The development and subsequent reconstruction of SHARC: a one-stop portal containing student resources and research tools

Randall K. Ward, MLIS
Independence University

Ian Q. King, MLIS
Independence University

Dr. Carmen Herbel Spears, RN DHA MSN BSN
Independence University

Abstract: Online access to resources for students and faculty are on the forefront of all education. Development of user friendly sites are important for the success of both traditional and non-traditional education. Stevens-Henager Online, now Independence University, sought to create a platform that would provide online access to resources and learning opportunities. In this discussion the Independence University challenges, experiences, principles, recommendations, and pitfalls are discussed as relates to a resource portal/hub in an online distance learning environment. Independence University visualized SHARC as a major component of student success and faculty support. The Study Hall and Academic Resource Center (SHARC) website is designed as a central “one-stop-shop”. A major component of SHARC is the online library to serve students and their research needs. SHARC was an original concept without precedent in the organization. Ongoing evaluation revealed revisions were necessary in 2015 and 2016. SHARC was updated for relevance, currency, and pertinence ensuring both students and faculty have access to a fresh and current resource platform. In May of 2016 the final version was implemented and revealed for all Independence University access. The challenges and resolutions create an opportunity for mitigation of future development projects.

Keywords: Portal, Website Development, Library, Student, Faculty, Resources, implementation

INTRODUCTION

Independence University (IU) is a medium-to-large online University offering graduate and undergraduate, degrees, diplomas, and certificates to students in many states. The aim is to provide students an opportunity to choose from a wide variety of employment-focused degrees to match career goals. Each of our programs has been engineered to help launch or advance a better career in today’s competitive job market. Providing a platform for asynchronous access to resources is a component of student and faculty success (Parise, 2000). The Study Hall and Academic Resource Center
(SHARC) was conceived as a tool to ensure that success. Formed in 2008, Stevens-Henager Online Division (a precursor of Independence University) was an outgrowth of Stevens-Henager College (S-H), a career college serving students in the western United States. In 2010, S-H Online leadership changes initiated a current stage of growth. In 2013, S-H strategic planning included current branding and the university was renamed IU. S-H and IU are both subsidiaries of the Center of Excellence in Higher Education (CEHE). The IU name is now the nomenclature that identifies the CEHE online division. IU has shown steady growth from less than 200 students in 2008 to its current 5400. There is an active student population studying programs in the technology, graphic arts, healthcare, and business fields.

BACKGROUND
In 2010, the leadership of the Online Division set into motion events that would create a portal or hub for students. This portal became known as SHARC. When the University name changed the title of the platform was revised to reflect the long and short term goal of the project. The SHARC acronym for the Study Hall and Resource Center was in keeping with both the consistency of naming convention and the vision of the platform. The original purpose and role of SHARC was to be a one-stop shop (Bringula and Basa, 2011; Laouar, Hacken, and Miles, 2009; Liao, To, Liu, Kuo, and Chuang, 2011) to help students by providing research tools, particularly in an online library and other resources such as career services, learning labs, etc. The expansion of the site for faculty use became an advantageous by-product of the project. The goal of SHARC is student success. However, faculty use and access is a fortunate additional benefit.

SHARC was designed as common location for student and faculty resources. SHARC does not replace student services, database portals or learning platform interfaces. Instead SHARC is a location for intellectual property intended to improve student success and achievements. SHARC is the common location for announcements, valuable information, training, learning, and innumerable other valuable resources. Students can access most of the learning and training tools needed to complete assignments, improve skills, find resources, learn about career acquisition, and many other virtual opportunities for success. SHARC is a synthesis of an online student union building and a library.

LITERATURE REVIEW
Bajracharya, Pradhan, Dangol, Shakya, and Shrestha (2010) describe a portal which shares two characteristics with the present SHARC hub/portal: a system designed for novice users and the division of the portal into different specific modules. The intended audience consists of a wide variety of constituents, of varying ages and background, thus necessitating an interface usable by all. It also has section that require an ID and password (Bringula & Basa, 2011). Various authors mention the need for portals as single-stop shops (Jukic & Gray, 2008; Neubauer & Piguet, 2009; Eke, 2011). Laouar, Hacken, & Miles (2009) in their work on developing a portal for an Algerian university posit that “a web portal can grant the information community (library users, company employees, etc.) access to the panoply of services involving electronic mail, discussion forum, digital publication
space, proprietary databases, search engines, and more” (p. 461-462). Further, Liao, To, Liu, Kuo, and Chuang (2011) defines a portal as “an internet-based application that acts as an entry point or gateway between users and a range of different services” (citing Akram et al 2005, p. 237-238). Laouar, Hacken, and Miles (2009) hit on a concept also desired for the hub, that of using already existing resources and services. And out of necessity, using extant resources “involved . . . creating a scholarly web portal while expending a minimum of labor and financial resources" (p. 471). Laouar, Hacken, and Miles (2009) additionally note that some portals evolved by gradually adding functionalities such as currents, chat, A-Z site index and a search box. The development of the Algerian portal had three objectives:

1. “Simplifying the users’ research;
2. Enhancing the visibility of the collections; and
3. Promoting and developing services of the Library” (p. 471).

Development of a web portal, however, does not stop once it is complete as technologies, design standards, programming languages, and student preferences change over time, all necessitating management review and examination of ongoing practices and planning for needed changes. As the current portal aged and current pages/sections were added to the existing platform, it was imperative that the site must be rebuilt in some fashion. Laouar, Hacken, and Miles (2009) propose an architecture that is scalable and can afford for future iterative changes. Neubauer and Piguet (2009) point out that knowledge portals are competing with search engines such as Google. “Even if we think that the results of these alternatives may be poor, or at least not satisfying from a professional point of view, we should accept that the users ‘vote with their feet’” (p. 595). This speaks to the need for quality portals and was a key determining factor for the hub/portal. The intended audience consists of a wide variety of constituents, of varying ages and background, thus necessitating an interface usable by all. Liao, To, Liu, Kuo, and Chuang (2009) discussed how when enticing and maintaining users’ interest, a portal must be built with the user in mind, be attractive, and entertain. Bomberger and Homan (2015) note that community-based websites, of which this portal could be considered a type, often encounter problems due to thinly stretched resources, lack of professionals, deficient understanding of the technology, and employee movement, all of which IU faced as the current portal became outdated. The current portal would need to incorporate the needs of the target user group with the ability to evolve with them, improve the visual appeal and user interface of the site, ensure the interoperability of the systems integrated into it, and consider user preferences and habits (Agosti, Crivellari, Di Nunzio, & Gabrielli 2010; Abuhamdieh & Sehwail 2007; Liao, To, Liu, Kuo, & Chuang 2011). Ignoring user needs could result “in the abandonment of the portal’s use altogether” (Abuhamdieh & Sehwail 2007, p. 45). Also, users desire resources to be at hand in as few “clicks” as necessary.

**METHODS**

The original vision for SHARC came directly from the leadership of S-H Online. When the SHARC component was visualized, leadership of IU developed a concept, described strategic initiatives, and
incorporated evaluation over time. The following steps were initiated for development of the platform.

A librarian, an intern, a graphic artist, technical advisor, and the associate dean were selected. Strategic planning was performed in a series of meetings using current industry planning techniques. The development process started with the formal planning process called Plan – Brief – Execute – Debrief or PBED, which is a process borrowed from the U.S. military and is described as part of the military’s Flawless Execution system (Murphy, 2006). When strategic planning identified additional needs, other positions were included mostly in task specific teams. A programmer was added to the core group. Over time the people originally holding positions may have changed however, the overall plan and roles remained constant in an effort to meet the goal of developing a useful platform.

The requirements for the portal included a mandate to use already-existing resources as much as possible. This request is mirrored by the portal described by Laouar, Hacken, and Miles (2009). The existing assets included such things as ProQuest (a subscription-based literature database), Career Services, a tutoring group, etc. As with the Algerian portal, there were several applications ready for plugging into the SHARC. For S-H Online, these included Blackboard Collaborate, which is the medium of instruction (for tutoring), links to the university’s Learning Management System and the student catalog (maintained by CEHE for all campuses, not just S-H Online and IU). Moreover, the requirements included development of videos, webinars and learning labs. The learning labs provided some automated and asynchronous help to students in evaluating and improving their various academic skills including math and writing. After these, additional resources would be developed and acquired by the university for inclusion in SHARC.

Some other development challenges for the original SHARC were time and personnel. Tight deadlines and extensive pressure on programming and design created significant challenges. Staffing issues arose until the right personnel were found. Identifying staff with the appropriate skill set is a component of success as described by Bomberger and Homan (2015). Another barrier to success was difficulty obtaining approvals for server time and usage. During the development of the original SHARC the technology was not available at the level necessary for the goals. SHARC development was not a priority for server access and conflicts arose that stalled the process. This drove a decision to purchase outside services which all came with barriers to success. Lessons learned in development of the original SHARC were somewhat trial and error. The Strategic planning for SHARC revisions sought to avoid many of the pitfalls experienced in development of the original SHARC.
By 2012, the sections in Figure 1 were the services/sections available on SHARC. It was an evolutionary process for the school, in which management and individual departments had input in development of sections including what to add and delete. The academics department was instrumental in the development. Input from the sponsors of particular sections was a significant part of the process. The SHARC maintenance team carried out the work of design and development with input from IU leadership who split the duties with the Dean of curriculum development. Also included in the maintenance team were the library supervisor, a part-time librarian, and the webmaster/programmer. The goal was for the section sponsor (for example, Career Services) to create and keep current their own content, informing the SHARC maintenance team of any changes that needed to be made. This created a stable pattern still followed today.

While space does not allow for a description of each section, by Dec 2012, there were four types of resources available in SHARC.

1. Student Orientation tutorials (Student Orientation and Early Admission)
2. Research and Student Services (Library, Career Services, Tutoring, and Certificates and Test Outs)
3. Student Information (Videos & Webinars, Contact Us, Catalogs Handbooks & Notices, Wall of Fame)
4. Non-student resources (PAC Bridge, Faculty Training). PAC stands for Program Advisory Committee and is a body that helps the school stay
current on industry trends for each program.

While reviewing the implementation of the initial platform, developers discovered a major component to success was navigation. When revising the platform, the team made navigation a high priority. Investigation into industry standards for successful navigation revealed key components that were implemented in the revised platform. Since deeper pages were not where one would logically expect them to be and were more than three clicks in from the home page, changes were necessary (Abuhamdieh, 2007).

![Figure 2 Screenshot of SHARC Home Page Circa 2014](image)

With the changing environment in social media and online access, leadership identified a need to revise the appearance of the platform. In 2014, graphics were changed (see figure 2). While mostly cosmetic in nature the changes stop-gap measure only intended to keep the platform from outdating while the overall revisions were in progress. One other item of note is the original development of SHARC did not include a section for announcements, only a “Currents” section. Announcements were made in twelve buttons/sections added later. Those announcements are not shown in Figure 2 due to space concerns. Toward the end of the original SHARC’s life cycle this practice became unwieldy. There were so many featured announcements listed that students often failed to scroll down to see them. Analytical tools used by the library showed that, on average, less than 10% of students scrolled past the main section. Inclusion of an announcement section was part of the review and a priority in the revisions.

**CURRENT SHARC**

During the strategic review and planning of the original SHARC several key components were identified for revision. In the revised SHARC, a distinct continuity of purpose was key. SHARC would still be a one-stop-shop for student needs except for essential student/university platforms as identified. SHARC will remain the key access point for research. The current SHARC would still house the library, tools such as ProQuest and CINAHL literature databases, along with the writing, tutoring, and career services.

Some driving forces for change were the deficiencies in the original SHARC. The appearance was outdated. The user experience was not meeting the needs of
the students or faculty in keeping with the IU Future Picture Statement for success. As stated previously, there were navigation issues and concerns. During the strategic review the team identified sections that had been added ostensibly for convenience. The sections included the Program Advisory Committee Bridge and Faculty services. Both of these sections did not meet the vision of SHARC. Another key component of the current SHARC planning was ensuring the content related to the intent of the platform.

On the technical side, there was a need to bring the hub to IU’s own servers. A possibility of a catastrophic breach of data was high unless this change was implemented. There was also a need for user authentication which required better integration with the Student Information System (SIS). Some pages were difficult to maintain (i.e. the Contact Page). The programming was original (HTML, CSS, & PHP-4) and had become an unwieldy over time. The code needed streamlining for modularity and needed the latest in language versions. Some additional requirements were updating the programming to HTML5, CSS3, PHP-7 and interface updates for use on tablets, mobile devices, and all major browsers.

After the strategic review the following priorities were identified:

- Modernize appearance and access to current hardware
- Substantial improvement of user experience
- Ease of use including less than three clicks to any page.

PLANNING PROCESS

During the planning process identification of key personnel was considered important for success. The people involved in the current SHARC planning process were the Vice President - Online, the Associate Director, and the Dean of Academics on the strategic level. On the tactical level were the Associate Director, the Head Librarian, a second librarian, a graphic artist intern (who left midway through the project), and the programmer/developer. Day to day development of SHARC was handled by the tactical team, with the head librarian and programmer taking most of the responsibility. Technical implementation was carried out by the programmer and head librarian with support from other staff and departments as needed.

After the initial strategic planning review several changes were implemented for the current initiative. While the same structure for change and review remained the same (i.e. PBED) There was now a top down directive approach from the management with more open interpretation of what was required. Input from departments such as Academics was used to identify components that would improve all three areas identified for planning.
Figure 3 shows the home screen for SHARC as of November 2016. Many of the sections were retained from the original SHARC. Others were added and a couple deleted or merged together. However, the overall look and user interface were changed to meet the three driving concepts for change.

TIMELINE

The timeline for the development of the current SHARC was:

- May of 2013, the Executive Director began discussing redoing/updating SHARC.
- July 2015. The head librarian met with instructors from the School of Graphic Arts (GA), members of Career Services who were graphic artists, and the library’s GA intern over the course of several weeks. Sample home pages were provided for determination of an effective design and layout.
- July 2015 the librarian and designers were ready to design and begin coding. Marketing was included. However, delays were experienced due to timing issues with marketing initiatives. SHARC revisions were delayed until November 2015.
- December 2015 the head librarian and programmer started coding using HTML5, CSS3, and PHP-7. Meticulous coding was performed to ensure a fully modular concept in nature. Emphasis was placed on performance of successful updates as needed.
  - Copywriting was time consuming due to the addition of captions and explanations so the students
thus improving the user experience.

- To modernize the appearance the head librarian spent a significant number of hours finding appropriate images for the various sections and subsections. The main sources of the images were from free open sources like Pexels, Pixabay, and Picjumbo, and subscription sources like Coppermine Photo Gallery.

- The programmer and head librarian met weekly with the Marketing department’s GAs and web designers improving the layout, discussing copy ideas, and exploring image suggestions and ideas.

- February 2016 was the original date for rollout of the current SHARC. However, a number of factors pushed the launch date back several times.

- April 2016 IU leadership assigned the Associate Direct to oversee the launch for consistency and timeliness. The inclusion of the Associate Director created a liaison between departments that expedited the launch.

- April 2016 testing concluded. Several student groups were used for beta testing.

- May 2016 the current SHARC was launched. The launch implemented several changes and included the full integration of the newly defined acronym. SHARC was now officially the Study Hall and Academic Resource Center.

**ORIGINAL SHARC VS CURRENT SHARC DEVELOPMENT**

The following discussion describes the development and implementation of strategic initiatives for changes between original SHARC and current SHARC. Many of the changes were identified by students, faculty, and leadership. The changing environment of both education and online technology were driving forces in many changes.

Some of the most significant changes included the deletion of the two student orientation tutorials. The team dropped the Contact Us, Certificates and Test Outs, PAC Bridge, and Faculty Training sections/pages. Subscription databases were given their own section. This database section included ProQuest, ProQuest Newsstand, and CINAHL (Cumulative Index to Nursing and Allied Health Literature, a database owned by EbscoHost). A username and password provided by the school was needed to enter this section. The login system was coordinated through the CampusVue system so that access was granted only to authorized users. The Help-Chat-FAQ page was given its own main section due to the need to improve service to students. It was overhauled to include current – or provide easier access to – Help phone numbers, emails, and times of operation along with a chat functionality. A Faculty page was added, geared to the student, by containing short bios of the deans and associate deans. There were also lists of majors with their required classes and class descriptions. Additionally, the team added an IU Stores section, in which students could purchase technology items,
IU branded clothing and memorabilia in cooperation with a national electronics chain. A Graphic Arts Gallery was added for samples of GA works by students and faculty to feature quality work. Furthermore, there are projects that are still in development. A Job Board is in the initial stages of development with preliminary material available to students.

In an effort to correctly brand resources the Tutoring Center was renamed the Student Success Center. This section required revisions since the writing review service had, by this point, become an internal IU service. An earlier version had been a contracted third-party writing-evaluation service. In response to student needs, the writing service was now internal and SHARC needed to reflect the appropriate process. Career Services was brought into the current SHARC, largely intact, with some updated information and material. Appropriate sections were created to reflect the different focus of services. Career Services, Student Information, the Library, Currents Articles, and an announcements section were all added as a separate section.

All sections of SHARC received descriptions and appearance to match the look and feel of the home page; the copy content was also updated in many instances. For example, the library, a major feature of SHARC, was redesigned with different secondary pages and navigation changes intended to provide a more intuitive flow and user experience. A number of different resources were added while may outdated or no longer necessary pieces, like the two student orientation tutorials that were transitioned to Canvas courses, were removed or highly modified.

The final piece of the strategic plan was SHARC maintenance. The maintenance of SHARC includes automated link checks using open-source software. With approximately 150 internal pages and thousands of outgoing links, this is imperative. The maintenance plan also includes a departmental standard requiring content to be driven by the departments’ changes.

The maintenance team for the current SHARC consists of (strategically) the Vice President – Online, both Associate Executive Directors, and the Dean of Academics. Tactically, maintenance is handled by one of the Associate Directors, the Head Librarian, and a technically-talented librarian. Day-to-day and technical management is handled by the second librarian and a programmer.

The maintenance team will make changes based on departmental information and recommendation. Ongoing review of the current SHARC is a major part of the strategic plan. While review of SHARC has not included student surveys specific to SHARC, there are individual questions referring to SHARC in the larger student satisfaction surveys that are run biannually.

**DISCUSSION**

As stated by Dr. Alan Hansen, the Vice President – Online, “It (SHARC) was a current and innovative idea for the organization with little else to draw on other than our own imagination. Within that scope it worked very well.” (Personal communication, 2016). He goes on to say, “The primary goal was to have as much one-stop (resources) meet all needs for students. That worked. It was reasonably intuitive for its time. It had a light feeling to it, rather than a heavy academic, ivory
tower look.” (Personal Communication, 2016). On the negative side, he goes on to say, “In hindsight, the project was (a) dream and not developed in a Project Management format. Documentation was limited. Decision makers did not have enough technical knowledge to demand certain programming requirements and documentation.” (Personal communication, 2016).

CURRENT SHARC

When assessing the implementation of SHARC, leadership performed a strategic planning review. The result was a revised strategic plan with long and short term goal revision. The goals of the revision as discussed before, include modernization, user experience improvement, and ease of use improvement. While many of the original SHARC challenges were overcome during the development of current SHARC, some of the same challenges remained.

As with the original SHARC some of the biggest challenges to development of current SHARC were personnel and time. The leadership recommended finding people with the right skill sets to manage the project. He also recommended a thorough meeting of the minds among the original stakeholders and any new stakeholders because of changes in IU over time. Some of the new stakeholders identified were management, academics, and marketing. These stakeholders were included to assure all have consistency of understanding. Emphasis was placed on goals, timelines, resource and outcomes.

There is a necessity for keeping up with changing technical demands (i.e. username/password and tablet/mobile device issues). The importance of metrics is reinforced with the current SHARC. There is always a need for uniformity in programming. Documentation is important and must be maintained for continuity. Enough quality documentation must be kept to ensure changes in personnel are seamless. Marketing concerns drove many decisions as student needs were discovered. Academics identified the importance of marketing SHARC to students through Associate Deans and instructors. Additionally, every course has a featured link to SHARC. A concerted effort was made to assure everything in SHARC was relevant to students. Many courses have SHARC driven assignments ensuring student use of SHARC.

Statistical analysis is a larger emphasis with current SHARC than on the original. Google Analytics is used, providing an almost limitless combination of statistical data on demand. In the beginning of current SHARC development, statistical data was gathered concerning browsers and devices accessing it. The process helps identify portals assuring appropriate access is developed.

Currently, the numbers provided through Google Analytics monitored by the Vice President - Online and Associate Director monitor are: Total visits, total users, page views per session, top five and bottom five non-home-page pages visits. Statistically, Figure 4 illustrates steady growth occurred in overall site visits until the last three quarters of the original SHARC life cycle. So it is plain to see the old SHARC was losing users. At the launch of current SHARC, the six month (Q2 & Q3 combined) usage grew by a factor of two over the same time period a year earlier.
<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
<th>Page Views Library Resources</th>
<th>Hub/Portal Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>Q1</td>
<td>9205</td>
<td>17594</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>11739</td>
<td>23552</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>17387</td>
<td>38514</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>21880</td>
<td>47926</td>
</tr>
<tr>
<td>2012</td>
<td>Q1</td>
<td>16173</td>
<td>42557</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>12288</td>
<td>32672</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>20189</td>
<td>44094</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>17154</td>
<td>39853</td>
</tr>
<tr>
<td>2013</td>
<td>Q1</td>
<td>22648</td>
<td>50905</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>25334</td>
<td>53763</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>29189</td>
<td>62575</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>27311</td>
<td>63079</td>
</tr>
<tr>
<td>2014</td>
<td>Q1</td>
<td>28416</td>
<td>69677</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>30442</td>
<td>77608</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Q4</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>2015</td>
<td>Q1</td>
<td>25172</td>
<td>61780</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>25945</td>
<td>60879</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>21161</td>
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<tr>
<td></td>
<td>Q4</td>
<td>17302</td>
<td>33842</td>
</tr>
<tr>
<td>2016</td>
<td>Q1</td>
<td>13303</td>
<td>27829</td>
</tr>
<tr>
<td></td>
<td>Q2</td>
<td>30658</td>
<td>80444</td>
</tr>
<tr>
<td></td>
<td>Q3</td>
<td>46258</td>
<td>110749</td>
</tr>
</tbody>
</table>

![Figure 4 Quarterly statistics showing Library pageviews and SHARC as a whole pageviews](image)

The librarian in the day-to-day maintenance group keeps track of several trends: The ten internal pages visited most, the top ten out-bound pages/links clicked, browser used, screen resolution, and page exit rate (see appendix 1). This is done to track which sections of SHARC are working and keep current with student habits in accessing SHARC.

**FUTURE PLANS**

IU leadership and the maintenance team plan to follow a traditional web development cycle of identifying student, faculty, and site needs; analyzing the available methods of meeting those needs; designing and developing those methods to be incorporated into existing or current structures; testing of all current components to ensure compatibility and full function; and implementation and maintenance of current additions. The
modular nature of the code is key and should be helpful in ensuring any current additions or required changes within the current life cycle of the site. The goal is to proceed smoothly and without extended development troubles.

With regard to content, desired improvements include: population of the Jobs Board, addition of another general literature database similar to ProQuest, an IU Master’s thesis database, a current IU-sponsored journal, and any other unforeseen need for major changes, such as for regulatory requirements, additions to scholastic programs, or reorganizations within the school etc. Furthermore, the PBED process will ensure ongoing strategic planning and review over time.

CONCLUSION

An overarching challenge of the current SHARC development related to the total rebuild of the platform. The original SHARC had not received an upgrade that caused a slip in usage. From experience, it is recommended that the strategic planning include timelines that do not encompass years, but months. Leaving the site essentially unchanged for years without regular updating in appearance and user experience does not produce effective use of the site (Bomberger, 2015; Liao, 2009). A major and continuing lesson learned was that appearance and user experience is an imperative not just a suggestion. This factor, more than anything, drove down site visits at the end of original SHARC life cycle. A highly-used service and student-oriented portal must be kept fresh. Since this portal is now used by all 19 campuses within the CEHE system, keeping the site current and up-to-date is a key component to success in the entire organization.

The following are some the things learned by this project. Use sound project management techniques to plan and implement the cycles of development. Know what you want before you start. When building a building have a complete set of blueprints in hand. Hold regular meetings with the stakeholders in the planning stages to have everyone on the same page. Maintain regular communications making sure what is being built meets the vision of stakeholders. In other words, get “buy-in” before going past the planning stage. Once this happened with current SHARC, the process moved along much quicker. Plan for changes to occur, but if the blueprints are largely set in the beginning, with approval from stakeholders, it is likely the change orders can be accommodated. Make sure to have sufficient resources, including those in programming, servers, photos, logos, and expertise.

Taking on any huge project is both rewarding and frustrating. Such a portal is possible, but there must be sufficient drive from the top, adequate management at the middle levels, technically skilled personnel, good program management, and buy-in from the various stakeholders who will be needed to guide and contribute to the content of the portal. Clear strategic planning with evaluation are an important part of the process. Ultimately, when student success drives decisions the result is worth the effort.
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Appendix 1
Statistics tracked by librarian on current SHARC maintenance team

### Top Ten Internal Page Visits as of May 9 - Nov 9 2016

<table>
<thead>
<tr>
<th>Name of Internal Page</th>
<th>Total visits</th>
<th>% of non-Home page views</th>
</tr>
</thead>
<tbody>
<tr>
<td>ProQuest CINAHL Login</td>
<td>59,800</td>
<td>15.17</td>
</tr>
<tr>
<td>Student Success Center (Tutoring)</td>
<td>50,128</td>
<td>12.71</td>
</tr>
<tr>
<td>ProQuest CINAHL main page</td>
<td>39,196</td>
<td>9.94</td>
</tr>
<tr>
<td>Library</td>
<td>34,460</td>
<td>8.99</td>
</tr>
<tr>
<td>Student Information</td>
<td>24,152</td>
<td>6.13</td>
</tr>
<tr>
<td>Writing Center</td>
<td>22,252</td>
<td>5.64</td>
</tr>
<tr>
<td>Help-Chat-FAZ</td>
<td>19,330</td>
<td>4.90</td>
</tr>
<tr>
<td>Writing Center login *</td>
<td>14,902</td>
<td>3.78</td>
</tr>
<tr>
<td>Writing Center main</td>
<td>11,092</td>
<td>2.81</td>
</tr>
<tr>
<td>Writing Center Student Submit Page</td>
<td>8,253</td>
<td>2.09</td>
</tr>
</tbody>
</table>

* The writing center student page acts as the student's main page for the writing center which accounts for the higher total visits.

### Top Ten Outbound Page Clicks as of May 9 - Nov 9, 2016

<table>
<thead>
<tr>
<th>Name of Out-Bound Link/Page</th>
<th>Total Clicks</th>
<th>% of Out-Bound Clicks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blackboard Collaborate (tutoring center tool)</td>
<td>21,991</td>
<td>25.17</td>
</tr>
<tr>
<td>School Catalog</td>
<td>12,198</td>
<td>13.96</td>
</tr>
<tr>
<td>ProQuest</td>
<td>7,170</td>
<td>8.21</td>
</tr>
<tr>
<td>CampusVue student portal</td>
<td>5,772</td>
<td>6.61</td>
</tr>
<tr>
<td>Play (same for all embedded videos)</td>
<td>5,735</td>
<td>6.56</td>
</tr>
<tr>
<td>Download (same for all linked PDFs and docs)</td>
<td>4,991</td>
<td>5.71</td>
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<tr>
<td>Canvas login</td>
<td>3,950</td>
<td>4.52</td>
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<tr>
<td>Teamviewer (IT support tool)</td>
<td>1,960</td>
<td>2.24</td>
</tr>
<tr>
<td>IU web store</td>
<td>1,707</td>
<td>1.95</td>
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<tr>
<td>Directory Open Access Journals</td>
<td>1,535</td>
<td>1.76</td>
</tr>
</tbody>
</table>

Table A1 Most Commonly Visited Pages of SHARC, May-Nov 2016

Table A2 Most Commonly Visited External Links, May-Nov 2016