Assessing a Theoretically-Derived E-Readiness Framework for E-Commerce in a Nigerian SME

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ABSTRACT

Purpose: To develop and test an appropriate e-readiness assessment framework for e-commerce for Nigerian SMEs.

Design/methodology/approach: The analysis and synthesis of existing literature on e-commerce adoption lead to the generation of an integrated framework for e-readiness assessment in SMEs. The framework was then instantiated in a questionnaire and trialled in an SME in Nigeria (MRT Ltd.).

Findings/results: Firstly the analysis of the literature shows that existing theories do not sufficiently capture the factors that are important to the adoption of e-commerce by SMEs in Nigeria. Secondly, the study findings revealed that some e-readiness factors in the trial SME such as management and process factors are suitable for e-commerce adoption but improvement needs to be made on people and technological factors in order for the organisation to be declared an e-ready organisation.

Limitation: This research made use of a questionnaire and an informal interview during the trial of the framework. This needs to be expanded into a full case study approach to thoroughly evaluate the framework.

Practical implications: It is possible to provide decision-makers in Nigerian SMEs with an operational framework for e-readiness e-commerce assessment: this has been successfully trialled within one such SME.

Keywords: E-commerce adoption, e-readiness assessment, Small and Medium Enterprise, Developing Countries, Nigeria

1. INTRODUCTION

It is widely acknowledged that the adoption of e-commerce has proven to be a potential method of boosting the efficiency and effectiveness of a business because it allows organisations to adjust to new market opportunities, and remain competitive in the ever-growing global market (Ahmed et al. 2011). The use of e-commerce has not only introduced a new way of conducting business, but has become a fundamental part of peoples’ lives. Organisations, individuals, and even government are paying increasing attention to e-business and using it as a strategic tool (Tan et al., 2010). Powered by mobile and social commerce it is termed as one of the essential key to success and growth in the present competitive business world (Almousa 2013). Indeed there exists a rich benefit of e-commerce adoption as opposed to the traditional commerce, however many researchers have shown that most organisations face difficulties on what to do before and after adopting the technology (Molla & Licker, 2005a,b; Tan et al. 2007; Aboelmaged, 2014). Some of these difficulties include the lack of awareness on the type of expertise needed, the type of technology infrastructures required and the financial implication both long and short term (Parker & Castleman, 2009). This reason has prompted many organisations aspiring to adopt and implement e-commerce, particularly small and medium enterprise in developing countries like MRT Ltd, to further explore how exactly they can go about implementing e-commerce systems. Aboelmaged (2014) have also claimed that it necessary to assess
the e-readiness of an organisation before adopting e-commerce in order to keep abreast with ever growing market demand.

Much research on e-commerce adoption has been focused on developed nations with little on developing countries. It should be noted that there is a great differences between developed and developing nations and therefore factors that affects e-commerce development may vary (Tan et al., 2007; Parker & Castleman, 2009). Therefore, it is important to further understand how SMEs in developing countries could overcome the external and organisational e-readiness impediments and realise the full potential of e-commerce adoption. This paper focuses on the creation and trial of a framework for use by SMEs in Nigeria to evaluate their e-readiness. This framework has been trialled with one SME (MRT Ltd) and the resulting findings suggest that it could be used by other SMEs in developing nations.

The remainder of this paper is structured as follows: key definitions for e-commerce, e-readiness and Nigerian SMEs are provided and known barriers and benefits of e-commerce adoption in SMEs are highlighted. An overview is given of relevant e-commerce adoption frameworks which lead to an integrated framework. The approach taken to collect the empirical data in the framework trial in MRT Ltd is discussed and the resultant data are used to demonstrate and discuss the utility of the framework. The limitations of the research and recommendations for future research conclude the paper.

2. LITERATURE REVIEW

2.1 Definitions: E-Commerce, E-Readiness and Nigerian SME

The definitions used in this paper are as follows:

E-Commerce is “a complete business strategy that offers a broad range of services and prospects for electronic trading regardless of geographical barriers” (Saffu et al., 2008)

E-Readiness is “the ability of a workgroup, department or organisation to embrace and use technology such as e-commerce” (Ruikar et al., 2006).

A Nigerian SME is “an enterprise that has asset base (excluding land) of between N5 million –N500 million and labour force of between 11 and 300” (Lawal and Ijaiya, 2007).¹

2.2 Theoretical Context for E-Commerce Adoption in SMEs

According to Ghobakhloo et al. (2011) “E-commerce adoption in SMEs can be described as utilization of Information Communication Technology and applications to support business operations, management, and decision making in SMEs”. Table 1 highlights some of the benefits and barriers of e-commerce adoption. From the literature four of these have been identified as the most commonly used in SMEs e-commerce adoption research. These are:

1. Technology Organisation Environment (TOE).
2. Technology Acceptance Model (TAM).
3. Verify end user e-readiness using diagnostic tool (VERDICT).
4. Perceived e-readiness model (PERM).

Table 2 summarises their key features and is followed by an overview of each.

¹£1 = 309 Nigerian Naira at the time of this research.

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Table 1: E-Commerce Adoption in SMEs - Benefits of and Barriers

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Main Sources</th>
<th>Barriers</th>
<th>Main Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheap way of advertising</td>
<td>Harindranath (2008)</td>
<td>Company culture</td>
<td>Awa et al. (2011)</td>
</tr>
<tr>
<td>Cost savings</td>
<td>Nguyen (2009)</td>
<td>IT systems too costly</td>
<td>Chuang et al. (2009)</td>
</tr>
<tr>
<td>Gaining competitive</td>
<td>Ghobakhloo et al. (2011)</td>
<td>Lack of resources</td>
<td>Awa et al. (2011)</td>
</tr>
<tr>
<td>Simplified</td>
<td>Collins et al. (2010)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time savings</td>
<td>Apulu &amp; Latham (2011)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Abstracted Features of The Four Models.

<table>
<thead>
<tr>
<th>FACTORS</th>
<th>TOE</th>
<th>TAM</th>
<th>VERDICT</th>
<th>PERM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisational</td>
<td>Management support</td>
<td>Management</td>
<td>Awareness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Formal and informal linking structure</td>
<td>People</td>
<td>Human resources</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Communication process</td>
<td>Process</td>
<td>Business resources</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Size</td>
<td>Technology</td>
<td>Technology resource</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slack</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental/</td>
<td>Market structure</td>
<td></td>
<td>Market forces</td>
<td></td>
</tr>
<tr>
<td>External</td>
<td>Technology support infrastructure</td>
<td>Government</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Government regulation</td>
<td>Supporting industries</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technological</td>
<td>Availability</td>
<td>Perceived usefulness</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Characteristics</td>
<td>Perceived ease of use</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.2.1 Technology Organisation Environment (TOE) Framework

Tornatzky and Fleischer’s (1990) TOE framework posits that technological innovation in organisations is influenced by three factors and therefore decision makers must consider their influences. The factors are: the technological context, the organisational context and the external environment. The authors propose that the organisational context encompasses informal and formal methods, communication processes, and the size of the organisation. The environmental context comprises characteristics such as government regulation, market structure and technology infrastructure. The technological context involves the availability and features of the technology.

2.2.2 Technology Acceptance Model (TAM)

TAM is commonly used in information technology adoption research. It was established by Davis (Davis & Viswanath, 1996) to describe user adoption of new technology innovation in organisations. It suggests perceived usefulness (PU) and perceived ease of use (PEOU) as the two most important determinants of technology adoption in an organisation. Perceived usefulness is defined in this model

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as the degree to which a person is certain that the continuous usage of a particular system will enhance his or her job performance. While perceived ease of use is the extent to which a person believes that using a particular system would be free of physical and mental effort.

2.2.3 Verify End-user e-Readiness using a Diagnostic Tool (VERDICT)

VERDICT was developed and tested by Ruikar et al. (2006). The main purpose their research was to design an e-readiness model and a prototype application that could analyse the readiness of construction companies willing to adopt e-commerce. The VERDICT model posits that for an organisation to be e-ready it must firstly have a management that believes in the technology and takes strategic measures to drive its adoption. Secondly, a process that enables and supports the successful adoption of the technology. Thirdly, people with experience and understanding of e-commerce technology. Finally, a technology infrastructure to support the business functions.

2.2.4 Perceived E-Readiness Model (PERM)

The main limitation of the three previous models from the perspective of developing countries is that they are designed to address issues in developed nations. Issues that might seem trivial or insignificant in developed countries may be important to organisations in the developing world. A more useful model that has been designed in the context of developing countries is the Perceived E-Readiness Model (PERM) by Molla and Licker (2005a). The theoretical root of Perceived E-Readiness Model (PERM) was motivated by the interactionism model. Working from this perspective Molla and Licker (2005a) posited that the multi-perspective assessment of managerial, internal organisational and external contextual factors could provide meaningful predictor of electronic commerce adoption in developing countries. The model encompasses two major constructs to access both internal and external factors. The internal factor is termed Perceived Organisation E-Readiness (POER), encompassing: organisational perception, manager’s commitment, and organisational perception toward adopting e-commerce. The external factor termed perceived Environmental E-Readiness (PEER) encompasses an organisation evaluation and assessment of relevant environmental factors such as market forces, government and industries that are willing to support the adoption of e-commerce. However, the limitation of the model is that the validity and reliability were tested once only in South Africa, during development. Secondly important industry descriptors, such as sector, firm size and educational background of employees (Molla & Licker, 2005a,b; Tan et al. 2007).

2.3 Toward an Integrated Theoretical Framework

The review of existing models commonly used in e-commerce adoption research has shown different factors and indicators that need to be considered when carrying out an e-readiness assessment. The most predominant factors are technological, organisational and environmental (or external) factors. PERM helps describe the organisational and external factor that affects the adoption of e-commerce in organisations. TOE has also been demonstrated by Ifinedo (2009) to have the potential of assessing the technological and environmental factors that might hinder the adoption of e-commerce in Canadian SMEs. TAM has also been confirmed by Nezakati (2012) as having the capability to assess the technical factors that might hinder e-commerce adoption in an organisation. Ruikar et al (2006) claimed VERDICT has the ability of assessing all the organisational factors that could affect the adoption of e-commerce. From the literature it appears that an integrated theoretical framework of VERDICT and PERM’s Perceived Organisational E-readiness (POER) model might be useful in contextualising the factors and indicators that underpins the organisational readiness of SMEs in developing country like Nigeria. Figure 1 illustrates the integrated framework and its elements are explained in Table 3.
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September 2015

Figure 1: Proposed E-Readiness Assessment Framework for SMEs in Developing Countries

Table: 3: Description of Indicators in the Framework.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Indicators</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>Governance</td>
<td>The strategic and operational model put in place by organisations for e-commerce initiatives.</td>
</tr>
<tr>
<td></td>
<td>Top management vision</td>
<td>The aim and ultimate vision of top management for e-commerce technology.</td>
</tr>
<tr>
<td></td>
<td>Top management commitment</td>
<td>The clear cut vision for e-commerce adoption championed by top management of an organisation.</td>
</tr>
<tr>
<td>Technology</td>
<td>IT infrastructure</td>
<td>The available hardware such as computers and network devices.</td>
</tr>
<tr>
<td></td>
<td>IT support</td>
<td>The internal and external technology support for the organisation</td>
</tr>
<tr>
<td></td>
<td>Flexibility</td>
<td>The flexibility of existing systems</td>
</tr>
<tr>
<td></td>
<td>IT policy</td>
<td>The protocols put in place to govern the use of IT in an organisation</td>
</tr>
<tr>
<td>People</td>
<td>Awareness</td>
<td>Employees’ perceptions of benefits, threats and impact of e-commerce adoption</td>
</tr>
<tr>
<td></td>
<td>Human resources</td>
<td>Availability of people with adequate experience and exposure to (ICT) and other skills</td>
</tr>
<tr>
<td></td>
<td>Employee commitment</td>
<td>Employees’ energy and support for e-commerce adoption in an organisation</td>
</tr>
<tr>
<td>Process</td>
<td>Business process</td>
<td>Existing business practices in an organisation</td>
</tr>
<tr>
<td></td>
<td>Change management</td>
<td>An organisation’s approach toward handling change that arises from e-commerce adoption.</td>
</tr>
</tbody>
</table>

3. METHODOLOGY

The focus of this research was to develop an appropriate e-readiness assessment framework for SMEs in Nigeria. From the literature review the two models that suited the focus of this research were integrated to develop a framework (see Figure 1). The empirical assessment of the framework was carried out in MRT Ltd by instantiating the framework as a questionnaire.
3.1 Background of the participating organisation (MRT Ltd)

MRT Ltd is a printing company based in Kogi State, Nigeria. It offers printing products and services to both individuals and organisation, for example graphic designs, publication of books, labels for pharmaceutical industries, money binders, stickers, magazines, transactional documents and sales of printing materials. The company initially started as a traditional printing press in (1987) with less than 10 employees, but now around 50 employees. Over the years the company has benefited from printing contracts from both businesses and individuals due to the demand for customised printing products. The customer base is still within its state of origin (Kogi state). This is due to lack of an e-commerce platform to reach out to the other potential customers in Nigeria and beyond. MRT Ltd is currently undergoing modernisation and is interested in expanding beyond regional boundaries and conducting business more effectively: for this reason MRT Ltd is planning to adopt e-commerce (b2b and b2c). MRT Ltd acknowledges that it is essential to assess its e-readiness and highlights possible factors that may inhibit its adoption of e-commerce technology.

3.2 Research Techniques

3.2.1 Informal Interview

An informal telephone interview was conducted with the manager of MRT Ltd in which 11 questions were asked. The interview was used to gather contextual information about the organisation in terms of the type of technology currently been used in the company, the company’s purpose for e-readiness assessment, what the company aims to benefit from e-commerce adoption and more importantly determine the current adoption level in the company. The theme of the interview arose from the literature review, this was necessary to ensure that appropriate questions that conforms to the factors and indicators found in the literature were asked. The result of the interview gave the researcher an insight into the current state of the company and what they intend to achieve from the e-readiness assessment. More interestingly it also gave the researcher a better idea of some additional questions to include in the questionnaire. A major rationale for conducting the interview was to determine the adoption level of the company.

3.2.2 Questionnaire Census

A questionnaire was designed by using the factors and indicators identified in the framework (see Figure 1). The questionnaire, which is provided in Appendix A, comprised one part for each of the four factors. The match of questions to framework factors is shown in Table 4. Each question was assessed against a 4 point Likert scale ranging from (1) strongly disagree to (4) strongly agree.

<table>
<thead>
<tr>
<th>Factors</th>
<th>Indicators</th>
<th>Question No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>Vision</td>
<td>1, 2</td>
</tr>
<tr>
<td></td>
<td>Governance</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Commitment</td>
<td>4</td>
</tr>
<tr>
<td>People</td>
<td>Awareness</td>
<td>5, 6, 7</td>
</tr>
<tr>
<td></td>
<td>Employee commitment</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Human resources</td>
<td>9, 10, 11</td>
</tr>
<tr>
<td>Process</td>
<td>Business process</td>
<td>12, 13, 14</td>
</tr>
<tr>
<td></td>
<td>Change management</td>
<td>15</td>
</tr>
<tr>
<td>Technology</td>
<td>IT infrastructure</td>
<td>16, 17</td>
</tr>
<tr>
<td></td>
<td>IT policy</td>
<td>18</td>
</tr>
<tr>
<td></td>
<td>Flexibility</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>IT Support</td>
<td>20</td>
</tr>
</tbody>
</table>
3.3 Pilot Study

A pilot test was conducted to identify any flaws in the questionnaire before conducting the full study. It was also used to check for instruction and question clarity. Eight selected graduate students with background in information technology agreed to participate. After four hours of distributing the questionnaires, a total of seven responses were received. Telephone conversations were held with three participants the next day to establish if there were any difficulties experienced in completing the questions, ease of understanding and any other shortcoming discovered in the questionnaire. All participants found the questions easy to understand. However one suggested that there was duplication in questions 4 and 15. This duplication was removed.

3.4 Administering the Census

The choice of participants for the survey was determined by the focus of this research which was to conduct an e-readiness assessment on MRT Ltd. In order to get a genuine response that portrays the e-readiness state of the organisation, a census was conducted, meaning that the questionnaires were directed to all employees in MRT Ltd. Most existing research in e-commerce adoption has made use of random sampling given a focus on more than one organisation but in the context of this research only one organisation was considered. Therefore random sampling was not needed.

The questionnaire was administered electronically through the contact person. A covering letter was attached to the questionnaire explaining its purpose, assuring anonymity, and giving instructions on how to complete the questions. Follow up effort was made through phone calls to ensure that the questions were completed before the stipulated deadline date. 44 of the 50 questionnaires sent were returned, three were incomplete, resulting in 41 usable responses (and 82% response rate). The researcher considered the response rate as satisfactory because it was in-line with previous studies on e-readiness assessment (Tan et al, 2007; Molla and Licker, 2005a,b).

3.5 Data Analysis Approach

The data collected from the survey were tabulated according to factors and indicators from the framework. The mean score of each indicator was calculated based on responses from participants and were depicted on column charts to give a visual representation of the results and make it easy for the SME to understand. Furthermore, an e-readiness scale was used to determine the readiness level of each factor in the framework. This was in-line with existing practice: for instance Ruikar et al. (2006) used traffic lights indicators to visually indicate company e-readiness; Ouma et al (2013) measured e-readiness level on a scale of 1 to 5. In this research, a similar (four point) scale was used:

- Total average between 1 and 2: SME is not ready in that area, a lot of work needs to be done.
- Total average between 2 and 2.5: SME is not ready in that part, some work is needed.
- Total average between 2.5 and 3: SME is ready in that part but can still be improved.
- Total average between 3 and 4: SME is fully ready in that part, ready for e-commerce adoption.
4. DATA ANALYSIS AND FINDINGS

4.1 Current Adoption Level of MRT Ltd

Molla and Licker (2005a,b) affirmed that determining adoption level of an organisation was an essential part of e-readiness assessment. For this basic reason determining the adoption level of MRT Ltd was the first step in the data analysis. Molla and Licker (2005a) categorised e-commerce adoption level into: Non adopters and Initial adopter. The non adopters are organisations that are connected to the internet but have no email and organisations that have email but have no website. While initial-adopters are organisations with a static website that is used for publishing company information without interactivity or those with interactive e-commerce accepting queries and forms from clients. Working from this perspective MRT Ltd was categorised under the non-adopter for the reason that the informal telephone interview with my point of contact in MRT Ltd. revealed that the company is connected to the internet but uses email. However, the company has no static or dynamic website (see interview transcript in Appendix B). That is to say the company has no information online neither do they process financial transaction online.

4.2 Questionnaire Analysis

This section contains statistical representation of participant responses based on factors and indicators used in the framework. Overall 41 out of 50 responded to the questionnaire. Microsoft Excel was used to analyse responses to give a visual presentation of the results using column charts. Each table below describes the response of participant according to their level of agreement ranging from strongly disagree to strongly agree. The total mean score for each factor were also calculated.

In order to assess the readiness of top management in MRT Ltd to adopt e-commerce technology 4 questions related to the factor and conforming indicators were asked. Table 5 and Figure 3 show that 88% of the respondents strongly agreed/agreed that the management has a vision on e-commerce adoption. 85% strongly agreed/agreed that the top management has a proper governance mechanism for e-commerce adoption. The was less agreement that the top management are committed to adopting e-commerce: although still 63% strongly agreed/ with the statement. The mean score for the management factors is 3.0.

Table 5: Assessment of Management Factors

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management vision</td>
<td>7.3</td>
<td>4.8</td>
<td>24.4</td>
<td>63.4</td>
</tr>
<tr>
<td>Governance</td>
<td>9.7</td>
<td>4.8</td>
<td>14.6</td>
<td>70.7</td>
</tr>
<tr>
<td>Management commitment</td>
<td>19.5</td>
<td>17.1</td>
<td>4.8</td>
<td>58.5</td>
</tr>
</tbody>
</table>

Figure 2: E-readiness Scale (Based on Ouma et al. 2013)
Seven questions were used to assess the readiness of the people (employees) of MRT Ltd. Table 6 and Figure 4 show that 61% strongly agreed/agreed that there was a proper awareness of e-commerce in terms of its benefit and impact it will have on the organisation. 73% strongly agreed/agreed that they are committed to e-commerce adoption in the organisation. Only a minority of 20% strongly agreed/agreed that there were sufficient human resources (in terms of skills and experience for e-commerce adoption). Despite the low score for human resources the mean score for the people related factor is 3.3.

### Table 6: Assessment of People Factors

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awareness</td>
<td>12.2%</td>
<td>5%</td>
<td>19.3%</td>
<td>8%</td>
</tr>
<tr>
<td>Employee commitment</td>
<td>17%</td>
<td>7%</td>
<td>9.6%</td>
<td>4%</td>
</tr>
<tr>
<td>Human resources</td>
<td>46.3%</td>
<td>19%</td>
<td>34.2%</td>
<td>14%</td>
</tr>
</tbody>
</table>

To assess the process factor four questions were asked. Table 7 and Figure 5 show that 73% of the respondents strongly agreed/agreed that the company’s business processes are suitable for e-commerce adoption. 80% strongly agreed/agreed that MRT Ltd is capable of handling change that may result from e-commerce. The mean score for the process factor is 3.1.

### Table 7: Assessment of Process Factors

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business processes</td>
<td>9.7%</td>
<td>4%</td>
<td>17%</td>
<td>7%</td>
</tr>
<tr>
<td>Change management</td>
<td>4.8%</td>
<td>2%</td>
<td>14.6%</td>
<td>6%</td>
</tr>
</tbody>
</table>
Five questions were used to assess the technological readiness of MRT Ltd. Table 8 and Figure 6 show that a slim majority of 56% respondents strongly agreed/agreed that the organisation has sufficient and adequate IT infrastructure for e-commerce adoption. Only 29% strongly agreed/agreed that the organisation has a well documented IT policy. A small majority, 56%, strongly agreed/agreed that the current system is flexible enough for e-commerce implementation. The negative assessment was for the availability of IT support: only 16% strongly agreed/agreed that the organisation has adequate IT support. The mean score for technological factors is 2.4.

Table 8: Assessment of Technological Factors

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>IT infrastructure</td>
<td>21 9</td>
<td>9</td>
<td>19.5</td>
<td>8</td>
</tr>
<tr>
<td>IT policy</td>
<td>41.4</td>
<td>17</td>
<td>29.2</td>
<td>12</td>
</tr>
<tr>
<td>Flexibility</td>
<td>17</td>
<td>7</td>
<td>26.8</td>
<td>11</td>
</tr>
<tr>
<td>IT support</td>
<td>48.9</td>
<td>20</td>
<td>36.6</td>
<td>15</td>
</tr>
</tbody>
</table>

The means score mean scores were abstracted from individual factors and indicators as shown in Table 9. The overall readiness of MRT Ltd was assessed as 2.9 which on the readiness scale used identifies the SME is ready for e-commerce, but the detailed measures indicate those areas that would benefit from further development.

Table 9: Summary of Average Scores

<table>
<thead>
<tr>
<th>Factors</th>
<th>Indicators</th>
<th>Mean average</th>
<th>Total average</th>
</tr>
</thead>
</table>

Figure 5 Existence of Process Indicators in MRT Ltd

Figure 6: Existence of Technology Indicators in MRT Ltd
### 4.3 Findings from E-Readiness Assessment of MRT Ltd

Before a judgment was made in respect to MRT Ltd’s e-readiness it was important to understand what the e-readiness scale (provided in Figure 2) says about each factor in the organisation. Figure 7 shows the level of readiness for each factor mapped onto this scale.

<table>
<thead>
<tr>
<th>Management</th>
<th>Management vision</th>
<th>3.4</th>
<th>3.3</th>
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<tbody>
<tr>
<td></td>
<td>Governance</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Management Commitment</td>
<td>3.0</td>
<td></td>
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<tr>
<td>People</td>
<td>Awareness</td>
<td>3.1</td>
<td>2.7</td>
</tr>
<tr>
<td></td>
<td>Employee Commitment</td>
<td>3.2</td>
<td></td>
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<tr>
<td></td>
<td>Human Resources</td>
<td>1.9</td>
<td></td>
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<tr>
<td>Process</td>
<td>Business Process</td>
<td>3.1</td>
<td>3.1</td>
</tr>
<tr>
<td></td>
<td>Change Management</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td>Technology</td>
<td>IT Infrastructure</td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IT Policy</td>
<td>2.0</td>
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<tr>
<td></td>
<td>Flexibility</td>
<td>2.9</td>
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</tr>
<tr>
<td></td>
<td>IT Support</td>
<td>1.8</td>
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</tbody>
</table>

![E-Readiness Assessment Diagram](image)
The e-readiness assessments are presented visually in Figures 7 and 8.

The management factor can be rated as “ready to go” with its total average of 3.3 and indicators with good mean scores above the “expected level”. This is a positive outcome since as Ruika et al. (2006) and others have demonstrated effective management is an essential factor that leads and govern the adoption, implementation and use of e-commerce technology in an organisation. The rating also implies that MRT Ltd has an effective strategy for technology adoption in terms of funds, manpower and time.

The people factor (employees) has a total average of 2.7, this is categorised as “ready” but further improvement is looked for. The more “human resources” indicator has a mean score of 1.9 flagging this as an area needing urgent attention in order to ensure successful e-commerce adoption.

The process factor can be rated as “ready to go” with its total average of 3.1: both of its lower level indicators (business process and change management) are also considered ready to go with this value. This implies MRT Ltd has carefully evaluated its business process and identified areas that need amendment. It also shows that the company has the capability of handling changes that may arise from the adoption of e-commerce.

The technological factor has the lowest average score of 2.4. This highlights inadequacies in that area. Its more detailed indicators revealed that IT infrastructure (2.82) and Flexibility of existing system (2.9) needs some improvement. But more seriously the analysis shows that IT policy (2.0) and IT supports (1.8) needs serious attention before embarking on e-commerce adoption in the organisation.

5. STRATEGIES TO IMPROVE THE E-READINESS OF MRT LTD.

The census data and e-readiness analysis indicates areas in MRT Ltd that need improvement to be truly e-ready. The following suggestions are made for how MRT Ltd could move towards e-readiness by addressing their identified areas of weakness.
5.1 Human Resources

Most of the company’s employees lack adequate experience and exposure to the information and communications technology (ICT) needed for e-commerce adoption. This can be overcome through establishing an appropriate training program (Niazi, 2011). Training provides a prime opportunity for MRT Ltd employees to expand their knowledge and experience in terms of e-commerce technology. The management should also ensure that the training involves a practical approach to enable the employees to have a feel of the real world. Monitoring and evaluation measures should also be put in place to evaluate the effectiveness of the training program.

5.2 IT Infrastructure

The research findings show MRT Ltd needs to make improvements in its Information technology infrastructure. An audit is needed to identify the specific infrastructure needed such as computers, e-commerce applications and other networking related facilities required for e-commerce. This includes high bandwidth connectivity to the internet and use of a reliable internet service provider (ISP).

5.3 IT Policy

MRT Ltd lacks a well-defined IT policy. It is essential that MRT Ltd creates a document that guides the use of IT systems within the organisation that binds both the employer and the employees. Learning from practices of leading companies such as Cisco and Oracle would highlight the following as areas of focus:

- Acceptable use of technology: This section should contain guidelines for the use of computers, emails, telephone, voicemails and fax machines and the consequences for misuse of these technologies.
- Technology standards: This section should give an insight on the types of hardware and software systems that will be purchase and used in the company, including any files prohibited by the company.
- Disaster recovery: This section should contain guidelines for recovering data in the event of any disaster. It should also include data backup methods.
- Network setup and documentation: This section should give guidelines regarding way to configure the company’s network, access levels of all employees and software licensing.
- IT services: This section should cover guidelines on how technological needs and problems will be addressed, the person responsible for technical support, installation, and long term technological planning for the organisation.

5.4 IT Support

MRT Ltd has no IT support team in place. An IT support team is needed to respond to issues quickly whether for network infrastructure, computers or other hardware. The IT support team will also need to train employees on use of new software applications. In practice, this IT support could be provided either in-house or outsourced. Outsourcing would reduce costs but is reliant of identifying an appropriate and reputable company. For MRT’s current situation outsourcing would be preferable since the company lacks the internal staff resources. Future in-house support could be developed through training selected employees.

5.5 Further Use of E-Readiness Framework and Scale

The strategies suggested above should improve the e-readiness of MRT Ltd. However, the company can further utilise the framework and its scale for the long term to continually evaluate and improve/maintain e-readiness. The questionnaire is a product of the e-readiness framework therefore the company can use it for self-evaluation. These evaluations could be either for occasional one-off
assessments or as part of a continuous improvement strategy where data are collected on a regular basis and analysed to see improvement trends and identify area of a drop off in performance/readiness.

6. CONCLUSION

6.1 Contribution to Theory and Practice

This research has integrated two frameworks and creating a scale for assessing the e-readiness of small and medium enterprises (SMEs) in developing countries. This framework and scale have been assessed for utility in one Nigerian SME.

6.2 Limitations and Recommendation for Future Research

In deriving an appropriate framework the author limited his theoretical analysis to four existing frameworks/models: it is possible that some important theoretical perspectives were excluded. Another limitation is that the robustness and reliability of the framework has not been tested because it was not part of the research scope. This research made use of an interview and questionnaire during the trial of the framework within one Nigerian SME. Further empirical work is needed to provide evidence of its degree of efficacy.

Therefore, there is still the need for further research: Firstly, it is recommended that the framework used in this research should be tested in other SMEs in Nigeria and other developing countries to determine its robustness and reliability. Secondly, more research should be undertaken to further understand the factors affecting e-commerce adoption by SMEs in developing countries. Case study methodology would provide one approach for insightful in-depth investigations: contrasting with the existing literature that has mostly made use of a “snap-shot” approach to empirical data collection. In time, this could lead to the development of robust e-readiness framework/tools that harmonise all necessary factors to achieve sufficient and sustainable adoption of e-commerce technology by SMEs in developing countries.

6.3 Summary

Evidence from literature has shown that the adoption of e-commerce has proven to be a potential method of boosting the efficiency and effectiveness of a business as it allows organisation to adjust to new market opportunities and remain competitive in the ever-growing global market. It has also been evident in previous literatures that in order for organisations to successfully adopt e-commerce technology, e-readiness assessment must be conducted to identify areas that need improvement and areas that are good.

The research finding indicated that MRT Ltd’s existing business processes are ready for e-commerce adoption. Moreover, the employees of the company are ready to adopt e-commerce technology but would benefit from ICT training to ensure successful adoption of e-commerce. However, the findings showed that MRT Ltd needs to do a lot of work in terms of technology as the company is not ready in that area. To enable the company achieve it e-commerce goal, strategies have been developed to address areas that need improvement in the company.

Finally, recommendations have been made for the future directions of follow-on associated research. These are areas the author is now pursuing in his PhD studies.

REFERENCES


APPENDIX A: QUESTIONNAIRE TEMPLATE

Questionnaires

1. Our management has an explicit vision on e-commerce

2. I believe that our management vision on e-commerce is appropriate

3. Our management have provided our e-commerce projects with necessary staffing and resources to achieve goals.

4. Our management are committed to addressing any issue that may arise in our organization as result of e-commerce adoption.

5. Our organization has a good understanding of e-commerce business models that are applicable to our business

6. We recognize the opportunities and threats enabled by electronic commerce

7. We think electronic commerce will have tremendous impact on the way we conduct business in our company

8. We are committed to using e-commerce to improve our business activities

9. We have unrestricted access to computers in our organization

10. Majority of us are computer literate

11. We have sufficient experience with network based applications

12. We have analysed our current business process

13. We have identified the bottleneck and inefficiencies in our current business process
14. Our existing business processes are flexible enough to accommodate e-commerce

15. Our organization is capable of change that may arise from the implementation of e-commerce.

16. Our organization is well computerized with LAN and WAN

17. We have high bandwidth connectivity to the internet

18. We have a well-defined IT policy

19. Our existing systems are flexible enough for e-commerce implementation

20. We have adequate IT support (in house or external)
APPENDIX B: INFORMAL INTERVIEW TRANSCRIPT

Informal telephone interview between Contact person [TM] and the researcher [AI]

[TM] Hello

[AI] Mr TM?

[TM] yes

[AI] I called in respect to the interview section I arranged with you yesterday.

[TM] ok that’s fine you can go ahead

[AI] Can you please tell me why your company is interested in adopting e-commerce?

[TM] our company has been in the printing business for a long time and has executed several contracts. But our customer base is still within Kogi states where the company was founded, which I think it’s due to lack of access to reach out to the other potential customer around Nigeria and even abroad. So, we think adopting e-commerce will give our company a prime opportunity and a competitive edge in the Nigerian printing industry.

[AI] What does your organization aims to achieve from the proposed e-readiness assessment.

[TM] we would like to use the e-readiness assessment to better understand the current state of our company and identify areas that we are not doing well.

[AI] Okay that’s fine. Does your organization have computers?

[TM] our company currently have several computers mainly for the purpose of graphic design and typesetting.

[AI] Does you organization have access to the internet?

[TM] yes, currently we use a dial up system in our organization.
[AI] How reliable is the internet service?

[TM] The network is not very reliable and the network is slow most times

[AI] How does your organization contact customers and business partners currently?

[TM] Currently we make use of telephone and sometimes email to contact our customers and business partners.

[AI] Does your organization have a website?

[TM] We don’t have a website for now but it is part of our e-commerce adoption plan.

[AI] Is your company involved in any type of online advertisement, either on social media or any website?

[TM] No.

[AI] Does your organization have any technical expertise for e-commerce technologies?

[TM] No because we have never used any e-commerce application in the company before.

[AI] Do you have any question that you would like to ask?

[TM] Not at all

[AI] Thank you very much for your time.

[TM] My pleasure. Have a good day ahead.

[AI] Bye bye.

[TM] Bye