as well as the necessary external charging stations (Siemens, 2015). The fully automatic charging system is supplied as a turnkey system that includes everything from the required electrical and structural engineering services to integration in existing power supply grids. The Finnish Helsinki Regional Transport Authority (HRT) responsible for organizing public transport in the Helsinki area announced that the agency will increase the e-bus share of the market from 1% in 2015 to 10% in 2020 and 30% in 2025. Similar principles are guiding agencies in various major European cities (Pihlatie, Kukkonen, Halmeaho, Karvonen & Nylund, 2014). In London, the transportation agency (Transportation for London, TfL) is launching the city's first purely e-buses that will improve mass transit and advance battery-electric vehicle technology (Miles & Potter, 2014). *The Guardian* reported that the new e-buses are the first of their kind to run purely on batteries. Six additional e-buses were set to be introduced to the TfL fleet in early 2014, four of which were secured with funding from the Department of Transport's Green Bus Fund. In addition to the e-buses, London will run 1,700 hybrid buses by 2016—covering a fifth of its fleet. E-bus use in the United States is still small and mainly concentrated in the airport and other short shuttle route arena. One notable counter-example is the service area of Foothill Transit, a provider that covers the far northeastern suburbs of Los Angeles. Similarly to electric cars, until battery technologies develop to the point a vehicle can comfortably travel 200–300 miles on a single charge, it is unlikely that the technology will be broadly adopted by the transportation industry. The delays caused by the need for en route charging will probably be too expensive for a transportation agency, especially those whose drivers are relieved for breaks instead of counting the layover at the end of the line as a driver break. As some agencies, such as the Toronto Transit Commission (TTC) in Toronto and the Société de Transport de Montréal (STM) in Montreal, frequently have scheduled layovers that are shorter than the time needed for charging, adopting e-buses in these areas would cause massive schedule changes and an increase in operating costs (MacKechnie, 2014).

Vendors' engagements

Among vendors of in-vehicle motors, Fukuta Motor cooperated with Tesla and ACP and produced the first electric roadsters available on the market. Fukuta Motor became one of Toyota's official partners because of the vendor's partnership with Tesla. Delta Electronics demonstrated its capabilities in developing and manufacturing electric parts and accessories, and released retrofitted electric and hybrid vehicles based on SAIC Motor's and Changan Motor's form factors. Delta Electronics has worked with Shanghai GM to develop motor systems and onboard chargers for the Chevrolet Sail pure electric editions. For vendors of battery materials, CAEC developed next-generation iron-sodium cathode materials, which are combined with low-cost elements, such as hydrochloric acid and oxalic acid, and made into powders, potentially decreasing production costs. LanYang Energy Technology develops, produces, and sells LiFePO₄ batteries. The company uses LiFePO₄ cathode materials for power batteries that have low cost, dense energy, secure stability, a long life cycle and eco-friendliness features. ALEEES is a cathode-material vendor with a patent on LiFePO₄ materials. For the body design and manufacturing vendors, HAITEC specializes in developing vehicle designs. It is currently focusing on developing electric platform technologies and researching plug-in hybrid vehicles. RAC's homemade pure-electric and low-chassis buses were the first e-buses certified by the Taiwanese government. RAC's key products and services include e-buses, electric parts and accessories, and electric commercial vehicle planning and manufacture.

Developments in Taiwan

Build Your Dreams (BYD) announced that it delivered e-buses to Taiwan, yet another country with Chinese mass transit electric vehicles (EVs). Twelve mid-sized e-buses purchased by Kinmen County were put into service. The automobile components industry in Taiwan also has strengths as some of the vendors have already integrated into the international supply chain. For example, more than 70% of the components for the

EVs produced by Tesla Motor are procured in Taiwan, and the key raw material in the motor is made with silicon steel produced by China Steel Chemical Corporation. In addition, Taiwanese vendors have been developing techniques for the raw materials and downstream products that EV motors require. In 2010, the Taiwanese government approved the “Intelligent Electric Vehicle Development Strategy and Action Plan,” which set up more ten pilot programs across the country involving around 3,000 vehicles. The Taiwanese government invested USD 73 million to facilitate the implementation of electric vehicles in the main urban areas. In addition to participation by the International Collaboration in the Future Steel Vehicle plan, an R&D center on materials and motor was also established. Through the combination of industry and academia, Taiwanese vendors try to motivate localization for related techniques. One hundred and fifty vendors in the Electrical and Electronic Manufacturers’ Association have formed a technical alliance.

The Ministry of Technology in China also conducted a “one thousand vehicles in ten cities” pilot for a new-energy automobile demo in 2009. According to “Energy-Saving and New-Energy Automobiles Industry Plan (2012-2020)” from the State Council of the People's Republic of China, the sales of pure EVs and plug-in hybrid vehicles are expected to total 500,000 in 2015 and 2 million in 2020. The Bridging Project makes Taiwan the ideal starting point to enter the new-energy automobile market in China. Within the structure of economic cooperation between Taiwan and China, automotive parts and accessories are included on the Early Harvest List. As Taiwanese vendors have high demands for next-generation EV technologies, international vendors’ strengths in cell materials, motor controllers, light-weight motor materials, light-weight materials, cooling control and e-bus chassis will complement local resources.

Charging standards and government subsidies

As conductive charging systems increasingly emerge on the market, work to standardize the interface to the charging infrastructure is becoming a matter of urgency (UITP, 2016). The potential benefits of this standardization are manifold, primarily the economic benefits to operators thanks to ability to charge buses from different manufacturers and boosting the resale value of vehicles. In the coming years, governments at all levels need to demonstrate a commitment to e-bus technology and implement clear policies and guidelines to facilitate the provision of the required infrastructure.

Many countries have made an effort to subsidize policies that transform traditional diesel engine bus systems to a fleet of e-buses to reduce air pollution. However, e-buses cannot achieve economy of scale in the early stages of their development (Chiang, 2016). This is because it is more expensive to both purchase and operate them. In such a situation, the government is usually required to adopt a subsidy policy to assist the private sector with public transportation. For example, the Chinese government has already put subsidies in place for e-bus purchases in Beijing and is supporting transport companies in replacing their conventional buses with e-buses. The German government is also supporting different projects and programs in the field of electromobility, for example within the National Climate Protection Initiative.

POWER ELECTRONIC SYSTEM AND GOVERNMENT POLICY

This section focuses on the power electronic system and government policy through in-depth interviews as follows.

Power Electronic System

The power electronic system is the most valuable asset in an e-bus, because this system protects the most costly part of the bus, the battery (Tie & Tan, 2013). Therefore, performance is not e-bus manufacturers’ goal; protecting a battery’s life cycle is (Hu, Murgovski, Johannesson & Egardt, 2013). The capacity of most

batteries seems to drops to lower than 50% within a year or two in almost every e-bus. Most of the decreases are due to the same cause, a poor power electronic system. A good BMS can save the battery a bit, and a well-designed and well-put-together power electronic system is a must (Jinrui, Fengchun & Qinglian, 2006).

There are several steps to creating a good power system. First, a suitable motor must be selected (Ostadi et al., 2013). E-buses need much larger torque to take off; therefore, a permanent magnet (PM) motor is preferred to an induction motor (IM) (Beniakar, Sarigiannidis, Kakosimos & Kladas, 2014). Second, the correct voltage must be set so it performs well while meeting government regulations and is safe for bus operators who are not familiar with high voltage or do not have a license to operate high-voltage devices (Lei et al., 2014). Some e-buses use low voltage (300 V), and some use up to 800 V. Another important issue is the buffer in the system. A good buffer can be either a super capacitor or a lithium-titanate oxide battery, since they absorb energy much faster than a lithium ion battery (Barbosa, 2014). Although an auto-industry-grade super capacitor is extremely expensive, it performs better than competitive materials, and it is relatively light. A lithium-titanate oxide battery is expensive and rare today, but can replace almost the whole battery pack. As an alternative to buffers, some e-bus manufacturers use brake resistors to turn extra energy into heat depending on the need of the route. Fourth, software is the most important component of the control system. To run e-buses safely, good logic firmware has fail-proof features (Tian, Wu & Wang, 2015). Well-written control logic software may aid the power electronic system.

Government Policy

Different countries have different policies regarding e-buses. Electromagnetic interference (EMI) and electromagnetic compatibility (EMC) are the most difficult regulations for most e-bus manufacturers (Obayashi & Tsukahara, 2014). In most countries, a certain percentage of items are either selected by locals or must be chosen from local companies, such as motors and batteries. Depending on the local government, some even require the whole power electronic system be purchased locally to protect local companies. This regulation forces e-bus manufacturers to build a bus that is very flexible in terms of components.

Bus manufacturers do not need to use a different body shape to build an e-bus. Using the same rigs can save e-bus manufacturers millions of dollars immediately. However, when people think about e-buses, they expect buses to be a little different. Therefore, the interior is usually different compared to diesel buses; for example, the USB plugs are standard on an e-bus. Unlike passenger vehicles, bus life cycles are much longer, and manufacturers sometimes use the same shape for several decades (Ou, Yan & Zhang, 2010). Parts such as headlights, indicators and rearview mirrors are usually chosen from a limited selection, so most of the time different bus manufacturers use the same parts as well. Side panels, windows, and bumpers are still the same; however, the whole chassis layout will be very different. Currently, there are no government regulations on how the chassis must be built other than the same as the diesel bus chassis (Wayne, Clark, Nine & Elefante, 2004). Nonetheless, bus manufacturers foresee this will change as soon as more e-buses are on the road. Moreover, the number of batteries needed for e-buses is huge, and it is hard to get this much battery past some countries' custom houses (Hu et al., 2013). Some countries require the whole pack be analyzed, and this can take up to a year or even more, which delays the delivery of bus orders. To solve this issue, local battery cells, modules, and packs are usually used. E-bus manufacturers usually cooperate with local battery companies to solve the firmware issue as well.

TWO CASE STUDIES

BYD is committed to developing new green energy. January 2010, BYD's pure e-bus K9 was developed successfully. Since that, BYD has secured its leading role in the global new energy vehicle business (BYD, 2017). ALEEEES endeavors to develop high quality lithium ferrous phosphate (LFP) cathode materials that lead in the global market for consecutive 5 years. Owing to the high performance/cost ratio of LFP batteries, ALEEEES has integrated with Siemens in 2010, and sign the MOU with the lithium battery leading

brand, Japan SONY in 2014, and jointly to create the top electric bus (ALEEES, 2017). Consequently, this section chooses two cases, BYD and ALEEES, for understanding contemporary issues and technology developments based on critical aspects of the power electronic system and government policy.

In addition, the background of twelve invited experts is listed in Table 1.

Table 1. Experts' background

Category	Number	Background
Industrial practitioners	6	Three practitioners work at ALEEES company, and three practitioners work at BYD company.
Academic scholars	4	Two scholars specialize in electric vehicle fields, and two scholars specialize in power electronic system fields.
Institutional researchers	2	Two researchers are engaged in automobile industry analysis and policy projection

The data analysis questions for the twelve experts are also shown below:

1. Background questions
 - (1) What e-bus company do you work for and what position are you?
 - (2) How many years of experiences have you been in this company or related industry?
 - (3) What do you see in good or bad in this industry?
 - (4) Is there a competing company that you admire? If so, why?
2. Technical questions
 - (1) How many buses does your company produce a year?
 - (2) How many buses does your company sell a year?
 - (3) What type of battery does the bus use from your company?
 - (4) Is the battery charging type or swapping type?
 - (5) How many percentages does the battery degrade per year if any?
 - (6) What is the longest battery life you have so far?

Case 1: BYD

BYD is the leading e-bus manufacturer in China. Among all the companies, BYD manufactures the largest number of parts without partners. As the market grows and more technology is put into the design, most people are looking forward to see even more BYD e-buses running.

The Power Electronic System

BYD uses its own power electronic system designed specifically for the company's buses. Most of the electronic components were redesigned or remanufactured after they were purchased from big brands to keep costs low. For example, the rear axle used the same design as ZF in Germany, and the motor was made by ZF. On K9, the e-bus made by BYD, in-wheel motors are used in the rear wheels to power the bus. This was a good design, since it saved a huge amount of space. In-wheel motor was good in industrial design, but for a bus this size, in accidents that involve wheels or small objects in the wheel well, the in-wheel motor would most likely require replacing. This could potentially increase the cost over the bus's lifetime. As K9 is a charging e-bus, engineers decided to use a full aluminum body and chassis to lighten the overall weight. This helped the K9 to stay just under 14 ton dry weight, which is only slightly more than a standard diesel bus. However, the overall price increased by more than 30%. In addition, in China, materials in different orders do not always have the same quality; therefore, quality is often an issue. In collisions, aluminum is weaker than the traditional steel body, which also leads to potential higher maintenance costs over the bus's lifetime.

During trade shows and advertisements, all BYD buses had a solar panel on top of the roof to partially power the motor. The bus roof is the perfect place for solar panels, since it is a flat surface that exposed to

sunlight almost all the time. According to calculations, a full solar panel bus roof can provide an electric city bus up to 8 km range, or about half an hour of running time in traffic. Several experts observed that in the real world, solar panels are never installed to save costs, weather, and efficiency. Although half an hour of driving range might not be much for a charging e-bus, solar panels would be a good idea for a swapping e-bus.

Government Policy

In China, only one bus manufacturer in each province is allowed to sell new energy-source buses. The license is extremely difficult to apply for, and once it has been taken by one company, there was no replacement. BYD now controls the most licenses in China, for buses and passenger vehicles. It is very rare for a bus manufacturer to own this many licenses, using the same brand. With the Chinese government's support, BYD is now the most valuable e-bus manufacturer to investors. Unlike the European Union and other countries, the Chinese government currently has very loose regulations regarding e-buses. However, as the market grows and the supply increases, the rules will become more strict. As of now, no regulation specifies which charging plugs are recommended or standard battery cases. Although this seems like a good opportunity to enter the Chinese market, it is highly risky if the Chinese government decides to set regulations later. All e-buses sold then must meet the requirement or be retired.

Case 2: ALEEEES

ALEEEES is the leading e-bus manufacturer in Taiwan. The firm also has the most operating mileage among all e-bus manufacturers in the world. ALEEEES is also currently the only swapping e-bus manufacturer. According to the general manager of ALEEEES, although new twin-type e-buses are coming in the near future, their costs are even higher.

The Power Electronic System

The swapping e-bus is the main advantage of the ALEEEES bus, although the initial cost might be high. To swap the battery, ALEEEES designed a special swapping cart that carries battery packs and swaps out the depleted battery with a fully charged battery within 10 minutes. This way, there is no need to carry many batteries on board, which is especially beneficial in the city bus environment. Each ALEEEES bus carries 100 kWh, divided into four packs, which is one third of what charging e-bus carries. This reduces a significant amount of the bus's weight, which means better efficiency, or more passengers on board.

ALEEEES has two versions of e-buses. The first generation is a series type, using a total of four packs of battery in series, paired with a Chinese-made motor system. When this bus first came out back in 2011, it was shocking. After a short period, ALEEEES quickly realized that the series battery is not a very reliable solution. If one of the four or more battery packs has a problem, the bus immediately loses power. Then the second generation came out, with a parallel system, using Siemens power electronics. The parallel system means each battery pack has the total voltage, at 512 V; therefore, in case of an emergency, as long as one battery pack is still active, the bus will run. For the second-generation ALEEEES bus, Siemens (a German company) stepped in and provided a total solution for the electronic system. Two industrial-grade motors are linked in parallel with a summation gearbox, paired with two inverters to control each motor. The summation gearbox then links to the rear axle, made by ZF in Germany, along with the Continental ZR30 electronic controller. By working with the two largest companies in the industry, ALEEEES has operated successfully for the past few years.

Government Policy

Several practitioners have stated that the Taiwanese automotive government policy is the strictest in the world. In Taiwan, a new, well-built German car that passes U.S. and Japanese regulations might not be able to pass four out of the six tests during inspection. The Vehicle Safety Certification Center (VSCC) is the automotive safety organization in Taiwan, which oversees bus specifications. The Automotive Research & Testing Center (ARTC) is the inspection organization that enforces the requirements set by VSCC. When ALEEEES designs a bus, VSCC checks that the design fulfills all hardware specifications, and then ARTC inspects the entire bus with pollution tests, EMI/EMC tests, and durability. Each new-generation bus must undergo a 200,000 km road test. Sometimes a concentrated test is performed to save time, but the test is extremely hard to pass when it is high-level concentrated test. At the same time, not only must the bus be able to run for all 200,000 km, but also all the surrounding components have to meet the regulations, such as lighting, brakes, air compressors, power steering, and so on. The EMI/EMC test is difficult for most e-bus manufacturers in Taiwan. These tests show all the electro-magnetic waves that emit signals from the bus components. As a result, the ALEEEES second-generation bus is the only bus that has passed this test.

DISCUSSIONS

Technological competence and network competence have a significant positive impact on a company's innovation success (Gerçek, Saleem & Steel, 2016). Companies with high technological competence have greater innovation success than those with low technological competence. This is why BYD needs a highly capable design team to help them get to the next level of success. BYD also has a strong shareholder group that utilizes all kinds of support from different industries plus a good relationship with the government, which can help with the innovation of e-buses.

Risk and uncertainty are inherent in innovation activities whose objective is path generation, that is, breaking away from path dependencies to create new markets with pioneering technologies. Firms seeking competitive advantages therefore face a paradox. If they embrace diversity, they risk workplace conflict, and if they avoid diversity, they risk loss of competitiveness. ALEEEES faces this problem. It is the benchmark in reliability but cannot seem to improve sales. Creativity is a necessary precondition for successful innovation. ALEEEES already has creative products and design teams but still needs creative processes and the environment to make sure the firm remains the benchmark for the next decade.

The e-bus market is still in its nascent phase, and requires further development for the increased adoption of e-buses. Based on the in-depth interviews and the two real cases, we did identify the major two issues that affect the proliferation of e-buses, that is, the performance of power electronic systems and the support of government policy.

CONCLUSION

Summary

The potential for greening urban mobility and the associated benefits is enormous. With lower noise levels, improved air quality and vibration mitigation, cities can cut costs, increase property values and benefit from a modern "green" image. E-buses can effectively solve problems created by public transportation. However, various issues affect the proliferation of e-buses. This study aimed at detecting, analyzing and concluding contemporary issues of the e-bus industry through conducting in-depth interviews. These issues include battery technology, BMS, charging tower types, power supply grids, charging voltage and current, onboard chargers, firmware, motor systems, power converters, supply chain of components, parts and accessories, government regulations (i.e., EMI/EMC, local purchases, etc.), and so on. The power electronic system and government policies are the two most critical issues. The power electronic system is the most valuable asset for protecting costly batteries in an e-bus, and government policy represents the local regulations with which e-bus manufacturers must comply. Moreover, using the two cases, we can understand the different

approaches between BYD and ALEEEES based on the two aspects, power electronic system and government policy.

Suggestions for government policymakers

Policies that help boost e-bus sales will foster large-scale commercialization of electric vehicles. In particular, policies should more broadly distribute tax incentives for purchasing these vehicles, and federal electric-vehicle programs should be extended and expanded to provide direct financial incentives to e-bus manufacturers. The federal government should target e-bus policies in regions where cleaner, renewable electricity is already being generated. Furthermore, the transition to e-buses will be discouraged if e-bus drivers who need to charge their cars face excessive electricity prices. Utility providers must be encouraged to revisit their electricity rate designs, invest strategically in recharging infrastructure, and investigate the effectiveness of decoupling regulations.

Implications and future research

This paper did provide readers with perspective insights on the contemporary issues of e-bus industry. For anyone involved in the research of competitive advantages and those seeking strategies to enter the global e-bus markets, this paper should offer some necessary fundamentals in terms of theoretical analysis and problem resolution. Future research may further apply fuzzy multiple criteria decision-making (MCDM) methods to different contexts. For example, researchers may use fuzzy Delphi method to explore and screen the critical influence factors of e-bus industry and/or fuzzy decision-making trial and evaluation laboratory (fuzzy DEMATEL) method to analyze the causal relationships of these factors.

ACKNOWLEDGMENTS

We are grateful to the experts who were willing to participate in our interviews.

REFERENCES

- ALEEEES. (2017). Overview of ALEEEES. Available at <http://www.aleees.com/en/aboutus/overview.html> [Accessed 14 April, 2017]
- Barbosa, F. C. (2014). Pure electric bus traction technology overview- A path towards enhanced environmental performance and efficiency for transit bus fleets. *SAE Technical Paper 2014-36-0205*.
- Beniakar, M. E., Sarigiannidis, A. G., Kakosimos, P. E., & Kladas, A. G. (2014). Multiobjective evolutionary optimization of a surface mounted PM actuator with fractional slot winding for aerospace applications. *IEEE Transactions on Magnetics*, 50(2): 665-668.
- Burmeister, F., Schnieder, L., & Kurczveil, T. (2015). Simulation Based Studies on the Integration of Battery-Electric Vehicles in Regional Bus Services. Paper presented at the 2015 IEEE 18th International Conference on Intelligent Transportation Systems, Las Palmas, Spain, September.
- BYD. (2017). Company profile of BYD. Available at <http://www.byd.com/la/aboutus/profile.html> [Accessed 14 April, 2017]
- Chiang, M.-C. (2016). An analysis of operating costs under the assumption of five different government subsidy policies. Master's Thesis. Chiayi: National Central University, Taiwan.
- Dan, W., Dan, X., & Binggang, C. (2013). Overview on key techniques of electric vehicle [J]. *Engineering Sciences*, 15(1): 68-72.

- DiCicco-Bloom, B., & Crabtree, B. F. (2006). The qualitative research interview. *Medical education*, 40(4): 314-321.
- Gercek, G., Saleem, N., & Steel, D. (2016). Networked Services Outsourcing for Small Businesses: A Lifecycle Approach. *Journal of Global Business and Technology*, 12(1): 23-32.
- Hu, X., Murgovski, N., Johannesson, L., & Egardt, B. (2013). Energy efficiency analysis of a series plug-in hybrid electric bus with different energy management strategies and battery sizes. *Applied Energy*, 111: 1001-1009.
- Jinrui, N., Fengchun, S., & Qinglian, R. (2006). A study of energy management system of electric vehicles. Paper presented at the Vehicle Power and Propulsion Conference, Windsor, UK, September.
- Lei, D., Yang, F., Jiaen, D., Changsheng, Y., Ping, Y., & Xiao, Y. (2014). Active Voltage Control enhances overall operating efficiency of traction motor in electric bus. Paper presented at the 2014 IEEE Conference and Expo on Transportation Electrification Asia-Pacific, Beijing, China, August.
- Lucas, S. R. (2014). Beyond the existence proof: ontological conditions, epistemological implications, and in-depth interview research. *Quality & Quantity*, 48(1): 387-408.
- MacKechnie, C. (2014). Electric buses - An introduction. Available at http://publictransport.about.com/od/transit_vehicles/a/electric-buses-an-introduction.htm [Accessed 5 January, 2017]
- Miles, J., & Potter, S. (2014). Developing a viable electric bus service: The Milton Keynes demonstration project. *Research in Transportation Economics*, 48: 357-363.
- Moraes, S. (2013). The strategic implications of alliances for the internationalization of firms in emerging countries: the case of TOTVS. *Journal of Global Business and Technology*, 9(2): 12-25.
- Obayashi, S., & Tsukahara, H. (2014). EMC issues on wireless power transfer. Paper presented at the 2014 International Symposium on Electromagnetic Compatibility, Tokyo, Japan, May.
- Ostadi, A., Kazerani, M., & Chen, S.-K. (2013). Hybrid Energy Storage System (HESS) in vehicular applications: A review on interfacing battery and ultra-capacitor units. Paper presented at the 2013 IEEE Transportation Electrification Conference and Expo, Detroit, MI, June.
- Ou, X., Yan, X., & Zhang, X. (2010). Using coal for transportation in China: Life cycle GHG of coal-based fuel and electric vehicle, and policy implications. *International Journal of Greenhouse Gas Control*, 4(5): 878-887.
- Pihlatie, M., Kukkonen, S., Halmeaho, T., Karvonen, V., & Nylund, N.-O. (2014). Fully electric city buses- The viable option. Paper presented at the IEEE International Electric Vehicle Conference, Florence, Italy, December.
- Research, P. S. M. (2016). Global electric bus market size, share, development, growth and demand forecast to 2025 - Industry insights by technology. Available at <https://marketpublishers.com/report/equipment/global-electric-bus-market-size-share-development-growth-n-demand-forecast-to-2020.html> [Accessed 2 December, 2016]
- Siemens. (2015). Fully electric city buses for environmentally friendly short-haul transport. Available at [http://www.siemens.com/press/en/feature/2013/infrastructure-cities/rail-systems/2013-07-ebus.php?content\[\]=MO](http://www.siemens.com/press/en/feature/2013/infrastructure-cities/rail-systems/2013-07-ebus.php?content[]=MO) [Accessed 6 February, 2017]
- Stake, R. E. (1983). The case study method in social inquiry. In *Evaluation Models* (pp. 279-286). Netherlands: Springer.
- Stiehler, B. E., & Tinson, J. S. (2015). Opportunistic luxury branding: understanding perceptions of brand authenticity in an emerging market context. *Journal of Global Business and Technology*, 11(1): 39-55.
- Tian, S., Wu, L., & Wang, Y. (2015). Simultaneous optimization of power train parameter and control strategy in a plug. In *Hybrid Electric Bus*. SAE Technical Paper 2015-01-2828.
- Tie, S. F., & Tan, C. W. (2013). A review of energy sources and energy management system in electric vehicles. *Renewable and Sustainable Energy Reviews*, 20: 82-102.
- UITP. (2016). Towards a standard for electric bus charging. Available at <http://www.uitp.org/news/electric-buses-charging-standardisation> [Accessed 3 November, 2016]
- Wayne, W. S., Clark, N. N., Nine, R. D., & Elefante, D. (2004). A comparison of emissions and fuel economy from hybrid-electric and conventional-drive transit buses. *Energy & fuels*, 18(1): 257-270.
- Yin, R. K. (2013). *Case Study Research: Design and Methods*. Sage publications.

RELATIONSHIP INTENTION AND CUSTOMER SATISFACTION AS PREDICTORS OF SOUTH AFRICAN SMES' LOYALTY TOWARDS A RISK FINANCIER

P. G. (Pierre) Mostert, T. F. J. (Derik) Steyn, and M. H. (Retha) Mentz

ABSTRACT

Despite organisations' efforts to build and maintain mutually beneficial long-term relationships with customers, not all customers want to reciprocate such relationship building efforts with supplier organisations. It is thus essential that organisations focus their relationship marketing efforts on those customers displaying the intention to build relationships. Organisations must also realise the importance of ensuring customer satisfaction, as there is a positive relationship between customer satisfaction and customer loyalty. The purpose of this study was to determine the extent to which SMEs' relationship intentions and customer satisfaction predict their loyalty to a South African risk financier. Results from hierarchical multiple regression indicate that SMEs' relationship intentions and their satisfaction predict their loyalty towards their risk financier. It was also established that SME customers' satisfaction fulfilled a mediating role between their relationship intentions and loyalty towards the risk financier. This study broadens the current understanding of customer loyalty, especially in B2B settings.

Keywords: Relationship intention; customer satisfaction; customer loyalty; small and medium enterprises (SME); B2B relationships

INTRODUCTION

Policy makers, economists, and business professionals agree that small and medium enterprises (SMEs) are the driving force of economic development and growth, especially in developing countries (Entrepreneur, 2013; Fatoki & Odeyemi, 2010; UCS, 2011). The importance of SMEs in developing economies such as South Africa becomes apparent when it is estimated that 91 per cent of recognised businesses in the country are SMEs (UCS, 2011), contributing approximately 54 per cent towards the GDP and providing nearly 61 per cent of private sector employment (Fatoki & Odeyemi, 2010).

***P.G. (Pierre) Mostert** (School of Business Management and WorkWell Research Unit, North-West University, South Africa) works on services and relationship marketing related research topics.*

***T.F.J. (Derik) Steyn** is Professor of Marketing in the School of Graduate and Professional Studies at Cameron University, Lawton, Oklahoma, USA where he teaches services marketing, retailing, international marketing and marketing management.*

***M.H. (Retha) Mentz** is a PhD Graduate at the School of Business Management and WorkWell Research Unit, North-West University, South Africa. She is currently a Senior Investment Manager at Business Partners Limited, a specialist risk finance company for SMEs in South Africa and selected African countries.*

RELATIONSHIP INTENTION AND CUSTOMER SATISFACTION AS PREDICTORS OF SOUTH AFRICAN SMES' LOYALTY TOWARDS A RISK FINANCIER

Despite an estimated six million SMEs operating in the country (Entrepreneur, 2013; UCS, 2011), it is increasingly difficult for South African financiers who service SMEs to become the service provider of choice and to retain their customers in an industry marked by fierce competition (Coetzee, Van Zyl & Tait, 2013). Additionally, with as many as 71 per cent of SMEs predicted to fail within the first two years (Davies in Kgosana, 2013), it is not surprising that commercial banks and equity and risk financiers try to retain their profitable SME customers despite finding it difficult to differentiate their products and services from competitors (Jesri, Ahmadi & Fatehipoor, 2013). The high failure rate of SMEs is, however, not unique to South Africa, with many other developing countries, such as Uganda, experiencing similar trends (Tushabomwe-Kazooba, 2006). Retaining of successful SMEs thus seems essential to financiers operating in developing countries.

Arguably the best way for financial service providers like risk financiers to retain SME customers is by creating customer loyalty through building long-term relationships (Mende, Bolton & Bitner, 2013). However, despite the rationale for organisations wishing to build long-term relationships with their customers, not all customers want to enter into relationships with organisations (Gilaninia, Almani, Pournaserani & Javad, 2011; Jones, Reynolds, Arnold, Gabler, Gillison & Landers, 2015; Kumar, Bohling & Ladda, 2003; Parish & Holloway, 2010). Gounaris, Tzempelikos and Chatzipanagiotou (2007) underline the importance of studying customers' relationship intentions, as this serves as an indication of customer commitment to the business relationship –and thus of customer loyalty. It is essential that financiers targeting SMEs identify those customers who display relationship intentions, as such customers will be more inclined to building organisational relationships (Conze, Bieger, Laesser & Riklin, 2010; Kumar *et al.*, 2003; Leahy, 2011; Raciti, Ward & Dagger, 2013).

In addition to considering SME customers' relationship intentions, it may also be important to consider their satisfaction, as it has been suggested that customer satisfaction is fundamental to achieving success and survival in a competitive market-place (Ndubisi & Wah, 2005). The importance of ensuring customer satisfaction lies in the belief that it can pave the way to loyalty and ultimately to customer retention (Aksoy, Keiningham & Bejou, 2008; Gounaris *et al.*, 2007; Kakeeto-Aelen, van Dalen, van den Herik & van de Walle, 2014).

Despite the apparent link between customer satisfaction and loyalty, Pan, Sheng and Xie (2012) argue that a broader conceptual framework is needed to understand customer loyalty in a business-to-business (B2B) context. Also, the effectiveness of relationship marketing and building long-term relationships with SME customers, and in particular within a developing country perspective, has not sufficiently been researched (Kakeeto-Aelen *et al.*, 2014). In responding to the call of Kakeeto-Aelen *et al.* (2014) and Pan *et al.* (2012), the primary objective of this study was to determine the extent to which SMEs' relationship intentions and customer satisfaction predict their loyalty within a developing country, specifically the South African B2B financing environment.

LITERATURE REVIEW

Relationship marketing

Relationship marketing refers to a marketing philosophy that emphasises establishing, building, and maintaining mutually beneficial long-term relationships with customers (Morgan & Hunt, 1994). As organisations recognise the importance of retaining customers (Chaman, Masoumi, Moghadam & Shaabani, 2013; Clark & Melancon, 2013; Raza & Rehman, 2012), relationship marketing is acknowledged as important for organisational survival in increasingly competitive markets (Kumar, 2014). Retaining customers in long-term relationships offers organisations a competitive advantage (Gilaninia *et al.*, 2011) and improves financial performance and profitability (Hoffman & Bateson, 2011; Palmer 2011; Sweeney, Soutar & McColl-Kennedy,

2011) due to the fact that it is more profitable to retain existing customers than it is to recruit new ones (Kaur, 2016; Mende *et al.*, 2013; Palmer 2011; Sweeney *et al.*, 2011). This facilitates organisational survival.

Other benefits organisations can expect to gain from following a relationship marketing approach include greater insight into customer needs (Gilaninia *et al.*, 2011); increased customer satisfaction (Mende *et al.*, 2013; Gilaninia *et al.*, 2011); enhanced customer life-time value (Gamble, Stone, Woodcock & Foss, 2006); reduced customer defection rates (Gamble *et al.*, 2006); customers spending more with the organisation; and customers spreading positive word-of-mouth about the organisation (Hoffman & Bateson, 2011).

When considering the benefits of the relationship marketing approach, it is not surprising that organisations would want to build relationships with their customers (Leahy, 2011; Parish & Holloway, 2010). However, since not all customers want to reciprocate the relationship building efforts of organisations (Gilaninia *et al.*, 2011; Jones *et al.*, 2015; Parish & Holloway, 2010), organisations stand a better chance of success by directing their relationship marketing efforts to those customers who display the intention to build relationships (Conze *et al.*, 2010; Kumar *et al.*, 2003; Leahy, 2011; Raciti *et al.*, 2013).

Relationship intention

‘Relationship intention’ refers to a customer’s intention to build a relationship with an organisation while buying products or services attributed to the organisation (Kumar *et al.*, 2003). Customers without relationship intention may not be profitable to the organisation, and relationship building attempts with such customers may be wasted (Tai & Ho, 2010). Kumar *et al.* (2003) argue that relationship intention should be measured with five constructs: involvement, expectations, fear of relationship loss, forgiveness, and feedback.

Involvement

Kumar *et al.* (2003:670) view involvement as the degree to which a customer willingly intends to engage in a relationship with an organisation without any intimidation or obligation to do so. Highly-involved customers are more likely to build long-term relationships with organisations (Varki & Wong, 2003). This view is based on the belief that customer commitment is the result of continuous involvement with an organisation (Pillai & Sharma, 2003). It has also been established that involved customers are more likely to form bonds with organisations (Moore, Ratneshwar & Moore, 2012) and that customers with a high degree of involvement will be more inclined to provide feedback about service delivery to organisations (Scott & Vitartas, 2008). Tai and Ho (2010) also found that, in a B2B setting, information-sharing (as evidence of involvement in a relationship) positively influences customers’ relationship intention. It has thus been postulated that involvement will result in greater customer satisfaction, and that involved customers will feel guilty about buying similar products or services from competing organisations (Kumar *et al.*, 2003).

Expectations

Customer expectations refers to how customers anticipate the service will be delivered (Kim, Ok & Canter, 2012). Although expectations are automatically formed when customers buy products or services (Kumar *et al.*, 2003), they are also formed by customers’ perceptions from past experience (Harris, 2009). Managing customer expectations before, during, and after the service experience is important (Sharma, Tam & Kim, 2012), as it has been established that customers’ expectations serve as a reference point when determining their satisfaction with actual service delivery (Berry & Parasuraman, 1997). Since higher customer expectations result in greater concern about an organisation, customers with higher expectations will be more likely to build relationships with organisations than those with lower expectations (Kumar *et al.*, 2003).

Fear of relationship loss

Kumar *et al.* (2003) propose that, if customers are concerned about a possible loss of their relationship with an organisation, its employees, or the services it offers, they will tend to show a higher relationship intention. Leverin and Liljander (2006) support this view by explaining that when relationships are established

between customers and organisations, customers may be reluctant about switching to a competitor. So, for the purpose of this discussion, fear of losing the relationship is based on the 'switching costs' (the consequences) of terminating an existing relationship and pursuing a new relationship. The switching costs can include economic risk costs, learning costs, set-up costs, evaluation costs, benefit loss costs, monetary loss costs, personal relationship loss costs, and brand relationship costs (Burnham, Frels & Mahajan, 2003; Egan, 2004). The more services customers use from a particular organisation, the higher will be their perceived switching cost (Burnham *et al.*, 2003) and fear of relationship loss. Pan *et al.*, (2012) concur with this view; they explain that, especially in a B2B setting, customers may experience higher switching costs and so will be reluctant to switch providers. Smaller B2B customers of financial service providers may experience higher switching costs due to their weak negotiating power when dealing with financial service providers; and, fearing the loss of such services, they will focus on establishing exclusive long-term relationships with their financial service providers (Marinković & Senić, 2012).

Forgiveness

McCullough, Berry, Luna, Tabak and Bono (2010) found that the willingness to forgive organisations when service failures occur may be influenced by the nature of customers' relationships with the organisations. Kumar *et al.* (2003) suggest that customers who willingly engage in a relationship with an organisation show a greater likelihood of forgiving the organisation, even if their expectations have not been met. The reason for this is that customers value the relationship more highly than the unfulfilled expectations (Kumar *et al.*, 2003). Customers may thus choose to forgive organisations when they experience service failures, as forgiveness can release the negative emotions associated with the failure. This may move customers to reinstate the relationship with the service provider (Tsarenko & Tojib, 2011). Kumar *et al.* (2003) accordingly propose that the willingness to forgive is indicative of relationship intention.

Feedback

Richey, Skinner and Autry (2007) are of the opinion that a two-way dialogue between customers and organisations is a prerequisite for developing a relationship. Customers communicate with organisations in the form of feedback (whether positive or negative), thereby giving organisations insight into what they are doing right and where they should improve. Wirtz, Tambyah and Mattila (2010) concur: organisations, they explain, can use positive feedback to identify strengths, whereas negative feedback (usually in the form of complaints) can be used to identify problem areas that should be improved to ensure greater customer satisfaction. Kumar *et al.* (2003) postulate that customers who have higher relationship intentions will more frequently provide positive and negative feedback to organisations without expecting a reward.

Customer satisfaction

In its simplest form, customer satisfaction occurs when customers' experiences meet or exceed their expectations (Esbjerg, Jensen, Bech-Larsen, de Barcellos, Boztug & Grunert, 2012). Customer satisfaction can be based on a single encounter; or it can be assessed over a longer period (also called 'overall satisfaction'), through which the positive outcome of experiences encountered over a lifetime of association with an organisation is considered (Abdul-Muhmin, 2005). From a B2B perspective overall satisfaction entails all the elements of a relationship that a customer finds rewarding, profitable, frustrating, problematic, or inhibiting (Abdul-Muhmin, 2005). For the purpose of this study, customers' overall satisfaction is considered as a single construct.

The importance of achieving customer satisfaction when trying to build relationships with customers lies in the fact that customer satisfaction is essential when customers decide whether to enter into a long-term relationship with an organisation (Cooil, Keiningham, Aksoy & Hsu, 2007; Mgxaji, Chinomona & Chuchu, 2016:66). This view is echoed by Halimi, Chavosh and Choshali (2011), who found that satisfied customers are more motivated to build relationships with organisations than are dissatisfied customers.

Achieving customer satisfaction is thus not only an important first step in creating relationships with customers: it also offers a number of other benefits to organisations, including satisfied customers showing a greater tolerance for mistakes, spreading positive word-of-mouth, and spending more on other products and services offered by the organisation (Ndubisi & Wah, 2005; Rese, Hundertmark, Schimmelpfennig & Schons, 2013). It has also been established that satisfied customers have higher repurchase intentions (Curtis, Abratt, Rhoades & Dion, 2011) and that customer satisfaction leads to customer loyalty (Goncalves & Sampaio, 2012; Aksoy *et al.*, 2008). Specifically within the South African B2B context, Theron, Terblanche and Boshoff (2012) have established a positive relationship between customer satisfaction and customer loyalty.

Customer loyalty

Oliver (1999:34) defined customer loyalty as “... the deeply held commitment to re-buy or re-patronize a preferred product/service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior”. Loyalty is also conceptualised as the strength of a customer’s attachment to an organisation or its brands, and the intention by the customer to re-patronise the same organisation more often over a period of time, notwithstanding competing alternatives (Egan, 2004; Pan *et al.*, 2012). From the above it can be surmised that loyalty is a complex, multi-dimensional construct with attitudinal and behavioural components (Pan *et al.*, 2012). Following Pan *et al.*’s (2010) conclusion that attitudinal loyalty could be viewed as “a plausible surrogate of behavioural loyalty”, this study consider customers’ overall loyalty.

The importance of studying customer loyalty lies in the fact that marketing scholars view customer loyalty as one of the primary goals of relationship marketing (Homburg, Müller & Klarman, 2011; Newell, Belonax, McCardle & Plank, 2011), as it is believed that customer loyalty paves the way to retaining customers (Christopher, Payne & Ballantyne, 2004). Customer loyalty is also associated with the free advertising given by retained customers through positive word-of-mouth communication, and with repeat sales, reduced operational and marketing costs, and ultimately greater profits and return on investment (Hoffman & Bateson, 2011; Kaur, 2016).

As can be seen from the discussion thus far, not all customers want to build long-term relationships with organisations (Gilaninia *et al.*, 2011; Parish & Holloway, 2010). In an effort to build customer loyalty, therefore, it stands to reason that organisations should focus their efforts on those customers displaying relationship intentions (Raciti *et al.*, 2013; Leahy, 2011; Kumar *et al.*, 2003). This view is supported by Bresler (2013) and Conze *et al.* (2010), who suggest that there is a positive relationship between relationship intention and customer loyalty. It can accordingly be hypothesised:

H₁: SME customers’ relationship intention significantly predicts their loyalty.

In addition to considering customers’ relationship intention when trying to build customer loyalty, it is also important that organisations realise the importance of customer satisfaction, as it is believed that there is a positive relationship between customer satisfaction and customer loyalty (Hansen, 2012; Ishaq, 2012; Raza & Rehman, 2012). Previous research supports this view by establishing that customer loyalty cannot exist without customer satisfaction, and that in fact customer satisfaction leads to customer loyalty (Chandrasekar, 2010; Moutinho & Southern, 2010; Marshall & Johnston, 2011). It can accordingly be hypothesised:

H₂: SME customers’ satisfaction significantly predicts their loyalty.

Considering the hypothesised relationships between SME customers’ relationship intention and customer loyalty, and between customer satisfaction and customer loyalty, it can also be hypothesised:

H₃: SME customers’ relationship intention and satisfaction, in combination, significantly predict their loyalty.

METHOD

Research context and study population

The study population for this study included the SME customers of Business Partners Limited (BPL), a leading South African and African risk financier that offers both debt and equity financing (BPL, 2013). BPL approved 380 business investments valued at R 1.1 billion during the 2014/2015 financial year (BPL, 2016). BPL was initially established in 1981 as the Small Business Development Corporation with the aim of investing capital, skills, and knowledge in viable entrepreneurial enterprises in South Africa and later also in Africa. Moving in a strategic new direction, the business was re-launched as Business Partners Limited in 1998. BPL was the first business in the financial services industry in South Africa to be certified with ISO accreditation (ISO 9001) (BPL, 2011).

Data collection

An email inviting potential respondents to participate in the study was distributed to BPL's customer base. The email contained a link that, if clicked on, would redirect respondents to the website where the questionnaire was hosted (www.questionpro.com). To encourage SMEs to participate in the study, a letter by a BPL executive director explaining the purpose of the study and requesting customers to participate in the study was attached to the email. Of the 1 028 e-mails sent, Microsoft Outlook confirmed 993 emails successfully delivered. Due to a low response rate – initially only 47 completed questionnaires were received – a reminder email was sent out four times over a period of almost two months to encourage potential respondents to participate in the study. From the five requests to participate in the study, 120 complete questionnaires were received.

Questionnaire and pretesting

The questionnaire used in the study, compiled from an extensive literature review of relevant constructs, comprised a number of sections. First, the categorisation information from the SMEs who participated in the study was established. Next, respondents' relationship intentions were determined by adopting the scale proposed by Kruger and Mostert (2012). Respondents' satisfaction with BPL was measured with seven items adapted from Bruner (2009), while their loyalty was determined by means of six items adapted from Bruner (2009). All items were measured on unlabelled 10-point Likert-type scales where 1 represented 'strongly disagree' and 10 represented 'strongly agree'. The questionnaire was pretested with 12 respondents from the study population, leading to minor language and editing changes before the final questionnaire was fielded.

Data analyses

Exploratory factor analyses, using principal axis factoring and Varimax rotation, were performed to reduce the dimensionality of the data and to evaluate the construct validity of the measurement scales used in the study (Hair, Black, Babin & Anderson, 2014; Field, 2013). Subsequently the reliability of each measuring scale was determined by calculating Cronbach's alpha coefficients. Once validity and reliability had been established, mean scores (M) and standard deviations (SD) for each composite construct were calculated. To test the hypotheses formulated for the study, a confidence level of 95 per cent, implying statistically significant findings where $p \leq 0.05$ was used (Hair *et al.*, 2014).

A hierarchical multiple regression analysis was conducted to determine whether SMEs' relationship intention and satisfaction with their risk financier predict their loyalty. Using hierarchical multiple regression, independent variables (relationship intention and customer satisfaction) are entered into the equation in steps to determine each variable's contribution to the prediction of the dependent variable (customer loyalty) after the previous independent variable entered into the equation has been controlled for (Field, 2013).

RESULTS

Sample profile

The majority of the respondents were either owners (53 per cent) or co-owners (21 per cent) of their SME. In relation to industry classification, most SMEs operated in manufacturing (21 per cent), catering, accommodation and other trade (20 per cent), retail and motor trade and repair services (18 per cent), or finance and business services (15 per cent). With respect to the number of employed staff, almost 42 per cent of SMEs employed between 11 and 49 employees, 23 per cent employed between five and 10 employees, and almost 17 per cent had fewer than five employees. The majority of the SMEs' annual turnover was between R2 million and R4,999,999 (32.5 per cent), less than R2 million (25.9 per cent), between R5 million and R19,999,999 (22.5 per cent), or more than R20 million (16.6 per cent). Three respondents (2.5 per cent) did not indicate their annual turnover. Finally, most of the SMEs have been customers of BPL for five to 10 years (27 per cent), between one and three years (25 per cent) or between three and less than five years (18 per cent).

Validity and reliability

According to Field (2013) data can be considered appropriate for factor analysis if the Bartlett's test of sphericity is significant ($p < 0.0001$) and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (MSA) is greater than 0.5. For all exploratory factor analyses performed, the Bartlett's tests of sphericity were significant ($p < 0.0001$) and the KMO MSA yielded satisfactory results for each measuring scale (respectively 0.831 for relationship intention, 0.898 for satisfaction, and 0.904 for customer loyalty). Due to the relatively small sample size (120), only factor loadings larger than .50 were retained to ensure that the loadings were considered significant (Hair *et al.*, 2014). All extracted factors from the factor analyses had Eigenvalues larger than 1, and were accordingly retained and labelled (Field, 2013) as relationship intention, satisfaction, and customer loyalty.

Next, the reliability of each scale was determined by means of Cronbach's alpha coefficient values, where values larger than .70 were indicating acceptable reliability (Hair *et al.*, 2014; Field, 2013). Since all the extracted factors had Cronbach's alpha coefficient values larger than .70 (relationship intention = .917, satisfaction = .983, and customer loyalty = .992), the measuring scales were deemed to be uni-dimensional, resulting in the authors computing composite scores for each extracted factor (Hair *et al.*, 2014).

Hierarchical multiple regression

A hierarchical multiple regression was performed to determine the extent to which respondents' relationship intention and their satisfaction with their financier predicted their loyalty. Before performing the regression, the authors ensured that the assumptions – sample size, presence of outliers, multicollinearity and singularity, and normality, linearity and homoscedasticity (Field, 2013; Hair *et al.*, 2014; Tabachnick & Fidell, 2014) – were met before the results from the hierarchical multiple regression were interpreted. These results are presented in Table 1.

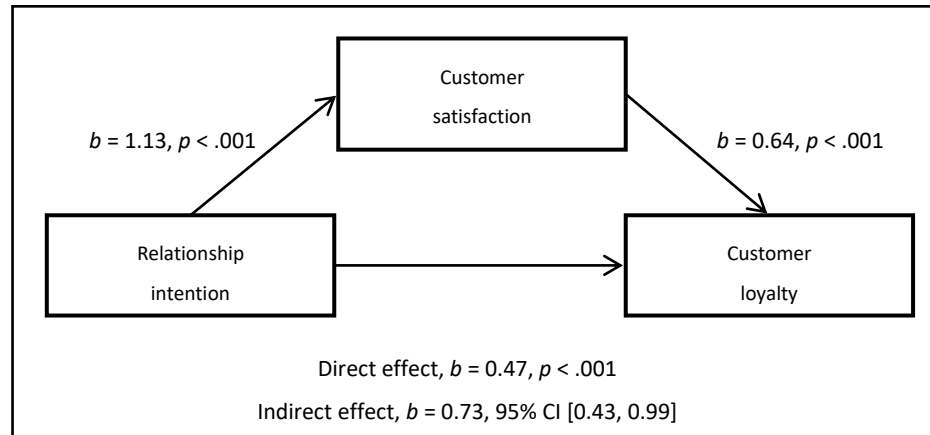
Table 1: Summary of hierarchical multiple regression analysis for variables predicting loyalty

Variable	β	t	p -value	R	R ²	ΔR^2
Model 1				0.658	0.433	0.433
Relationship intention	0.658	9.500	0.000*			
Model 2				0.788	0.622	0.188
Relationship intention	0.258	3.334	0.001*			
Satisfaction	0.590	7.630	0.000*			

*Statistically significant ($p < 0.05$)

It can be seen in Table 1 that the first model, including only relationship intention as a predictor of customer loyalty, produced a coefficient of determination (R-square value) of 0.433, indicating that relationship intention explained 43.3 per cent of the variance in customer loyalty. When customer satisfaction was added as a second predictor in the regression model, the coefficient of determination improved to 0.622, thus implying that relationship intention and customer satisfaction in combination explained 62.2 per cent of the variance in customer loyalty. Thus including customer satisfaction as a second predictor in the regression equation explained an additional 18.8 per cent of the variance in loyalty. It can also be seen that, for the first model, relationship intention is a statistically significant predictor of customer loyalty ($\beta = 0.658$, $p < 0.05$), and that, for the second model, both relationship intention and satisfaction are statistically significant ($p < 0.05$) predictors of customer loyalty. Of the two predictors, satisfaction recorded a higher beta value ($\beta = 0.590$, $p < 0.05$) than relationship intention ($\beta = 0.258$, $p < 0.05$). Hypothesis 1 (SME customers' relationship intention significantly predicts their loyalty towards the risk financier) (β value = 0.658; $p < 0.05$), hypothesis 2 (SME customers' satisfaction significantly predicts their loyalty towards the risk financier) (β value = 0.590; $p < 0.05$), and hypothesis 3 stating that SME customers' relationship intention and satisfaction, in combination, significantly predict their loyalty towards the risk financier (relationship intention: β value = 0.258; $p < 0.05$; satisfaction: β value = 0.590; $p < 0.05$) are *therefore supported*. Considering these results, a mediation analysis to determine whether respondents' satisfaction is a mediator between their relationship intentions and their loyalty towards the risk financier was performed.

To perform the mediation, bootstrapping resampling was done. Results indicated a significant indirect effect between relationship intention and customer loyalty through customer satisfaction ($b = 0.73$, BCa CI [0.427, 0.987]), thereby providing evidence for a mediation effect. To determine the practical effect size of the mediation effect, the kappa-squared (κ^2) effect size was calculated, resulting in a large effect, $\kappa^2 = .40$, 95 per cent, BCa CI [.26, .52] (Preacher & Kelly, 2011, in Field, 2013). Although Field (2013) is of the opinion that it is better to interpret the bootstrap confidence intervals (as shown above) than to conduct formal tests of significance, the authors also interpreted the results from the Sobel test performed. The results of this test (size of indirect effect: $b = 0.725$, z -score: $z = 6.05$, and p -value: $p < .0001$) confirmed the significant indirect effect, and thus the mediation effect of customer satisfaction between relationship intention and customer loyalty. The results from the analysis are shown in Figure 1.

Figure 1: Customer satisfaction as mediator between relationship intention and customer loyalty

DISCUSSION AND RECOMMENDATIONS

Despite organisations' efforts to build and maintain mutually beneficial long-term relationships with customers as a customer retention strategy (Kumar, 2014; Morgan & Hunt, 1994), it has been established that not all customers want to reciprocate relationship building efforts with organisations (Gilaninia *et al.*, 2011; Parish & Holloway, 2010). It is thus essential that organisations focus their relationship marketing efforts on those customers who display the intention to build relationships (Conze *et al.*, 2010; Kumar *et al.*, 2003; Leahy, 2011; Raciti *et al.*, 2013). In addition to focusing on those customers who display relationship intentions, organisations must recognise the importance of ensuring customer satisfaction, as it is believed that there is a positive relationship between customer satisfaction and customer loyalty (Hansen, 2012; Ishaq, 2012; Raza & Rehman, 2012).

With the expressed need for a broader conceptual framework to understand customer loyalty in a B2B context (Pan *et al.*, 2012) and in particular under SMEs within a developing country perspective (Kakeeto-Aelen *et al.*, 2014), this study set out to determine the extent to which SME customers' relationship intention and satisfaction predict their loyalty to a financier within the South African B2B financing environment.

The results of this study indicate that SME customers' relationship intention significantly predict their loyalty towards their risk financier, BPL. This finding supports previous research that suggests a relationship between customers' relationship intention and loyalty (Bresler, 2013; Conze *et al.*, 2010). More specifically, the finding confirms the hypothesis of Kumar *et al.* (2003) that customers' relationship intention will ultimately lead to customer loyalty. It is therefore recommended that financiers direct their relationship marketing spending towards customers who show relationship intention. Marketers should also attempt to increase the relationship benefits for such customers, since these benefits could increase customer willingness to build long-term relationships (Wei, McIntyre & Soparnot, 2014; Conze *et al.*, 2010). This strategy could be especially effective, since customers with relationship intention fear the loss of such relationships (Kumar *et al.*, 2003), thereby decreasing the chances of them defecting to competitors when relationships have been formed (Leverin & Liljander, 2006). This recommendation is supported by research findings indicating that SMEs within a developing country, namely India, are reluctant to switch to competitors within a financial services environment due to perceived switching barriers (Kaur, 2015).

In line with previous research (Chandrasekar, 2010; Moutinho & Southern, 2010; Marshall & Johnston, 2011), it was also established that SME customers' satisfaction predicts their loyalty to their risk financier. This finding also supports previous research among SMEs within a developing country, namely Uganda, where it was established that SMEs' satisfaction significantly impact their loyalty (Kakeeto-Aelen *et*

al., 2014). Accordingly, it can be recommended that financiers and service providers in similar industries servicing SMEs not only meet customer expectations and needs, but exceed them. It can furthermore be recommended that financiers not only establish customers' satisfaction levels, but also determine customers' expectations about all products and services offered. This will ensure that any gaps between the customers' expectations and wants on the one hand, and the organisation's perceived product and service delivery on the other, are limited (Parasuraman, Zeithaml & Berry, 1985). By doing so, customers' unique needs will be established, leading to customer being treated individually, thereby possibly increasing customer satisfaction, as established by Fatima and Razzaque (2014) under banking customers in Bangladesh. Also, research by Ozuem, Thomas and Lancaster (2016) established that the sustainability of B2B relationships, within a small island economy, should be based on high levels of product and service performance and the willingness of service providers to acknowledge and respond to customer needs. Meeting and exceeding customer needs in developing countries could thus result in increased customer satisfaction.

It was finally established that customers' relationship intention and satisfaction, in combination, predict their loyalty towards their risk financier. In fact, it was determined that customers' satisfaction fulfilled a mediating role between their relationship intention and their loyalty towards the risk financier. This implies that, despite the direct relationship between relationship intention and customer loyalty, customers' satisfaction with the risk financier plays an additional indirect complementary role in this relationship. Although previous studies considered the relationship between customers' relationship intention and their loyalty (Bresler, 2013; Conze *et al.*, 2010) and between customer satisfaction and loyalty (Hansen, 2012; Ishaq, 2012; Raza & Rehman, 2012), no studies could be found that considered the influence of both predictors, in combination, on customer loyalty. This study thus broadens the current understanding of customer loyalty, and especially so in a B2B setting. It can therefore be recommended that B2B risk financiers, and financial service providers in similar industries such as banking and insurance, identify customers with relationship intention and make additional investments to ensure these customers' satisfaction. The combination of customer relationship intention and satisfaction should result in increased customer loyalty.

Considering the fact that not all customers want to build relationships with organisations, the findings of this study can be applied to similar services (Shi, Bu, Ping, Liu & Wang, 2016), such as other financial services, consulting and legal services, where the sub-dimensions forming customers relationship intentions (i.e. involvement, forgiveness, feedback, expectations and fear of relationship loss) determine customers' willingness to build long-term relationships.

Finally, with the findings from this study supporting previous research results in developing countries (Fatima & Razzaque, 2014; Kakeeto-Aelen *et al.*, 2014; Kaur, 2015), the findings can be applied beyond a South African context to other developing countries. Service providers servicing SMEs in developing countries should thus focus on customers with higher relationship intentions and focus on these customers' satisfaction when trying to build long-term customer relationships and customer loyalty.

LIMITATIONS AND DIRECTIONS FOR FURTHER RESEARCH

Despite efforts to encourage participation, a relatively small number of respondents participated in the study. Future research should consider targeting more potential respondents by using the databases from multiple organisations. Since the target population included busy business executives, future research could consider offering appropriate incentives in an effort to encourage participation. Another limitation is that, since the research was confined to only one financier, the results are not representative of the industry as a whole. A final limitation that should be reported concerns the statistical analyses that were hampered due to low correlations between some of the relationship intention constructs. It is suggested that future research consider the appropriateness of each of the five relationship intention constructs when measuring overall relationship intention. Future studies could, for example, only consider three or four constructs to measure respondents' relationship intentions instead of the five hypothesised by Kumar *et al.* (2003).

Although this study offered a unique contribution about customer loyalty within the South African B2B financing environment, future research could replicate this study in other industries to determine the applicability of the findings beyond the scope of the current study. Finally, by establishing that customers' relationship intention and satisfaction predict their loyalty towards the risk financier, future research could consider determining the antecedents that lead to customers forming relationship intention – for example, those proposed by Kumar *et al.* (2003): perceived brand equity, perceived organisational equity, trust, commitment, and perceived channel equity.

REFERENCES

- Abdul-Muhmin, A. (2005). Instrumental and interpersonal determinants of relationship satisfaction and commitment in industrial markets. *Journal of Business Research*, 58:619-628.
- Aksoy, L., Keiningham, T.L. & Bejou, D. (2008). Objectives of customer centric approaches in relationship marketing. *Journal of Relationship Marketing*, 6(3):1-8.
- Berry, L.L. & Parasuraman, A. (1997). Listening to the customer – the concept of a service-quality information system. *Sloan Management Review*, 38(3):65-76, Spring.
- BPL (Business Partners Limited). (2016). *What sets us apart*. Retrieved 7 May 2016 from <http://www.businesspartners.co.za/>.
- BPL (Business Partners Limited). (2013). *Business Partners Annual Report, 2013*. Johannesburg, South Africa.
- BPL (Business Partners Limited). (2011). *Business Partners Annual Report, 2011*. Johannesburg, South Africa.
- Bresler, M. (2013). *Black Generation Y expectations of their banks' customer relationship management*. Unpublished Masters dissertation. University of Johannesburg.
- Bruner, G.C. II. (2009). *Marketing scales handbook: A compilation of multi-item measures for consumer behavior & advertising research*. Volume 5. Carbondale, IL: GCBII Productions.
- Burnham, T.A., Frels, J.K. & Mahajan, V. (2003). Consumer switching costs: A typology, antecedents and consequences. *Journal of the Academy of Marketing Science*, 31(2):109-126.
- Chaman, F., Masoumi, S.R., Moghadam, N.S. & Shaabani, F. (2013). The survey effect of relationship marketing strategies on customer loyalty: A case study of comparison between a private and government owned bank. *African Journal of Business Management*, 7(3):164-171.
- Chandrasekar, K.S. (2010). *Marketing management: Text and cases*. New Delhi: Tata McGraw-Hill.
- Christopher, M., Payne, A. & Ballantyne, D. (2004). *Relationship marketing: Creating stakeholder value*. Norfolk: Butterworth Heinemann.
- Clark, M. & Melancon, J. (2013). The influence of social media investment on relational outcomes: A relationship marketing perspective. *International Journal of Marketing Studies*, 5(4):132-142.
- Coetzee, J., Van Zyl, H. & Tait, M. (2013). Perceptions of service quality by clients and contact-staff in the South African retail banking sector. *Southern African Business Review*, 17(1):1-22.
- Cooil, B., Keiningham, T.L., Aksoy, L. & Hsu, M. (2007). A longitudinal analysis of customer satisfaction and share of wallet: Investigating the moderating effect of customer characteristics. *Journal of Marketing*, 71:67-83.
- Conze, O., Bieger, T., Laesser, C. & Riklin, T. (2010). Relationship intention as a mediator between relational benefits and customer loyalty in the tour operator industry. *Journal of Travel & Tourism Marketing*, 27(1):51-62.
- Curtis, T., Abratt, R., Rhoades, D. & Dion, P. (2011). Customer loyalty, repurchase and satisfaction: A meta-analytical review. *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior*, 24:1-26.
- Davies, R. in Kgosana, C. (2013). Small businesses failure rate high. Retrieved 1 October 2015 from <http://www.sowetanlive.co.za/news/business-news/2013/05/16/small-businesses-failure-rate-high>.
- Egan, J. (2004). *Relationship marketing: Exploring relational strategies in marketing*. Harlow: Pearson Publishers.

RELATIONSHIP INTENTION AND CUSTOMER SATISFACTION AS PREDICTORS OF SOUTH AFRICAN SMES' LOYALTY TOWARDS A RISK FINANCIER

- Entrepreneur. (2013). *Small Business*. Retrieved 1 October 2015 from <http://www.entrepreneurmag.co.za/advice/starting-a-business/small-business-advice/small-business/>.
- Esbjerg, L., Jensen, B.B., Bech-Larsen, T., de Barcellos, M.D., Boztug, Y. & Grunert, K.G. (2012). An integrative conceptual framework for analyzing customer satisfaction with shopping trip experiences in grocery retailing. *Journal of Retailing and Consumer Services*, 19(4), 445-456.
- Fatima, J. K. & Razzaque, M.A. (2014). Service quality and satisfaction in the banking sector. *International Journal of Quality & Reliability Management*, 31(4):367-379.
- Fatoki, O. & Odeyemi, A. (2010). Which new small and medium enterprises in South Africa have access to bank credit? *International Journal of Business Management*, 5(10):128-136.
- Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. 4th ed. London: Pearson.
- Gamble, P.R., Stone, M., Woodcock, N. & Foss, B. (2006). *Up close and personal: Customer relationship marketing @ work*. 3rd ed. London: Kogan Page.
- Gilaninia, S., Almani, A.M., Pournaserani, A. & Javad, S. (2011). Relationship marketing: A new approach to marketing in the third millennium. *Australian Journal of Basic and Applied Sciences*, 5(5):787-799.
- Goncalves, H.M. & Sampaio, P. (2012). The customer satisfaction-customer loyalty relationship. *Management Decision*, 50(9):1509-1526.
- Gounaris, S.P., Tzempelikos, N.A. & Chatzipanagiotou, K. (2007). The relationships of customer-perceived value, satisfaction, loyalty and behavioral intentions. *Journal of Relationship Marketing*, 6(1):63-87.
- Hair, J.F., Black, W.C., Babin, B.J. & Anderson, R.E. (2014). *Multivariate data analysis*. 7th ed. Harlow: Pearson.
- Halimi, A.B., Chavosh, A. & Choshali, S.H. (2011). The influence of relationship marketing tactics on customer's loyalty in B2C relationship – the role of communication and personalization. *European Journal of Economics, Finance and Administrative Sciences*, 31:49-56.
- Hansen, T. (2012). The moderating influence of broad-scope-trust on customer-supplier relationships. *Psychology & Marketing*, 59(5):350-364.
- Harris, E.K. (2009). *Customer service. A practical approach*. 5th ed. Upper Saddle River: Prentice Hall.
- Hoffman, K.D. & Bateson, J.E.G. (2011). *Services marketing: Concepts, strategies and cases*. 4th ed. Belmont, CA: Cengage Learning.
- Homburg, C., Müller, M. & Klarmann, M. (2011). When does salespeople's customer orientation lead to customer loyalty? The differential effects of relational and functional customer orientation. *Academy of Marketing Science*, 39:795-812.
- Ishaq, M.I. (2012). Perceived value, service quality, corporate image and customer loyalty: Empirical assessment from Pakistan. *Serbian Journal of Management*, 7:25-36.
- Jesri, P., Ahmadi, F. & Fatehipoor, M. (2013). Effects of relationship marketing (RM) on customer loyalty. *Interdisciplinary Journal of Contemporary Research in Business*, 4(11):304-312.
- Jones, M.A., Reynolds, K.E., Arnold, M.J., Gabler, C.B., Gillison, S.T. & Landers, V.M. (2015). Exploring consumers' attitude towards relationship marketing. *Journal of Services Marketing*, 29(3):188-199.
- Kakeeto-Aelen, T.N., van Dalen, J.C., van den Herik, H.J., & van de Walle, B.A. (2014). Building customer loyalty among SMEs in Uganda: the role of customer satisfaction, trust and commitment. *Maastricht School of Management*, Working paper: 2014/06:1-32.
- Kaur, M. (2015). What drives exporting SMEs' banking loyalty? *Metamorphosis*, 14(2):51-61.
- Kim, W., Ok, C. & Canter, D.D. (2012). Moderating role of a priori customer-firm relationship in service recovery situations. *The Service Industries Journal*, 32(1):59-82.
- Kruger, L. & Mostert, P.G. (2012). Young adults' relationship intentions towards their cell phone network operators. *South African Journal of Business Management*, 43(2):15-23.
- Kumar D. (2014). Relationship marketing: A new dimension of marketing. *International Journal of Research* 1(7):1045-1049.
- Kumar, V., Bohling, T.R. & Ladda, R.N. (2003). Antecedents and consequences of relationship intention: Implications for transaction and relationship marketing. *Industrial Marketing Management*, 32:667-676.
- Leahy, R. (2011). Relationships in fast moving consumer markets. *European Journal of Marketing*, (45)4:651-672.
- Leverin, A. & Liljander, V. (2006). Does relationship marketing improve customer relationship satisfaction and loyalty? *International Journal of Bank Marketing*, 24(4):232-251.

- Marinković, V. & Senić, V. (2012). Loyalty patterns in corporate banking: Insights gained from analysing willingness to recommend and share of wallet concepts. *Total Quality Management*, 23(12): 1465-1478.
- Marshall, G.W. & Johnston, M.W. (2011). *Essentials of marketing management*. New York: McGraw-Hill Irwin.
- McCullough, M.E., Berry, J.W., Luna, L.R., Tabak, B.A. & Bono, G. (2010). On the form and function of forgiving: Modelling the time-forgiveness relationship and testing the valuable relationships hypothesis. *American Psychological Association* 10(3):358-376.
- Mende, M., Bolton, R.N. & Bitner, M.J., (2013). Decoding customer-firm relationships: How attachment styles help explain customers' preference for closeness, repurchase intentions, and changes in relationship breadth. *Journal of Marketing Research*, 125-142.
- Mgxaji, B., Chinomona, R. & Chuchu, T. (2016) the predictors of business performance in the investment management industry. *Journal of Global Business & Technology*. Fall, 12(2):56-69.
- Moore, M.L., Ratneshwar, S. & Moore, R.S. (2012). Understanding loyalty bonds and their impact on relationship strength: A service firm perspective. *Journal of Services Marketing*, 26(4):253-264.
- Morgan, R.M. & Hunt, S.D. (1994). The commitment-trust theory of relationship marketing. *Journal of Marketing*, 58(3):20-38.
- Moutinho, Z. & Southern, G. (2010). *Strategic marketing management*. Hampshire: South-Western Cengage Learning.
- Newell, S.J., Belonax, J.J., McCardle, M.W., Plank, R.E. (2011). The effect of personal relationship and consultative task behaviors on buyer perceptions of salesperson trust, expertise and loyalty. *Journal of Marketing Theory and Practice*, 19(3):307-316.
- Ndubisi, N.O. & Wah, C.K. (2005). Factorial and discriminant analyses of the underpinning of relationship marketing and customer satisfaction. *International Journal of Bank Marketing*, 23(7):542-557.
- Oliver, R.L. (1999). Whence consumer loyalty. *Journal of Marketing*, 63(4):33-44 (special issue).
- Ozuem, W., Thomas, T. & Lancaster, G. (2016). The influence of customer loyalty on small island economies: and empirical and exploratory study. *Journal of Strategic Marketing*, 24(6):447-469.
- Palmer, A. (2011). *Principles of services marketing*. 6th ed. London: McGraw-Hill Companies.
- Pan, Y., Sheng, S. & Xie, F.T. (2012). Antecedents of customer loyalty: An empirical synthesis and reexamination. *Journal of Retailing and Consumer Services*, 19:150-158.
- Parasuraman, A., Zeithaml, V.A. & Berry, L.L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing*, 49(4):41-50.
- Parish, J.T. & Holloway, B.B. (2010). Customer relationship proneness: A reexamination across service exchanges. *Journal of Services Marketing*, 24(1):61-73.
- Pillai, K.G. & Sharma, A. (2003). Mature relationships: Why does relational orientation turn into transaction orientation? *Industrial Marketing Management*, 32:643-651.
- Raciti, M.M., Ward, T. & Dagger, T.S. (2013). The effect of relationship desire on consumer-to-business relationships. *European Journal of Marketing*, 47(4):615-634.
- Raza, A. & Rehman, Z. (2012). Impact of relationship marketing tactics on relationship quality and customer loyalty: A case study of telecom sector of Pakistan. *African Journal of Business Management*, 6(14): 5085-5092.
- Rese, M., Hundertmark, A., Schimmelpfennig, H. & Schons, L.M. (2013). Loyalty program types as drivers of customer retention: A comparison of stand-alone programs and multi-vendor loyalty programs through the lens of transaction cost economics. *The International Review of Retail, Distribution and Consumer Research*, 23(3):305-323.
- Richey, R.G., Skinner, L. & Autry, C.W. (2007). A multilevel approach to retail management education: Integrating customer and supply chain perspectives. *Marketing Education Review*, 17(2):27-43.
- Scott, D. & Vitartas, P. (2008). The role of involvement and attachment in satisfaction with local government services. *International Journal of Public Sector Management*, 21(1):45-57.
- Sharma, P., Tam, J.L.M. & Kim, N. (2012). Intercultural service encounters (ICSE): An extended framework and empirical validation. *Journal of Services Marketing*, 26(7):521-534.
- Shi, G., Bu, H., Ping, Y., Liu, M.T. & Wang, Y. (2016). Customer relationship investment and relationship strength: evidence from insurance industry in China. *Journal of Services Marketing*, 30(2):201-211.
- Sweeney, J.C., Soutar, G.N. & McColl-Kennedy, J.R. Jr. (2011). The marketing practises-performance relationship in professional services organisations, *Journal of Services Marketing*, 22(3):292-316.
- Tabachnick, B.G. & Fidell, L.S. (2014). *Using multivariate statistics*. 6th ed. Harlow: Pearson.

RELATIONSHIP INTENTION AND CUSTOMER SATISFACTION AS PREDICTORS OF SOUTH
AFRICAN SMES' LOYALTY TOWARDS A RISK FINANCIER

- Tai, Y., & Ho, C. (2010). Effects of information sharing on customer relationship intention. *Industrial Management & Data Systems*, 110(9): 1385-1401.
- Theron, E., Terblanche, N.S. & Boshoff C. (2012). A managerial framework for relationship management in the business-to-business financial services industry. *Management Dynamics*, 21(4): 31-52.
- Tsarenko, Y. & Tojib, D.R. (2011). A transactional model of forgiveness in the service failure context: A customer-driven approach. *Journal of Services Marketing*, 25(5):381-392.
- Tushabomwe-Kazooba, C. (2006). Cases of small businesses failure in Uganda: a case study from Bushenyi and Mbarara Towns. *African Studies Quarterly*, 8(4):27-35.
- UCS (Underhill Corporate Solutions). (2011). *Literature review on small and medium enterprises' access to credit and support in South Africa* (Prepared for National Credit Regulator). Pretoria: South Africa.
- Varki, S. & Wong, S. (2003). Consumer involvement in relationship marketing of services. *Journal of Service Research*, 6(1):83-91.
- Wei, Y., McIntyre, F.S. & Soparnot, R. (2014). Effects of relationship benefits and relationship proneness on relationship outcomes: A three-country comparison. *Journal of Strategic Marketing*, 23(5):1-21.
- Wirtz, J., Tambyah, S.K. & Mattila, A.S. (2010). Organizational learning from customer feedback received by service employees: A social capital perspective. *Journal of Service Management*, 21(3):363-387.

AN ENTREPRENEURIAL ENTITY'S EXPERIENCE WITH OPPORTUNITY REALISATION

Le-Roi Nel and Geoff Goldman

ABSTRACT

Entrepreneurial activity is widely recognised as being a catalyst for booting economic growth. Prudence in recognising and successful pursuit of business opportunities that present themselves is a crucial part of the entrepreneurial endeavour. The formation of the Saxum Group is used in this paper as a qualitative case study to illustrate how an entrepreneurial entity engages with opportunity realisation. Data were collected through semi-structured interviews with key role players of the Saxum Group as an entrepreneurial entity, and analysed using Grounded Theory coding principles. Findings revealed that opportunity realisation is strongly linked to the prevailing market conditions as well as how the entrepreneurial entity is formed and behaves. Practical recommendations are presented to aspiring entrepreneurs that could be useful in the pursuit of new opportunities.

Keywords: Insurance industry, entrepreneurial entity, opportunity, qualitative research

INTRODUCTION AND BACKGROUND

This paper aims to understand how entrepreneurial entities engage and grapple with new opportunities that emerge over time. Successful pursuit of emergent opportunities has become an important issue for business to deal with as competitive and environmental pressure and challenges have had a marked impact on business ventures' sustainability.

This is particularly prevalent in the insurance industry, as it has been subject to extreme losses due to dual exposure in both underwriting and investments exposure (Araichi & Belkacem, 2014; Hong, Min-Ming, Chuanhou & Mulong, 2012). The insurance industry suffered a loss of \$40 billion due to the 9/11 terrorist attack (Ragin & Halek, 2015; Chen, Doerpinghaus, Lin & Yu, 2008; Booth, 2010). The industry had to bear further losses amounting to \$280 billion due to hurricanes Katrina, Rita and William, and most recently the global financial crises with failing bank systems and shortage in credit (Ragin & Halek, 2015; Booth, 2010). Financial survival was the number one priority for many insurance firms in the wake of these disasters (Hagendorf, Hagendorf & Keasey, 2015; Ellenburger & Trussell, 2012). Financial survival was the number

Le-Roi Nel is a Master's graduate of the Department of Business Management at the University of Johannesburg, South Africa. He has completed a BCom (Logistics), a BCom (Hons)(Strategic Management) and an MCom (Business Management). Mr Nel has built his career in the insurance industry. This article was taken from the Masters' study of Mr Nel.

Geoff Goldman is Professor and Head of Department: Department of Business Management at the University of Johannesburg, South Africa. His lecturing interests are in Research Methodology and History and Philosophy of Management, and his research specialisation lies within the domain of Critical Management Studies. Prof Goldman has authored in excess of 90 conference papers, journal articles and books, mainly in the area of Strategic Management and Critical Management Studies, and is also editor of the management journal Acta Commercii.

one priority for many insurance firms in the wake of these disasters (Hagendorf, Hagendorf & Keasey, 2015; Ellenburger & Trussell, 2012). Multinational European and North American insurance firms have been forced to focus on core business activities, which necessitated improvements in holistic risk and capital management of global and regional operations (Marovic, Njegomir & Maksimovic, 2010). Multinational insurance firms were therefore forced to withdraw from the South African insurance market in an attempt to improve financial performance through recapitalisation of funds to their core operations in Europe and America, thereby mitigating their international risk exposure in developing countries.

The South African insurance community has been presented with significant risk and opportunity over the past two decades with the withdrawal of multinational insurance firms. This has paved the way for increased entrepreneurial behaviour. The Saxum Group of Companies was one such company which was able to exploit prevailing market opportunities, particularly with the withdrawal from the South African market of German insurance company Gerling Global. The Saxum Group became the first re-insurance firm in South Africa to be privately owned by a group of entrepreneurs.

Entrepreneurs are repeatedly confronted with uncertainty and risk, and use their cognitive decision-making processes based on experience, education and knowledge to make decisions with limited information to take advantage of opportunities (Jaiyeoba, Marandu, & Kealesitse, 2015; Brockman, 2014; Park, 2005). Opportunity is a central concept within the field of entrepreneurial activity (Brockman 2014; Wang, Ellinger & Jim Wu, 2013; Short, Ketchen, Shook & Ireland, 2010). The interaction between the entrepreneur and opportunities plays a key role in the identification, exploration and pursuit of opportunities by means of actions designed to create value. (Brockman, 2014; Wang, Ellinger & Wu, 2013; Cha & Bae, 2010). The increased emphasis on opportunity recognition and realisation necessitates further research on the issue. Furthermore, as entrepreneurial endeavour is a central tenet of promoting economic growth in South Africa, the successful pursuit of new opportunities is even more relevant to grow SMME's in South Africa and inquiry into opportunity realisation in SMME's has a vital role to play in helping to stimulate entrepreneurial endeavours.

RATIONALE AND RESEARCH SETTING

The formation of the Saxum Group was an opportunity that presented itself with the withdrawal of some multinational insurance firms from South Africa (most notably, in this case, Gerling Global). Despite entrepreneurial activity in the South African insurance market surfacing due to changing market conditions following the withdrawal of multinational firms, there is little information that describes opportunity realisation within the context of the South African insurance industry.

The purpose of this study is to understand how an entrepreneurial entity realised opportunities within the South African insurance industry as a result of the withdrawal of an international company, Gerling Global. Against this backdrop, the objective of the study can be stated as follows: *To understand the dynamics surrounding opportunity realisation of an entrepreneurial entity within the South African Insurance industry.*

The ensuing literature review will unpack the concept of 'opportunity' and contextualise it in the realm of entrepreneurship. Following an Interpretive research paradigm, the case of the formation of the Saxum Group out of Gerling Global is presented in to illustrate the dynamics of opportunity realisation.

LITERATURE REVIEW

As mentioned in the introduction, the insurance industry has suffered huge losses over the past two decades due to exposure in underwriting and investments (Ragin & Halek, 2015; Araichi & Belkacem, 2014; Hong *et al.*, 2012). The impact of disasters such as 9/11, hurricane damage in the USA and the 2008 financial

crisis, has resulted in billions of dollars of losses in the insurance industry (Ragin & Halek, 2015; Booth, 2010; Chen *et al.*, 2008). In the wake of such catastrophes, insurers are faced with having to make large pay-outs to clients, leading to a depletion of reserves (Hagendorf *et al.*, 2015; Hong *et al.*, 2012; Chen *et al.*, 2008). The demand for capital becomes immediate and industry wide, causing an increase in the cost of capital (Hagendorf *et al.*, 2015; Chen *et al.*, 2008). Catastrophic losses and global financial turmoil negatively impacts the insurance industry (Ragin & Halek, 2015; Araichi & Belkacem, 2014; Marovic *et al.*, 2010), however such turmoil is associated with both opportunities and threats for insurance firms (Brimble, Stewart & De Zwaan, 2010). Being able to take advantage of opportunities while dealing with market threats during times of turmoil requires a specific entrepreneurial proclivity not every business might possess.

‘Opportunity’ is central to the entrepreneurial endeavour, and without an opportunity, no entrepreneurial activity can take place (Andersson & Evers, 2015; Short *et al.*, 2010; Shane & Venkataraman, 2000). However, contrasting views exist about the definition and the nature of opportunities (George, Parida, Lahti, & Wincent, 2016; Short *et al.*, 2010). Given the importance of the opportunity concept it is imperative to review the functional differences in theoretical perspectives when using the term ‘opportunity’ (George *et al.*, 2016; Short, *et al.*, 2010).

Much literature on ‘opportunity’ can be found in the realm of entrepreneurship. García-Cabrera and García-Soto (2009), as well as Heinrichs and Walter (2013) purport that an opportunity is a creative process whereby entrepreneurs identify and exploit situations based on the entrepreneur’s cognitive ability to link the identification and exploitation of such opportunities. Hmieleski and Baron (2008), as well as Van Gelderen (2014), explain that opportunities are mostly discovered, and mostly influenced by the character of the entrepreneur’s self-regulatory mode, which allows or prevents risk and uncertainty. Cliff, Jennings and Greenwood (2006), as well as Wasdani and Mathew (2014), postulate that opportunities involve the creation of new firms that vary in terms of innovativeness. Differences in knowledge allow individuals to identify such opportunities.

Literature from the broader field of business management also addresses the issue of ‘opportunity’. Short, et al., (2010) describe opportunity as the chance to introduce innovative goods, services or processes into the market and Shane (2000) states that opportunity is driven by technological change in the business environment, and such changes create new processes, products, markets and new ways of organising. Opportunities often present themselves alongside dimensions of changes in products or service markets (Eckhardt & Shane, 2003), and can often result from technological innovation that cause industries to vary in opportunity richness (Markatou & Stournaras, 2013; Eddleston, Kellermanns & Sarathy, 2008). Choi and Shepherd (2004) opine that new firm creation could exploit opportunities caused by changing consumer demands, and Baron and Ensley (2006) as well as Gruber (2010) explain that opportunities involve new products or services that lead to the creation of new business.

From the preceding views, the following factors relating to ‘opportunity’ emerge:

- ***Opportunity can be viewed as a creative process*** that links opportunity identification and opportunity exploitation, which is gradual over time and which is dependent on the personal attributes of the entrepreneur.
- ***Opportunities are created*** by changing market conditions. Disequilibrium in the current market environment brings the opportunity to introduce innovative goods, services or process.
- ***Opportunity leads to new firm creation*** resulting in wealth creation.
- ***Opportunity leads to new relationship formation:*** Opportunity is a chance to introduce new goods, services, raw materials, markets and organising methods through the formation of new means, ends or means-ends relationships when pursuing opportunities.

The different theoretical perspectives on the construct of opportunity seem to crystallise into two distinct streams of thought, those that view ‘opportunity’ as borne from concrete realities, and those that view the concept of opportunity as the enactment of an entrepreneur’s unique vision. These streams have shaped three dominant views of the construct of opportunity, namely the Allocative view, the Discovery view and the Creative view (Heinrichs & Walter, 2013; Alvarez & Barney, 2007 in Short, *et al.*, 2010). These three views are summarised in Table 1.

Table 1: Summary of dominant views on entrepreneurial opportunity

View	Description
Allocative view	<ul style="list-style-type: none"> ▪ Opportunities arise from inefficient resource allocations in the market ▪ Focus is on system improvements and not on individuals ▪ Uncertainty is managed through diversification ▪ The allocation view is strongly linked to the opportunity recognition process
Discovery view	<ul style="list-style-type: none"> ▪ Opportunities are discovered when searching for problems ▪ The discovery view regards organisational strategies as vital for organisational success ▪ The innovation process can be used as a management tool to improve organisational success ▪ The discovery view is strongly linked to the opportunity creation process
Creative view	<ul style="list-style-type: none"> ▪ Entrepreneurs seek to maximise decision-making by using innovation techniques to become more creative ▪ Creative thinking brings entrepreneurial opportunities through innovations, and creative processes increase knowledge ▪ Entrepreneurial actions like effectuation are used to manage uncertainty ▪ The creative view is strongly linked to opportunity creation processes

Source: Adapted from Cohen & Winn (2007); Lehner & Kansikas (2012).

The opportunity concept requires consideration of two more related concepts, namely ideas and dreams, both of which could potentially evolve into opportunities (Short, *et al.*, 2010). Ideas are a function of creativity and learning; however, ideas lead to potential opportunities only if carefully vetted and developed (Heinrichs & Walter, 2013; Hsieh, *et al.*, 2007 in Short, *et al.*, 2010; Dimov, 2007). Dreams are aspirations whose connection to bona fide opportunities remains undefined (Ardichvili, *et al.*, 2003 in Short, *et al.*, 2009). Entrepreneurial dreams often centre on non-economic goals, such as gaining autonomy, improving society and creative expression (Rindova, Barry & Ketchen, 2009 in Short, *et al.*, 2010). In these cases, ambiguity surrounds the ability to become economically viable (Short, *et al.*, 2010).

The argument that ideas and dreams are pressures to entrepreneurial opportunities is consistent with Kirzner's (1997) suggestion in Short, *et al.*, (2010) that alert individuals come upon opportunities by surprise. These surprises are not inherently opportunities, but rather they become opportunities via evaluative processes such as the assessment of risk and uncertainty (Heinrichs & Walter, 2013; Short, *et al.*, 2010).

From the preceding literature, the nature of opportunities draws attention to three main issues (Heinrichs & Walter, 2013; Short, *et al.*, 2010):

- the discovery versus creation of opportunities,
- temporal market dynamics surrounding opportunities, and
- the evolution of ideas and dreams into opportunities.

In conclusion, Short, *et al.*, (2010:55) probably presents the most all-encompassing definition of the concept of opportunity that captures the essence of the preceding discussion: "*An opportunity is an idea or a dream that is discovered or created by an entrepreneurial entity and that is revealed through analysis over time to be potentially lucrative*".

The realisation of such opportunities is subject to the potential impact of various factors, however, opportunity realisation can manifest itself positively in terms of business growth and new venture creation. The dynamics of opportunity realisation therefore need to be thoroughly understood in order to pursue them aptly.

RESEARCH METHODOLOGY

The Interpretive research paradigm was employed in this study, which aims to gain a deeper understanding of engaging with new opportunities in the South African insurance industry, through the experience of those involved in the process. In line with an interpretive paradigm, qualitative research methods were employed in this study as it allows for rich description and interpretation (Leedy & Ormrod, 2014).

As this study was conducted in a very specific setting, a case study design was followed. Creswell (2007), as well as Yin (2013) state that the case study approach facilitates the examining and understanding of unique, rare and typical events and/or processes within a company, and presents a possibility for generating new theoretical constructs in a way that is more sensitive to the social, cultural, and economic context compared to quantitative research approaches. In this instance, the private acquisition of Gerling SA and rebranding to the Saxum Group, presents a case from which insightful theoretical constructs could be developed regarding opportunity realisation.

Qualitative, semi-structured interviews were conducted as primary means of data collection. The study employed purposeful sampling, where research subjects were selected on the basis of their involvement with the transition of Gerling SA to the Saxum Group. The research population was identified as those entrepreneurs who constituted the entrepreneurial entity as well as people who were involved in engaging with this opportunity. Twelve research participants were selected for interviewing purposes. The sample included all remaining members of the entrepreneurial entity as well as people who played active roles in the private equity acquisition of Gerling SA. All the interviews took place at the offices of the Saxum Group and were conducted during August 2012. The semi-structured interviews sought to access descriptions of the lived world of the participants regarding their interpretation of the meaning of the described phenomenon (Irvine, Drew, & Sainsbury, 2013). The semi-structured interview made use of a questioning agenda to guide the inquiry.

Grounded Theory techniques were used for the analysis of the data rather than as the research design itself. Although Grounded Theory was originally developed as a particular research design, it also has application as a method of qualitative data analysis within an overarching research design (Goldman, 2008). In this instance, the use of Grounded Theory as a method of analysis as opposed to a design lies in the research setting itself. As this study is interested in the specific instance of opportunity recognition that led to the formation of the Saxum Group, it was important to frame this study as a case. In qualitative research, data is interpreted by looking for themes embedded in the interview subjects' responses (Irvine, *et al.*, 2013). Grounded Theory, as method of analysis, provides a structured and relatively systematic way of narrowing down large amounts of raw data into a concise conceptual framework that describes and explains a particular phenomenon (Leedy & Ormrod, 2014; Goldman, 2008). The phases of data analysis employed in this study are:

- **Transcription of voice recordings into individual data sets**
- **Analysis of individual data through open coding and memo writing** The individual data sets were analysed by making use of a two-dimensional analysis of each data set through open coding and memo writing (Strauss & Corbin, 1990; Goldman, 2008). This process began immediately as categories were being identified, while the interviews were being transcribed verbatim. The open coding started with line-by-line coding of each data set, and the data was coded through asking questions about the data as suggested by Charmaz (2011). Initially memos were brief, but as the coding process evolved, the memos became more extensive as they integrated the ideas of earlier memos, and in return generated further memos. The open-coding process identified 70 labelled categories.
- **Analysis of open-coded data through axial coding and memo-ing to identify categories.** The next step was to reduce the data to a small set of themes that appear to describe the phenomenon under investigation (Strauss & Corbin, 1990). This entailed axial coding whereby the open-coded data is categorised and examined for specific dimensions, properties and consequences (Goldman, 2008; Strauss & Corbin, 1990). Here, the focus is on determining more about each

category in terms of conditions that give rise to it, the context in which it is embedded, the strategies that people use to carry it out, and the consequences thereof (Charmaz, 2011). This step led to reduction of categories from 70 to 34.

- **In-depth analysis of categories through selective coding to identify the interrelationship of categories.** Selective coding was used to rearrange the data in new ways, by identifying interrelationships and making interconnections among the categories and subcategories as provisional theory that can be used to understand the dynamics of opportunity recognition (Corbin & Strauss, 1990). The categories and their interrelationship were combined to form a storyline that describes best “what happens” in the phenomenon being studied. The selective coding process identified four overarching themes.

The development of theory to address the purpose of the study is based on the outcome of the selective coding process. Thus, the subsequent Findings section encompasses a conceptually abstract narrative that describes each of the main themes identified through the selective coding process by articulating the theoretical propositions and relationships between the main concepts (Charmaz, 2011). Evidence of claims made is presented in the form of direct quotations from interviews conducted with research subjects. In the interests of brevity, these have been kept to a minimum, but further evidence can be obtained from the authors.

The ethical principle guiding this study was based on securing the integrity and confidentiality of the opinions raised by the participants, so as to avoid any experiences of physical and psychological distress during the interview process and research procedures (Leedy & Ormrod, 2014). The researcher undertook to adhere to the principles of ethical research, which can be stated as informed consent, confidentiality, avoiding harm, integrity and professionalism (Gibson & Brown, 2009; Leedy & Ormrod, 2014; Irvine, *et al.*, 2013). For this study, written consent from research participants was sought before continuing with interviews. Furthermore, research participants were given the assurance that they could opt out of the interview at any stage if they felt uncomfortable. Research participants were also given the option to peruse the findings of the study once they had been written up. Where direct quotations were included in the study which contained peoples' names, pseudonyms were used and placed in square brackets. Permission was also gained from the Managing Director of the Saxum Group to use the names of the companies in question.

FINDINGS

To understand how the Saxum Group engages with new opportunities, it is important to gain insights into how this company was formed, and how it went about realising opportunities in order to become the organisation it is today. The research participants shared insights regarding the dynamics of the organisation and its history. Individual insights were provided regarding the origins of the organisation and the opportunities that were realised. In total, four overarching themes emerged from the analysis of the data. These will now be discussed in turn.

Theme 1: Sources of opportunity

Historic market conditions were a significant source of opportunity in the case of the Saxum Group. These market conditions provided the context for the entrepreneurial behaviour and the entrepreneurial entity formation. Under this theme, the following dimensions emerged:

- ***The aftermath of 9/11:*** Market conditions after these attacks led to a systemic collapse of equity markets across the world and many multinational insurance firms were forced into undercapitalisation, with a negative impact on the solvency of international reinsurers. This necessitated repatriation of funds to the home country, resulting in depleted investment portfolios and forcing multinational insurance organisations into mergers or withdrawal from markets.

- **African risk:** Some multinational insurers decided to exit South Africa, due to a belief that investment risk in Africa was too high and uncertain. These risks included ambiguity regarding the ANC, the impact of HIV/AIDS and political uncertainty.
- **Run-off markets:** Insurance run-off markets¹ developed globally after 9/11, as insurers tried to recapitalise due to depleted portfolios. During this period, Gerling Global decided to place Gerling SA in run-off.
- **Recovering equity markets:** As global equity markets started recovering, there was a potential for profit gains, as purchase prices were low, and selling prices high.
- **Market scanning, familiarity and knowledge:** Research participants reflected that they heard that Gerling SA was in run-off, and possibly up for sale. They explained how they came together for the informal formation of an entrepreneurial entity to investigate the possible purchase of Gerling SA.
- **Risk appetite:** The risk appetite and personality of the entrepreneurial entity members were key drivers during this process as the opportunity to purchase Gerling SA presented itself.

The following quotations attest to the dimensions of this theme:

“It was after 9/11, and there was a merger between the St Paul head office in the States and Travelers Insurance: Travelers Insurance, which was possibly about the third biggest company in the States. And the new MD of the joint group decided you know these branches overseas were not contributing properly to the overall picture”	Interviewee F
“So the business, because we were already in run-off – the competition was no longer; it was just a case of how many companies could we recapture and it wasn’t going to Germany, so therefore they had to look at getting someone to take over the business”	Interviewee E
“As I understand it, I mean, this was really a post 9/11 event, that the Gerling Group was one of those that withdrew from, it was, I suppose, after the collapse of equity prices that world markets led to a position, where insurers in fact, or reinsurers couldn’t write as much business as they previously had. Their solvencies were affected, so they had to withdraw from smaller markets. That was the opportunity that allowed them to then, the Saxon Group originated out of the Gerling Group, and as a result of post 9/11 events, that Gerling ended up for sale locally. With the collapse in equity markets, their whole capital basis essentially collapsed, and forced them, in some cases, forced mergers”	Interviewee I
“And then that was the opening that they needed. Thereafter, entrepreneurs enough to sell the risk, to understand that they wanted to get rid of the company because of a strategic risk, okay, they saw the opportunities financially to utilise the finance of the company to buy itself, without putting a hand in their pocket. Very, very clever...”	Interviewee G
“It started with a certain awareness that run-off can be a very profitable case if it is managed well and the underlying reserves are set adequately. We signed confidentially agreements, we got hold of the due diligence information, and it ended up us entering into negotiations with the seller to take over the company and that is how this all started.”	Interviewee A

¹ Run-off markets refer to insurance markets where new business is not generated. Instead, they manage remaining claims until all claims are paid in full from the reserve funds that have been accumulated over the years. The difference between reserve funds and outstanding claims is actualised as profit, hence the term, “run-off”.

Theme 2: Understanding business models

A thorough understanding of appropriate business models is vital for success of a business venture as it indicates where the organisation needs to focus attention and how the organisation should be managed. In terms of business models, the following dimensions can be discerned:

- ***The nature of the insurance business:*** A thorough understanding of the dynamics of the insurance industry is not necessarily a source of opportunity, but is crucial for the evaluation of potential opportunities in the insurance industry
- ***Investment income and the protection of funds:*** Sound investment management is an important factor for the profitability of an insurance company and the business model of an insurance company is shaped by its strategic decisions and its understanding of the operational aspects of managing the organisation.
- ***Organisational infrastructure and technology:*** The infrastructure of the Gerling SA played a fundamental role in the decision to acquire it, as the company had good staff, skills, and technology that enabled the entrepreneurial entity members to leverage those actions.
- ***Changes in strategic direction: run-off position:*** The business model of Gerling SA was forced by a decision to place it in run-off and not to liquidate it. With run-off portfolios, if managed successfully the shareholders would realise profits. With run-off business, a different skills set is needed as one is not actively writing new business, but rather managing costs against reserve funds.
- ***Corporate venturing and portfolio increases:*** By purchasing a run-off business they were able to enter into ventures by using the investment capital gained from the run-off purchase. Through this process, they acquired skills in structuring deals and managing claims, and hence the extension of current business into acquiring more run-off business and related insurance venturing.

The table below presents evidence from the interviews pertaining to this theme:

"You basically have the claims and the money in the bank to manage it out, and nobody gets hurt in the process, as opposed to a liquidation where normally all the creditors are not paid out to that what is due to them"	Interviewee B
"Acquire a company that has infrastructure, has staff, has everything, and the owners decided that they do not want to be part of this anymore"	Interviewee H
"It started with a certain awareness that run-off can be a very profitable case if it is managed well and the underlying reserves are set adequately"	Interviewee E
"...the opportunity that a well-established insurance company presents, particularly on a run-off basis is that it has, that regulators force insurers to become almost like investment trusts. It works like an investment trust, that there are equities, and that was the opportunity that they saw at the time. Here were a suite of equities, which were probably priced low, and that world markets were likely to move upwards"	Interviewee I
"I made contact with the German seller, the person who was in charge, and we basically had a very long telephone conversation, that I understood a little better what the financial mechanics of the company were, and I thought it could be something we could pursue"	Interviewee A

Theme 3: The entrepreneurial entity

The formation of an entrepreneurial entity, albeit an individual or group of individuals, is a prerequisite for opportunity realisation within the SA insurance industry. The behaviour of an entrepreneurial entity is strongly shaped by the formation process and the initial interactions amongst its members. The

characteristics of the entrepreneurial entity became increasingly more important as they evolved from an informal membership to a dynamic formal membership.

- **Informal entrepreneurial entity formation:** The entrepreneurial entity members got together in an informal way to discuss the possibility of purchasing Gerling SA. This meeting was based on the need for mutual skills to understand the dynamics of purchasing and running Gerling Global. The entrepreneurial entity was formed in an informal manner when the individual entrepreneurs started to collectively evaluate and explore the possibility of running and purchasing Gerling SA
- **Formal entrepreneurial entity formation:** The informal entrepreneurial entity members became the buying consortium who successfully purchased Gerling South Africa, and consequently became the four legal shareholders of the organisation.
- **Communication:** Communication between the entrepreneurial entity members was extremely important, as the entrepreneurial entity had to continuously discuss matters relating to running the organisation with each other. During the initial stages of purchasing the organisation, the communication to existing staff members was not sufficient, and this caused great uncertainty among the existing staff members.
- **Conflict management:** The entrepreneurial entity members were initially extremely focused on identifying problems and addressing problems quickly and effectively.
- **Changes in shareholding:** A change in shareholding occurred as a result of ineffective interaction amongst the entrepreneurial entity members.
- **Relationship management:** The entrepreneurial entity members were four very different, strong-willed individuals with complementary skills and mutual needs who got together to explore and actualise the opportunity. They realised that it was very important for them to establish good relationships with each other in order to actualise the opportunity.
- **Compromise:** Entrepreneurial entity members felt they had to compromise a lot in order to achieve the goals of acquiring the organisation.

The evidence suggests that entrepreneurial entity formation is part of opportunity realisation and entrepreneurial behaviour, and that entrepreneurial entity characteristics play a significant part in pursuing the opportunity, as the quotations below attest to:

“No, it was very secretive, initially, so we didn’t know much. We only got to know once the actual transaction happened. We were kept in continuous feedback, which was very good, from the old German company, and the MD at that time, [Jim Clark]. We were told that there were certain discussions taking place, but obviously the confidentiality was quite intense, so...”

Interviewee C

“Normally, he would try to smooth over the relationship and some of the issues in that sense, as he understands the insurance industry quite well. [John Carter], he brought IT skills as well to the party. So when touched on specific issued such as how to take over, and would be using our own IT platform, or using the currently platform that would have cost us a lot of money. He was quite good in those operational types of issues. [Joe] who has the attorney’s background, was quite good in terms of structure and how we would structure things, and helping the drawing up of the sale and purchase agreement, and that was his area of speciality. While we all would focus more on the numbers, how much we have to pay, and how we would structure the payments, and how much money we thought we could make out of this. In that sense all four shareholders were needed to make the transaction”

Interviewee B

“I think we compromised a lot with each other in order to take acquisition of the company. So there in hindsight you could say that we should have gotten to know each other a bit better before one does things like this. But unfortunately opportunities don’t wait for you to sort out your issues. You see, we started negotiations in September and concluded the negotiations before Christmas the same year”

Interviewee A

“I think they’re all exceptionally bright, but the personalities are not conducive to a successful entrepreneurship, and I think that has a lot to, why they’re not as successful as they wish they could have been. They want to have... Have you ever been in a shareholders’ meeting? No, you haven’t? Let me tell you something now. It’s not the idea that’s put to the table that everybody listens to; it’s who shouts the loudest to get their point across. That is not a successful unit that has to do that, okay”

Interviewee G

"I hold them in very high regard in the sense that I think they're exceptionally bright, and they're entrepreneurs, in the sense they understand the bigger picture. Where my biggest concern for them, and I think their biggest downfall is the interaction and the personalities between them"

Interviewee K

Theme 4: Individual characteristics of entity members

The behaviour of the entrepreneurial entity is strongly influenced and directed by its members. The background of the entrepreneurial entity members is fundamental to their decision making abilities and interaction. Responses pertaining to attributes of entrepreneurial entity members exhibited nine underlying dimensions:

- **Formal education:** The formal education background of the members had a significant impact on their skill base.
- **Specialised skill base:** The members had a specialised skill base that individuals acquired over the years. These included the ability to negotiate during acquisitions, the ability to understand and interpret financial data accurately, the ability to understand investment management, and the ability to comprehend the mechanics of running a business in the insurance industry. However, members were also aware that in order to achieve and evaluate the opportunity, they needed to make use of their combined skill base.
- **Self-employment:** As a result of working for themselves there was a sentiment that the entrepreneurial ability was already imbedded within their DNA.
- **Industry credibility:** Good industry reputation, gave the entrepreneurial entity credibility with regulators such as the Financial Service Board (FSB).
- **Experience:** It was the ability to identify an opportunity that was important, and then also the ability to draw people together who could actualise the opportunity by means of structuring the deal, evaluating finances and due diligence reports to ultimately run the operations.
- **Approachability and forcefulness:** The members of the entrepreneurial entity exhibited a blend of being approachable as well as taking a stand on matters. Staff found this quite reassuring as they saw it as a sign of dedication and vision. Staff felt that it was good to see decisions made and that these decisions were not changed. At the same time they commented that entity members were open to debate on why decisions were made and listened to staff concerns.
- **Confidence and risk taking:** Members exhibited confidence and bravery in buying the organisation without knowing the outcome. This, combined with the ability to calculate the risk in decision making were noted as key success factors.
- **German nationality:** One entrepreneurial entity member is from German origin, and this played a marked role in initiating discussions with Gerling Global in Germany.
- **Trust:** A key element in the establishment of the Saxum Group was the element of trust in one another and trust in the goals that were being pursued.

The following table provides excerpts from interviews in support of these dimensions:

"We needed to pull in somebody who had done this before, and [Anthony] suggested [John Carter] had done something like this before, and who has been appointed by the financial services board as a curator for a company that has been in run-off before, who understand the hands-on mechanics of a run-off company"	Interviewee D
"I started to do consulting work for myself"; "firstly I joined IBM, and then we did some work for the Old First National Bank, where the bank wanted to start an insurance company, and I basically helped the guys to set up, and I did some consulting work for them"	Interviewee H
"Firstly, it started with me identifying the opportunity, and at that point in time it was [Graham Wallace] who worked in my currently company as the CFO, and it was an temporary appointment as I knew about his financial skill and knowledge in analysing an balance sheet and understanding due diligence information. and also I was in the insurance industry for over 20 years before we acquired the opportunity, so I think I acquired sufficient insurance skills over the years to ..."	

Interviewee A
"I think trust was the biggest element, that what worked as the biggest element to build the organisation because I think they trusted each other's decisions, they trusted each other's knowledge and ideas and then they believed in them, they all believed in the same goal and then it worked out as a business, as a successful business"
Interviewee J
"I think because they're entrepreneurs. I think that's why they were able to do it, but I think the opportunity arose for one fact only; [Tony] being German, and having the right connection"
Interviewee G
"When I felt, I needed a bit of new challenge, one of my old friends that I used to work for and with at Alliance Insurance, [Tony Adams], and he needed someone to help him with short-term consultancy with a task at a company he was working with, WinterBach ...Africa"
Interviewee B

DISCUSSION

The purpose of this paper was to understand how an entrepreneurial entity realised opportunities within the South African insurance industry and the objective of the study was to understand the dynamics surrounding opportunity realisation of an entrepreneurial entity within the South African Insurance industry. It would appear as though the aim and the resultant objective of the study have been partially met. The study does highlight key variables involved in the dynamics of opportunity realisation, but it does not pertinently link them together in a cause and effect manner, as shall be expounded upon in this section.

From the findings presented above, it is apparent that the formation of the entrepreneurial entity consists of two distinct parts: informal formation and formal formation. Informal formation seems to begin with the initiative of an individual and over time other members are co-opted based on the need for additional skill and experience. The number of co-opted members depends on the information needs presented by the opportunity in question. The informal group interaction needs to be dynamic, confident, and problem solving orientated. It is advantageous if entity members are acquainted through work experience and industry reputation as this helps in solidifying roles and responsibilities in the formal entrepreneurial entity. Although not elaborated upon in detail, Van Gelderen (2014), as well Hmieleski and Baron (2008) do touch upon entrepreneurial character and the establishment of networks and relationships to pursue opportunities. This formation of the entrepreneurial entity can thus be seen as the starting point of the dynamic of opportunity realisation, as the character of this entrepreneurial entity will set the tone for this dynamic.

Key success factors for opportunity realisation of an entrepreneurial entity seem to be the knowledge and market scanning ability of the entity, the ability to successfully network and build trust based on skill, knowledge, experience and industry reputation. This sentiment is echoed by Gruber (2010), and Van Gelderen (2014). The entrepreneurial mind-set of the entity is also crucial for engaging with opportunities that present themselves. The ability to transform an opportunity into a viable business venture seems to require an intimate knowledge of the business and the industry, keen business acumen, confidence in the ability of the entity as well as trust in the abilities of the entity members, credibility and reputation in the industry, and the ability to create a business model capable of constant change, factors also mentioned by Garcia-Cabrera and Garcia-Soto (2009), as well as Heinrichs and Walter (2013). These factors therefore shape the dynamic of opportunity realisation and will have a marked influence on the entity's ability to translate an opportunity into a viable business venture.

The fundamental nature of entrepreneurship is value creation through combining unique resources to exploit opportunities (Groenewald, 2010). The entrepreneurial opportunity framework rests upon five key elements (Groenewald, 2010; Vaghely & Julien, 2010) namely (a) **process**, implying it is manageable, continuous, and can be broken down into steps, (b) entrepreneurship creates **value** where there was none before within business and in the market place, (c) that entrepreneurs **combine resources** in unique ways to create value and differentiate their efforts (d) entrepreneurial opportunities represent a chances for **individuals**

or teams (entrepreneurial entities) to offer new value to society, and (e) entrepreneurship is **opportunity driven behaviour** in which new goods, services, raw materials, markets and organising methods can be introduced.

It would seem as though the findings of this paper concur with this entrepreneurial opportunity framework. Literature does not specifically address the behavioural action of informal entrepreneurial entities, its formation process or the future impact of the behaviour actions. Literature does provide insightful information regarding organisational entrepreneurial behaviour. Furthermore, the study also sheds light on the dynamics of opportunity realisation, albeit limited to the Saxum Group. In this regard, it would seem as though the formation process of the entrepreneurial entity, as well as the knowledge, skills, networking ability and reputation of the entrepreneurial entity all influence successful transition from opportunity realisation to the pursuit of a viable business opportunity.

CONCLUSIONS

The paper suggests that opportunity realisation within the insurance industry is strongly driven by the historical and prevailing market conditions. Thus, entrepreneurial behaviour within the South African insurance industry increases with the exit of multinational insurance firms. Furthermore, competition within this market will be oligopolistic in nature due to the fact that few new entrants will be able to comply with the changing regulatory environment, and that the products of these firms will be highly differentiated.

This paper also proposes that opportunity realisation for an entrepreneurial entity within the South African insurance market appears to be strongly influenced by its own formation and behaviour. Therefore, entrepreneurial ability of the entity develops over time and is not fully developed at the point of opportunity identification. Rather a specialised skill set develops as opportunity identification develops into opportunity realisation. Furthermore, the sustainable behaviour of an entrepreneurial entity rests upon the self-awareness of its members, uniformity in decision making, and the ability of the entity members to effectively communicate with each other and manage conflict.

Opportunity identification is highly dependent on the insurance market conditions, the abilities of individual entrepreneurial entity members, and the entrepreneurial entity. Therefore, opportunity identification is the interaction between the entrepreneur and the environment, manifested in evolving business models. Although evolving business models allow the entrepreneurial entity to be adaptive to change within the environments, organisational stress arises due to uncertainties.

Opportunity realisation for an entrepreneurial entity within the South African insurance market appears to be influenced by strategic development activities. Acquisitions seem to be the main choice for market growth by entrepreneurial entities within the South African insurance industry, which requires strong negotiation and financial skills. Although competitive advantages can be found in employee skills, organisational technology platforms and organisational infrastructure, a sustained competitive advantage is found in strategic entrepreneurial development activities that allow for specialised and rare skills to emerge.

RECOMMENDATIONS

Successful entrepreneurial behaviour is dependent on an entrepreneur's ability to continuously develop and learn. The personal networking ability of the entrepreneur can be improved by focusing attention on improving projected images of self, building sustainable networks with other entrepreneurs to build on trust and professional conduct. Networks of informal collaboration should be established alongside value chain activities that correspond with the entrepreneurial interest. The entrepreneur should also predefine his investment expectations before engaging in networking activities, as this will help focus attention.

The interaction between the entrepreneur and his environment is of vital importance for successful entrepreneurial activity. Aspiring entrepreneurs could enhance their entrepreneurial skills by developing effective communications techniques, financial skills and negotiations skills. Market scanning and knowledge should be imbedded within an entrepreneur. Aspiring entrepreneurs should: (a) consider new and emerging trends in consumer markets, (b) apply planned networking with industry stakeholders in order to be up to date with possible opportunities, and (c) establish an understanding of how business modes adapt to changing environments.

AREAS FOR FUTURE RESEARCH

Due to limited empirical information available on opportunity realisation in South Africa this study provides valuable insights into a pivotal aspect of the entrepreneurial endeavour. As such, more studies of this nature need to be embarked upon in order to develop a comprehensive body of knowledge on opportunity realisation in the South African context.

REFERENCES

- Andersson, S. & Evers, N. (2015). International opportunity recognition in international new ventures—a dynamic managerial capabilities perspective. *Journal of International Entrepreneurship*, 13(3): 260-276.
- Araichi, S & Belkacem, L. (2014). Solvency capital for insurance company: modeling dependence using copula. Available at: <http://docs.isfa.fr/labo/2014.8.pdf>. Downloaded 23 November 2016
- Baron, R. & Ensley, M.D. (2006). Opportunity Recognition as the Detection of Meaningful Patterns: Evidence from Comparisons of Novice and Experienced Entrepreneurs. *Management Science*, 52(1): 1331-1344.
- Booth, G. (2010). A Decade of Disaster. *Reactions*, 4(4): 18-21.
- Brimble, M., Stewart, J. & De Zwaan, L. 2010. Climate Change and Financial Regulation. *Griffith Law Review*, 19(1): 71-85.
- Brockman, B.K. (2014). Entrepreneurial alertness in opportunity identification and opportunity development. *Journal of Business and Entrepreneurship*, 26(2): 27- 44
- Cha, M-S. & Bae, Z-T. (2010). The Entrepreneurial Journey: From Entrepreneurial Intent to Opportunity Realization. *Journal of High Technology Management Research*, 21(1): 31-42.
- Charmaz, K. (2011). Grounded theory methods in social justice research. *The Sage handbook of qualitative research*, 4(1): 359-380.
- Chen, X., Doerpinghaus, H., Lin, B. & Yu, T. (2008). Catastrophic Losses and Insurer Profitability: Evidence from 9/11. *The Journal of Risk and Insurance*, 75(1): 39-62.
- Choi, Y.R. & Shepherd, D.A. (2004). Entrepreneurs' decisions to exploit opportunities. *Journal of Management*, 30(1): 377-395.
- Cliff, J., Jennings, P. & Greenwood, R. (2006). New to the Game and Questioning the Rules: The Experiences and Beliefs of Founders who start Imitative versus Innovative Firms. *Journal of Business Venturing*, 21(1): 633-663.
- Cohen, B. & Winn, M.I. (2007). Market Imperfections, Opportunity and Sustainable Entrepreneurship. *Journal of Business Venturing*, 22(1): 29-49.
- Creswell, J.H. (2007). *Qualitative Inquiry and Research Design*. Los Angeles: Sage.
- Dimov, D. (2007). Beyond the Single-Person, Single-Insight Attribution in Understanding Entrepreneurial Opportunities. *Entrepreneurship Theory and Practice*, 5(1): 713-731.
- Eckhardt, J.T. & Shane, S.A. (2003). Opportunities and Entrepreneurship. *Journal of Management*, 29(3): 333-349.
- Eddleston, K., Kellermanns, F. & Sarathy, R. (2008). Resource Configuration in Family Firms: Linking Resources, Strategic Planning and Technological Opportunities to Performance. *Journal of Management Studies*, 45(1): 26-50.

- Ellenburger, F. & Trussell, M. (2012). The Intelligent Insurer: Creating Value from Opportunities in a Changing World. Available at: <http://www.kpmg.com/intelligentinsurer> [Accessed 20 December 2012].
- García-Cabrera, A.M. & García-Soto, M.G. (2009). A Dynamic Model of Technology-Based Opportunity Recognition. *Journal of Entrepreneurship*, 18(2): 167-190.
- George, N.M., Parida, V., Lahti, T. & Wincent, J. (2016). A systematic literature review of entrepreneurial opportunity recognition: insights on influencing factors. *International Entrepreneurship and Management Journal*, 12(2): 309-350.
- Gibson, W. & Brown, A. (2009). *A Research Design: Sage Research Methods Online*. [Online] Available at: <http://www.0-srmo.sagepub.com.ujlink.uj.ac.za/view/working-with-qualitative-data/d43.xml?r> [Accessed 24 April 2010].
- Goldman, G.A. (2008). *Academic's Experience of a Merger in Higher Education*. Unpublished PhD Thesis, Johannesburg: University of Johannesburg.
- Groenewald, D. (2010). *Assessment of Corporate Entrepreneurship and the Levels of Innovation in the South African Short-Term Insurance Industry*. Unpublished DPhil thesis, Pretoria: University of Pretoria.
- Gruber, M. (2010). Exploring the Origins of Organizational Paths: Empirical Evidence from Newly Founded Firms. *Journal of Management*, 36(5): 1143-1467.
- Hagendorff, B., Hagendorff, J. & Keasey, K. (2015). The Impact of Mega-Catastrophes on Insurers: An Exposure-Based Analysis of the US Homeowners' Insurance Market. *Risk Analysis*, 35(1): 157-173.
- Heinrichs, S. & Walter, S. (2013). *Who becomes an entrepreneur? A 30-years-review of individual-level research and an agenda for future research*. Universität Kiel: Arbeitspapiere des Instituts für Betriebswirtschaftslehre.
- Hmieleski, K. & Baron, R. (2008). Regulatory Focus and New Venture Performance: A Study of Entrepreneurial Opportunity Exploitation under Conditions of Risk versus Uncertainty. *Strategic Entrepreneurship Journal*, 2(1): 285-300.
- Hong, Z., Min-Ming, W., Chuanhou, C. & Mulong, W. (2012). Underwriting and Investment Risks in the Property-Liability Insurance Industry: Evidence Prior to the 9-11 Event. *Review of Quantitative Finances and Accounting*, 38(46): 25-46.
- Irvine, A., Drew, P. & Sainsbury, R. (2013). 'Am I not answering your questions properly?' Clarification, adequacy and responsiveness in semi-structured telephone and face-to-face interviews. *Qualitative Research*, 13(1): 87-106.
- Jaiyeoba, O.O., Marandu, E. & Kealesitse, B. (2015). Proclivity of environmental uncertainty and market orientation behaviours among Botswana's small service firms. *Journal of Global Business and Technology*, 11(1): 13-23.
- Leedy, P.D. & Ormrod, J.E. (2014). *Practical Research: Planning and Design*. Upper Saddle River: Pearson Education.
- Lehner, M. & Kansikas, J. (2012). Opportunity Recognitions in Social Entrepreneurship: A Thematic Meta-Analysis. *Journal of Entrepreneurship*, 21(1): 25-58.
- Markatou, M. & Stournaras, Y. (2013). Innovation for entrepreneurship: Is new technology a driving mechanism for the creation of a firm? *Journal of Global Business and Technology*, 9(2): 1-11.
- Marovic, B., Njegomir, N. & Maksimovic, R. (2010). The Implication of the Financial Crisis to the Insurance Industry-Global and Regional Perspective. *Economic Research*, 23(2): 127-141.
- Park, J.S. (2005). Opportunity Recognition and Product Innovation in Entrepreneurial Hi-Tech Start-Ups: A New Perspective and Supporting Case Study. *Technovation*, 25(7): 739-752.
- Ragin, M.A. & Halek, M. (2015). Market expectations following catastrophes: An examination of insurance broker returns. *Journal of Risk and Insurance*. 83(4): 849-876
- Shane, S. & Venkataraman, S. (2000). The Promise of Entrepreneurship as a Field of Research. *Academy of Management Review*, 25(1): 217-226.
- Short, J.C., Ketchen, D.J., Shook, C.L. & Ireland, D.R. (2010). The Concept of "Opportunity" in Entrepreneurship Research: Past Accomplishments and Future Challenges. *Journal of Management*, 36(1): 40-65.
- Strauss, A. & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park: Sage.
- Vaghely, I.P. & Julien, P-A. (2010). Are Opportunities Recognized or Constructed? An Information Perspective on Entrepreneurial Opportunity Identification. *Journal of Business Venturing*, 25(1): 73-86.
- Van Gelderen, M. (2014). Generating initial ideas for new venture opportunities. *Venturing*, 19(1): 173-188

- Wang, Yu-Lin, Andrea D. Ellinger, & Yen-Chun Jim Wu. (2013). Entrepreneurial opportunity recognition: an empirical study of R&D personnel. *Management Decision*, 51(2): 248-266.
- Wasdani, K.P. & Mathew, M. (2014). Potential for opportunity recognition: differentiating entrepreneurs. *International Journal of Entrepreneurship and Small Business*, 23(3): 336-362.
- Yin, R.K. (2013). *Case study research: Design and methods*. Thousand Oaks: Sage.

INVENTORIES CONTROL, THE INVENTORY MANAGER AND MATRIXES OF WEIGHING WITH MULTIPLICATIVE FACTORS (MOW_{wMf})

María J. García G., Lucía M. Schwarz I., Trina M. Schwarz I., Gilberto J. Hernández G., and José G. Hernández R.

ABSTRACT

This paper presented solutions to the negative influence on inventory control (IC) by externals interventions, particularly on the part of the state. A logistics vision was followed, from the Inventory Manager (IM) of the Logistic Model Based on Positions (MoLoBaC) and the situation was analyzed with a Matrix Of Weighing with Multiplicative factors (MOW_{wMf}). The influence of restrictions on inventories has already been previously addressed, particularly on the part of the state as it affects society, using the MoLoBaC. In this work, the MoLoBaC was also used, through its IM, and actions to take by organizations to alleviate this intervention of the state were studied. To analyze the alternatives, a MOW_{wMf} was used. From the above emerges the objective: Analyze through a Matrix Of Weighing with Multiplicative factors, the alternative that can take an Inventory manager and the organization as a whole, if it is subject to state restrictions, affecting its control of inventories.

Keywords: Inventory control (IC), Business logistics, Logistics Model Based on Positions (LoMoBaP [MoLoBaC]), Inventory manager (IM), Matrix Of Weighing with Multiplicative factors (MOW_{wMf} [MDPcFm]).

INTRODUCTION

As Burduf (2014) comments, one of the most discussed aspects in economics is, according to different points of view, the necessary or unwanted state intervention, in the basic aspects of the companies. And she points out, sometimes this can lead to market failures. But this is not a new topic. Taking as a conductive threat

María J. García G. holds a master in Operations Research. Her investigations focus on risk management, evaluation and management of projects and knowledge management, among others.

Lucía M. Schwarz I. is Industrial Mathematician and Production Engineer at Metropolitan University. Her areas of specialization are Sales and Operation Planning (S&OP) and Inventory management.

Trina M. Schwarz I. is Production Engineer at Metropolitan University, Caracas, Venezuela. Her areas of specialization are Sales and Operation Planning (S&OP) and Inventory management.

Gilberto J. Hernández G. has a master in Technology of Foods. His research is mainly in the areas of food technologies, knowledge management, logistics and risk management.

José G. Hernández R. is chemical engineer and holds a master in Operations Research. He has published and presented in the areas of knowledge management, managerial and social decision-making, logistics, risk management and operations research.

the theory of the capitalist development of the state, associated with the development of the Asian tigers or the so-called Asian miracle in the decade of the eighties of the XXth century, different authors (Beeson, 2009; Evans, 1989; Onis, 1991; Stubbs, 2009) analyze from diverse points of view positive and negative aspects of the intervention of the state. In their works, these authors comment on some of the Schools of economic thought that have supported one position or another. Also, they emphasize the presence of a “strong” state (Onis, 1991). On the other hand, not only do they mention the four Asian tigers, but they also allude to Japan and China (Beeson, 2009) and even refer to other countries outside Asia, such as Brazil and Zaire (Evans, 1989), commenting on the state’s direct influence on their economies.

When analyzing the intervention or non-intervention of the state in the essential aspects of the economy, an element that plays a very important role in any outside intervention is corruption (Del Monte & Papagni, 2007; Hellman et al., 2000), which is present in many countries of the world. Another aspect that can also be considered of importance when it comes to analyzing the excessive state intervention is what Robinson (2010) considers the presence of elites, specifically, the national and transnational elites. Especially because it is possible to think that elites would reduce the impact of state intervention. Also, it can be important to consider the formation and vision of the leaders of the different states, especially, as emphasized by Bresser-Pereira (2012), their aptitude to be useful in realizing lucrative investments that generate socio-economic growth. Also worthy to consider are the political concepts of the left and right, as presented Wiesehomeier & Doyle (2012). And before assessing state intervention as positive or perverse, it is interesting to note the affirmation of those who argue that society, as a whole, needs to decide for itself what it wants and needs (Goldman, Nienaber & Pretorius, 2015).

Regarding state intervention, on one hand it is necessary to refer to the works of Fritz, & Rocha (2007) and Kohli (2006), which stress the importance of a good government to fight against poverty, and to refer to growth in India at the end of the XXth century and beginning of the XXIst, which stems from a suitable participation of the state. On the other hand, one finds the work of Schwarz et al. (2016) which stress the disadvantages that can confront companies as a result of the intervention of the state in inventory management. First, Schwarz et al. (2016), calls attention on the relevance that the inventory control has for the logistics and for companies as a whole and states that inventory management, by its prominence, is studied from many different approaches. To illustrate its importance, there are articles on inventory control and the impact of information sharing in the supply chain (Costantino et al., 2014) and the levels of service (Disney et al., 2015; Larsen & Thorstenson, 2014), or even in the military sphere (Skipper et al., 2016), or when it is handle multiple suppliers, as in the works of Mousavi et al. (2014), Sheopuri, Janakiraman & Seshadri (2007), and of Allon & Van Mieghem (2010), where the latter focused on the location of the suppliers, or the of Jain, Groenevelt & Rudi (2010), who view the problem from the multiple reset modes, or the work of Gercek, Saleem & Steel (2016) who relate them to third party services.

Works where dynamic price models compete with inventory control should also be mentioned (Adida & Perakis, 2010), or models that consider the deterioration of goods during the inventory periods (Chen, Pang & Pan 2014; Qin, Wang & Wei, 2014; Taleizadeh & Nematollahi, 2014) either because they are fresh or perishable products, or are deteriorated by handling. Already, Schwarz et al. (2016) identified studies that relate the management of inventories to: information (Cachon & Fisher, 2000), to risk aversion (Chen et al., 2007), to integer programming in the oil industry (Lee et al., 1996), to finance (Michalsky, 2008), with the simulation (Schwartz, Wang & Rivera, 2006), with a vision of Sales and Operation Planning (S&OP) (Schwarz & Schwarz, 2015), and even with reverse logistics (Toktay, Wein & Zenios, 2000), and as in some of the previously mentioned cases, taking into account multiple products and multiple processes (Mieghem & Rudi, 2002).

Schwarz et al. (2016) also highlighted that the Operations Research inventory models focus on two fundamental aspects, when to acquire and how much to acquire (Mousavi et al., 2014), and that these models try to ensure that companies can maintain a balance between supply and demand. They emphasize that an excessive inventory results in costs and vices in the productive processes, meanwhile a scarce inventory is translated in a poor customer service, both being detrimental to organizations. The fact that the inventory control is a fundamental aspect of the logistics means that this will have a systemic impact. On the other hand, business logistics have repercussions on the entire organization, as suggested by García, Hernández & Hernández (2014); Hernández, García & Hernández (2016); Schwarz et al. (2016). From there stem all those

INVENTORIES CONTROL, THE INVENTORY MANAGER AND MATRIXES OF WEIGHING WITH MULTIPLICATIVE FACTORS (MOWwMf)

measures that affect inventory control have an impact on the entire organization. In the work of Schwarz et al. (2016) it is noted that any disturbance in inventories brings worse consequences to the organization if they come from laws dictated by a country's government. They based their study on the Bolivarian Republic of Venezuela and reached a series of consequences that are presented in Table 1. On the other hand, while an advantage of logistics, with a high impact on almost all areas of an organization, it is also a disadvantage, since it makes teaching difficult. For this reason, four quantitative-qualitative models have been created to facilitate its study (García, Hernández & Hernández (2013; 2014); Guerrero et al. (2014); Hernández, García & Hernández (2016); Schwarz et al. (2016)).

These four models try to explain the logistics from different points of view: The Logistic model Supply, Production, Distribution and Inverse (LSPDI [LAPDI]) focuses on logistical flows to analyze business logistics (García, Hernández & Hernández, 2014); The Logistics Model Based on Positions (LoMoBaP [MoLoBaC]) takes into account all the functions performed by those who hold positions related to business logistics (Hernández, García & Hernández, 2016; Schwarz et al., 2016); The Logistic Model Based on Indicators for Positions (LoMoBaIPo [MoLoBaICa]), overlaps with the MoLoBaC and analyzes the logistics through performance indicators (Guerrero et al., 2014); and the Logistic, Strategic, Tactical, Operational with Inverse Logistics Model (STOILMo [MoLETOI]) is based on the three components of the administrative pyramid; and the Strategic, Tactical and Operative, including reverse logistics, analyzes business logistics (García, Hernández & Hernández, 2013).

This paper will focus on the MoLoBaC, and will study how an organization can face the repercussions of restrictions outside the organization that affect the control of inventories through its General Manager of Inventories or simply Inventory Manager (IM). Table 1 examines the negative impacts of state intervention. Table 1 suggests certain possible actions, who will manage, and what are the criteria and possibilities that will lead to the survival of the organization. To address a set of alternatives and criteria used to evaluate them, a multicriteria model will be necessary. Among the numerous multicriteria models that could be used for this work, for its implementation simplicity, is the Matrix Of Weighing with Multiplicative factors (MOWwMf [MDPcFm]), which will be used in this study.

Table 1. Social impact of government measures that affect the inventories

Situation	Consequences for the organization and society and possible ways to face them
There is no supply.	1. Stop producing. Would lead to the bankruptcy of the company, leave without employment a group of workers, there would be a less of supply of products of this organization. It would cause large monetary losses to the shareholders.
	2. To stop producing temporarily until it is possible to have inputs. It would be an uncertain situation where there would generally be a dependence on third parties. Temporarily, there would be less of supply and it could lead to loss of employment, but, if the shortage is extended, it would have the same consequences as in 1 and always with a loss to the shareholders.
	3. Remove products in inventory. Although the company is not able to produce any of its usual products, it might have an inventory of raw materials and packaging, and even semi-finished products, which it can no longer use and of which it should discard. In the best case scenario, they could be sold to competing companies or to third parties in different markets, generally at a financial loss. For society, in the end, there would be the same consequences as in 1.
Insufficient supplies of some products.	4. To prepare different products. In general, these products would be an incomplete version of the originals, where some of the components would not be present. Sectors of society could be strongly affected, since the eliminated product was part of their daily use. This may be the case of children and the elder consumers who require fortified, or fat-free products, or other products that meet certain requirements. In the organization, there are necessary changes, especially in production and packaging. It could lead to job loss and even monetary loss, since in general, the company is reduced.
	5. Change of products. The new products would be modified versions of existing products, where some of its

	components would be replaced. Just as in 4, some sectors of society could be affected because the new products cannot fit in their daily use. For the rest of society there must be a process of adaptation to the new products. As in 4, the organization must make internal changes and again there may be job losses and monetary losses.
	6. To change branch completely. The company is dedicated to producing new products, which can be very different from their usual lines. This usually leads to a forced reduction of the company, causing losses of work positions and monetary losses. For society, it means losing a source of supply of the original products, which could be basic, at least for some sectors. At the end, from the point of view of the original products, it is possible to come to a situation like that described in 1.
	7. Get rid of inventories. Although the organization can handle a type 4 or type 5 situation, there will still be complementary products that will not be able to integrate the new production lines, so they must discard them, staying in a situation equal to 3.

Source: Schwarz et al. (2016).

Objectives

The above research begs the question: can some quantitative help be offered to Inventory Managers (IM) to analyze the alternatives to be followed in case their inventory control is affected by external causes? The answer to this question is expressed as the objectives of this work: To analyze, through a Matrix Of Weighing with Multiplicative factors, the alternative that an Inventory Manager and the organization as a whole might take, if subject to state restrictions, affecting its control of inventories.

To achieve this overall objective will be included three specific objectives:

- Present the Inventory manager (IM) of the Logistics Model Based on Positions (MoLoBaC), emphasizing the functions that performed.
- Explain the Matrix Of Weighing with Multiplicative factors (MOWwMf) and describe how it works.
- Relate the functions of the IM and the possible scenarios of the impact of the intervention of the state in the inventories control and through a MOWwMf, to analyze some of the actions that an organization can take.

Limitations and scopes

With regard to limitations and scopes, no field study will be done on any particular organization or type of organization, but the analysis of alternatives will be hypothetical and the most general possible, to give the study a universal validity.

It is also important to note that the present study is theoretical, with the intention of offering universal options. In this paper, the analysis is made to deal with state interventions that affect the inventory management. However, the final purpose, is that what is done here can be generalized for any type of external intervention that affects the control of inventories.

Methodology

In order to achieve the general objective and its specific objectives, the Integrated-Adaptable Methodology for the development of Decision Support System (IAMDSS, in Spanish, Metodología Integradora-Adaptable para desarrollar Sistemas de Apoyo a las Decisiones [MIASAD]), was used. It was

INVENTORIES CONTROL, THE INVENTORY MANAGER AND MATRIXES OF WEIGHING WITH MULTIPLICATIVE FACTORS (MOWwMf)

developed to create support systems, but because of its flexibility adapts to different types of research (García, Hernández & Hernández, 2013; 2014; Guerrero et al., 2014; Hernández, García & Hernández, 2016; Schwarz & Schwarz, 2015; Schwarz et al., 2016).

MIASAD, as presented in previous works (Hernández, García & Hernández, 2016; Schwarz et al., 2016) and in others mentioned by them, approaches the investigations without going through the hypothesis approach, but follows a set of steps, which, due to the flexibility of the methodology, can be adapted to each situation in particular. This makes MIASAD very easy to follow and apply, especially for working in groups. In this paper, like what was done in most of the previously mentioned works will be used:

- a) Define the problem, which as stated in the objective is to analyze through a Matrix Of Weighing with Multiplicative factors (MOWwMf), the alternative that can take an Inventory manager (IM) and the organization as a whole, if it is subject to state restrictions, that affecting its control of inventories;
- b) Elaborate a first prototype, where, in addition to offering the most complete vision possible of what the research will be, one of its first functions is to identify the users of the final product, in this case, because it is a scientific article, its main readers will be expected to be interested in studying the external influences in the inventories control, to which will be added the students of the logistics, from all its aspects, especially those interested in the quantitative approaches and in those interested in analyzing the functions performed by those who have positions related to logistics performance and to all of them will join the students of the multicriteria models, in particular the interested in the MOWwMf. Also there is established, with the first prototype, the structure of the article, which in addition to this introduction it consisted of three central chapters, in the first of them was presented the IM, especially through some of its functions, in the second was discussed the MOWwMf and some of its particularities and in the third chapter, which comes to be the main one of the work, was presented as it is possible to make use of a MOWwMf and of the functions of the IM, to analyze the possible alternatives to be taken by an organization to confront the intervention of the state in the control of inventories. The paper was closed with a chapter for conclusions and future research;
- c) Search for data, particularly on the Logistics Model Base on Positions (MoLoBaC), specifically the IM and about multicriteria models, especially on MOWwMf;
- d) Define alternatives, which consist in visualizing possible actions to face with the impact of some governmental measures on the control of inventories, making use of the functions of the IM;
- e) Evaluate the alternatives, taking as an element of evaluation, the feasibility of the proposed alternatives according to the established objectives;
- f) To select the best alternative, in accordance with the secondary, tacit or explicit, objectives that have been contemplated. Although it should be made clear here that the alternative selected, can be a set of strategies to follow, according to the situation of each organization;
- g) To implement the selected alternative. Although being a theoretical study, without any implementation as such, the important thing is to visualize the mechanisms that allow the chosen alternative can be implemented and
- h) Set controls or mechanisms to recognize that the chosen alternative remains valid in time.

As has already been said, it is important to insist that the alternative selected, which can be a set of strategies, can also be formed by a set of functions.

THE INVENTORY MANAGER OF THE LOGISTIC MODEL BASED ON POSITIONS

The General manager of inventories or simply Inventory manager (IM), in the Logistics Model Based on Positions (MoLoBaC), is responsible for establishing all the parameters and rules of control of all inventories, except the physical handling that correspond to the Stores manager (SM). However, the IM must be attentive to all physical movements of the merchandise to ensure that what appears in the inventory systems coincides with the physical reality of what is available and specially to attend on the life cycle of the inventories, that is to say, all the changes that it could suffer the different items to inventory, since its arrival, permanence, processing, transport and even the possibilities that return to the organization by means of the

reverse logistics. Equally under his responsibility and direct supervision are the final approval of all the models created and put in use for the handling of the inventories of the organization. In this inventory management are included the raw materials and other inputs, as well as products: in the production chain or in intermediate stages of elaboration, finished, in transport to be delivered or that returning to the organization through the operation of the reverse logistics, as well as all the equipment, spare parts, materials and parts that are in all the stores in the organization.

To ensure the control of all these inputs and equipment, the IM must be closely integrated with all posts in the organization and have a perfect knowledge of the same, as well as of its changing reality and its environment. This requires that the IM meets, like their subordinates, with many functions, some of them very complex and all very varied, so that the company can achieve its main objective that is none other than satisfy the end customer and achieve it without the sacrifice of many resources.

This permanent need to keep final customers satisfied and not to incur excessive use of resources forces the IM to fulfill a set of functions that allow him to guarantee a strict control of inventories, while maintaining high interaction with many of the positions and areas of the organization. Some of the functions that must be performed, the IM are reflected in table 2, many of them taken, modified, based or inspired, among others, of Adida & Perakis (2010); Chen, Pang & Pan (2014); Dekker, Bloemhof & Mallidis (2012); García, Hernández & Hernández (2013); Larsen & Thorstenson (2014); Mota et al. (2015); Qin, Wang & Wei (2014); Taleizadeh & Nematollahi (2014); Tilokavichai, Sophatsathit & Chandrachai (2012) and particularly of Schwarz & Schwarz (2015) and Schwarz et al. (2016). In table 2, were used abbreviations such as EM by Environmental manager, IC by inventory control, IL by Inverse logistics, ILM by Inverse logistics manager, IM by Inventory manager, IMM by Inventories model manager, ISIR, by industrial safety and internal relations, HR by Human Resources, MG by Manager, MH by Material handling, M&S by Marketing and Sales, R&D by Research and Development, SC by Supply Chain, SCM by Supply Chain Management, SM by Stores manager, S&OP by Sales and Operation Planning. Some of these abbreviations have already been used and these and some of the new will continue to be used in the rest of the work. Also in this table 2, if there is no possibility of confusion, the term items will be used to encompass both products, such as spare parts, materials and parts and other inputs to be handled.

Table 2. Some of the most important functions of the Inventory manager

Intrinsic to the position.	
01	Define all the policies of management and IC, which will be applied in the organization.
02	Establish clear rules that allow the IC of perishable items and of fast obsolescence.
03	To have a special control of the inventories of those items of easy deterioration.
04	To guarantee that the different premises that are used for every IC, are fulfilled.
05	Maximize customer service levels through the IC.
06	Be innovative in everything that relates to IC.
07	Identify the most appropriate IC class to handle each situation.
08	Take care with special attention to the IC of seasonal products.
09	To take measures to improve the inventor rotation or to act according to it, at the worst case.
10	To bear in mind that the IC is more than the control in the store and that it involves the cycle of life of the inventories.
11	Prepare strategies that allowed it to use the IC to know the cycle and the life time of the organization.
12	Carry out IC that guarantees a minimum level of losses due to inventory problems.
13	Ensure that are available models to calculate the deterioration of items in inventories.
14	Guarantee through IC, which minimize penalties for late deliveries to customers.
15	Constantly review the IC, especially in view of the profitability.
16	Stay attentive to the prices at the present value of the inventories.
17	Consider in the IC, delivery times, of the different items of the organization.
18	Ensure that the management and IC, be as flexible as possible, without losing the administrative formality.
19	Work to achieve flexible IC that can quickly be adapted to changing situations.
20	Know and handle the restrictions of the warehouses to be included in the IC.
21	Establish mechanisms that allow him to monitor inventory levels always.

INVENTORIES CONTROL, THE INVENTORY MANAGER AND MATRIXES OF WEIGHING WITH MULTIPLICATIVE FACTORS (MOWwMf)

22	Generate special policies of inventory management to serve specific clients, such as hospitals.
23	To have different classifications ABC (80/20) for the diverse situations that it could to present.
24	To create particular IC for the different items that the organization handles, especially the type A.
25	To incorporate the new experiences and lessons learned to the IC.
26	Use models that allow the prediction of the inventory totals breaks.
27	Maintain a constant review of the various IC that are in use in the organization.
28	Take care that the IC are sufficiently dynamic to respond to unfavorable scenarios.
29	Include in the flexibility of the IC the possibility of managing alternative products.
30	Incorporate Security inventories in all IC used by the organization.
31	Take care that the IC used, in addition to responding to the costs, also guarantee the quality.
32	Use the models of inventories to determine components which may be in short supply for each product.
33	Keep the organization informed of any change in the IC used.
34	Be persistent in the search for new ways to get more of the different IC.
35	To constantly review the results of the IC used to measure its effectiveness.
36	To participate, the organization as a whole, the results obtained by IC that represent special situations.
37	Incorporate new tools and techniques that will help to improve the performance of the IC.
38	To bring into the organization, equipment, technologies and processes those improve the use and performance of the IC.
39	Learn about the different Material Requirement Plan (MRP), of the different final products of the organization.
40	Ensure that the IC will help to predict accurately the obsolescence of components and products.
41	Take care that the IC will help to ensure the safety and security (S&S) of the organization.
42	Ensure the proper functioning of the equipment used to execute the ICs.
43	Adapt the IC to the launching of new products, whether their own or competition.
44	To create systems those allow him to evaluate the proper performance and of his subordinates.
45	To realize constantly analysis of sensibility (What if?) with the IC, to cover any change in the environment.
46	Contribute in the S&OP of the organization helping, through the IC, to the coordination between: marketing, production, sales, finance, production and inventories.

Table 2. Some of the most important functions of the Inventory manager (continuation)

47	To direct the formulation, approval and fulfillment of the inventor plan of materials.
48	To achieve that the IC contribute in all the aspects of the S&OP of the organization.
Related to other positions of MoLoBaC.	
49	To analyze with all the members of the MoLoBaC their respective relations with the IC.
50	To evaluate the new approaches on IC who propose the remaining positions of MoLoBaC.
51	To guarantee, with the collaboration of the MG of Quality, that the IC take in account the quality of the received supply.
52	Try, together the Procure MG and his subordinates, which the IC will help to maintain the balance between the demand and supply received.
53	Consider in the IC, the times of delivery of the supplies, with the help of the Procure MG and his subordinates.
54	Request support from the Costs MG, so that the IC used tend to minimize costs.
55	To be attentive, joint Finance and Costs managers, that the IC does not be affected by the delays in the payments and for the inflation and other aspects that affect the cash flows of the organization.
56	Support the Finance MG, in the preparation of the budget of the organization.
57	Seek the support of the Layout MG and SM for an adequate physical distribution of inventories.
58	Work together with the SM to know the items that are in the different warehouses.
59	Coordinate with the SM an adequate temperature management in the productive areas, particularly in the warehouses.
60	Check with the SM, that the actual values in store, match the IC systems.
61	Contact the Order processing and M&S managers to know the demands of the customers.
62	Assist in the functions of the Order processing MG, through the IC.
63	Provide support to the Maintenance MG and his subordinates through appropriate IC.
64	Make efforts for the IC to assist the Picking MG in his performance.

65	Give clear support to the MH MG through the IC.
66	Work jointly with the IMM and Equipment and spare parts MG, to better manage the inventories of the entire organization.
67	Contribute, with the IMM and Forecasting MG, to develop predictive models for the whole organization.
68	Review, together with the R&D MG and his subordinates, all the new technologies that can contribute to generate better IC.
69	To make available to the M&S MG of, IC for the control of promotional products.
70	Seek the support of the Transportation MG and his subordinates in the IC of transit products.
71	Give support through the IC to the Location MG, when a new installation must be established.
72	To create IC especially directed to handling the products of the IL.
73	To collaborate with the ILM and his subordinates in the inventor handling of products of the IL.
74	To prepare, together the HR MG, the plan of career and training courses of the personnel to his charge.
75	To take part with the Project MG, in projects those improve the performance of the IC.
76	To include, with the support of EM, political of IC, that favor the environment.
77	Ask for help to the EM, to generate IC that helps preserve the environment.
78	Seek, together to the ISIR MG that the IC, also contribute to the safety of the organization.
79	Use, together with the Customer service manager, the IC to provide a better service to customers.
Related to MoLoBaCa, LAPDI, MoLETOI and the enterprise logistics in general.	
80	Work, through the IC, so that the handling of flows, particularly information flows, is very efficient.
81	Helping through ICs to have better control of organizational flows.
82	To generate indicators, those measure the proper performance and of his subordinates.
83	To improve supported on the IC the tactical performance and especially the operative, of the organization.
84	Contribute to fulfill the vision, mission, and guiding principles of the organization, through the IC.
85	Collaborate in the minimization of waste of products and especially of time, through the IC.
86	Provide support, through the IC, for the company to fulfill the strategic and tactical plans.
87	To adapt the IC of the organization to the changeable conditions of the environment.
88	To achieve a better logistic performance of the whole organization, trough the IC.
Related to SCM and the enterprise and its environment as a whole.	
89	Ensure that IC polities help providers to better serve to the organization.

Table 2. Some of the most important functions of the Inventory manager (continuation)

90	To be attentive to the changes in the economy that can affect the demands of certain products and with that the IC.
91	Promote agreements with the rest of the SC to share inventories and the IC.
92	To try that his decisions do not affect negatively his associates in the SC.
93	To collaborate with the whole SC to minimize the bullwhip effect.
94	Create, through the IC, opportunities for improvement, for the organization and the whole SCM.
95	To generate systems of IC those are capable of offering support to the remaining members of the SCM.
96	Share with the other members of the SC the advances in IC.
97	To help in the preservation of the resources, especially the energy ones.
98	To use the IC, like a tool of support to the society, from the organization.

Although almost one hundred functions have been mentioned, this number could grow if others are included, particularly related to the S&OP, for which it is recommended to review the work of Schwarz & Schwarz (2015), however with those presented in table 2, we can see the importance of IM. This suggests that it can be used as a starting point to analyze the recovery possibilities of an organization that is subjected to a series of governmental measures that affect its control of inventories. However, to implement this analysis will be necessary to present, previously a multicriteria model with which it can be carried out. For this reason, in the next section will briefly present the Matrix Of Weighing with Multiplicative factors (MOWwMf).

BRIEF COMMENTS OF THE MATRIX OF WEIGHING WITH MULTIPLICATIVE FACTORS

As its name indicates and as it could be seen in García, Hernández & Hernández (2016), Hernández, García & Hernández (2012), Jeney (2014) and in works on this topic cited by them, the Matrix Of Weighing (MOW [MDP]) are simply an array of rows and columns, which allows hierarch and selecting alternatives according to compliance with respect weighted criteria, which have been established to value them. And as illustrated below, this MOW can be converted into Matrix Of Weighing with Multiplicative factors (MOW_{wMf} [MDPcFm]) when the latter are incorporated into the model.

Although MOW are widely used, since they are very intuitive, they are not usually mentioned in the literature on multicriteria models and in general is usually speak of them through similar techniques as highlight García, Hernández & Hernández (2016), who also emphasize that the MOW should not be confused with other methods such as the techniques of Multiple criteria Sorting (Almeida-Dias, Figueira & Roy, 2012; Kadziński & Tervonen, 2013; Sobrie, Mousseau & Pirlot, 2013), which are based on ELECTRE which is another multicriteria technique.

The information presented below has been taken mainly from García, Hernández & Hernández (2016). As can be seen in Figure 1, in general, the alternatives are placed in the rows and the criteria in the columns, although there is total freedom to interchange them, especially if the seconds are more numerous than the first. In any case, for each one of n criteria (C_j), there is a weight range that goes from PC_{ji} to PC_{jf} , where PC_j mean weight of the criterion j and i represent the initial and f final. In general, these weights of criteria ranging from 0 or 1 to a higher value, which in many cases is a multiple of five or ten, although they are allowed any initial value and any final value, always and when the first is lower than the last. In this way in a MOW, each alternative k (A_k) is weighted by assigning it a value, according to its compliance with each criterion, which must be a number between PC_{ji} up to PC_{jf} , which will be multiplied by a multiplicative value (v_j), as it can see in equation one (1). The sum of these values obtained by each alternative in each criterion, as will be shown in equation three (3), will be multiplied by the values of the multiplicative factors, which may be more than one, although in figure 1 they were expressed by only one, the fg_h . It is important to note that although these multiplicative factors (fg_h) are moved in a pre-established range, each alternative is valued independently. To complete the assessment of each alternative, in the last column of figure 1, under Total is recorded the value reached by each alternative, thus having the Total A_m .

Figure 1. General characteristics of an MOW.

		Criteria (C_j) and its weights				Multiplicative factors (fg_h)	Total
		Criterion 1	...	Criterion $n-1$	Criterion n		
Weight		PC_{1i} to PC_{1f}		PC_{n-1i} to PC_{n-1f}	PC_{ni} to PC_{nf}	---	---
Alternatives (A_k)	A_1	$P_{1,1}$	...	$P_{1,n-1}$	$P_{1,n}$	fm_1	Total A_1
	A_2	$P_{2,1}$	...	$P_{2,n-1}$	$P_{2,n}$	fm_2	Total A_2
	..	...	$P_{k,j}$	...	...	---	...
	A_{m-1}	$P_{m-1,1}$	...	$P_{m-1,n-1}$	$P_{m-1,n}$	fm_{m-1}	Total A_{m-1}
	A_m	$P_{m,1}$	...	$P_{m,n-1}$	$P_{m,n}$	fm_m	Total A_m

Source: Modified from García, Hernández & Hernández (2016).

About PC_{ji} and PC_{jf} , to greater rank, the greater differentiation it is wanted with that criterion and the greater the final value of a criterion (PC_{jf}), greater importance is being assigned to it. At the same time, these

ranges allow to classify the MOW, as can be seen in table 3. Hence it can talk about six basic types of MOW, whether they have equal ranges (types 1, 3 and 5) or different ranges (types 2, 4 and 6), differing in turn if they are affected or not by multiplicative values (v_j) (types 3, 4, 5 and 6) and if these multiplicative values add up to a constant value, particularly the unit (types 5 and 6). As point out García, Hernández & Hernández (2016) these multiplicative values are a constant value of multiplication, which affect the score obtained by each one of the alternatives for the respective criterion. This contribution is reflected in equation one (1), where Total A_k , represents the total value reached by the alternative k , the $P_{k,j}$, are the evaluations of alternative k for each one of the criteria j and n represents the number of criteria. Those v_j are usually integers, generally not greater than ten.

$$\text{Total } A_k = \sum_{j=1,n} v_j * P_{k,j} \quad (1)$$

Table 3. Variants of the Matrix Of Weighing (MOW)

Variant	Initial Value (PC_{ji})	Final Value (PC_{jf})	Multiplication Value (v_j)
First	All equals	All equals	All equals to 1
Second	Equal preferably	Different	All equals to 1
Third	All equals	All equals	Different, in general integers
Fourth	Equal preferably	Different	Different, in general integers
Fifth	All equals	All equals	Different and they add 1
Sixth	Equal preferably	Different	Different and they add 1

Source: García, Hernández & Hernández (2016).

In the case of variants 5 and 6 of the MOW, the multiplicative values that affect the weights obtained by each of the alternatives satisfy the equation two (2).

$$1 = \sum_{j=1,n} v_j \quad (2)$$

It is important to note (García, Hernández & Hernández, 2016) that the multiplicative values (v_j), should not be confused with the multiplicative factors (fg_h). The latter are a concept taken from the Multiattributes Models with multiplicative factors (MMwMf [MMcFm]) (García, Hernández & Hernández, 2016) and which, as already noted, can affect each one of the alternatives differently. In the case of using multiplicative factors, equation one (1) would be transformed into equation three (3), where, it can be seen that, now the total value of the alternative will be affected by the product of the H multiplicative factors (fg_h). Although there is no rule in this regard, it is recommended that the multiplicative factors are not greater than three.

$$\text{Total } A_k = \prod_{h=1,H} fg_h * \sum_{j=1,n} v_j * P_{k,j} \quad (3)$$

Equation three (3) will be taken as the general expression of MOW with multiplicative factors (MOWwMf), where, in the case of not existing, fg_h would be taken equal to 1, and even the same would be done with respect to v_j , when using variants 1 and 2, for which these v_j would also be taken as the unit. Although there are other conditions to apply the MOWwMf, similar to what was done in García, Hernández & Hernández (2016), no other comments are made here on the MOWwMf and dominated alternatives, neither on the application of MOWwMf in group decision making, nor will the steps for applying a MOWwMf, for all this it is recommended to review García, Hernández & Hernández (2016), Hernández, García & Hernández (2012), Jeney (2014) and the works cited by them. However, a brief comment on the multilayer MOWwMf, will be made below.

Multilayer Matrix Of Weighing with Multiplicative factors (MOWwMf)

In normal conditions, a MOWwMf is used to hierarchize a series of alternatives and in the final case choose the best of them. To do this the appropriate criteria are available, but if these criteria in turn are prone to an evaluation, it could be said that a multilayer MOWwMf is being used. To better understand how multilayer

INVENTORIES CONTROL, THE INVENTORY MANAGER AND MATRIXES OF WEIGHING WITH MULTIPLICATIVE FACTORS (MOWwMf)

MOWwMf works, it is recommended to review Hernández, García & Hernández (2012) and Jeney (2014). But to get a better idea of how multilayer MOWwMf can be applied, suppose it wants to evaluate the cashiers in a branch of an auto market and for this a series of criteria are available. By way of illustration it will be said: punctuality, customer service (kindness), rapidity and efficiency in terms of the minimum of mistakes made.

If it only wants to rank the cashiers of a branch a MOWwMf would be enough. But if it wants to evaluate the cashiers of several branches and at the same time knowing in which one of the criteria is having a better performance, these four criteria, at the same time become a kind of alternatives to be evaluated, so it would be making use of a multilayer MOWwMf. In this case being proposed, not only would be evaluating each of the cashiers, of each branch, but would be evaluating all the cashiers and could see the overall performance per branch and what is more important would be evaluating the criteria with which the comparison is being made.

Another situation where a multilayer MOWwMf can be used is when decisions are conditioned to different scenarios. To continue with the hypothetical situation presented above, suppose that it works seven days a week and are interested in the performance of the cashiers every day of the week, but separately and at the same time interested in measuring this performance during the months of higher sales, to wit, the month of December and the months of lowest number of customers, that is to say, the summer months or school holidays. For these cases, each scenario can be seen as a layer. Regarding the structure of a MOWwMf of multiple layers, there is no difference with respect to a normal MOWwMf, as well as there is no difference with respect to the steps to carry out the valuation. The fundamental difference is displayed in the criteria, which now, in addition to its range of valuation often have multiplicative values and what is more important, in addition, there is interest in the overall result that they can be throwing.

In summary, the MOWwMf are a very simple model to apply. The only thing what it does with them is: 1. Assign weights to each of the alternatives, according to certain criteria previously established, 2. Make the sum of each of these weights. In case of multiplicative values this sum is weighted, according to the weight of each multiplicative value and if there are multiplicative factors that final result is multiplied by each of the multiplicative factors. Finally, 3. If necessary the hierarchy of the alternatives is made in descending order to the weights obtained by each one. Completed these brief comments on the MOWwMf of multiple layers it can go to check, such as through a multilayer MOWwMf and making use of the functions of the Inventory manager (IM), it is possible to analyze the scenarios of the repercussions of the intervention of the state in the control of inventories and try to generate or analyze some actions that an organization can take to face the situation.

USE OF A MOWwMf TO ANALYZE HOW TO FACE INTERVENTIONS IN THE CONTROL OF INVENTORIES

Before constructing the multilayer Matrix Of Weighing with Multiplicative factors (MOWwMf), that helps to confront interventions in the inventories control, it is necessary to remember that there will be done use of some of the functions of the Inventory manager (IM) were seen in the table 2 and the situations to be analyzed will obey the one presented in table 1. Of the table 2, the alternatives were taken, a set of functions are selected, which one could directly or indirectly influence possible decisions to make.

These actions were taken from Table 1, but in this case, they were managed as criteria to be evaluated. In addition, it was proposed the use of scenarios, although they were not developed in this work. To simplify, were mentioned as scenarios, flexibilities, on the one hand the resources, in this case: economic (ECO), labor (LAB) and technological (TEC) and in addition, market flexibility (MAR). Although different variations can be handled, even for each of the different scenarios, it was assumed that each of those four scenarios were moved in three possibilities: low (l), medium (m) and high (h).

From table 1 the following criteria are extracted: A: Stop producing, which would result in almost immediate closure of the company. B: Keep the company open, but dedicated to eliminating all inventories, understanding that, ending all possible inventories, the company closes. Stop producing temporarily, which

would translate into two different criteria: C: Temporary closure of the company, for a certain time, which can be extended upon expiration, and may even become a definitive closure and D: Decrease the rhythm of work, whether working fewer hours per day or less number of days per week or even a combination of both, which in the long time, too, can become a definitive closure.

E: Maintain a production of products equivalent to the current ones but with substitute inputs. F: Start producing new products, but like the current ones and targeting the same markets. G: Start producing new products different from current ones and even targeting other markets. H: Continue to produce under current conditions as long as possible. Criteria A, B, C, D and H, in general will lead to the definitive closure of the organization in a short time. Hence, the criteria to be pursued are E, F and G, which probably offer a little more useful life for the company.

As already mentioned, in a hypothetical and very simplified way, it was assumed that all four scenarios are low. And for the functions selected from the table 2, their possible impact on the situation being handled will be considered, which is to say in the low control of the inventories given the intervention of the state. The measurement of the impact is important to see it with a lot of care, since in general, in a normal study on the IM, would be measuring, for each function, how the IM plays in it.

The MOWwMf is shown in table 4. The functions chosen from the table 2, were only represented by their respective number, understanding that what is measured is the impact that they may have. Regarding the type of MOWwMf to use, although it was already seen that there are criteria that could be more interesting than others, it will be of the type three, is to say, all the ranges of the weights of the criteria equal (0 to 10) and with multiplicative values (vj). Although there are no details of these multiplicative values, they had two functions one to give greater value to the criteria most desired and the other give a greater strength to those functions that promote each of the criteria, is to say, a larger the vj, greater contribution offer functions that support this criterion.

Table 4. MOWwMf to measure the impact of IM functions on actions to follow when a company is affected by the state in its inventory control

Scenario: ECO (I), LAB (I), TEC (I) y MAR (I)									
Function	Criteria								Total
	A (2) (0 to 10)	B (3) (0 to 10)	C (4) (0 to 10)	D (5) (0 to 10)	E (7) (0 to 10)	F (7) (0 to 10)	G (7) (0 to 10)	H (4) (0 to 10)	
01	10 (20)	10 (30)	10 (40)	10 (50)	10 (70)	10 (70)	10 (70)	10 (40)	80 (390)
04	2 (4)	9 (27)	8 (32)	8 (40)	9 (63)	8 (56)	8 (56)	9 (36)	61 (314)
05	1 (2)	2 (6)	5 (20)	5 (25)	8 (56)	7 (49)	7 (49)	8 (32)	43 (239)
07	8 (16)	8 (24)	6 (24)	7 (35)	9 (63)	8 (56)	8 (56)	9 (36)	63 (310)
11	3 (6)	7 (21)	7 (28)	8 (40)	9 (63)	8 (56)	7 (49)	8 (32)	57 (295)
15	7 (14)	7 (21)	6 (24)	7 (35)	8 (56)	7 (49)	7 (49)	8 (32)	57 (280)
16	6 (12)	8 (24)	7 (28)	7 (35)	7 (49)	6 (42)	5 (35)	7 (28)	53 (253)
18	5 (10)	8 (24)	9 (36)	9 (45)	8 (56)	8 (56)	8 (56)	9 (36)	64 (319)
19	5 (10)	9 (27)	9 (36)	9 (45)	10 (70)	9 (63)	9 (63)	10 (40)	70 (354)
21	7 (14)	10 (30)	9 (36)	9 (45)	9 (63)	9 (63)	9 (63)	10 (40)	72 (354)
25	7 (14)	7 (21)	8 (32)	8 (40)	8 (56)	8 (56)	8 (56)	9 (36)	63 (311)
26	8 (16)	8 (24)	6 (24)	7 (35)	8 (56)	6 (42)	7 (49)	8 (32)	58 (278)
28	6 (12)	7 (21)	8 (32)	8 (40)	8 (56)	8 (56)	7 (49)	9 (36)	61 (302)
29	5 (10)	6 (18)	7 (28)	7 (35)	10 (70)	9 (63)	8 (56)	7 (28)	59 (308)
32	9 (18)	9 (27)	9 (36)	9 (45)	8 (56)	9 (63)	8 (56)	9 (36)	70 (337)
34	7 (14)	8 (24)	8 (32)	9 (45)	8 (56)	8 (56)	7 (49)	10 (40)	65 (316)
37	8 (16)	7 (21)	6 (24)	6 (30)	6 (42)	6 (42)	6 (42)	7 (28)	52 (245)
39	7 (14)	10 (30)	8 (32)	8 (40)	10 (70)	9 (63)	8 (56)	9 (36)	69 (341)
43	3 (6)	4 (12)	5 (20)	5 (25)	6 (42)	9 (63)	8 (56)	7 (28)	47 (252)
45	9 (18)	9 (27)	9 (36)	9 (45)	9 (63)	9 (63)	9 (63)	9 (36)	72 (351)
46	6 (12)	8 (24)	7 (28)	7 (35)	8 (56)	8 (56)	8 (56)	7 (28)	59 (295)

INVENTORIES CONTROL, THE INVENTORY MANAGER AND MATRIXES OF WEIGHING WITH MULTIPLICATIVE FACTORS (MOW_{wMf})

48	7 (14)	8 (24)	7 (28)	7 (35)	8 (56)	8 (56)	8 (56)	8 (32)	61 (301)
50	3 (6)	6 (18)	7 (28)	7 (35)	8 (56)	7 (49)	7 (49)	5 (20)	50 (261)
52	9 (18)	6 (18)	7 (28)	8 (40)	7 (49)	6 (42)	6 (42)	9 (36)	58 (273)
61	4 (8)	4 (12)	6 (24)	8 (40)	8 (56)	8 (56)	7 (49)	8 (32)	53 (277)
66	5 (10)	9 (27)	8 (32)	8 (40)	9 (63)	8 (56)	8 (56)	9 (36)	64 (320)
67	7 (14)	8 (24)	8 (32)	9 (45)	9 (63)	9 (63)	9 (63)	9 (36)	68 (340)
75	2 (4)	4 (12)	6 (24)	6 (30)	7 (49)	7 (49)	8 (56)	4 (16)	44 (240)
79	3 (6)	4 (12)	6 (24)	7 (35)	7 (49)	6 (42)	5 (35)	5 (20)	43 (223)
80	5 (10)	7 (21)	7 (28)	7 (35)	8 (56)	7 (49)	6 (42)	8 (32)	55 (273)
81	3 (6)	8 (24)	8 (32)	8 (40)	8 (56)	8 (56)	8 (56)	8 (32)	59 (302)
83	4 (8)	8 (24)	7 (28)	8 (40)	8 (56)	8 (56)	8 (56)	8 (32)	59 (300)
86	6 (12)	7 (21)	8 (32)	8 (40)	7 (49)	7 (49)	7 (49)	8 (32)	58 (284)
87	7 (14)	9 (27)	8 (32)	9 (45)	8 (56)	9 (63)	10 (70)	8 (32)	68 (339)
88	7 (14)	9 (27)	8 (32)	10 (50)	9 (63)	10 (70)	10 (70)	10 (40)	73 (366)
89	5 (10)	5 (15)	6 (24)	6 (30)	8 (56)	9 (63)	9 (63)	10 (40)	58 (301)
90	10 (20)	10 (30)	8 (32)	8 (40)	9 (63)	9 (63)	10 (70)	8 (32)	72 (350)
92	6 (12)	6 (18)	7 (28)	7 (35)	9 (63)	8 (56)	7 (49)	9 (36)	59 (297)
94	4 (8)	5 (15)	6 (24)	6 (30)	7 (49)	8 (56)	9 (63)	6 (24)	51 (269)
98	6 (12)	7 (21)	7 (28)	8 (40)	7 (49)	8 (56)	8 (56)	8 (32)	59 (294)
POI	1	1	1	1	1	1	1	1	---
Total	232 (464)	291 (873)	292 (1168)	307 (1535)	327 (2289)	319 (2233)	312 (2184)	327 (1308)	2407 (12054)
Total %	58.00	72.75	73.00	76.75	81.75	79.75	78.00	81.75	75.22 (77.27)

These multiplicative values have been placed next to each letter that identifies each of the criteria. Equally under each criterion has been placed the rating range. In any case it is important to remember that the analysis is being carried out with the aim of allowing the organization a longer period of permanence. For this reason, the higher v_j corresponds to the criteria that can offer a greater durability. It had also been considered a multiplicative factor, Possibility of implement (POI), which, for simplicity, had been taken as 1 for all possible actions. On the other hand, in this table 4, in the columns of the criteria (possible actions) and in Total the first number is without the multiplicative values and the number in brackets includes them.

It is interesting to note that function 01, independent of a very pessimistic scenario being handled in all areas (ECO (I), LAB (I), TEC (I) and MAR (I)) however it has a very high score for all the criteria. This is to be expected, since this function is related to establishing all the policies to follow and its impact will be independent of the scenario and the criterion. This situation of certain way is ironic, since an alternative that is highly evaluated however could be discarded, since it impacts of equal way in all the criteria and for which it does not help to discern.

In this sense, it is more interesting the function 88, which has a 91.25% (93.85%) of impact and does not have equal influence in all the criteria. Remember that the numbers in parentheses represent the weighted impact and the numbers without parenthesis the direct impact.

It is also interesting to highlight what happens with functions 19, 21, 45 and 90, where the first three have a direct impact of 90.00% and the last of 87.50%, but seeing the weighted impact function 19 is equal to that of function 21 of 90.77%, while the weighted impact of functions 90 and 45 are 89.74% and 90.00% respectively. Where in addition it should be noted that for the function 45, match the direct impact and the weighted impact.

As for the actions that were taken here as criteria (columns), except what would be the action A, that only gets 58%, all other exceed 70%, which can be considered a high value. Here the H column attracts attention, with a percentage of 81.75 %, but that is deceitful, since this column only reaches 46.71% of the maximum achievable, since although its direct valuation is the highest, sharing this position with column E, having a very low multiplicative value, implies that it is not being given a greater incentive and hence its low value against the maximum achievable.

So, the three most valued actions are E, F and G, which have percentages, with respect to the maximum attainable, of 81.75%, 79.75% and 78.00% respectively. It was possible to continue evaluating both the impact on the functions and the possible actions to be taken under this scenario, but it is neither the objective nor the interest of this work.

Before going on to present some managerial implications and some conclusions and recommendations, it will be emphasized that globally to the Total column are obtained 75.22% percentages in the direct values and a 77.27% in the values weighted by the multiplicative values, that both cases are very high percentages, which indicates that the forty selected functions of the Inventory manager (IM) have a high impact on possible actions to take.

MANAGERIAL IMPLICATIONS

In this work are converged the mathematical models and the business logistics, especially the control of inventories. Making use of them it is presented possible solutions to the negative influence they can have on the inventory control (IC) measures imposed by the state. This search for possible solutions is made with a vision of the logistics, in particular, the Inventory manager (IM) of the Logistic Model Based on Positions (MoLoBaC). And a quantitative analysis is performed with a multicriteria model, the Matrix Of Weighing with Multiplicative factors (MOWwMf).

Regarding the managerial implications are found in all of these fields of knowledge. Starting with multicriteria models, they allow the manager to analyze different business situations with a more open approach. In particular, a very simple model is presented, to implement and use, the MOWwMf, which are characterized by contributing to decision making considering only two basic aspects: the alternatives and the criteria.

For a manager to have clear alternatives that allow him to face a problematic situation makes it easy in a large part of the solution of the problem. But while it is important to identify and recognize the alternatives, it is just as important to be able to determine the criteria against which to evaluate. But in addition, much of the analysis will be carried out when it can identify the weight that each of the criteria has on the decision to take. This is a great contribution that MOWwMf can make to managers, since in constructing them, the criteria and their relevance in the decision will be defined very clearly, as well as the alternatives, which can be managed by the organization.

On the other hand, the managerial implications of business logistics is much clearer, since it is relating to practically all areas of an organization. In this case, when using MoLoBaC, it allows managers to analyze, in greater detail, all these relations. Particularly the position of MoLoBaC used here, IM, is of specific relevance, since every company must have a clear control of its inventories, since a mismanagement of them, can lead to big losses.

If, in addition, when a company is subject to external interventions, explicitly state controls, which affect its performance, the society as a whole, will be affected and the managers have the responsibility to give answers to these situations. Although in this work, no major comments are made about social problems, it makes contributions so that the managers could confront these unwanted interventions of the state. From this work, managers can extract scenarios to be encountered as well as some actions to follow and can even know how, through the functions of the IM, implement these alternatives. Although each organization must do the analysis for its situation, in this work some macro parameters which can be followed are offered.

CONCLUSIONS AND FUTURE RESEARCH

In Table 4 were chosen 40 functions of the Inventory manager (IM) of the 98 that were shown in the table 2. With these forty functions, a total valuation of 2407 was obtained, which when considering the multiplicative values amounted to 12054, giving percentages of measurement of the impact of 75.22% and 77.27% respectively, which means that they have a very high impact. But without going into detail what can be the best action to follow, according to the presented scenario, it is necessary to emphasize that the most important of the table 4, is to have an element of measurement of the impact of the functions of the IM, on the possible actions to be taken, to confront the effect of governmental measurements that affect the inventor control.

Here only one of the many possible scenarios was presented and very generically, however, it can be pointed out that by making use of a multilayer Matrix Of Weighing with Multiplicative factors (MOWwMf), it is possible to have an approximate evaluation of the best actions to follow, depending on the situation in which the organization for which the analysis is being done. With this in addition to achieve the objectives of the investigation, it offers to the business sector, which may feel affect its inventories control by measures external to the organization, a simple tool, which could be of help to analyze the situation. At least to have a prior assessment of the actions that could be taken.

All the above allows proposing further research on this subject, particularly in two very specific lines, one is to measure the performance of IM in organizations, particularly small and medium-sized enterprises and the other is to study the scenario that best fits the respective organization and to do a study like the one presented here, but that is best suited to that scenario. It is also interesting to continue researching in the application of other multicriteria models, such as Multiattributes Models with Multiplicative factors (MMwMf) and even go far away and try to do a similar analysis, but following decision-making techniques under risk or under uncertainty.

ACKNOWLEDGMENTS

This investigation would not have been possible without the support of Minimax Consultores, C.A.

REFERENCES

- Adida, E. & G. Perakis (2010). Dynamic pricing and inventory control: Uncertainty and competition, *Operations Research*, 58(2), 289-302.
- Allon, G. & J. A. Van Mieghem (2010). Global dual sourcing: Tailored base-surge allocation to near-and offshore production, *Management Science*, 56(1), 110-124.
- Almeida-Dias, J., J. R. Figueira & B. Roy (2012). A multiple criteria sorting method where each category is characterized by several reference actions: The Electre Tri-nC method, *European Journal of Operational Research*, 217(3), 567-579.
- Beeson, M. (2009). Developmental Status in East Asia: A comparison of the Japanese and Chinese experiences, *Asian Perspective*, 33(2), 5-39.
- Bresser-Pereira, L. C. (2012). Structuralist macroeconomics and the new developmentalism, *Revista de Economia Política*, 32(3), 347-366.
- Burduf, A. (2014). State intervention in the Economy, *Management Strategies Journal*, 26(4), 153-158.
- Cachon G. P. & M. Fisher (2000). Supply chain inventory management and the value of shared information, *Management Science*, 46(8), 1032-1048.
- Chen, X., Z. Pang & L. Pan (2014). Coordinating inventory control and pricing strategies for perishable products, *Operations Research*, 62(2), 284-300.

- Chen X., M. Sim, D. Simchi-Levi & P. Sun (2007). Risk aversion in inventory management, *Operations Research*, 55(5), 828-842.
- Costantino, F., G. Di Gravio, A. Shaban & M. Tronci (2014). The impact of information sharing and inventory control coordination on supply chain performances, *Computers & Industrial Engineering*, 76, 292-306.
- Dekker, R., J. Bloemhof & I. Mallidis (2012). Operations Research for green logistics - An overview of aspects, issues, contributions and challenges, *European Journal of Operational Research*, 219(3), 671-679.
- Del Monte, A. & E. Papagni (2007). The determinants of corruption in Italy: Regional panel data analysis, *European Journal of Political Economy*, 23(2), 379-396.
- Disney, S. M., G. J. Gaalman, C. P. T. Hedenstierna & T. Hosoda (2015). Fill rate in a periodic review order-up-to policy under auto-correlated normally distributed, possibly negative, demand, *International Journal of Production Economics*, 170, 501-512.
- Evans, P. B. (1989). Predatory, Developmental, and Other Apparatuses: A Comparative Political Economy Perspective on the Third World State, *Sociological Forum*, 4(4), 561-587.
- Fritz, V. & A. Rocha M. (2007). Developmental states in the new millennium: Concepts and challenges for a new aid agenda, *Development Policy Review*, 25(5), 531-552.
- García, M. J., G. J. Hernández & J. G. Hernández (2013). Enterprise diagnosis and the STOILMo, In N. Delener (Ed), *GBATA Reading Book 2014*, GBATA: USA, 330-338.
- García, M. J., G. J. Hernández & J. G. Hernández (2014). Logistics flow through the functions of the Cost manager, In N. Delener (Ed), *GBATA Reading Book 2014*, GBATA: USA, 185-192.
- García G., M. J., G. J. Hernández G. & J. G. Hernández R. (2016). Research lines and Matrixes Of Weighing (MOW), in *X Congress de la Unimet*, available from November 2016 in: https://www.researchgate.net/publication/310818574_Research_lines_and_Matrixes_Of_Weighing_MOW_Lineas_de_investigacion_y_Matrices_De_Ponderacion_MDP
- Gercek, G., N. Saleem & D. Steel (2016). Networked services outsourcing for small business: A lifecycle approach, *Journal of Global Business and Technology*, 12(1), 23-32.
- Goldman, G. A., H. Nienaber & M. Pretorius (2015). The essence of the contemporary business organization: A critical reflection, *Journal of Global Business and Technology*, 11(2), 1-13.
- Guerrero M., L. E., G. J. Hernández G., M. J. García G. & J. G. Hernández R. (2014). Indicators and the Picking manager of the Logistic Model Based on positions, In G. Dukic (Ed), *Proceedings ICIL 2014*, University Zagreb: Croatia, 273-282.
- Hellman, J. S., G. Jones, D. Kaufmann & M. A. Schankerman (2000). Measuring governance, corruption, and state capture: How firms and bureaucrats shape the business environment in transition economies, Work paper 2312, *World Bank Policy Research*, Washington, DC, USA.
- Hernández, J. G., M. J. García & G. J. Hernández (2012). Dynamic knowledge: Diagnosis and Customer Service, in N. Delener (Ed.), *Service Science Research, Strategy, and Innovation: Dynamic Knowledge Management Methods*, IGI Global: Hershey, PA USA, 547-573.
- Hernández R., J. G., M. J. García G., G. J. Hernández G. (2016). Enterprise diagnosis and the Environmental manager of LoMoBaP, *Journal of Global Business and Technology*, 12(1), 60-76.
- Jain, A., H. Groenevelt & N. Rudi (2010). Continuous review inventory model with dynamic choice of two freight modes with fixed costs, *Manufacturing & Service Operations Management*, 12(1), 120-139.
- Jeney, A. (2014). Impacto del Gerente de Sistemas de Información y Redes del Modelo Logístico Basado en Cargos en la gestión del conocimiento de una organización, medido a través de una Matriz De Ponderación, *Disertación Maestría en Gerencia de sistemas*, Universidad Metropolitana, Caracas, Venezuela.
- Kadziński M. & T. Tervonen (2013). Stochastic ordinal regression for multiple criteria sorting problems, *Decision Support Systems*, 55, 55-66.
- Kohli, A. (2006). Politics of economic growth in India, 1980-2005: Part I: The 1980s, *Economic and Political Weekly*, 1251-1259.
- Larsen, C. & A. Thorstenson (2014). The order and volume fill rates in inventory control systems, *International Journal of Production Economics*, 147, 13-19.
- Lee H., J. M. Pinto, I. E. Grossmann & S. Park (1996). Mixed-integer linear programming model for refinery short-term scheduling of crude oil unloading with inventory management, *Industrial & Engineering Chemistry Research*, 35(5), 1630-1641.

INVENTORIES CONTROL, THE INVENTORY MANAGER AND MATRIXES OF WEIGHING WITH MULTIPLICATIVE FACTORS (MOW_{wMf})

- Michalsky G. (2008). Corporate inventory management with value maximization in view, *Zemedska Ekonomika-Praha*, 54(5), 187-192.
- Mieghem J. A. V. & N. Rudi (2002). Newsvendor networks: Inventory management and capacity investment with discretionary activities, *Manufacturing & Service Operations Management*, 4(4), 313-335.
- Mota, B., M. I. Gomes, A. Carvalho & A. P. Barbosa-Povoa (2015). Towards supply chain sustainability: economic, environmental and social design and planning, *Journal of Cleaner Production*, 105, 14-27.
- Mousavi, S. M., V. Hajipour, S. T. A. Niaki & N. Aalifar (2014). A multi-product multi-period inventory control problem under inflation and discount: a parameter-tuned particle swarm optimization algorithm, *The International Journal of Advanced Manufacturing Technology*, 70(9-12), 1739-1756.
- Onis, Z. (1991). The Logic of the Developmental State, *Comparative Politics*, 24(1), 109-126.
- Qin, Y., J. Wang & C. Wei (2014). Joint pricing and inventory control for fresh produce and foods with quality and physical quantity deteriorating simultaneously, *International Journal of Production Economics*, 152, 42-48.
- Robinson, W. I. (2010). Global Capitalism Theory and the Emergence of Transnational Elites, Work paper 2010/02, *University of California*, California, USA.
- Schwartz, J. D., W. Wang & D. E. Rivera (2006). Simulation-based optimization of process control policies for inventory management in supply chains, *Automatica*, 42, 1311-1320.
- Schwarz, L. M. & T. M. Schwarz (2015). Propuesta de modelo de toma de decisiones en la planificación de ventas y operaciones de empresas venezolanas de consumo masivo, *Production Engineering dissertation*, Universidad Metropolitana, Caracas, Venezuela.
- Schwarz I., L. M., T. M. Schwarz I., M. J. García G., G. J. Hernández G. & J. G. Hernández R. (2016). Social Impact of Restrictions on Inventory Management, *Proceedings ICIL2016*, AGH University of Science and Technology in Krakow, Krakow, Poland, 272-282.
- Sheopuri, A., G. Janakiraman & S. Seshadri (2007). New policies for the stochastic inventory control problem with two supply sources, *Operations Research*, 58(3), 734-745.
- Skipper, J. B., W. A. Cunningham, Ch. A. Boone & R. R. Hill. (2016). Managing Hub and spoke networks: A military case comparing time and cost, *Journal of Global Business and Technology*, 12(1), 33-47.
- Sobrie, O., V. Mousseau & M. Pirlot (2013). Learning a majority rule model from large sets of assignment examples, *Algorithmic Decision Theory*. Springer Berlin Heidelberg, 336-350.
- Stubbs, R. (2009). What ever happened to the East Asian Developmental State? The unfolding debate, *The Pacific Review*, 22(1), 1-22.
- Taleizadeh, A. A. & M. Nematollahi (2014). An inventory control problem for deteriorating items with back-ordering and financial considerations, *Applied Mathematical Modelling*, 38(1), 93-109.
- Tilokavichai, V., P. Sophatsathit & A. Chandrachai (2012). Innovative Logistics Management under Uncertainty using Markov Model, *Information and Knowledge Management*, 2(5), 19-29.
- Toktay L. B., L. M. Wein & S. A. Zenios (2000). Inventory management of remanufacturable products, *Management science*, 46(11), 1412-1426.
- Wiesehomeier, N. & D. Doyle (2012). Attitudes, Ideological Associations and the Left–Right Divide in Latin America, *Journal of Politics in Latin America*, 4(1), 3-33.

THE RELEVANCE OF SOCIAL MEDIA AS INFORMATION SOURCE WHEN SELECTING PRIVATE SCHOOLS IN SOUTH AFRICA

Mornay Roberts-Lombard and Reaan Immelman

ABSTRACT

Parents are considering many sources of information when selecting a private school in South Africa. The aim of this paper is to determine these sources of information and the relevant importance thereof. The research methodology was exploratory and quantitative in nature with respondents from thirty private schools surveyed in the study with a total of six hundred and sixty nine respondents. The analysis used was descriptive statistics as well as factor analysis. Nineteen (19) information sources were identified with social media indicated as a less preferred choice of information source. The opportunity however for private schools lies in social media as marketing tool.

Keywords: School marketing, consumer behaviour, information sources, integrated marketing communication

INTRODUCTION

The South African primary and secondary education system is characterised by two categories of schools, namely government schools providing open access to the general public and private schools (Fedsas, 2015). The total amount of private schools in South Africa, has increased from five hundred and eighteen in 1994 to a total of one thousand, eight hundred and fifty five schools in 2016. A total of thirty nine percent of these schools (seven hundred and thirty schools) are located in the Gauteng province of South Africa (Department of Basic Education, 2016). According to Fedsas, 2015, there are two types of schools in South Africa, namely private schools and public schools (also known as government schools).

***Mornay Roberts-Lombard** is Professor of Marketing in the Department of Marketing Management at the University of Johannesburg in South Africa. His areas of specialisation are Relationship Marketing and Customer Relationship Management (CRM). He has published numerous articles both international and South African journals, delivered papers at international and South African conferences, supervised at both Masters and Doctoral level and also published articles in industry journals. He has been nominated for and won six academic paper awards at international conferences and is the editor and section editor of International and South African academic publications.*

***Reaan Immelman** obtained his PhD in School Marketing at the University of Johannesburg. He has been involved mainly in the banking industry for more than 20 years, and more specifically the Education portfolio in both Retail, Business bank and Corporate Bank. He is currently the General Manager for Education and Skills at Absa. Previous education experience includes positions such as the Dean of Commerce and Campus Director at the Pearson Institute of Higher Education, part time researcher at the University of Johannesburg, part time lecturer at Monash South Africa and supervision of post graduate students. He authored International academic Journals and conference papers. He is also the Founder and President of Smart Global Training Academy (www.sgta.co.za), specialising in continuous staff development for Educators, including School Marketing Seminars.*

THE RELEVANCE OF SOCIAL MEDIA AS INFORMATION SOURCE WHEN SELECTING PRIVATE SCHOOLS IN SOUTH AFRICA

The South African primary and secondary education system is characterised by two categories of schools, namely government schools providing open access to the general public and private schools (Fedsas, 2015). The total amount of private schools in South Africa, has increased from five hundred and eighteen in 1994 to a total of one thousand, eight hundred and fifty five schools in 2016. A total of thirty nine percent of these schools (seven hundred and thirty schools) are located in the Gauteng province of South Africa (Department of Basic Education, 2016). According to Fedsas, 2015, there are two types of schools in South Africa, namely private schools and public schools (also known as government schools).

Van der Berg, Van Wyk, Burger, Kotzé, Piek, and Rich (2017) concur and state that the growth of the South African private school sector has been prominent in the past 15 years. Between 2000 and 2013 the enrolment at private schools increased between 250 000 to 500 000 learners which illustrates a 76% growth. This growth has predominantly occurred between 2000 and 2010 compared to only 1.4% in state funded schools over the same period. The growing middle class in South Africa is mainly responsible for the growth in the private school sector and newly build government schools are not build in affluent areas (Hasenfuss, 2011) and according to IFC, 2010, more parents are not satisfied with government school.

According to Thomas (2015), Curro Holdings and AdvTech are two private school groups listed on the Johannesburg Stock Exchange and contributed to the growth in the private school sector. The Old Mutual Investment Group in South Africa allocated R80-million for the development of low-fee schools over the next five years (Mahlaka, 2004). There are also other education groups which want to enter the private schools market, namely Pearson and GEMS which have international operations (Lobban, 2014).

According to Petruzze and Romanazzi, 2010, parents are more informed when they choose private schools for their child/children and some parents conduct their own research when choosing a school (Molland, 2007). The intangible characteristics of a service such as education, make school choice difficult for parents (Cant and Van Heerden, 2010). It therefore becomes important for private schools in South Africa to have a clear comprehension of the parental decision-making process when selecting a private school for their child (Blythe, 2013). This research article focus on the searching of information within the pre-purchase stage of the consumer decision-making process. In South Africa there is a clear shortage on action research that focus specifically on the marketing of private schools in the country, with limited previous research conducted on the topic by Immelman and Roberts-Lombard, 2015; Read and Bick, 2014; Vigar-Ellis, 2013 and McAlister, 2005. Research by Immelman and Roberts-Lombard (2014) identified information sources when choosing private schools, but this research focus is on social media as information source.

According to Fourie, 2014, private schools are finding it difficult to market themselves due to the fact that parents have limited information with regards to private schools. It is for this reason that schools need to understand the information sources that parents considered when selecting a private educational institution. This will assist private schools in the compilation of their marketing communication strategy. Traditional communication tools such as advertising is expensive, and private schools need to investigate more cost effective ways, such as social media, to communicate to parents. A special focus on social media as communication tool for prospective and current parents are the aim of this research.

LITERATURE REVIEW

The majority of South Africa private schools apply marketing principles and the Independent Schools Marketing Association (ISMA) is well established with the objective to promote marketing efficiency in these schools (ISASA, 2015) (For the purpose of this study the terms private school and independent school has the same meaning). The need for private schools in South Africa is illustrated by JSE-listed Advtech and Curro Holdings (Greyling 2013) and these JSE-listed companies all have marketing departments and therefore the marketing of private schools are a management function which is imperative for every private school (Oplatka & HemsleyBrown, 2004).

Integrated Marketing Communication (IMC)

The United Kingdom and the United States of America are acknowledged as the founding countries for theoretical information on school marketing (Oplatka and Hemsley-Brown, 2004). These include general literature in school marketing, the school principal's attitude towards the concept of marketing as well as limited research in school marketing. There are various definitions of school marketing and according to Sferle, Gárdan, Gudei and Geangu (2012), it is defined as communication of the school's values, purpose and services to the parents, learners, staff and all other stakeholders of the school. The marketing mix of services include traditional marketing mix elements such as price, product (service), place (distribution) and promotion (IMC) as well as people, process and physical evidence (Soedijati and Pratminingsih, 2011). In the context of this study, the focus is on IMC.

IMC elements constitutes of promotion (also referred to as advertising), marketing directly to the public, media relations, social events, experiences, person selling and word-of-mouth (Kotler and Keller, 2012). In the context of schools, promotion include print commercials in publications such as the South African Schools Collection magazine (South African Schools Collection, 2010, as well as advertisements in local newspapers (Roodepoort Record, 2015) and outdoor commercials such as street pole advertising (Smith, 2015). Sales promotion may include scholarships such as the Ruta Sechaba Scholarships of Curro Holdings, a JSE listed private school group in South Africa (Ndzabela, 2017). A popular example of a school event is the annual Easter sport festivals at St Stithians and St John's private schools in Johannesburg. Education expo's (Education Week, 2015) is a form of direct marketing and school open days are utilised as personal selling (Lombard, 2013). The school website is an example of interactive marketing (Foster, 2010) and the final element of IMC is word-of-mouth. According to Kalpaklioglu and Taros (2011), the suggestions, recommendations and advice of family and friends are of significant importance for any parent selecting a private educational institution for their offspring.

The Consumer Decision-making Process of Private schools

Private schools need to understand the need of prospective parents and how these parents make their decisions when considering a school (Blythe, 2013). According to Fox and Foxall (2012), this process contains three stages, namely the pre-purchase stage, the service encounter stage and the post-encounter stage. In the pre-purchase stage of the consumer decision making process in the context of a school, the need recognition is demonstrating by parents that it is compulsory for them to register their son or daughter at a South African school. (South African Schools Act, 1996). The second element of the pre-purchase stage is where prospective parents investigate all possible source of information to make an informed decision of private schools, such as social media, website and open days.

The third element of the pre-purchase stage is known as the assessment of substitutes or consumer evaluation (Parumasur and Roberts-Lombard, 2014). In a school context it is the choice factors of parents in their choice of private schools. According to Immelman (2013) a significant choice factor for fathers and mothers are small class sizes and the spiritual beliefs of the school. The service encounter stage occurs when parents have selected and enrolled the child at a selected school, while the post-encounter stage is the last stage in the consumer decision-making process in the context of a service (Wells and Foxall, 2012). In this stage consumers may experience doubt after enrolling the child (Kotler, Armstrong and Tait, 2010) and it may happen that parents doubt their enrolment decision. This research study focuses on the information sources that are important for parents when choosing a private school.

The choice of private schools are influenced by information sources

Limited research is available with regards to information sources in the private schools sector. International research includes the Independent Schools Queensland Survey (ISQ), 2011, the Independent Schools Council of Australia (ISC), 2008 and Gorard, 1999. According to ISQ (2011), recommendations from

THE RELEVANCE OF SOCIAL MEDIA AS INFORMATION SOURCE WHEN SELECTING PRIVATE SCHOOLS IN SOUTH AFRICA

friends, colleagues and current parents with children registered at the school, as the favoured information source. Other information sources identified are the school website, brochures, open days and school expos. The identified information sources of ISQ (2011) correspond with ISC (2008), which include word-of-mouth and personal engagement with teachers and staff at school open days as the most important information sources. The reputation of the school promoted by their current parent community, community activities, open days and an interview with the school principal are cited by parents as important sources of information when selecting a school. In a South African context, Immelman and Roberts-Lombard (2014) identify open days at schools and the school website as the two most important information sources. The object of this research is to focus on the opportunity of social media as information source. Other research in South Africa on the topic of school marketing is presented in Table 1.

Table 1: School marketing studies in South Africa (2005-2015)

Topic	Source
Marketing guidelines for independent schools in South Africa	Immelman and Roberts-Lombard, 2015
Marketing of independent schools in the United Kingdom and South Africa – a comparison	Read and Bick, 2014
The choice criteria of parents at boarding schools	Vigar-Ellis, 2013
The image of a high school – a measuring instrument	Van Wyk and Bischoff, 2012
Marketing strategies for independent schools	McAlister, 2005

RESEARCH METHODOLOGY

The population included all grade one parents from 651 private schools in the Gauteng province of South Africa. An exploratory research design was followed, supported by a non-probability sampling approach through the application of the judgment sampling technique. Parents or guardians of a child in grade one who corresponded with the sampling frame participates in the survey. The self-administered questionnaire technique was used to obtain data from parents through the application of a five-point Likert scale questionnaire. The questionnaire contained self-developed items considering reliability and validity. The different factors in the study were developed from information gathered from the interviews with parents (qualitative research) as well as from an information sources literature review. The questionnaire was pretested with ten respondents and a total of 669 completed questionnaires were received. Validity was secured by assuring that the different statements used in the research instrument was in line with the formulated objectives of reliability was measured through the Cronbach Alpha technique. The data obtained was coded and captured in the statistical software package for Social Sciences (SPSS V18) to secure data analysis (Pallant, 2013). Exploratory Factor Analysis (EFA) was applied to establish the principal structure of the factors in the study. Through the EFA analysis, a total of nineteen information source variables were grouped into four factors as illustrated by table 4. The most suitable communication tools for private schools were identified through an EFA analysis.

DISCUSSION

Demographic profile of respondents

From the 669 respondents, a total of forty three percent reported that they speak English at home and fifty three percent of those who responded has a monthly income of R45 000 (US\$3500) per month. Interesting to note is that eighty four percent of respondents have a post-school qualification, seventy seven percent were female and a total of eighty four percent were married.

Reliability

Table 2 illustrate the reliability values for the different factors in the study. This table illustrate that the different factors used in the study are reliable, as the Cronbach alpha coefficients are all above 0.7 (Pallant, 2010). From the table it can be noted that public relations and interactive marketing = .805; advertising = .852; personal selling = .707; word-of-mouth = .826.

Table 2: Cronbach's alpha

Factor	Cronbach's alpha coefficient
Public relations and interactive marketing	0.805
Advertising	0.852
Personal selling	0.707
Word-of-mouth	0.826

Validity

The questionnaire items were developed to be in alignment with the formulated objectives for the study to ensure the validity of the research instrument. The following actions were also undertaken to enhance the overall validity of the research instrument, namely:

- The questionnaire was adapted after the pilot study was conducted to include feedback from respondents.
- The statistical services unit of the University of Johannesburg was used to secure the accuracy of the measurements of the results.
- EFA was applied to obtain deeper insights into the structural validity of the different factors. The Kaiser-Meyer-Olkin value indicated 0.896 supporting the factorability of the correlation matrix. Table 3 illustrates the different factors in the study that clarify a total of 61.68% of the variance. Factor 1 contributes 42.51%; factor 2 9.56%; factor 3 5.85%; factor 4 3.76% of the total variance explained.

Table 3: Total variance explained

DS	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of Variance	CL %	Total	% of Variance	CL %	Total	% of Variance	CL %
1	8.839	44.196	44.20	8.502	42.511	42.511	4.017	20.085	20.085
2	2.215	11.076	55.27	1.912	9.560	52.071	3.379	16.897	36.983
3	1.517	7.583	62.86	1.170	5.849	57.920	2.879	14.396	51.379
4	1.164	5.821	68.676	0.752	3.760	61.679	2.060	10.300	61.679

* [CL = Cumulative %; DS = Dimension]

VARIABLES OF INFORMATION SOURCES IDENTIFIED WHEN CHOOSING PRIVATE SCHOOLS

Table 4 presented nineteen variables of information sources when fathers and mothers choose a private school for their children.

THE RELEVANCE OF SOCIAL MEDIA AS INFORMATION SOURCE WHEN SELECTING PRIVATE SCHOOLS IN SOUTH AFRICA

Table 4: Information sources identified

Factor	Factor loading	Statement
Promotion Mean = 2.37	0.747	Magazine advertisements
	0.737	Radio advertisements
	0.707	Outdoor signage
	0.665	Print advertising in local newspapers
	0.565	Flyers
Personal selling Mean = 3.88	0.809	Exhibitions
	0.745	Open day or information evening
	0.389	DVD promoting the school
Interactive marketing and public relations Mean = 2.95	0.807	Fundraising activities
	0.695	Outreach programmes involvement
	0.671	School publicity
	0.597	Scholarships offered
	0.425	Website of the school
	0.418	Mobile phone marketing
Word-of-mouth Mean = 1.85	0.911	LinkedIn
	0.866	YouTube
	0.804	Twitter
	0.783	Person-to-person word-of-mouth
	0.637	Social media platform

Table 4 illustrate that personal selling (School exhibitions, school open day and promotional DVD) resulted in an overall mean score of more than 3. Promotion, Interactive marketing and public relations and word-of-mouth has a mean score less than 3, although some individual variables of the factors realised a mean score above 3 (school website, mean = 3.45 and word-of-mouth, mean = 3.31). The mean for the different promotional elements are lower than 3, with outdoor signage (e.g. street pole advertising) having the highest mean of 2.60. Person-to-person word-of-mouth is the third most important information source (mean = 3.31) and social media (Facebook, Twitter, LinkedIn and YouTube) realised a mean score of below 2. Although social media has the lowest mean score, it can be the greatest opportunity for schools to market their school to prospective parents. These opportunities will be discussed in managerial implications and practical recommendations.

DISCUSSION

The study makes both a theoretical and a practical contribution. From a theoretical perspective, the results confirm that the measurement scales used to measure the information sources factor, its antecedents and outcome are reliable and valid. From a managerial perspective, the study contributes in assisting the management of private schools to improve their usage of information sources as part of their marketing strategy, with a specific focus on social media. From a theoretical perspective, the study also contributes to the literature and research on school marketing which is limited in an emerging market context. The literature on school marketing in this article can be used by future researchers to study further topics on school marketing in emerging markets.

MANAGERIAL IMPLICATIONS AND PRACTICAL RECOMMENDATIONS

Recommendations focused specifically on word-of-mouth, and more specifically social media, to demonstrate the opportunity of this medium in school marketing. Different recommendations are provided to assist the management of private schools to improve their usage of information sources as part of their marketing strategy.

Recommendation 1

Marketing research in the form of focus groups with parents and guardians as well as questionnaires is recommended for private schools to establish what is currently said about the specific school. In addition, the parents of children at the school can also be requested to bring friends and family to the open days of private schools and current parents can be encouraged to be brand ambassadors for their school. Social media such as Facebook, Twitter, YouTube and LinkedIn is of less concern to parents when choosing private schools, but the recommendation is that schools integrate social media such as Facebook into their marketing efforts. Private schools might have excellent services, such as a balanced approach in academics, sport and culture, but these prospective parents need to be aware this and an effective way to demonstrate these services is by means of social media platforms. The following recommendations, in terms of the application of social media tools, are provided to private schools to be of assistance to these schools in improving their marketing communication strategy.

Recommendation 2

Facebook users have more than doubled in a period of four years with more than 14 million users (Worldwideworx, 2017). A recommended for schools are to establish their own School Facebook page, additional to their current school website. Another recommendation for schools are to have their own social media policy while administrator rights are necessary to be assigned to a staff member such as the school's marketing manager, who will be responsible for collecting and posting content.

Lastly it is recommended that the school share its calendar with parents and prospective parents, share positive stories of the school, post photos of school events and congratulate students and staff who excell. Schools can also promote their service offering by means of Facebook adverts where the adverts are shown to prospective parents based on the parent's location, age and interests.

Recommendation 3

With YouTube's active user base of over 7 million South Africans (South African Social Media Landscape, 2015) making it second in social network use in the country, it private schools are advised to create their own YouTube video and promote the school through its own You Tube Channel. YouTube videos must be embedded in the school's website with different content on a regular basis. The school also needs to engage the community with YouTube, and current parents or any other stakeholders can share and comment on the video content of the school. The last recommendation is that the school can embrace YouTube advertising due to the fact that paid media is a critical part of effective video content marketing, and that this type of advertising delivers a very effective click-through rate compared to traditional AdWords.

Recommendation 4

THE RELEVANCE OF SOCIAL MEDIA AS INFORMATION SOURCE WHEN SELECTING PRIVATE SCHOOLS IN SOUTH AFRICA

Twitter users in South Africa have grown by 20% to more than 6 million users (South African Social Media Landscape, 2015) and therefore twitter cannot be ignored by schools. Twitter differs from other social media channels because tweets are public, and anyone can follow a user. It is recommended that schools reserve a Twitter ID and due to the limitation of 15 characters, it is important for schools to think of the school's branding and how the school wants to be known on Twitter. It is also important for schools to personalise the school's twitter profile in the form of a picture of the school building or school logo. The Schools Twitter account needs to be mentioned in its newsletter and any other communication sent to parents. It is also recommended that school staff, and especially the school marketer, have a personal Twitter account sharing tweet information and starting promoting the school. The final recommendation is that the school put links to the school's Twitter account on the school's website and Facebook account.

Recommendation 5

The professional network LinkedIn have 3.8 million users in South Africa (South African Social Media Landscape, 2015) and a final recommendation is that the school utilise this social media platform to advertise vacant positions to recruit educators and other vacant academic positions. In this way, private schools can reach more job applicants and can choose the best educators for recruitment.

LIMITATIONS AND AREA FOR FURTHER RESEARCH

Due to budget and time constraints, the research focused only on one of the nine provinces in South Africa and only parents or guardians with a child in Grade 1. Knowing the limitations of this research, it is recommended to conduct a similar study with parents with a child that wants to exit the primary school level and enter the next phase of secondary education, thus needing to select a private school in that phase.

CONCLUSION

The opportunity of social media as marketing tool are recommended for private schools. It is significantly more cost effective for private schools to employ social media strategies than to consider other more expensive communication tools. Private schools therefore need to embrace social media in their marketing strategy and should include all types of social media platforms such as Youtube, LinkedIn, Twitter and Facebook.

REFERENCES AND BIBLIOGRAPHY

- Blythe, J. (2013). *Consumer Behaviour*. 2nd ed. London: South-Western.
- Bowen G. & Bowen, B. Social media: A strategic decision-making tool. *Journal of Global Business and Technology Spring 2016*, 12(1): 48-59.
- Cant, M.C. & Van Heerden, N.H. (2010). *Marketing Management: A South African perspective*. Cape Town: Juta & Co. Ltd.
- Department of Basic Education. (2016). School realities. Retrieved May 28, 2017, from <http://www.education.gov.za/DocumentsLibrary/Publications>.
- Fedsas. (2015). Federation of Governing Bodies of South African Schools. 2012. Legislation: The South African Schools Act, nr 84. of 1996. <http://www.fedsas.org.za/english/downloads>. Date of access: 29 Nov. 2015.

- Fourie, B.J. (2014). *The success of Queens Private School* (personal interview). 12 January, 2014. Johannesburg.
- Foster, B. (2010). *School marketing manual for the digital age*. 3rd ed. Benowa: School Marketing Australia Pty Ltd.
- Education Week. (2015). Exhibitor List. Retrieved May 18, 2015, from <http://educationweek.co.za>.
- Gorard, S. (1999). Well, that about wraps it up for School Choice Research: a State of the Art Review. *Journal of School leadership and Management*, 19(1):25-47.
- Greyling, A.J. (2013). Bursaries for learners (e-mail). 30 August. Cape Town.
- Hasenfuss, M. (2011). School fees paid: *Will PSG make money out of private education?* Fin Week: 14, 28 April.
- Immelman, R. (2015). A South African perspective on school facilities as choice factor when selecting independent primary schools. *Journal of Global Business and Technology Spring 2015*, 11(1): 1-12.
- Immelman, R. (2013). *Choice factors of parents selecting independent primary schools in Gauteng*. PhD Thesis, University of Johannesburg, Johannesburg.
- Immelman, R. & Roberts-Lombard, M. (2015). Guidelines for the marketing of independent schools in South Africa. *Acta Commercii*, 15(1): 1-9.
- Immelman, R. & Roberts-Lombard, M (2014). Information sources influencing parents' choice of independent primary schools in Gauteng, Conference proceedings of the 26th annual conference by the Southern African Institute of Management Scientists (SAIMS): 14 – 17 September 2017, Vanderbijlpark, South Africa.
- Independent Schools Association of Southern Africa (ISASA). (2015). Marketers ISMA. Retrieved January 12, 2015, from <http://www.isasa.org>.
- Independent Schools Council of Australia. (2008). Factors affecting school choice. Retrieved October 31, 2014, from <http://www.isca.edu.au>.
- Independent Schools Queensland Survey. 2011. Retrieved May 23, 2013, from http://www.aisq.qld.edu.au/files/Communications/survey/what_Parents_Want_SurveyReport-2011.pdf.
- International Finance Corporation (IFC). (2010). Education Investment Guide. Retrieved June 15, 2013, from <http://www.ifc.org/wps/connect>.
- Irvine, R. (2013). For the love of the game. *Financial Mail*: 19 April.
- Kalpakklioglu, N.U. & Taros, N. (2011). Viral marketing techniques within online social network. *Journal of Yasar University*, 24(6): 4112-4129.
- Kotler, P., Armstrong, G. & Tait, M. (2010). *Principles of Marketing: Global and Southern African Perspectives*. Cape Town: Pearson.
- Kotler, P. & Keller, K.L. (2012). *A framework for marketing management*. 5th ed. New Jersey: Pearson.
- Lobban, J. (2014). New independent school role players in South Africa [personal interview]. 5 Feb. Johannesburg.
- Lombard, A. (2013). Weekly open days [personal interview]. 20 July. Krugersdorp.
- Lovelock, C. & Wirtz, J. (2011). *Services Marketing: People, Technology and Strategy*. 7th ed. New Jersey: Pearson.
- Maragon Private Schools, 2015. Newspaper Advertisement. Roodepoort Record, 15 Aug.
- Mahlaka, R. (2004). Low-fee independent schools get a R1.2bn nod. Retrieved May 15, 2015, from <http://www.moneyweb.co.za/archive/lowfee-independent-schools-get-a-r12bn-nod/>.
- McAlister, D.R. (2005). A Marketing Strategy for Independent Schools. MEd Dissertation, University of Johannesburg.
- McGovern, M. (2012). What motivates parents. *Independent School Magazine*, Spring 2012, vol. 71, no.6.
- Molland, J. (2007). Straight talk about schools today: understand the system and help your child succeed. Minneapolis: Free Spirit.
- Ndzamela, P (2017). *Reta Sechaba Scholarships* (personal interview). 15 June, 2017. Johannesburg.
- Oplatka, I. & Hemsley-Brown, J. (2004). The Research on School Marketing: Current issues and future directions. *Journal of Educational Administration*, 42(3):375-397.
- Pallant, J. (2010). SPSS Survival Manual. Berkshire: McGraw-Hill.
- Pallant, J. (2013). SPSS Survival Manual. 5th ed. McGraw-Hill Education, England.
- Parumasur, S.B. & Roberts-Lombard, M. (2014). *Consumer Behaviour*. 2nd ed. Cape Town: Juta.
- Petrizzellis, L. & Romanazzi, S. (2010). Educational value: how students choose university. Evidence from an Italian university. *International Journal of Educational Management*, 24(2):139-158.

THE RELEVANCE OF SOCIAL MEDIA AS INFORMATION SOURCE WHEN SELECTING PRIVATE SCHOOLS IN SOUTH AFRICA

- Read, C.-A. & Bick, G. (2014). A comparison of the marketing of independent schools in South Africa and the United Kingdom. *International Journal of Teaching and Education*, 2(1): 18-37.
- Sferle, S., Gârdan, D.A., Gudei, S.C. & Geangu, I.P. (2012). Implementation of marketing principles – a necessity in primary school education. *Contemporary Reading in Law and Social Justice*, 4(2): 764-773.
- Smith, L. (2015). Marketing of Curro Krugersdorp [personal interview]. 9 March. Krugersdorp.
- Soedijati, K.E. & Pratminingsih, S.A. (2011). The impacts of marketing mix on students' choice of university. Conference proceedings of the 2nd International Conference on Business and Economic research. Conducted by Universitas Widyatama, Indonesia.
- The South African Schools Collection. 2010. Cape Town: Picasso Headlines.
- South African Social Media Landscape. (2015). Executive Summary. Retrieved May 25, 2015, from <http://www.worldwideworx.com>.
- Thomas, T. (2015). Shareholders approved AdvTech's acquisition of Maravest Schools. Press Release. Retrieved April 29, 2015, from <http://www.advtech.co.za>.
- Van der Berg, S., Van Wyk, C., Burger, R., Kotzé, J., Piek, M., & Rich, K. (2017). The performance of low fee independent schools in South Africa-What can available data tell? (No. 01/2017).
- Van Wyk, A. & Bisschoff, C. (2012). 'n Meetinstrument om die beeld van 'n sekondêre skool te bepaal. *Tydskrif vir Geesteswetenskappe*, 52(3):415-432.
- Vigar-Ellis, D. (2013). Boys' boarding school management: understanding the choice criteria of parents. *South African Journal of Education*, 33(1): 1-15.
- Wells, V. & Foxall, G.R. (2012). *Handbook of Developments in Consumer Behaviour*. Cheltenham: Elgar Publishing Limited.
- Worldwideworx. (2017). SA-Social-Media-Landscape-2016-Executive-summary. Retrieved April 25, 2017 from <http://www.worldwideworx.com/wp-content/uploads/2017/02/SA-Social-Media-Landscape-2017-Executive-summary.pdf>
- Zikmund, W.G. & Babin, B.J. (2010b). *Exploring marketing research*. 10th ed. (International Edition). South-Western, Cengage Learning.

JOURNAL OF GLOBAL BUSINESS AND TECHNOLOGY

MANUSCRIPT TOPICS

Accounting; Advertising & Promotion Management; Business Education; Business Information Systems (MIS); Business Law, Social Responsibility & Ethics; Communication; E-Commerce; E-Government; Economics; Finance & Investments; Global Business; Managing Information for Innovation, Health Care Administration; Insurance; Labor Relations & Human Resource Mgt.; Information Technology; Marketing Research; Marketing Theory & Applications; Non-Profit Organizations; Office Administration/Management; Operations Research/Statistics; Organizational Behavior & Theory; Organizational Development; Production/Operations; Public Administration; Purchasing/Materials Management; Risk; Sales/Selling; Services; Small Business Entrepreneurship; Strategic Management Policy; Taxation; Technology & Innovation Management; Total Quality Management; Tourism, Hospitality and Leisure; Transportation/Physical Distribution.

MANUSCRIPT GUIDELINES/COMMENTS

Purpose of the Journal

As an interdisciplinary journal, the purpose of the *Journal of Global Business and Technology* is to contribute to the advancement of knowledge related to the theory and practice of international business and technology. Its primary goal is to present scholarly and managerially relevant articles on a wide variety of topics in international business and technology to a broad audience in academia (educators, administrators, students), industry (business executives, consultants), as well as those involved in formulating and implementing public policy. Articles should be timely, providing guidelines, techniques, and suggestions for problem solving in international business and technology management. Case studies relating to specific organizations, products/services, and industries are also welcome. It is a prime objective of *JGBAT* to bridge the gap between theory and practice. To this end, articles should offer strong managerial insights to help in the development of action-oriented business programs and strategies.

Style and Submission Guidelines to Authors

1. Submissions must be made electronically with a cover letter indicating that the manuscript is not currently being considered at another publication in addition to one-page managerially oriented executive summary. Send submissions to:

Dr. N. Delener
Editor-in-Chief
Journal of Global Business and Technology
E-mail: info@gbata.org; delener@gbata.org

Submission of a paper will be held to imply that it contains original unpublished work and is not being submitted for publication elsewhere. The Editor-in-Chief does not accept responsibility for loss of papers submitted. Upon acceptance of an article author(s) will be asked to transfer copyright of the article to the publisher. This transfer will ensure the widest possible dissemination of information.

MANUSCRIPT GUIDELINES

2. A cover letter must accompany each submission indicating the name, address, telephone number, fax number and e-mail of the corresponding author.
3. Manuscripts should be double-spaced with wide margins. All pages should be numbered sequentially.
4. Manuscripts should have a cover page with the author's name(s), contain affiliation, and the area of concentration (i.e., accounting, marketing, etc.). No other pages should contain information about the author(s). An abstract of 150 words or less, including five key words, should appear on the second page. The paper itself should begin on the third page. Manuscripts should not exceed 25 double-spaced, typewritten pages, including tables, figures, and references. Manuscripts that exceed these limits are routinely returned to the author(s) for shortening before consideration.
5. Tabular material and figure legend should be in box-form and incorporated in the proper part of the text. They should also be contained in the word processor file in MS Word, and cannot be hand drawn. Tables should be numbered in Arabic numbers (i.e., Table 1). Columns should be set using tab stops, not spaces, so they align. Figures are numbered similarly to tables (i.e., Figure 1).
6. References should be made by the in-text form of citation. The reference list should include information for all sources cited in the manuscript. The author should make sure that there is a strict one-to-one correspondence between the references in the text and those on the list. It should be double spaced and listed in alphabetical order according to APA style by author's last name, but including first name initial, on a separate sheet at the end of the manuscript.

The following are examples of proper form:

Journal Article

Hurmelinna-Laukkanen, P., Ritala, P., & Sainio, L. (2013). Protection of Radical Innovations-Differences in Domestic and International Markets. *Journal of Global Business and Technology*, 9 (1): 1-16.

Authored Book

Delener, N. (1999). *Strategic Planning and Multinational Trading Blocs*. Connecticut, USA: Quorum Books.

Edited Book

Delener, N. (Ed.) (2012). *Service Science Research, Strategy, and Innovation: Dynamic Knowledge Management Methods*, U.S.A. IGI Global.

Chapters in Edited Book

Delener, N. & Lees, F. (2001). Global Planning of Business Activity. In Milner, M. & Lees, F. (Eds.), *Management of the Modern Company*, Moscow, Russia: 366 – 378.

Paper Presented at ...

Sturma, P. (2009). Global Challenges and International Law. Paper presented at Global Business and Technology Association's Eleventh Annual Conference, Prague, Czech Republic, July.

Published Proceedings

Florinda, M., Rodrigues, S., Lopes, A., & Matos, N. (2011). Intellectual Capital Tool. In Delener, N., Fuxman, L., Lu, V. & Rivera-Solis, L.E. (Eds). *Fulfilling the Worldwide Sustainability Challenge: Strategies, Innovaitons, and Perspectives for Forward Momentum in Turbulent Times* (pp. 615-621). USA: GBATA Press.

Instance of Publication in press

Afriyie, K., Torres-Baumgarten, G. & Yucetepe, V. (in press). Internationalization and Value-Creation Perfromance of Latin American Multinationals: The Case of Outbound Foreign Direct Investment. *Journal of Global Business and Technology*.

Article in an Internet-Only Journal

Fredrickson, B. L. (2000, March 7). Cultivating positive emotions to optimize health and well-being. *Prevention & Treatment*, 3, Article 0001a. Retrieved November 20, 2000, from <http://journals.apa.org/prevention/volume3/pre0030001a.html>

7. Sections of the paper such as INTRODUCTION should be flush in all capital letters with one extra line space between section head and text. Subheads should be in upper and lower case letters, flush with one extra line spacing above and no extra line spacing below subhead. For subheads below the first level subhead, indent one tab for second subhead.

8. The text should appeal to a wide audience by avoiding the use of methodological/technical jargon wherever possible. It may be more appropriate to include technical details in an appendix rather than in the body of the article.

9. Every effort should be made to avoid the use of specific national names of organizations and/or individuals which might be unfamiliar to the international audience of *JGBAT*. Authors may need to provide brief explanations in a footnote or an appendix.

10. Acknowledgements and information on grants received can be given before the References.

11. Explanatory footnotes should be kept to a minimum and be numbered sequentially throughout the text with superscript Arabic numerals. They should be double-spaced and not include displayed formulae or tables.

12. All spelling, grammar, and punctuation are the responsibility of the author(s). No corrections will be made by the Journal Editors. Therefore, all articles must be edited prior to submission.

Refereeing Procedure

Each manuscript is reviewed by at least three referees, as well as an Editor-in-Chief.

The Editor-in-Chief reserves the right to refuse any manuscripts, whether an invitation or otherwise, and to make suggestions and/or modifications before publication. The refereeing process takes up to three months from date of receipt of the article to communication to the author. The revised manuscript will be reviewed by one of the original referees.

The Editor-in-Chief is always happy to discuss contributions before submission.



Corporate, Institution, & Library Subscription Information

Name_____

Institution_____

Address_____

City, State, Zip

Country_____

Annual Fee US \$ 245.00

Please indicate when you want subscription to begin:

☐ Spring 201__ ☐ Fall 201__

Please complete the subscription form as well as the credit card particulars and e-mail to the Editor-in-Chief at info@gbata.org

* For subscriptions, please do not remove this page. A **photo copy** would be appreciated.



***Journal of Global Business
and Technology***

Individual Subscription Information

Name_____

Institution_____

Address_____

City, State, Zip

Country_____

Annual Fee US \$ 150.00

Please indicate when you want subscription to begin:

☐ Spring 201__ ☐ Fall 201__

* Please complete the subscription form as well as the credit card particulars and e-mail to the Editor-in-Chief at info@gbata.org

* For subscriptions, please do not remove this page. A **photocopy** would be appreciated.