Enabling Higher Education Leaders towards an Effective Web Presence Strategy

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Abstract

In recent years, Higher Education has been faced with enrolment and financial challenges. Higher Education leaders are seeking low cost, creative opportunities that provide a competitive advantage for the institution. Institutions have realized the devastating effect of a poorly designed web presence may have adverse effects on recruiting and retaining students. Institutions are finding they need to incorporate new strategy to better serve learners through data-driven analysis, behavioural insights, and improved user experience to enrich a student-centric web site environment. This paper outlines how the Chief Information Officer (CIO) may establish an effective web presence within a higher educational environment.

Key Words: Higher Education, Web Presence, Web Strategy

1. Introduction

Immersed in financial and enrolment quandary, Higher Education institutions are exploring new competitive advantage strategies to increase an institution’s attractiveness and satisfaction for the prospective and current student. Institutions are hard-pressed to be more progressive in optimizing strategies that may enhance increased enrolment, improved retention, and financial sustainability. New strategy requires a comprehensive self-assessment to determine the state of operations within the current ecosystem and identify areas for improvement.

There may be strategic advancement opportunities within technology operations. Lowendahl [25] states Chief Information Officer (CIO) leaders need to be more consistent in aligning technology strategies with business priorities or opportunities. However, aligning technology strategies with business priorities may present obstacles in communication, budgeting, governance, and planning. To address strategy obstacles a CIO leader may need to be more cognizant in making decisions that are well informed, justifiable, and align with strategic planning to avoid scrutiny. One strategic trend demonstrating significant advancement is the comprehensive examination of an effective institutional web presence. Opportunity presents itself in decision making through data-driven analysis, behavioural insights, and improved user experience to enrich a student-centric web site environment.

CIO leaders may recognize that past web presence practices have become dated, less effective, and require a re-conceptualized approach. In the past, Higher Education web presences often would provide an experience that is one-directional and may consist of content containing an inconsistent voice with internal terminology, cluttered content, muddled navigation, and unfriendly user services. An effective web presence strategy is often achieved by blending both analytical and behavioural information captured from the user’s experience. The blended approach directly bonds data-driven decisions and the understanding of user experiences to ultimately establish a student-centric framework for an effective web presence. Informed decision making may be attained through the analysis of web analytics and the metrics used for measuring business goals. McFadden [28] defines analytics as the measurement, collection, analysis, and reporting of internet data for the purpose of understanding and optimizing web usage. CIO’s may gain competitive advantage analysing quantitative data which provides insight and actionable outcomes into user demographics, engagement behaviours, technology utilization, advertisement effectiveness, traffic sources, content impact, or goal tracking in a Higher Education setting. Proper interpretation of web analytics may lead to effective prediction of behavioural trends and actionable outcomes which may be used to increase an institutional attractiveness.

Understanding user experiences may be a daunting task since it requires awareness of how
the mind works. User experience and usability analysis methods provide insight into how the mind works in order to improve function and ease of use. Usability methods establish how design rules are based on human psychology: how people perceive, learn, reason, remember, and convert into action. Johnson [20] explains that perception is based more on past experience expectations than what is actually presented. Johnson continues to explain that sometimes perception confounds designers, who expect users to see what is on the screen, but that is not how perception works.

A quality student-centric environment originates with properly aligned combinations of information and transactional services. CIO’s and institutions sometimes struggle to provide an equal level of information and service to prospective students, online students, and current students. Historically, the institutional framework was built primarily to serve current, on-campus students and not for today’s online or technologically advanced student. Those existing on-campus quality services were not built for today’s online web service demands. For example, student advising services originated solely for on-campus students. The on-campus advising service excludes the same opportunities for distance learning students or students interested in pursuing education. Implementing these same quality services for all audiences may directly correlate to student success, enrolment increase, and improved retention.

Decisions no longer have to be based on intuition or opinions and may now be influenced through informed decision making. CIO’s are now able to focus on methods which integrate business tools with web analytics to help institutions make improved and quick decisions in a rapidly changing online environment. Bichsel’s [6] study indicates that an analytic framework is a process that starts with a strategic question. The strategic question outlines important business goals and identifies appropriate benchmarks to be utilized. Bichsel’s [6] study continues to state that the framework includes collecting appropriate data related to the question, analyse prediction or insight, and apply those that are actionable.

User experience principles exist to enhance the student experience online. Johnson [20] explains the Gestalt principles integrate human psychology based on visual perception online. The principles of visual perception are based on similarity, continuation, closure, proximity, figure and ground. Johnson continues to explain there are ways to generate qualitative metrics based on user experience and observations. To accomplish the principles, the CIO may apply User-centred Design Process (UCD) methodology to a web presence. The process centre’s on planning, research, design, and measuring the results. Johnson describes the planning model as information by and about users and is central to learning what to design, how to design it, and how to improve the next release in a cycle of continuous online improvement.

Establishing a successful student-centric framework is a challenge for most leaders. Most frameworks surround the admissions process in a funnel format. The admissions funnel framework describes the possible steps that occur for a student at each swirl layer of the funnel. It begins at the widest part of the funnel where the prospective student is enticed through a marketing or analytical strategy. Once interest is acquired, the user indicates an interest or desire to attend. The next layer presents an opportunity to educate the user with what this paper will refer to as success qualifiers. The success qualifiers cover topics like life planning, advising, financial advice, and other services. Imagine a funnel and how it begins to narrow as it reaches the bottom of the cone. The success qualifiers should result in students being more informed which may widen the admissions funnel. The wider funnel results in students being more informed prior to enrolment which may prepare the student for success. Finally, the action swirl of the funnel will be the admissions action where the prospective student may enrol themselves as a student. The student-centric framework may then have a direct correlation to improved retention. Current literature explains the need for new analytical and student-centric paradigm strategies within Higher Education.

2. Literature Review

There is difficulty identifying which web presence improvements may improve Higher Education student enrolment and retention. Most improvements, such as a modern design for a more aesthetically appealing site, provide little resolution to a complex issue addressing student satisfaction within an institutional setting. Simplicity is also troublesome in Higher Education due to the vast amount of information intended for the various educational audiences. Although existing literature covers vast topics with plausible recommendations, this paper will focus on the compilation of three significant concepts that, when combined, may establish an effective web presence for student enrolment and retention in a Higher Educational setting. The three concepts of understanding audiences are the incorporation of data-driven decision making through web analytics, behavioural insights exhibited through usability analysis, and an improved student web services. Understanding audiences may allow the institution to determine effective online services that successfully meet business goals towards increased student enrolment and retention. Another report finds that more than 50% of students stated that the web played a significant role in the student’s
decision to attend and 75% favoured simplicity of the visit.

The introduction of web analytics offers an alternative solution to the issue of limited findings. Jansen [19] states that web analytics can be achieved through unobtrusive methods that do not require intruding on the context of others and does not involve direct elicitation of information from the users. The focus of web analytics is to provide insight and actionable outcomes from the collection and analysis of data being captured from user visits and transactions. Atchinson, Burby, and Stern [5] propose a strategy based on defining business metrics through key performance indicators and defined goals. Albert, Goes, and Gupta [1] indicate web analytics may identify previously unknown segments of visitors which may lead to promising business opportunities. Dykes [12] supports analytics but cautions the data is considered a means to an end, not the destination itself. The data indicates how to progress to the destination through properly established goals.

The Google Analytics methodology and its advanced techniques of identifying key performance indicators will be the identified tool for this research. Joly [22] states Google Analytics allows the monitoring of desired actions initiated by web visitors. Hyman’s [17] supports the use of tools such as Google Analytics which help to drive better decision making since they only offer services that influence and impact strategic decision making.

Search Engine Optimization (SEO) offers another method of informed decision making through applying internal search activities that increase the number of visitors at the institution’s web presence. Rogers and Rowles [32] indicate that SEO provides an institution the tools to lure prospects. Traditional menu and link navigation are becoming less important as long as people can discover what they need through search engines. Another study cited that 55 percent of respondents had difficulty with web presence navigation. Navigation was among the greatest challenges encountered with Higher Education web presence. The switch from menu and linked based navigation to search engine may have a direct impact on providing self-service applications to help students find or troubleshoot their goal. SEO optimization requires analysis of keyword generation, optimizing tags, domain name structure, and advanced web presence structuring that involves the generation of landing pages.

Landing pages are a powerful method of using analytical approaches in providing a competitive advantage for an institution. Ash, Ginty, and Page [4] explain that a landing page is a web page dedicated to important, isolated information and action that you want a user to focus on. In today’s online marketing society, the concept of landing pages is also called “squeeze pages” because they are mainly used to get the user to read the short page, enter their information (e.g., name, email) and click Submit to be directed to the page they wish to really read. The landing page “squeeze” out of them their information that they then add to their contact list, which they will sell their products and upsells to at a later date, once they have established a relationship with them. The landing page is meant to operate independently of all other web site information and provide direct business service function. All other web site information may be considered a distraction to the user. Landing pages are a method for driving business value through usability and user experience. Ash, Ginty, and Page [4] explain the landing page optimization (LPO) goal is to get people to act or use a service after they arrived on the landing page. Saleh and Shukairy [34] state that landing pages allow prospects to quickly know you through first-hand knowledge, establish a liking stage to either proceed or not, and ultimately establish trust. Proper incorporation of landing pages may ultimately lead from prospective student viewing the web presence to the conversion of enrolled student. In order to anticipate value of landing pages, it is important to understand the behaviour of the prospective student.

Usability may have a tremendous impact on the prospective and current student due to the ever-increasing complexity of the web presence interactions. Johnson [20] states there are science-based techniques to create effective user experience and effective interactive design. Usability testing is the most common method of understanding user trends on a web presence. The usability method involves the watching of user performed tasks, discovering difficulties, and fixing them through redesign. In addition, Johnson [20] proposes incorporating design rules that support cognitive and perceptual science of understanding how the mind works. Users often click buttons or links without looking at them. The user’s perception of the display is based on past experience which leads them to expect, rather than on what is actually on the screen.

Higher Education institutions are struggling to create a holistic, convenient web presence that meets audience needs and expectations. Rozwell and Sallam’s [33] indicate institutions struggle how to embrace the voice of the visitor through a student-centric environment. Alvarez and Maoz [2] suggest developing a customer-centric web framework through a web application mind map. Alvarez and Maoz [2] state this mind map application captures visitor context, visitor understanding, and web presence content. The goal would be to establish a prevailing business model for a web presence based on the information captured. Jacobs [18] states often the CIO embark
on web projects without truly understanding the value and completeness of the service they are offering, making mistake of unfulfilling the user needs and the user eventually abandons for phone support instead. The institution must keep in mind that students are unique and may not require all of the same information or treatment as other students seeking similar information.

Each year CIO leaders face difficulty in funding, support, and the decision of which project initiatives to pursue. Lowendahl and Bell [26] state that credibility of IT often hurts funding streams when past projects failed to foster strategic direction, cost-effectiveness, and sustainable Higher Education decisions. Lowendahl and Bell [26] explain it is the objective of the CIO to achieve institutionally aligned and sustained decisions. Lowendahl and Bell [26] state the challenge is for the CIO to create transparency that instils trust and commitment and a need for shift in cultural mind-sets so the institution no longer views operations as a series of independent events. It is common within Higher Education to have people trust personal experience over data being reported. Bichsel [6] states that many institutions have administrators, faculty, and staff who fear or mistrust institutional data, measurement, analysis, reporting, and change because they feel that is not what they are experiencing. There is an overwhelming consensus that cultural change needs to start at the top with administrator support and if support is lacking it becomes a significant barrier to overcome. There is little research demonstrating that cultural strategy may be successful without senior leadership support.

Data validity and interpretation of student data may always be a concern for CIO leaders. Edjlali and Friedman [12] state there are challenges in how Higher Education examines web analytics since traditional practices may not account for the various types of web data. Most data collected has direct numerical values with a clear result making it quantitative. Qualitative data is more subjective and may be subject to interpretation. In addition, Edjlali et al. continue to state that web analytics data is often in large data volumes and complexity. Edjlali et al. explain that traditional data quality approaches fail to adapt to the same data validation rules. There is most likely data that is insignificant, approaches fail to adapt to the same data validation rules. There is most likely data that is insignificant, the same information or treatment as other students seeking similar information.

The stated concepts for an effective web presence may be supported through a Higher Education case study analysis. PureDriven [30] implemented an analysis reviewing web practices and structure of Lake Superior College. Lake Superior College is an institution that operates one of the largest and most comprehensive online instructional programs in the Minnesota State Colleges and Universities system, serving more than 4,200 students annually and offering more than 165 courses online. PureDriven [30] continued to state that Lake Superior College offers a high volume online presence, but requires more targeted, relevant information and services. This case study review focuses on the institution's improvement of the workforce development web presence.

3. Solution Model

The solution model outlines the strategy and findings derived from a Higher Education case study pursuing an effective web presence. The Higher Education case study is based on a two year college’s workforce development unit. The workforce development unit provides continuing education courses for individual people seeking personal or professional enrichment and customized training courses or programs for employees of corporations. The focus of the solution is to identify which key components provided success based on the workforce development case study analysis.

Web analytics offers a meaning to web information and a strategy that utilizes this information to establish business key performance indicators (KPI’s) that provide appropriate, meaningful action. According to Atchison & Burby (2007) there is a cyclical process created by ZAAZ, Inc. known as the ZAAZ methodology for optimizing websites. The ZAAZ platform consists of business metrics, reports, analysis, and optimization and action. Figure 1.0 illustrates the ZAAZ methodology which may establish a methodology framework for analysing web analytics.

![Figure 1.0 ZAAZ Methodology](image)

Business metrics is the first step of the ZAAZ process. Atchison et al. state that hits, numbers of
visitors, or average visit length are not business metrics and are merely ways of measuring activity on a website. Atchison et al. continue to state getting real business metrics requires an institution to look at the web presence in the context of the overall business strategy. The goal is to determine how the behaviour of users on a website relates to the overall business goals of the institution. Atchison et al. state the easiest way to think about user behaviour is to ask the question on what is expected from individuals that utilize the website. Clifton [8] adds that best-practice KPI implementation principles for analytics are to identify everything, clean and segment the data through filters, and define goals with benchmarks. Clifton [8] explains that a low-performing web presence may starve the institutions return on investment and may damage the company reputation.

The next step is collecting data in the reporting phase of the ZAAZ methodology. Rather than learning an overly complex definition of data, an institution should only identify data that articulates goals on a site. Atchison et al. state it includes things like what links they’re clicking, where they’re going, what they’ve looked at, where they came to your site from, and so on.

The analysis phase begins once the business metric goals have been established and the reporting tools are leveraged correctly for collecting data. Atchison et al. describe analysis as the process involved in looking at the factors driving performance so an institution can identify opportunities for improvement. Analytical tools provide an abundance of data so it is important to determine which data should be reviewed and which type of methodology an institution may choose to use with the data. Analysis findings may present more changes and opportunities than the institutions has the resources to address.

Most institutions using and monitoring web analytics have only been informed about the institution’s web environment but do not know how to proceed. Atchison [5] state the real power of analytics occurs by having a plan in place to take action through optimizing the web site. Clifton [8] explains while engaging in this process to improve an institutions website performance, consider the changes as part of a continuous process, not a one-hit fix. Think in terms of the AMAT acronym: Acquisition of visitors, Measurement of performance, Analysis, and Trends as a way to address web analytics.

To be effective it is important to understand how to measure and report data-driven analysis through web analytics tool. Google analytics is a free web-based tool to help institutions measure and understand user engagement. Within the Google analytics tool, institutions may form and monitor key performance indicators as well as visually understanding how visitors flow and interact with a web site. For the purpose of this solution, Google analytics will be the preferred analytical tool based on popularity, cost, and experience with the tool.

Even though Google analytics provides a plethora of reporting and analysis tools, this solution might only outline key reporting features that have proven successful in the case study example outlined later in this solution. Based on the case study findings, the key reporting features focused on will be visitor flow, location based reporting, content, bounce rate, and event tracking.

Visitor flow is a set of paths visitors take on the way to the end goal. According to Clifton [8] this reporting feature uses an intelligence algorithm that groups together the most likely visitor paths of a web site and study the flow of traffic in a web site. The results may help establish a clearer workflow or business process improving return on investment. For example, in the workforce development case study, this data was important to realize where visitors are clicking to achieve the desired end goal. The study of the visitor flow provides a look into the thought process behind the user’s actions. Figure 2.0 depicts the visitor flow/funnel process of continuing education and customized training for a two week window.

![Visitor Flow/Funnel](image)

The measurement of location data provides visitor behaviour by region and this information may be broken down by Country/Territory, State, and City. Many institutions use this information for understanding where visitors come from. In the workforce development case study, this data was relevant in asking internal questions to determine an answer for visitors from a particular area. For example, what did the workforce development unit do to increase traffic from the city? Was there a representative visiting a location to promote continuing education or customized training?
Could the workforce development unit target this area with more effective web marketing? Figure 2.1 illustrates how Google identifies location and demographic data.

![Figure 2.1 Location demographic](image)

Content reports measure the opportunity for an institution to improve content writing, content layout, and shows how frequently the information is being viewed. Google looks at sites where content is updated frequently as one that is “active”. It is important that the institution analyzes the content, link, or image for proper placement. The web analytics reviewer may then determine if visitor traffic or usage has improved based on new placement. Figure 2.2 represents Google’s report on traffic or usage flow of site content.

![Figure 1.2 Content](image)

Bounce rate is the percentage of visitors that visit and leave from that web site to go to an external web site. The higher the bounce rate the less effective the web site which is considered a negative mark by Google in ranking the institution’s web site. The goal is to have the institution’s site lead to other pages within the institution’s site, which lowers the bounce rate. Figure 2.3 depicts the bounce rate of a site.

![Figure 2.3 Bounce Rate](image)

Event tracking allows institutions to establish specific, targeted user interaction tracking. This form of tracking allows an institution to identify highly trafficked media and establish a call to action prompting user transaction to complete a goal from the institution’s web site. For example, an event tracking report might demonstrate the effectiveness of a workforce development course being promoted through a YouTube video. Due to the popularity, the web site developer may adjust the functionality of this video to a registration call to action. Figure 2.4 depicts Event Tracking of a web site.

![Figure 2.4 Event Tracking](image)

Content structure is important in how Google values web site ranking. Past strategies placed importance on keywords and metadata so some web sites would list hundreds of keywords representing the institutions web site. This practice is also known as “keyword stuffing”, which Google frowns upon. This practice made it difficult to disseminate between site pages and demographical location. To improve this problem, Google has chosen to place value on content over old metadata practices. This is accomplished through: effective content writing strategies, proper use of header tags, clear page titles, proper demographic listing, and proper tagging. Figure 2.5 depicts an illustration demographically promoting a Continuing Education course at Lake Superior College, the Duluth, MN location.

![Figure 2.5](image)
Jones [21] states that search engine optimization (SEO) is the process of setting up an institution’s Web site so that it ranks well within the organic search results of major search engines. To get the most of out your search engine optimization efforts, the PureDriven [30] institution suggest that other institutions should correct certain key components around domain issues, limiting non-domain links, removing document format (pdf’s), and improving local or national search listings. In addition, institutions may improve on-site optimization through embedding maps, properly placing contact information, and inserting pictures and videos. PureDriven states that sites should limit the chance that someone may leave the institution’s site through non-domain links, which may increase the web site’s bounce rate. In the example of the workforce development website, the institution had many links pointing to external third party web sites, which resulted in an increased bounce rate by taking individuals away. It is okay to have external links, but they should be to high public relations or authority sites that are relevant. There should also be high public relations inbound links to the institution’s website as well. PureDriven also suggest converting PDFs from document format to web page format since PDF documents create barriers for search engines to effectively search the content. In addition, PureDriven recommends correcting common website errors, such as duplicate page titles, heading tags, image tags, or broken links, to enhance a web site’s presence. Lastly, PureDriven suggests taking advantage of registering the institution’s website in local directory listings which create a reputation and credibility for a web site.

The next step is to improve the functionality of a website. PureDriven [30] strongly encourages incorporating calls to action on the web site. Call to action is a method for placing a transactional trigger, such as a button on the page, which prompts a user to perform an action. For example, these actions are mostly accomplished through a “register” or “buy now” carts. Saleh and Shukairy [34] state as an institution is able to successfully establish trust with the customer; the customer confidence may grow with the institution. Saleh et. al. continue to state the more confidence a visitor has in a web site, the more likely the customer may continue business and a repeat customer is more valuable. In order to effectively incorporate call to action, PureDriven [30] recommends strategically placing content and transactional services on a landing page. Landing pages are becoming more important than ever in enticing users to a web site and converting people as regular users of the web site. The goals of landing pages are to promote or advertise a particular item from the institution’s website. On the landing page there should be concise, relevant content and action items. The page should exclude any distraction from the transactional goal being sought.

Usability Testing is a technique for evaluating a system through analysing and reviewing user’s interaction with the system. It is the method of improving function and ease of use of the software design. Johnson [20] states many institutions incorporating usability may establish design rules based on human psychology: how people perceive, learn, reason, remember, and convert into action. An example may be how a person allows past experience to dictate the motions navigating a web site for trying to achieve the desired goal. Usability is central to learning what to design, how to design it, and how to improve the next release in a cycle of continuous product improvement. Johnson explains that these are effective practices for implementing usability through content, controls and navigation, colours, and visualization. Johnson states content should not be ambiguous, it should be short, and the text should provide meaningful purpose.

The next usability goal is to establish effective controls and navigation through consistency of buttons and links. Johnson [20] suggests creating web based systems that minimize complexity of settings by letting the system do the calculations, not the user. The web based system should indicate a visual system status indicating a user’s progression in achieving the end goal. In addition, web systems should never require users to diagnose web based system problems. This is especially important on web forms with improper values or missed fields, which include proper validation. Johnson [20] suggests web based systems should provide visual structure. For example, the “date” field is commonly listed in an eight digit “mm/dd/yyyy” format separated by the slash symbol. Johnson’s [20] last recommendation is to establish a clean and concise navigation path for users trying to reach the desired end goal. The web based system should guide users towards the goal and items unrelated to the end goals should be filtered out.

recommendation for colour usage would be to separate strong opponent colours. The separation of colours is more appealing to the eye and addresses accessibility concerns with the blind.

The final recommendation from Johnson [20] is to work on website visualization. Visualization is based on the Gestalt principles of proximity, similarity, continuity, closure, and symmetry. The proximity principle refers to the spacing and distance between objects. For example, objects that are near each other appear to be grouped, while those farther apart appear to be separate. The similarity principle describes objects that look alike appear to be grouped by the human mind. Johnson continues to explain the continuity principle identifies our perception as being biased to perceive continuous forms rather than disconnected segments. The closure principle describes how the mind’s visual system automatically tries to close open figures so they are perceived as a whole. The final principle, symmetry, is described how the mind tends to parse complex scenes in a way that reduces complexity.

A quality prospective student-centric environment originates with the proper combination of information and transactional services. The implementation of this web layer presents an opportunity to share, communicate, and educate the prospective student with success qualifiers. Success qualifiers may cover such informational topics as life planning, advising, competencies, and financial advice to help a prospective student succeed in a relatively unfamiliar environment. This allows prospective students the opportunity to decide if they are able to be successful at school without incurring any financial liability and could be applied to the prospective student’s daily life, regardless if they attend college or not. The proposed prospective student-centric solution is a modification of the admissions funnel concept. The funnel begins with the recruitment of the prospective student. In the recruitment section of the funnel, an institution will design a data-driven framework to capture a prospective student’s interest. It is the goal of this framework (e.g. Marketing, Analytics, SEO) to get the visitor to commit to a transaction or seek more information. In this case, the transaction would be to determine program information and competencies to complete their desired program successfully. The goal is to “package” student success qualifiers such as advising, student services, financial planning, and knowledge systems in this layer of the application process. At this point, if a student feels they are unable to meet these success qualifiers, they have the opportunity to leave prior to any firm commitment and cost to the student or Higher Education institution. The final section of the funnel is where most institutions begin the admissions funnel process. This is the layer that establishes commitment to becoming a student and enrolling into the Higher Education institution. Ultimately this may increase enrolment, improve retention, and satisfaction. Figure 3.0 depicts an illustration of the prospective student-centric framework.

This next section will outline some key practices CIO leadership may incorporate when implementing Higher Education web presence initiatives. CIO leadership may need to address many issues surrounding support, governance, planning, and budget. For the purpose of this solution, the focus will be on the support, budgeting, and planning challenges of a Higher Education web presence improvement.

Clifton [8] states the implementing, analysing, interpreting, and making website changes based on analytics requires a resource investment on the institution’s end. The amount of investment made in web analytics depends on how significant your website is to your overall business. Clifton [8] demonstrates in Table 1 an example of the benefits of web analytics.
In this case, the target was to grow the online conversion rate by 1 percent by using visitor acquisition and onsite factors such as funnel analysis and bounce rates. When increase is achieved, the values of total profit (P) and return on investment (R) shown in the last two rows of the table, put the analysis in context. Clifton [8] illustrates the profit will rise by $37,500 and return on investment will quadruple to 50 percent. Once an investment is determined, the following step is to establish planning.

Higher Education technology divisions often take on countless projects during the year. Lowendahl [26] study indicates that the CIO is faced with issues of supporting the mission of the institution with low practical guidance on prioritization with limited funds. The outcome indicates that the CIO should develop the project portfolio with ideally five or fewer projects. The Figure 4.0 below depicts a three layered portfolio framework.

Lowendahl [26] states the focus of this diagram should be on the middle piece whose main goal is to manage service level and cost. Lowendahl [26] continues to state there is a minimum of three criteria that need to be met. The three criteria include the need to define the services the way the users consume them, show the full cost for providing the service to the institution, and never have more services than can be comfortably overviewed on a page.

In order to understand how all of these components come together, this paper will examine the complete web redesign of the workforce development unit at Lake Superior College (LSC) in hopes to establish a more effective web presence. The workforce development unit consists of continuing education courses and customized training for corporations. The inception of this project began as part of the college’s Strategic Planning goals. The goal was to increase the institution’s workforce development revenue by 50 percent. The financial goal presented challenges on how the unit would adjust to ignite such an improvement. The greatest, quickest, and cost effective opportunity involved the development of a new web presence. At this point, institutions should be cautious on how to proceed with a new web site, because most new web facelifts often do not address the underlying problems related to business alignment and functionality. After reviewing and understanding the business needs the group met to gather requirements about course offerings, the registration process, payment options, and clientele demographics. During the requirements phase, the technology unit was able to determine that the main roadblock to success was a poorly designed web presence that could be positively influenced with an analysis of data-driven and user behaviours. The challenges quickly presented themselves, beginning with achieving administrative acceptance to a concept that has proven successful in the private sector but has little exposure in Higher Education. In addition, the organization quickly realized the personnel did not have the skillset to properly review and assess analytics or other effective web presence practices. However, the time and resources needed to do this job most likely would be lobbied as an additional full time position which was not an option. The campus leadership realized that in order to make the appropriate changes to the workforce development unit to address the strategic goal growth, then money, resources, and consultation would be necessary. The institution hired PureDriven [30] to assist in review of analytics and improved web functionality. Next they began reviewing the institutional web analytics. The workforce development website had been tracked with Google analytics for the last five years but the data had never been reviewed. Figure 5.0 illustrates the original version of the workforce development website.
PureDriven’s [30] review of the workforce development web site discovered some key findings and significant improvements to the web presence. PureDriven [30] recommended that it was poor practice to combine two distinct business processes into one web site and each should have their own identity. The review of web analytics provided insights based on location and visitor flow about focusing marketing and promotions on courses of interest. The visitor flow showed the visitors wanted course information and then campus maps or instructor information. This information was spread throughout the entire campus web site, making it hard to find and causing a disconnection for the user trying to reach the goal. In addition, PureDriven’s [30] findings demonstrated the continuing education and customized training pages with related course content did not display in search engine list results. Furthermore, some courses that are only offered by the LSC institution in that geographical area did not surface in searches. For example, a truck driving course, which is highly sought, did not show up in a simple Google search of the region. The outcome determined that inadequate tagging, keywords, and page structure were missing. The next major issue outlined by PureDriven [30] was the improper use of PDF’s. It was determined the web site was riddled with PDFs representing the course content resulting in a vast amount of data being unsearchable. In addition, the site was built with white text on a light blue background resulting in not enough contrast for people to read or interpret the text based on colour. The controls and navigation of the site were inconsistently placed, represented in an inconsistent format, and provide no call to action to complete a transaction. Finally, the workforce development unit was missing out on establishing a user friendly, prospective-student environment that captured the students’ needs.

After identifying challenges related to courses, enrolment, and payment, the technology unit listed the improvements, estimated time to fix, and associated costs to fix the issues. The items were then broken into quick fixes and long term fixes. Based on those findings, the group found items as business critical fixes. The fixes began with developing independent sites for separate business functions, resulting in a site for continuing education and a site for customized training. The main page of each web site should not be dedicated to explaining the purpose. Those visitors seeking the material are already informed of the purpose. The main page of each site should be designed like a store front selling the courses. The courses must be easier to find and access through effective landing pages. The promotional materials will provide a strong call to action and be isolated as landing pages. A need to incorporate improved navigation based on visitor flow, along with improved search engine optimization through the web site structure. All PDF’s will be developed into web pages and PDF’s will no longer to be used. Finally, there will be improved usability and improved colour visualization. The following improvements are illustrated through Figure 6.0 Continuing Education New Web Presence and Figure 7.0 Customized Training New Web Presence.
Often after the inception of a new web site, many will feel that the project is complete; however it is really the initial phase and provides the opportunity to review data and provide further analysis for continuous improvement. For instance, what worked well? What didn’t? What is being missed? Where can we grow and market? How can this be applied elsewhere? What staffing needs are necessary? How do we establish an appropriate budget? Although this project was performed on a small scale, many of its practices could be applied to larger web presence projects.

4. Discussion and Implementation

The effective web presence solution is outlined in a format for general implementation at any Higher Education institution. The generalized implementation approach explains how the solution will benefit the institution. The solution addresses organizational adjustments, key risk areas, and how they are managed. The paper concludes with a review of potential limitations to the research, future opportunities of research, and a summation of value for the institution implementing a Higher Education effective web presence.

A generalized implementation of an effective Higher Education web presence has been outlined in a five (5) step framework. The goal of the process identifies ownership, establishes goals, gathers data, and analyses or reports findings. The outcome demonstrates informed decision making through data-driven analysis, behavioural insights, and improved user experience to enrich a student-centric web site environment. Step 1 of the implementation is the assignment of an executive sponsor or champion to lead the project. Gassman [14] states the sponsor or champion may be able to collaborate and drive cross-channel activities, data quality, and process best practices. The sponsor should be able to identify key business processes or strategic objectives that may be addressed through informed decision making. Step 2 of the implementation requires the sponsor to determine to what degree the solution will be implemented. For example, the solution may only cover one of the sections for a data-driven, behavioural insight, and improved user experience environment. Or the sponsor may choose to limit the implementation to a pilot program of the overall web presence, just like in the Lake Superior College workforce development case study which applied all principles. Step 3 is the determination of the tool being utilized for capturing and reporting data-driven information. For ease of use, it is recommended to insert Google Analytics web based solution into the institution’s web presence site. The advantages include the product being free, ease of implementation, no infrastructure requirements, and fast implementation. Step 4 requires obtaining a resource that is able to analyse the data-driven results. Google does provide ample documentation for the tools. However, it is easy to misconstrue the meaning of the data, data accuracy, or which data is relevant to your business process. In addition, this resource would be responsible for initiating changes. This resource would require thorough knowledge of analytics, search engine optimization, and usability practices. Since most institutions do not have personnel with these skillsets it would be recommend to outsource. Step 5 falls back to the sponsor to be able to effectively convey the results of the data. This sponsor is required to provide valuable information transfer and provide results to the business process being affected. Like all processes, there often requires organizational adjustments to improve the projects chance of success.

Boniig, Harris, and Lowendahl [7] indicate that a one solution often does not fit all. To address this issue, an institution may require the CIO to make internal adjustments to achieve the most value from a solution. This process may begin with identifying the CIO’s role. For instance, Logan and Raskino [24] state it is time to create value from the information, so the information age shifts from a past focus of managing technology applications and infrastructure to an increased demand for information to drive the focus of technology. Logan et al., [24] explain the CIO will know data-driven decisions are needed, however they may be unable to articulate what is needed and why. Prentice [29] continues to explain that a CIO is often clear about the business priorities; however business priorities and web data do not always align easily. A CIO is clearly focused on the goals but is likely unclear how this information can help achieve the set goals. To address these concerns Logan et al., [24] recommend the CIO team with innovation leaders in the business to create a strategy for innovating with information or around new information types. In addition, this transformation to an information age may require the CIO to acquire new skills and methodologies.
necessary for becoming a strategic information advisor. Logan et al., [24] state it is the CIO’s responsibility to understand and quantify the value of information and its contribution to the business. In the case study of Lake Superior College’s workforce development effective web presence implementation, the Director of Web Services became well versed through independent research and training. Further knowledge was obtained through a consultant who explained web analytics concepts. The project also required a deeper understanding of strategic planning drivers, and the value data analytics brought to business processes. According to Prentice, a CIO has a necessity to diagnose exactly what new types of data-driven information will lead to measurable progress against the institution’s key priorities. In addition to be an information advisor, the CIO is obliged to understand the risks associated to this transformation, and the adjustments necessary to successfully implement a Higher Education effective web presence.

Often there are risks associated with any project that affects the overall institution. This web presence project presented two critical risks around data analytics and the institutional cultural challenges involved with implementing web presence practices. Prentice [29] explains that both a CIO and business leadership should be aware of the dangers of human bias and behaviour to acceptance of analytical outcomes in management decision making. In the example of the workforce development website, the risks were associated with budget, planning, and culture. From a financial standpoint, the Lake Superior College institution was aware that we were using free tools in the assessment; however there was a need to technical training and guidance from an outside organization. At this point, money was tight that it required a reassessment of our planning to determine which projects would no longer be pursued. Finally, even though these practices have proven successful in the private sector, there was limited success demonstrated by higher education institutions. The lack of exposure led to a doubtful feeling within the organizational culture and a hesitation to embrace the new concepts. In addition, the culture had to accept the way the institution was operating for so many years may now need to change.

The analysis of data presented risks around its validity, management, and action based on the results. The validity of data is always a concern when capturing web analytics since the data results are not directly tied to a specific user. Often an institution is receiving ambiguous data which is being analysed for behavioural insight and trends. In addition, there is an abundance of data found in web analytics that can overwhelm someone trying to analyse the results. Prentice [29] explains that often internal culture often works in favour of experience over the application of analytical information. Prentice [29] continues to explain that individuals within an institution’s culture often lack trust in the provenance of the data or the reliability of the analysis. Laney and Yuen [23] explain there are strategies for easing the change in internal culture. They suggest senior executives should lead culture changes by demonstrating institutional preference and value in using data-driven and fact-based analyses to make decisions. Prentice [29] explains there is a less intrusive processes for easing the change in culture. Prentice [29] explains a successful delivery of pilot projects to prove the connection between better analytics and business objectives will help to reinforce the value of analysis over experience. Gassman [14] explains the most effective organizational adjustment begins with the sponsorship or a champion from a business executive for any web presence initiative to be successful. Gassman [14] continues to explain this sponsor or champion may drive the business case around investments, skills, process and training. A good sponsor is willing to extend both political and budget capital to drive the program forward.

The proposed solution’s foundation of analytics, usability, and student-centric concepts is based on research, consultation, and a case study review findings. A limitation exists in the amount of research and training that one individual could achieve in web analytics, usability, and a student-centric web environment to apply to a larger scale. A limitation also exists in that the optimal solution was comprised by one’s individual research and findings of best practices. In the case study reviewed, the sole focus was on the workforce development department. The workforce department represents a small segment in population of students and of the overall institution’s business function. The study may require a larger sample size to determine a more convincing state of value derived from how to establish an effective web presence.

The proposed solution presents limitations in that the focus was on a single, data-driven analytical tool, and Google Analytics. Google presents challenges in that it is a free tool that often lacks integration into core data warehouse or customer relationship management. This integration challenge exists since Google is a free system and the other systems are proprietary. However, this awareness should be seen as an opportunity to provide further research into other technologies or implementing an effective web presence solution on a larger scale.

The proposed solution presents additional opportunities in further research to potentially include in the solution. According to Harris [15], while most education institutions are familiar with
social media and social media tools, few have consciously developed an institutional social media strategy. According to Harris, a social media strategy allow for institutions to create value based on the mission, with focus on a combination of teaching/learning, research and community service.

This concept mainly applies to the student-centric framework, which applies knowledge management system (KMS) or customer relationship management (CRM) technologies to make the ecosystem more service friendly. According to Dalkir [9] knowledge management is the strategies and processes designed to identify, capture, structure, value, leverage, and share an institution’s intellectual assets to enhance its performance and competitiveness. Drakos, Mann, and Rozwell [10] suggest having an effective knowledge management approach requires institutions to embrace the shift from just collecting content into a repository, and refocus efforts on tools that connect people with the content or colleagues being sought. The implementation of a prospective student-centric knowledge management web presence presents an opportunity to share, communicate, and educate the prospective student with success qualifiers based on life planning, advising, competencies, and financial advice that are offered to enrolled students.

Future studies may research and incorporate predictive analytics to help in the forecast of analytical trends. Predictive analytics leads to the forecasting, predictive modelling, simulation, and optimization of goals or services. Hostmann [16] explains that predictive models use historical data with known responses to develop or estimate a model that may be used to predict values or outcomes for new data. In the Higher Education industry, this knowledge might be helpful in establishing academic program trends, employee skillsets, or needs of the future.

5. Conclusion

Data-driven decision making provides value and contribution in Higher Education because it presents insight. No longer do critical decisions have to be made from intuition or personal experience. Data-driven insight now provides a deep look into a data-rich environment and educating key decision makers on how to approach critical business processes. A successful approach of handling web analytical data will be a critical business capability in the data-rich environment of the future, delivering significant competitive advantage to institutions that invest not only in analytical approaches, but also adopt a business model and decision-making processes to capitalize on the insight gained. For this solution’s purpose, the insight gained through web analytics may ultimately improve student success, student enrolment, and student retention for the institution.

6. References