FAKULTÄT II - INFORMATIK, WIRTSCHAFTS- UND RECHTSWISSENSCHAFTEN

Adoption of Green E-Business Applications for Sustainable Tourism Development in Developing Countries
The Case of Tanzania

Dissertation

Submitted in Fulfillment of the Requirement for the Title of **Doktor der Wirtschaftswissenschaften (Dr. rer.pol.)**

Submitted by

Juma James Masele

October, 2013
Oldenburg, Germany

First Supervisor:	Prof. Dr. Bernd Siebernhüner
Second Supervisor:	Prof. Dr.-Ing. Jorge Marx Gómez
Place of Dispution:	Oldenburg - Carl von Ossietzky University of Oldenburg
Disputation Date:	30.01.2014

Eidesstattliche Erklärung

Hiermit erkläre ich an Eides statt, daß ich die vorgelegte Dissertation mit dem Titel**"Adoption of Green E-Business Applications for Sustainable Tourism Development in Developing Countries: The Case of Tanzania"** selbständig verfaßt, keine anderen als die von mir angegebenen Quellen und Hilfsmittel benutzt und die den benutzten Werken wörtlich oder inhaltlich entnommenen Stellenkenntlich gemacht habe.

Oldenburg, den 10.02.2014

(Juma James Masele)

Oldenburger Schriften zur Wirtschaftsinformatik

Band 12

Juma James Masele

Adoption of Green E-Business Applications for Sustainable Tourism Development in Developing Countries

The Case of Tanzania

Shaker Verlag
Aachen 2014

Bibliographic information published by the Deutsche Nationalbibliothek
The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at http://dnb.d-nb.de.

Zugl.: Oldenburg, Univ., Diss., 2014

Printed in Germany.

ISBN 978-3-8440-2615-3
ISSN 1863-8627

Shaker Verlag GmbH • P.O. BOX 101818 • D-52018 Aachen
Phone: 0049/2407/9596-0 • Telefax: 0049/2407/9596-9
Internet: www.shaker.de • e-mail: info@shaker.de

ACKNOWLEDGEMENTS

Accomplishing this dissertation would not have been possible without efforts and support from several individuals. First and far most sincere graditude is due to our God the Almighty, who is not only the Creator of all that is in heaven and on earth; He is also the giver of life and all blessings for all humankind. Second, profound gratitude is due to Prof. Dr.-Ing. Jorge Marx Gómez of Department of Computer Science, Business Informatics /VLBA Unit, and Prof. Dr. Bernd Siebernhüner of Department of Ecological Economics, both from the Carl von Ossietzky Universität Oldenburg for supervising me. I greatly benefited from their guidance, encouragement, constructive criticisms, patience and trust. I feel to have been privileged to work under their supervision.

I am especially gratefully to the German Academic Exchange Services (DAAD), in collaboration with the Tanzania Ministry of Education and Vocational Training (MoEVT) for granting me with the opportunity to undertake my PhD studies, through continuous support and financial funding. My acknowledgements are also directed to my PhD fellow students in both departments - Business Informatics and Ecological economics for their continuous readiness to provide me with insights and feedback.

Many thanks go to Prof. Dr. Marcelina M. Chijoriga, and Dr. Ulingeta O. L. Mbamba, the former and the current UDBS Deans respectively for their continued support. My thanks are also due to Dr. Benjamin Mutagwaba, and Dr. Severine Kessy, my former and the current heads of department. Others are Mr. David Rweikiza, Mr. Florian Mtei, Mr. Victor Wilson, and Mr. Gerald Magova who deserve mention for their support in coordinating survey and field work. My sincere thanks are also directed to Dr. Tumsifu Elly, Dr. Wineaster Anderson and, the late Dr. Justin Katunzi who provided constructive comments, advice and support during my very initial search for a way to doctoral degree studies.

I extend thanks to my family members, starting with my father Stanley S.D. Masele, and my mother, Winifrida L. Njuka, for their immense sacrifice as well as persistent assistance towards my education. “You are, and will remain, my heroes and lifelong tutors”. To families, of the late Linus K. Bundala; my granduncle George M. Kanzaga, and my uncle Lucas L.M. Masele, for their founding principles that they laid for my academic life including their distinguished care, support and encouragements. Others are families of Mzee Lucas Kisusi and Mr. Elia J. Kalinga, for their invaluable support and encouragements. To my young brothers Paul and Abel, I say “Thank you”.

Last but not the least; I extend sincenre graditude to my wife Rachel for her priceless encouragement not only during the preparatory stage in search for PhD scholarship, but also during my three years absence when I was away at the University of Oldenburg. I left her all this time alone with our little children, Elisha, Stanley, Faith and Ebenezer. To our children, though they missed my presence yet, the role they played in supporting this work is priceless. Their love, prayers, material and moral support made my study period bearable, as they were always there to cherish, inspire and support. At times, they were timekeepers by ensuring that things happen and deliverables are realized. There is no real good word to say, than “God bless you, as your labour is not in vain”.

For those whose names do not appear in this account, but contributed, no matter what it takes to success of this work, thanks a lot. However, I remain solely responsible for any inadequacy that may be found in this thesis.

Juma James Masele University of Oldenburg, 2013

ZUSAMMENFASSUNG

Nachhaltigkeitsprobleme des Wirtschaftens in der Tourismusbranche in sogenannten Entwicklungsländern stehen im Mittelpunkt dieser Studie. *Grüne* Geschäftsanwendungen sollen nicht nur helfen, Kosten zu senken, sondern auch die Belastung der Umwelt durch Treibhausgasemissionen und Abfälle zu minimieren. Während sich E-Business-Strategien auch in kleinen und mittleren Unternehmen der Tourismusbranche (SMTE) von Entwicklungsländern durchgesetzt haben, fehlt bislang ein Modell für die Einführung und Aneignung eines *grünen* E-Business.

Die Arbeit befasst sich dazu mit der übergeordneten Fragestellung: Was begünstigt die Einführung energieeffizienter, grüner *E-Business Applications* in SMTEs? Zur Beantwortung dieser zentralen Forschungsfrage muss zunächst einmal festgestellt werden, in welchem Grad solche grünen Geschäftsanwendungen überhaupt in der Tourismusbranche zum Einsatz kommen, welche Einflussfaktoren in Frage kommen, und mit welchem Gewicht diese Faktoren die Einführung grüner *Business Applications* determinieren, allgemein gesprochen müssen also günstige Umgebungen für die Einführung solcher Systeme untersucht werden.

Dafür wurde ein Green E-Business Adoption Model (GEBAM) formuliert. Das Konzept umfasst insgesamt 12 Beziehungen zwischen organisationalen, managementbezogenenen, technologischen und Umweltfaktoren, die die Einführung grüner E-Business-Anwendungen betreffen könnten. Nach einer quantitativen Befragung von 148 SMTEs in Dar es Salaam, Zanzibar, Kilimanjaro und Arusha wurde unter Verwendung eines Strukturgleichungsmodells eine konfirmative Faktorenanalyse durchgeführt. Zur Absicherung kausaler Zusammenhänge wurde die Untersuchung durch einen qualitativen Part ergänzt. Dafür wurden diverse Stakeholder der Branche interviewt, und zwar Vertreter aus Behörden, Systemhäusern, Veranstaltern, Entsorgungsfirmen im Bereich der Elektronik und NGOs sowie Touristen.

Von den 12 formulierten Hypothesen erwiesen sich sieben als signifikant. Nutzerfreundlichkeit erhöht das Selbstvertrauen der Anwender und begünstigt somit eine Entscheidung zur Einführung einer grünen Anwendung. Trainingsmaßnahmen und eine klare Darstellung der Funktionsweise solcher Anwendungen helfen den prospektiven Nutzern, die ökonomischen und umweltbezogenen Vorteile besser zu verstehen.

Günstige Bedingungen werden als wichtig angesehen, um neue Nutzer zu gewinnen. Daneben kann normativer Druck die Bereitschaft zum Einsatz grüner E-Business Anwendungen verstärken. Angesichts des entscheidenden wirtschaftlichen Beitrags, den kleine und mittlere Unternehmen erbringen, aber auch ihres Ressourcenbedarfs, scheint die Entwicklung einer nationalen politischen Strategie, die diese Akteure bei der Einführung grüner Geschäftsanwendungen unterstützt und führt, geboten. Allerdings sind auch die Unternehmen selbst gefragt, entsprechende Kompetenzen aufzubauen, um die Potenziale einer nachhaltigeren Wirtschaftsweise zu heben. Dazu müssen sie grüne Strategien entwickeln; die Beteiligung an einschlägigen Netzwerken kann ihnen dabei helfen, den Anschluss an technologische Entwicklungen zu halten und Förderprogramme zu nutzen. Von größter Bedeutung ist dabei die Verfügbarkeit von einschlägigem technischen Know-how, das entweder unternehmensintern oder durch externe Beratung bereitgestellt werden kann.

ABSTRACT

Concerns on emerging sustainability issues in doing business were the epicentre of this study. In ensuring that each of business applications is actually green, it is imperative to save not only companies' operational costs, but also the environment by reducing IT induced Greenhouse gas emissions and resultant chemicals that fill the land, hence, enhancing companies' Corporate Social Responsibility (CSR). Although E-Business has recently turned to be a way of doing business and a strategic tool for competition, there exists no comprehensive model to explain Green E-Business adoption among Small and Medium Tourism Enterprises (SMTEs) in developing countries.

This study was designed in order to answer the main research question, "What is it that makes some SMTEs adopt and use energy efficient as well as Green E-Business applications and not others?" Specifically, it sought to determine the extent to which E-Business applications in use are ecologically and energy efficient (green) for sustainable tourism development; to examine the pull and push factors towards energy and Green E-Business applications among SMTEs; to examine the relative importance of determinant factors involved in adoption of Green E-Business application in SMTEs; and, to examine the environment suitable for SMTEs' adoption for Green E-Business applications. In order to execute these objectives, a conceptualized Green E-Business Adoption Model (GEBAM) was formulated along with three adoption models, namely; Unified Theory of Acceptance and Use of Technology (UTAUT), Technology-Organizational-Environmental (TOE) model, and Institutional Theory. The conceptualized model hypothesized 12 relationships among organizational, managerial, technological and external-environmental factors to affect Green E-Business adoption including use. A survey employing a 5 point Likert Scale (from 1-Strongly Disagree to 5-Strongly Agree) was used to collect data among 148 cases of SMTEs in Dar es Salaam, Zanzibar, Kilimanjaro and Arusha – Tanzania. Using SEM, a Confirmatory Factor Analysis was tested through Statistical Package for Social Sciences – Analysis of Moment Structure 20 version (SPSS-AMOS 20) to validate the model and test the hypothesized relationships. The quantitative part was followed by qualitative face to face in-depth interviews conducted in the revealed Green E-Business adoption stakeholders including regulatory/authoritative bodies, computer sellers, tour operators, e-waste collectors, tourists and NGOs, so as to get word of mouth explanations, for strongly featuring quantitative aspects.

From the SMTEs in developing countries' contexts, the findings demonstrated that although all hypotheses indicated a positive influence, only seven out of the twelve hypothesized relationships were revealed significant. The study concluded that if a firm is to adopt Green E-Business, the technology behind it has to be easy to use, something which may inculcate an individual's self- efficacy to use Green E-Business drivers which altogether influence Intention to Use. Clear information coupled up with training will increase an understanding about Green E-Business including its accrued benefits both to the environment and the firm. On the other hand, presence of facilitating conditions is regarded important to persuade new adopters, while existence of coercive pressures is emphasized in order to reinforce Green E-Business behaviors. In so doing, it will raise Intention to Use, a precursor which will stimulate commitment for actual Green E-Business adoption and use for sustainable tourism development. Given their number and pivotal role they play in the economy and their resource as well as information poor characteristics, need for national policies and other interventions to effectively guide and empower SMEs for Green E-Business adoption arises so as to make development sustainable. On the other hand, firms need to equip themselves with Green E-Business skills, knowledge and insights in order to accrue benefits. Formulation of own relevant green policies, and staying in green network will keep firms updated for new programs, invention and interventions. Of utmost importance is having required technical knowhow, be it through sourcing, or in-house made.

Table of Contents

List of Figures