eCommerce Solutions and eLeadership: Impact Analyses at Historically Black Colleges and Universities and Their Organizational Leadership

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Abstract: - Existing literature reveals a significant surge in the investment in Electronic Commerce (eCommerce) solutions at Higher Educational Institutions (HEIs) globally. However, there is little or no research on their successes and failures and many HEIs are interested in attaining a clear understanding of the returns on their investments. Furthermore, no known research has been conducted to reconnoitre the effect of these eCommerce solutions on organizational leadership/hierarchies at HEIs, especially, when this is considered to be critical to institutions’ strategic mission and planning. This paper presents a comprehensive impact analysis of eCommerce solutions at Historically Black Colleges and Universities (HBCUs), by reconnoitring their effects on different operational constructs of the institutions. Choosing HBCUs for this study galvanised from their uniqueness and their numerous roles in providing education for minorities. We utilized cross-sectional quantitative approach and we surveyed a significant spectrum of such institutions across the United States of America. The impact of eCommerce solutions on institutional leadership, student enrolment, investment, image and reputation, student’s satisfaction, student learning, and other optional activities, are described in this paper.

Key-Words: - eCommerce, eBusiness, Enterprise, HBCUs, HEIs, TWIs

1. Introduction
The rapid expansion in Information Technology witnessed in the late twentieth century and the commencing of the twenty-first century heightened the penetration of eCommerce in every facet of business organization [35], [13], [22], [44]. Therefore, to say that a significant number of business transactions are conducted through the Internet and other Telecommunication channels is an understatement; eCommerce solutions underscore the way business organizations, whether public or private, engage in their day-to-day business operations [1], [15], [31], [33]. Organizations that have not yet clinched to eBusiness struggle to compete in the competitive global market. [22] enumerates various benefits of eCommerce, including increases in profits, improvements in communications and understanding of information requirements, development of test beds for system evolution, and gauging cost reductions. She posits that eCommerce solutions support decision making in the organization through the identity and provision of improvements for areas in the organization that requires change.

Albeit the significant surge in investment in eCommerce solutions at Higher Educational Institutions globally, little or no research exists on their successes and failures [13], [14]. Report on the benefits HBCUs have reaped vis-à-vis eCommerce, have been mostly anecdotal. eCommerce connotes business transactions conducted over the Internet and other telecommunication networks [40], [6], [19], [21], [33], [34], [37]. According to [12] and [32], many HEIs are interested in gaining a clear understanding on the returns amidst their investments. Additionally, government agencies and other organizations contributing financially to HBCUs in these efforts generally demand accountability [2].
Research on the impact of eCommerce on the administrative hierarchy and corporate leadership is minimal [24], [33]. The same applies to the impact of eCommerce solutions on organizational leadership/hierarchies at HEIs, particularly, Historically Black Colleges and Universities (HBCUs). Designated by the U.S. Congress, Historically Black Colleges and Universities were originally designed for underrepresented blacks who were denied education at traditionally white dominated HEIs in the middle of the twentieth century and have grown to “have majority population of African American/Underrepresented Minority students.” The U.S. Congress Higher Education Act of 1965, created federal recognition of HBCUs for the first time, allowing HBCUs to receive federal financial support for their advancement. According to [45], HBCUs serve as a source of accomplishment and pride not only in the African America community, but also in the whole nation. Up until now many African Americans have relied on HBCUs for their higher education. While there is still room for improvement, up until ten years ago, HBCUs have been known to lack support from the government for necessary Information Technology infrastructure in order to provide competitive quality education and respond to the needs of its increased student population [43]. Like the Traditionally White Institutions (TWIs), HBCUs have witnessed an upsurge in eCommerce solutions in many facets of their business operations [2], [43].

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Over the years, several definitions of Enterprise eCommerce have evolved. In this paper, a comprehensive definition of eCommerce will be the execution of transactions between two or more parties using interconnected networks [21], [37], [34]. eCommerce solutions at HBCUs in the context of this research include E-Learning including distance education, E-Procurement, E-Admissions/Registration, E-Enrolment, E-Payroll, E-Advising, E-Conferencing/Meeting, E-Payment and E-Budget. It is worthy to point out that, for the purpose of this paper, eCommerce and eBusiness are used interchangeably to mean the same entity [37].

It is well documented that factors that attribute to the success and failures of eCommerce solutions at organizations and institutions include legal, ethical, social and cultural issues. As such, in investigating the impact of eCommerce solutions on organizational leadership at HBCUs, it is to be noted that it was deemed necessary to reconnoitre how judiciously HBCUs enforce security, ethical, legal, social and cultural measures as these factors or attributes are vital to eCommerce solutions, pertaining to augmenting their image and reputation [20], [27], [30], [36] and [37]. It is of the essence that higher institutions understand legislation governing eCommerce systems, particularly legislation relating to privacy and property rights [27], [36] and [37]. [42] stated that for organizations to take advantage of eBusiness, the organizations must be heedful and be willing to invest money and time learning how to apply eBusiness technologies to their operations. Furthermore, organizations that do not take measures in overcoming cultural issues as discussed by [30] might be overshadowed by their competitors because the only constant with eBusiness is change and many organizations have difficulty dealing with change because some organizations are ill-equipped to deal with change.

2. Problem Background
The impact of Enterprise eCommerce solutions has been studied extensively from the perspectives of revenue generation, profit realization and customers’ impression regarding the image and reputation of the organization. According to [9], Enterprise eCommerce solutions are always almost driven by the desire to increase profit margins. For non-profit organizations, image, reputation and quality of service are a driving force for eCommerce integrations [25]. Therefore, the impact of eCommerce on organizational leadership/hierarchies which is the core of this research stems from the fact that in all cases, the need for proper leadership in promoting
eCommerce solutions for the organization cannot be over-emphasized.

Report on the benefits HBCUs have reaped vis-à-vis eCommerce, have been mostly anecdotal. And the myriad expository reports are on the positive impact of eCommerce solutions at HEIs, yet, there is no known research that has been conducted on the effect of these eCommerce solutions on organizational leadership/hierarchies at HEIs, considering that this is critical to their strategic mission and planning. Moreover, existing research on the impact of Enterprise eCommerce solutions focuses mainly on returns on investment culminating from sales volume and profit maximization. However, there is no data demonstrating how the conclusions were derived. [24] and [33] postulate that, research on the impact of eCommerce on the administrative hierarchy and corporate leadership is minimal. This is also true for the impact of eCommerce solutions on organizational leadership/hierarchies at HEIs, particularly, Historically Black Colleges and Universities (HBCUs). According to [26] the study of the impact of eBusiness on business operations at HEIs vis-à-vis the magnitude of investment is a difficult problem. An even more difficult problem is ascertaining the degree of the impact of eCommerce on administrative hierarchy and organizational leadership. In this research, the focus is on eCommerce solutions at HBCUs and their organizational leadership/hierarchies with the goal of investigating their impacts on organizational leadership and flow of information.

Many HBCUs have strategically embarked on online course offerings and eCommerce based academic activities to boost student enrollment and improve student academic performance while providing quality education [2]. As reported by the US Dept. of Commerce, HBCUs are catching up with many Traditionlly White Institutions (TWIs) in their eCommerce solutions for human resources, procurements, account receivables and payables, admissions, registrations, alumni database, and capital campaign. Where will all these eCommerce solutions lead HBCUs from both customer and business perspectives? How successful and effective are these HBCU eCommerce solutions? It is tempting to conclude that all eCommerce solutions achieve the expected returns on investment without considering the implementation strategies and the targeted customers. The underlying issue here is how effective is eCommerce at HBCUs? What are the views of all stakeholders on eCommerce at HBCUs?

Given the underlying issues in the previous paragraph, it is prudent to state that government agencies and other organizations contributing financially to HBCUs in these efforts generally demand accountability [2]. The study of the impact of eBusiness on business operations at HEIs vis-à-vis the magnitude of investment is a difficult problem [26]. A more difficult problem is ascertaining the degree of the impact of eCommerce on administrative hierarchy and organizational leadership. In this research, the focus is on eCommerce solutions at HBCUs and their organizational leadership/hierarchies with the goal of investigating their impacts on organizational leadership and flow of information.

3. Goal

The raison d'être of this research was to study the impact of eCommerce solutions on organizational leadership at Historically Black Colleges and Universities (HBCUs) because of their uniqueness and of their numerous roles in providing education for minorities. It is hoped that this study will serve to spur research interests in this field and thereby create significant awareness in this field both nationally and globally.

4. Consequence on Organizational Leadership

In order to implement eCommerce at HBCUs, approval must be obtained from higher level administrators within the institution. The process of such decision-making has critical impact on organizational leadership and effectiveness and efficiency of organizational leadership. Key individuals in such decision-making processes are, for example, Presidents, Vice Presidents and IT personnel. Impact on eCommerce on HBCUs and their organizational leadership therefore, measures the correlation between, for example, increase in quality job productivity and eCommerce solutions, increase in revenue and eCommerce solutions, increased student enrollment and eCommerce solutions and increase in higher quality education and eCommerce solutions at.
HBUCs. Cited in the literature, are increase in enrollment [16] (Goral 2003b), efficiency (reduction of paperwork) in procurement process as a result of E-Procurement [17] [31] (Goral c; Olsen, 2000), efficiency in tuition and bill payments due to E-Payment [5], increased flexibility in course delivery as a result of E-Learning [7] and flexibility in event scheduling due to E-Calendaring [41].

According to [18] eCommerce has been a driving force for most of the operations in institutions of higher education, including admissions, registration, procurement, scheduling, fundraising, retention, budgeting, technology, physical plant, meeting, evaluation, and distance education. Institutions of higher education, including Historically Black Colleges and Universities, can no longer ignore the implementation of eCommerce [18], [23] and [31]. Hence, studying the impact of eCommerce on the organizational leadership/hierarchies and management at selected Historically Black Colleges and Universities is vital to organizational leadership. Additionally, it is apparent, considering the ever-increasing growth in Information Technology and the astronomical rise in the use of the Internet and World Wide Web, the operations and survival of institutions of higher learning is indisputably dependent on eCommerce [18], [23]. This is in congruence with [38] notion of organization which he described as a learning place and that an organization cannot be any greater than the individuals in the organization. While according to [32], college officials may be sceptical of money saving claims, made by eCommerce companies, it is imperative that institutions of higher education have leaders who will fully embrace eCommerce [29].

Leaders at HEIs must possess leadership qualities that fit the context of their institutions. As contended by the classic management theorist [10] that the most important single determinant of working behaviour is technology. In defining technology, [10] uses two major phases, with the first phase comprising the tools, instruments, machines and technical formulas basic to the performance of the work and the second phase comprising, the body of ideas which express the goals of the work, its functional importance and the rationale of the methods employed. As such, HBCUs need transformational leaders who possess effective communication and influential qualities as stated by [4]. Fidler’s contingency theory states that leaders’ style of leadership must fit the context of the organization. In contingency theory, leadership style is either task motivated or relationship motivated [8]. In task-motivated leadership, the leader’s interest is centred by the accomplishment of the stated goals, whereas, the relationship leader is concerned with the development of a close rapport with subordinates or followers, building appropriate interpersonal relationships [8], [11].

5. Research Method

To carry out this study, we employed a cross-sectional approach using a self-designed survey instrument to collect data. Using Cochran’s sampling formula discussed in the article by [3], a random cluster sample of 55 HBCUs out of 105 HBCUs across the United States of America was surveyed. A total of 715 higher level administrators, such as presidents/chancellors, vice (presidents/chancellors), associate vice (presidents/chancellors), assistant vice (presidents/chancellors), deans, associate/assistant deans, chairs, directors and associate/assistant directors from the 55 HBCUs were sent the instrument and a letter of consent via U.S. mail. Data was collected via U.S. mail, custom-designed website and e-mail a website. Univariate, bivariate and multivariate statistical analyses were performed on the collected data.

6. Results

Approximately 96% of or 53 out of the 55 HBCUs participated in the research. See figs. 1 and 2. This signified clearly, a good representation of the number of HBUCs surveyed. About 21.4% of administrators participated in the study. The univariate statistics showed indication of the central tendency variability and dispersion of the collected data for both dependent and independent variables. The value of the standard error of the mean \( \sigma \mu \) for each variable was clearly reasonable and did not show any apparent strong variation of the estimated mean from the actual mean. This and the fact that for most of the variables, 95% of collected data fall within 2 standard deviations (2\( \sigma \)) from the mean, \( \mu \), [\( \mu-2\sigma \), \( \mu+2\sigma \)].
\[ \mu + 2\sigma \] demonstrate significant clustering of the data.

**Fig. 1.** Percentage Distribution HBCUs Administrators’ Participation

![Distribution of Administrator’s Participation](image)

**Fig. 2.** Distribution of Media of Data Collection

![Distribution of Media of Data Collection](image)

Four dependent variables, namely NoECS or the average number of eCommerce solutions, NaECS or the average number of years of adoption of eCommerce solutions, InECS or the average investments in eCommerce solutions and IaECS or the average impact assessment of eCommerce solutions were regressed the independent variables which will be described in the following paragraphs. NaECS was found not to correlate significantly with any of the independent variables.

The investment in eCommerce solutions at HBCUs showed positive relation to efficiency in the conduct of administration. The variables IMPEELEADER or the level of eCommerce solutions impact on effective or efficient leadership and InECS are used to measures the efficiency and effectiveness for the purpose of this research in terms of time reduction in flow of information, improved administrative, social and cultural atmosphere, legal and ethical issues. On a scale of 1 to 9, the respondents claimed with a high average impact level of 5.19 that eCommerce solutions promote efficient leadership. The data for IMPEELEADER resembles that of normal distribution based on the skewness and kurtosis values. Variable IMPEELEADER significantly correlates positively with InECS with \( R = 0.433 \), \( P = 0.0001 \). It was also found that IMPEELEADER also correlates significantly with NoECS and IaECS with \( R \) values 0.240 and 0.322, respectively. See fig. 3.

Using the average number of clientele complaints about eCommerce solutions (NCECS) and the clientele satisfaction of eCommerce solutions (CSEC) and other impact assessment variables, namely, the usefulness of eCommerce in sustaining positive customer relations (POSCUSTREL), the usefulness of eCommerce solutions in sustaining student satisfaction (STUSATISF) and the usefulness of eCommerce in sustaining an institution’s positive image and reputation (IMAGEREPUT) were used to measure clientele satisfaction of eCommerce solutions at the HBCUs. The findings showed, on a scale of 1 to 5, that eCommerce solutions bolstered the image and reputation of the institution with an average impact level of 3.84 and \( \sigma \) of 0.964. See figure 6. The impact of eCommerce on positive customer relations and students’ satisfaction was not as strong with average impact levels of 3.75 and 3.74, respectively. These average impact levels for POSCUSTREL and STUSATISF are a clear indication of the validity and reliability of the data. All three factors POSCUSTREL, STUSATISF and IMAGEREPUT correlated positively with the IaECS.

The results showed that NCECS did not correlate with any of the dependent variables. It is likely that the institutions did little to maintain records or any form of database of complaints from users of its eCommerce solutions, thus, the values given by the respondents may be extraneous. On the other hand, institutions document customers’ satisfaction of their eCommerce solutions regularly. As a consequence, the CSEC correlate positively with NoECS, InECS and IaECS. The \( \beta \) coefficients are 1.023, 0.326 and 9.882 respectively. The intercepts are 3.584, 1.373 and 6.481 respectively. It is believed that clientele satisfaction of eCommerce solutions impact the image and reputation.

Leadership effectiveness and efficiency was measured in terms of quality of education programs and increased online and degree course offerings for the purpose of study. From the
Pearson Correlation and regression, it was shown that NoECS significantly correlates positively with CSEC and the number of students using E-Registration (NSER). The β coefficient of 1.023 and 3.584 intercept are an indication how initial investment needed in eCommerce solutions for positive impact to be realized in NoECS vis-à-vis CSEC. NOC and NSOC showed significant relation with InECS and IaECS. Examining STUSATISF factor, about 60% of the respondents say that eCommerce solution was useful in sustaining students’ satisfaction at an average impact level > 4 (on a scale of 1 to 8). Although the Pearson Correlation between NoECS and STUSATISF was computed, it was found to be unimportant in this analysis since impact level is already determined by STUSATISF factor. As mentioned in the earlier sections, NCECS did not correlate significantly with any of the independent variables.

While not statistically significant at p<0.5, based on the results, NoECS had a direct relationship with the number of student enrolment (NSE). This could be due largely to the value ranges provided for response options. Many of the institutions have enrolment did not span the ranges provided. The enrolment growths, computed based on the responses, were generally within one range and therefore, did not result in major differences. This explanation is supported by the descriptive statistics for NSE (mean = 0.1307, median = 0, mode = 0, std. dev = 0.48249, skewness=-1.081, kurtosis=11.570). The data skewed negatively with high kurtosis. Importantly, a significant number of respondents (about 62%) indicated that the investment on eCommerce solutions has an impact on student enrolment (INVIMPENROLL) with a mean impact level of 4.85. See fig. 4. In similar vein NoECS correlated significantly positively with the number of students making electronic payments (NSEP), the number of students selecting courses using E-Registration (NSER), and the number of students making electronic payments for services provided by the institution (NOSTUEPAY). These findings suggest that the number of eCommerce solutions is significant booster of student enrolment if they are able to register for classes and make payment faster electronically. The β coefficients of NSEP and NSER are 0.831 and 1.127 with intercepts of 5.622 and 5.643 respectively.

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Further shown by these findings, InECS correlated significantly with NSEP and NSER at 0.294 and 0.314 (p=0.001) respectively. IaECS correlated significantly with NSEP and NSER at 0.417 and 0.332 (p=0.001) respectively. Additionally, the findings suggested that eBusiness solutions overall, impact organizational leadership on a very positive note. By these findings, the relationship of the variables will help leadership to determine level of allocation of investments in their institution’s eBusiness solutions.

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7. Conclusion

Statistical analyses performed included univariate, bivariate, and multivariate analyses with the objective of identifying the specific impact of eCommerce solutions at HBCUs. It is argued that if adequately installed, eCommerce solutions, improves effectiveness and efficiency of
organization leadership at HBCUs. Additionally, not only do these new findings reveal factors that impact the success of eCommerce at HBCUs, but also show the level of investment that must be allocated to the acquisition of various components of eCommerce solutions at these institutions. This is critical in leadership decision-making process. As shown by this study, the number of years of adoption of eCommerce solutions, on the other hand, is not affected by any of the independent variables. These results show that institutions must critically take into consideration their organizational fabric and invest in the appropriate and suitable eCommerce solutions; else the length of time eCommerce solutions are put to use at institutions will not impact positively on these institutions.

References:


