2016 AUM Leadership Academy
Solutions Project

AUM and the Montgomery Cyber Connection

September 30, 2016
David Ang
Professor and Head, Department of Information Systems

Luis Cueva-Parra
Associate Professor and Associate Head, Department of Mathematics and Computer Science

Aaron Fraze
Senior Graphic Designer, Strategic Communications and Marketing

Bridgette Harper
Associate Professor, Department of Psychology and President-Elect, Faculty Senate (2017–18)

Matthew Jordan
Director, University Honors Program and Associate Professor, Department of English and Philosophy

Suman Majumdar
Senior Consultant, SummaSource

Jeffrey Vinzant
Director, The Warhawk Shop
Overview

In January 2016, the Montgomery Internet Exchange (MIX) came online, bringing with it expectations of a significant economic impact on the River Region. MIX is the first internet exchange in the state of Alabama and one of just four exchanges operating in the southeastern United States. It is the technological driver behind the Montgomery Cyber Connection, a nascent partnership between public organizations that seeks to harness the potential of MIX to attract new businesses to the Montgomery area. In the eyes of its advocates, that potential is extraordinarily significant. Mayor Todd Strange has spoken of “a wave of economic development that may rival Hyundai.”¹ Lieutenant General Steven Kwast of Air University sees an opportunity for the River Region to become not merely a regional, but a global center for research in cybersecurity: “There's no place in the country, not Silicon Valley or any of the other communities that are pouring billions into their ‘Gig City,’ [that] have what we have here in Montgomery.”²

Our challenge over the last few months has been to identify a clear role and benefits for Auburn University at Montgomery from engaging as a strategic partner in the Montgomery Cyber Connection. Our conclusion is that AUM is uniquely well-positioned to play a leading role in the Cyber Connection’s growth and development, and thereby to fulfill a number of the goals that have been laid out in the university’s strategic plan. AUM can do this, first and foremost, by facilitating partnerships between various stakeholders, and also by entering into partnerships with those stakeholders ourselves and by investing in academic programs that will make AUM graduates prime candidates for jobs in information systems management, cybersecurity, and related fields.

¹ https://www.montgomerychamber.com/montgomery-cyber-connection
Background

An internet exchange is the physical infrastructure that makes possible the transmission of data from one network to another. It is analogous in some ways to an airport. Just as a person who wishes to travel from one city to another may use airplanes and airports to do so, data being sent from one location to another travels from machine to machine via a series of physical connections. In both cases, nonstop travel between geographically proximate locations is faster and more efficient than travel between distant places or travel that requires multiple transfers. Unlike flyers at a well-functioning airport, however, the data that travels to an internet exchange may also be stored there. This both increases the speed at which it can be obtained and keeps it more secure. Thus organizations of all sorts—private and public, in any industry—that need reliable, high-speed internet access benefit from the presence of a nearby internet exchange. An internet exchange makes data storage more secure and transmission of data more efficient, improving the quality of service while simultaneously lowering its cost. As the ability to store and transmit data becomes ever more central to all sectors of the twenty-first century economy, institutions of all kinds have strong incentive to do business in places located near an internet exchange.

MIX was made possible by the presence of Maxwell Air Force Base and its Gunter Annex, which is home to the United States Air Force’s principal cybersecurity efforts, and the Retirement Systems of Alabama’s data center in downtown Montgomery. The RSA’s servers helped meet the USAF’s need for access to a reliable commercial internet connection. This partnership between the military and the state quickly became a partnership with the city and county as well; Montgomery invested in consulting fees and infrastructure investments to make MIX possible. The most prominent involvement with MIX by a private entity to date has been
that of Akamai Technologies, which already had a relationship with the USAF and which now stores servers in the RSA data center. Most of the other private organizations that are already involved with MIX are local internet service providers. To date, it appears that the only educational institution of any kind to announce its involvement with MIX and the Montgomery Cyber Connection is Air University itself.3

**Opportunity**

Based on conversations with various stakeholders, it seems clear that there is a window of opportunity for AUM to take the lead in helping the Montgomery Cyber Connection reach its full potential. There is a widely shared sense that MIX will contribute significantly to the future growth and prosperity of the River Region, and that mutually beneficial collaborations, within and across economic sectors, are on the horizon. This sense of pending greatness is tempered somewhat by the fact that no one has taken the initiative to identify, in an organized and systematic way, specific opportunities for collaboration. AUM’s location, physical facilities, professional capital, and existing relationships with stakeholders in the River Region (and beyond) make it uniquely well-suited to facilitate collaborative projects organized around MIX.

**Recommendation 1: Establish an AUM Task Force to Organize the First Annual Montgomery Cyber Connection Summit**

We recommend that an AUM task force be established to identify, cultivate relationships with, and begin a formal needs assessment of the many stakeholders who are connected to MIX. This task force should include Professor David Ang of the Department of Information Systems,

3 https://muninetworks.org/content/montgomerys-internet-exchange-bringing-business-mix
Professor Luis Cueva-Parra of the Mathematics and Computer Science Department, a representative from SummaSource’s Advanced Technologies division, a representative from the Office of Strategic Communications and Marketing, and at least one “at large” member, possibly selected from among the members of the Deans’ Council or the Leadership Academy team that developed this proposal. This task force would organize the annual Montgomery Cyber Connection Summit, beginning in the fall of 2017. The purpose of the summit is to bring together stakeholders of all kinds, on the AUM campus, to identify specific opportunities for collaboration and engage in ongoing needs assessment.

Recommendation 2: Coordinate and Lead the Montgomery Cyber City Alliance

A successful Montgomery Cyber Connection Summit will lay the groundwork for the Montgomery Cyber City Alliance (MCCA), a more structured and formal partnership than the existing Cyber Connection (a relatively loose affiliation between local government and Air University that has been described as a “cooperative”⁴). MCCA is the heart of this proposal. Coordinated and led by AUM faculty and staff, in partnership with representatives from the Cyber Connection and the Montgomery Area Chamber of Commerce, the MCCA will consist of four centers, each with a distinctive focus:

- **Cybersecurity Center**: computer and network security, data and information protection, encryption technologies, infrastructure protection, computer forensics, etc.

- **Data Storage and Management Center**: data storage technologies, data management services, data center services, internet service provider technologies, etc.

• **Innovation and Entrepreneurship Center**: e-commerce innovation and support, e-business incubators for small and new businesses, app development for small and new businesses, etc.

• **Education Center**: cybersystems education and training for workforce development, technology collaboration for K–12 and two-year college systems, live classroom education, higher education certification and degree program development, etc.

The primary function of these centers is to ensure that the ideas and partnerships that are discussed at the annual Cyber Connection Summit are effectively implemented. They will provide a collaborative environment where experts from industry, academia, and government can combine their expertise and organizational perspectives to advance and promote internet-based industry for the benefit of the River Region as a whole. The MCCA will make it easier to connect technology solution providers (including AUM’s SummaSource) with those who would
benefit from their services. It will also create new avenues for academic collaboration and the development of collaborative grant proposals, oriented toward both research and public service.

**Recommendation 3: Add Certificate Programs to Existing Degrees in Computer Science, Cybersystems and Information Security, and Information Systems Management**

In addition, the Montgomery Cyber Connection Summit and the MCCA will make it possible for AUM to maintain a clear and accurate picture of the present and near-future needs of the local market. The coordinators of the MCCA centers will be in a strong position to ask MIX stakeholders, on an ongoing basis, “what are the skills and abilities you need from AUM graduates *right now*?” This leads to the third component of our proposal: in light of needs assessments conducted by MCCA, AUM should add certificate programs to existing undergraduate and graduate degrees in computer science, cybersystems and information security, and information systems management. Such programs can be developed quickly and on an as-needed basis, taking advantage of the university’s existing resources without adding new costs and without requiring a lengthy approval process. Wisely implemented, these certificate programs can attract new students to AUM and enable those students to become sought-after candidates for internships and jobs in the River Region.

**Recommendation 4: Invest in Academic Programs Related to Information Technologies**

Finally, we recommend that AUM continue to invest in academic programs related to information technologies. The details here are, of necessity, to be determined. In the short term, we recommend pursuing an educational partnership with Air University. The USAF’s Cyber College at Maxwell Air Force Base is still in development; the opportunity exists to build joint certificate and/or degree programs, to the benefit of AUM and Air University. In the long term, if
MIX’s proponents prove to be correct about its economic impact, there should be many opportunities for AUM to be a central player in the economic growth of the River Region. At present, however, it is not possible to know precisely what those opportunities will be. A principal charge of the MCCA’s Education Center will be to assess how the development of new programs and/or the addition of new faculty positions at AUM would enable the university to take full advantage of MIX and the evolving local job market.

**MCCA and the AUM Strategic Plan**

It is worth noting that all of the components of this proposal can be explicitly linked to the 2013–2018 AUM Strategic Plan. MCCA will help Auburn Montgomery achieve a number of its stated goals:

- Enhance academic quality and program development reinforced by scholarship;
- Grow faculty research and scholarly activities and increase support of intellectual property management and research commercialization;
- Increase student recruitment and retention;
- Create a culture of collaboration; and
- Increase funds from alternative revenue streams through sponsored programs, private giving, and outreach to ensure long-term viability of the University.

More specifically, MCCA will achieve these goals by:

- providing necessary resources to support and foster excellence in selected academic units;
- developing academic and research/scholarly programs of distinction for the University;
- increasing faculty involvement in funded research;
• building relationships and linking University expertise to the community to solve industry problems, engage in outreach and entrepreneurial opportunities, stimulate the growth of research and technology development, develop intellectual property, and foster innovation, commercialization, and economic competitiveness;
• increasing the number of academic and non-academic collaborations;
• expanding existing and creating new collaborative programming with Air University;
• improving faculty and student engagement with businesses, governmental agencies, and other constituents in the community; and
• developing grant and other proposals, including collaborative efforts with other universities, businesses, and organizations.

Cost

Although the potential benefits to AUM represented by MCCA are quite substantial, the short-term costs are modest. The annual Montgomery Cyber Connection Summit will be held on the AUM campus and be catered by Chartwell’s. With roughly 100 people expected to attend, the total cost of the event will not be more than $5000, much of which may be funded by stakeholders who serve as sponsors. Faculty members who coordinate the four MCCA Centers should be released from teaching one course per year; if adjunct instructors are hired to teach those courses, this represents an additional cost of $2500—14000 per year, beginning in 2017. Developing new certificate programs and partnerships with Air University will require significant time and effort, but no substantial financial resources. Long-term costs are more difficult to predict and are likely to be greater, as we anticipate that the MCCA’s Education

---

5 The precise cost of hiring adjunct instructors depends upon how many faculty members serve as coordinators of the MCCA centers, which departments they are housed in, and whether it is necessary to find a replacement instructor in each case.
Center may recommend the addition of new faculty members, and other Centers may eventually need resources of various kinds: new technology, meeting spaces, or administrative staff. The purpose of the MCCA, however, is to engage with MIX and its stakeholders in ways that directly contribute to the long-term viability of AUM as an institution. Our expectation is that MCCA Centers will recommend expenditures only on the basis of evidence that those expenditures will lead to offsetting sources of new revenue.