

From Bootcamps to Digital Badges: How to Effectively Develop Mainframe Skills

- Dr. Cameron Seay on mainframe bootcamp models, and why more HBCUs must adapt them to fill the need for IBM Z skills and create student opportunities for paying jobs
- Interskill Learning's Darren Surch on creating a culture of learning through digital credentialing, comprehensive mainframe workforce training programs and more

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Mainframe Training Strategies, and Room for Improvement



As the existing mainframe workforce gradually ages out of the industry, effective mainframe training has become top of mind for the IBM Z ecosystem. But what strategies seem to work best, and where is there room for improvement?

Despite the growing need for mainframe skills, there doesn't seem to be an increase in mainframe courses on college campuses. That's in large part why Dr. Cameron Seay and his colleague John Thompson collaborated to create a replicable mainframe bootcamp model (especially geared toward historically Black colleges/universities), beginning at Tennessee State University.

The results of the bootcamp were astonishing—of the 15 bootcamp candidates deemed as “ready to go” (after working through the program and developing corporate readiness skills), all 15 secured positions (internships, apprenticeships or regular hires). This bootcamp model works—and more colleges and universities should consider adapting it.

The pandemic has also brought mainframe training strengths and shortcomings to light. As many companies expect to move more permanently to hybrid or fully remote workforce models, delivering mainframe training becomes more challenging. However, as Interskill Learning's Darren Surch notes, we can work to create a culture of learning through digital credentialing, comprehensive mainframe workforce training programs and more.

When it comes to mainframe training, there's not going to be a “one size fits all” answer. But taking into account various tips and techniques from training professionals in the IBM Z ecosystem is a place to start. In this e-book, learn why bootcamp models are effective, and what strategies you can use to foster mainframe skills and grow a pipeline of diverse mainframe personnel.

Keelia Estrada Moeller, Senior Editor

Virtual and Hybrid Training for Mainframe Personnel

Darren Surch on the importance of creating a culture of learning through digital credentialing, comprehensive mainframe workforce training programs and more

BY JENNIFER GOFORTH GREGORY

Delivering training for mainframe personnel is becoming more challenging as more companies continue to use hybrid or fully remote workforces following the pandemic. Companies' workforce skills, engagement, retention and productivity hinge on training, yet in the **Deloitte 2020 Mainframe Market Pulse** survey of mainframe leaders, 59% identified knowledge skills gaps among their mainframe personnel.

"Optimally training today's workforce in the new mainframe workplace is an organizational imperative," says Darren

Surch, chief operating officer at Interskill Learning. "Fortunately, a wide array of new training technologies and methodologies are uniquely suited to the task."

While virtual training is not new, the mainframe industry has largely relied on the classroom training model since the 1960s. However, the old cycle of waiting to take a class, traveling to the class and then returning to your job isn't training at the speed of today's business. In the past, technical skills were relevant for 10 or more years before they needed refreshing, but today the majority of technical

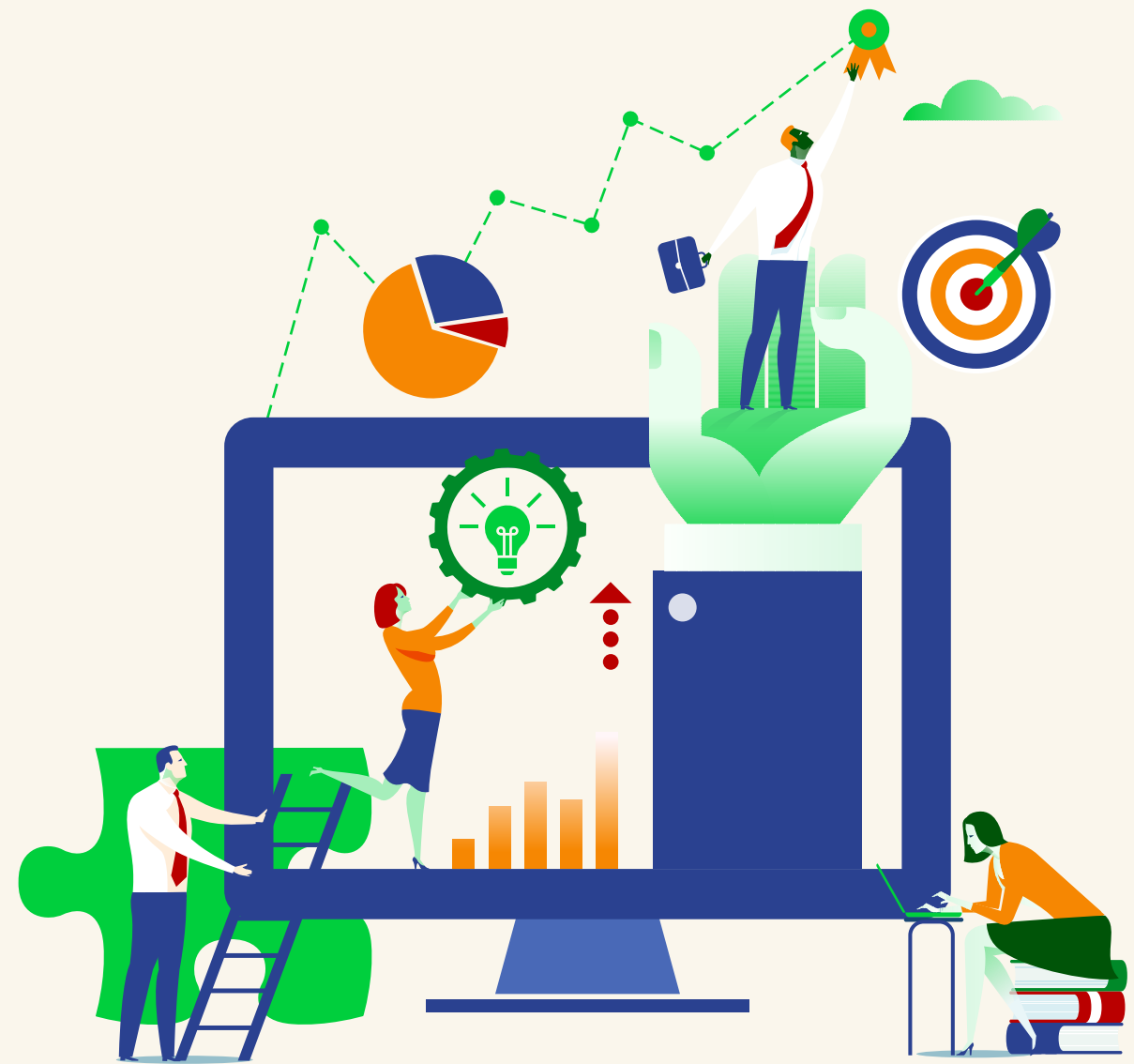
skills have a half-life of about 2.5 years requiring a continuous reskilling effort and readily available training, according to Surch.

Using Digital Credentialing to Create a Culture of Learning

Creating a high impact learning environment is an important step toward an optimal mainframe workforce, but to fully realize the benefits, organizations must create an environment where employees genuinely want to learn new skills and grow their careers. Surch says that the IBM Digital Badge Program has been a powerful tool to help organizations to create a culture of learning.

“Though companies invest in training and make it available to their personnel, they often don’t take the final step and create an environment where that training will be consumed voluntarily, consumed regularly, consumed passionately!” says Surch. “Teaming digital credentialing with copious, readily available training drives higher training consumption, improves training outcomes and enhances employee engagement and workforce retention.” Creating and fostering a culture of learning is one of the greatest competitive advantages a modern mainframe organization can enjoy.

Recruiting is also a key component of creating a culture of learning. Organizations should consider whether



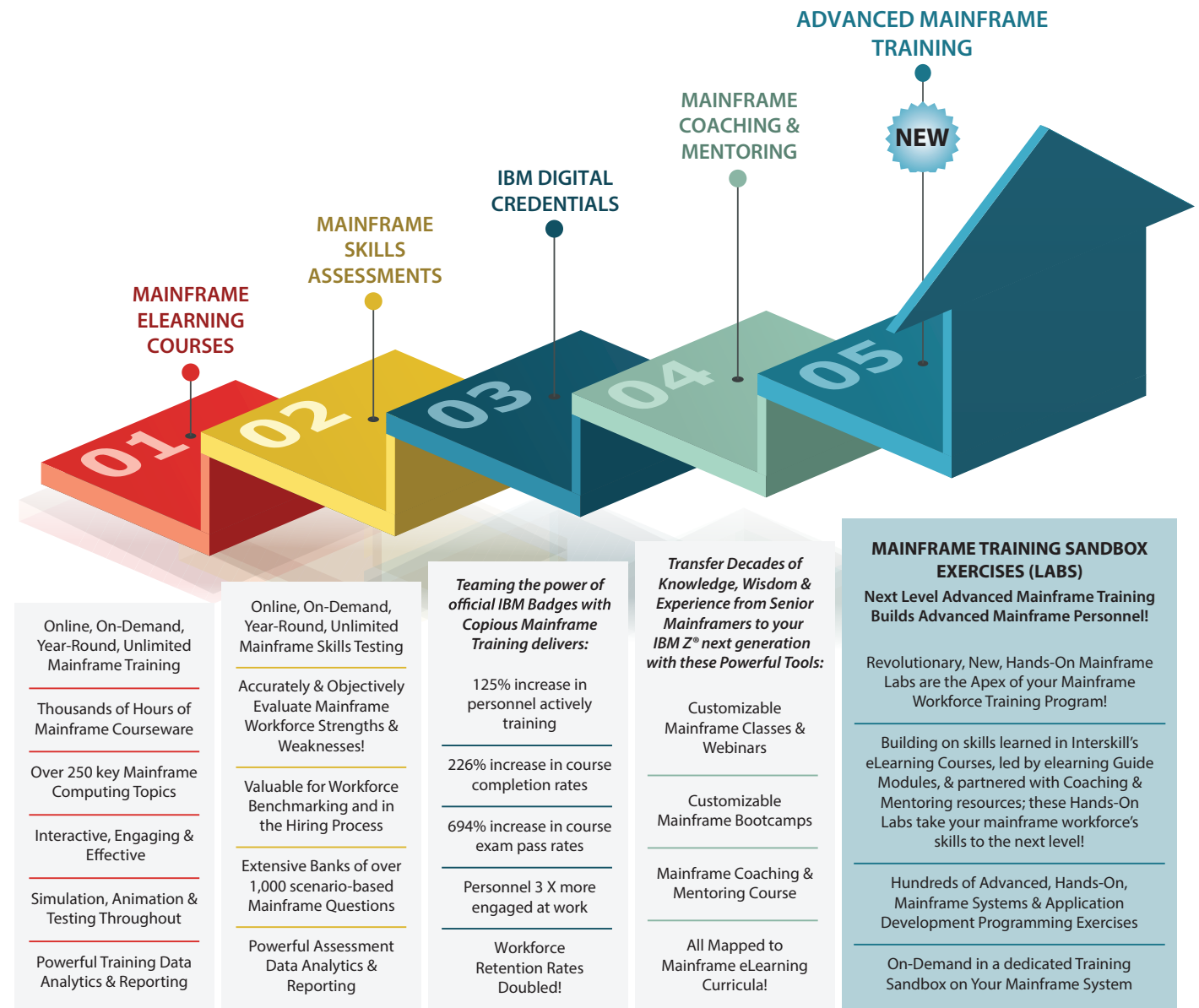
mainframers applying for a position are interested in increasing their skills and enhancing their careers. Surch says organizations shouldn’t just hire people based on their ability to code COBOL or their knowledge of z/OS, they should hire people who are intellectually curious and hungry to learn.

Creating a Comprehensive Mainframe Workforce Training Program

Organizations should aim to make training part of their mainframe personnel's normal workday rather than a separate task. Surch says the industry's standard 40 hours of training per year, which is less than an hour a week, is optimal. Because of the shortening half-life of skills, mainframe personnel needs are not even served in a class or two each year, so training must instead be fully integrated into their daily work life.

By using technology and new approaches to training, organizations can create microlearning and nano-learning opportunities that can be consumed in small bits throughout the work week.

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Surch says organizations should include the following types of training in a comprehensive learning program for today's mainframe personnel:

➤ **Conferences/classroom training:** Offering networking, instructor feedback and dedicated training time, in-person training will likely remain a key mainframe training method. Due to logistical and cost issues though, Surch recommends this method be used strategically and limited to one or two conferences or classes per employee per year.

➤ **E-learning:** Utilizing the corporate Learning Management System (LMS), organizations can create an extensive library of year-round, on-demand mainframe training. Surch recommends getting creative with these modular, easily delivered training elements, teaming e-learning courses with coaching/mentoring, creating bootcamps, developing mainframe learning plans and more. Additionally, LMS reporting and data analytics offer managers powerful, objective insight into training progress and skill levels of the workforce, team or individual employee.

➤ **Skills assessments:** Objectively and analytically determining what personnel know (and don't know) is critical to mainframe organizations. Including skills assessments in the LMS enables organizations to identify gaps and utilize the most effective type of training to fill them.



➤ **Coaching and mentoring:** It's critical that organizations transfer the knowledge, wisdom, experience and culture from senior mainframers to the next generation. "Coaching and mentoring must be a regular part of organizational life," says Surch. "Busy senior mainframers must use modern training tools to carry the teaching load and keep the demands on their time to passing on wisdom and experience."

➤ **Microlearning:** Organizations are increasingly utilizing bite-size pieces of training that their mainframe personnel can consume every day. Texts, videos, podcasts, articles, documents, GIFs and more can be delivered to desktop or smartphone and consumed quickly and easily.

➤ **Communities and events:** Virtual events, hackathons, accelerators and online communities are becoming widely used in the modern mainframe workplace. "These are highly attended training events and platforms that not only provide fun and highly effective training, they tie in coaching, mentoring and peer networking, plus they improve the problem solving, communication, critical thinking, public speaking and teamwork skills so vital to an optimal mainframe workforce," Surch says.

Increasing Diversity Through Training Opportunities

Many organizations only view training as a way to improve the skills of their existing workforce. However, as companies are proactively increasing their diversity, offering training programs to potential employees creates a pipeline of skilled personnel and opens opportunities to those who have not earned a four-year degree.

By identifying “new collar” roles in the mainframe development processes, organizations can hire employees who have gained skills through credentialing instead of college degrees. Enterprises that create apprenticeship programs such as the IBM Enterprise Computing Technology Apprentice, instead of only offering traditional internships, increase both diversity and skilled employees.

Organizations looking to grow their pipeline of diverse mainframe personnel should consider partnering with Pathways and Technology Early College High School (P-TECH). Students attending these high schools graduate in six years (starting in ninth grade) with a high school diploma and an associate degree, with a focus on technology skills. These graduates often can walk right into new collar jobs without additional training.

IBM programs like the Master the Mainframe competition teach skills to high school and college students, awarding

IBM Digital Badges for progress and completion. In 2020, over 25,000 school students from 129 countries participated in this program, planting the seeds of passion and skill for a new generation of mainframe computing personnel.

Holistic Training for Success

When creating a mainframe workforce training program, organizations should focus on the broad spectrum of skills needed by optimally performing mainframe professionals. As well as focusing on the critical mainframe technical skills, Surch says organizations should also train on “power skills” like agility, collaboration, teamwork, resilience, problem-solving, critical thinking and communication.

“A modern mainframe training program, utilizing new training technologies and methodologies, covering technical and power skills, and driven by a culture of learning, is a critical tool for organizations to empower their workforce and create a formidable, versatile, agile mainframe computing organization,” says Surch.

Building an LGBTQ-Inclusive Workplace in the Tech Industry

BY ALYSSA STORY

In January, the Human Rights Campaign Foundation (HRC), America's largest LGBTQ civil rights organization, released the 2021 Corporate Equality Index (CEI), an annual report on LGBTQ equity and inclusion in the workplace. The most recent report was a standout for tech companies—with 18 new companies being rated and published in the report for the first time, a “significant number” of new arrivals from a single sector according to Beck Bailey, director, HRC Workplace Equality Program.

The CEI survey has very clear perimeters, notes Bailey, and the publicized benchmarks make necessary outcomes available for every organization to attempt to reach. HRC focuses on outcomes in three categories:

1. Nondiscrimination protections
2. Employee benefits
3. Internal practices and external engagement

An increased commitment to creating a more equitable environment was evident within the tech sector, given the 2021 CEI results. 2021 was a particularly notable year in the CEI for tech industry—with 71 companies receiving a score of 100.

While 2021 has shown some of the best results yet from the CEI, that doesn't mean the fight for equality is over. The CEI, as explained by Bailey, is used as a tool to report on the benchmarks of foundational policies, practices, and benefits for an employer to begin the journey to being inclusive. But even if a company achieves all of the aforementioned benchmarks, and gets a high score on the index, it may not be as inclusive as it seems on paper. “It means that you have all of these foundational policies and practices that are truly critical and necessary, but by themselves they aren't enough to create a fully inclusive environment” says Bailey. “If you get 100 on our survey, that doesn't mean you're done.”

[Read the full article](#)

Why Mainframe Bootcamp Models Are Successful

Why more HBCUs must adapt mainframe bootcamp models to fill the need for IBM Z skills and create student opportunities for paying jobs

BY DR. CAMERON SEAY

Of late, the IT industry appears to have “discovered” the mainframe. This could be attributed to Gov. Phil Murphy recognizing that the State of New Jersey did not have enough COBOL programmers. Companies are looking around their shop floors and the demographics are undeniable: The mainframe workforce is aging out and that rate is increasing rapidly. Yet, college campuses are seeing no appreciable increase in mainframe courses. While training companies are waking up to the need for courses in mainframe, colleges remain obstinately oblivious of the need to teach this technology so essential to the global economy.

Creating a Mainframe Bootcamp Curriculum

These are among the reasons, that my colleague John Thompson, founder and CEO of Mobile Collaborative Education Consulting (MCEC), and I developed mainframe “bootcamps.” Thompson serves as an enterprise systems curriculum infusion consultant to Tennessee State University (TSU), a public historically Black college/university (HBCU) located in Nashville, Tennessee. We see this bootcamp model as replicable, and we intend to not only replicate it, but scale it as far as our resources will allow.

After a fall 2020 TSU COBOL class was canceled due to a faculty shortage, Thompson contacted me about delivering a weekend mainframe bootcamp at TSU. I was certain that we could deliver a weeklong bootcamp because we had successfully delivered one at TSU in 2016. However, I was dubious as to the potential efficacy of delivering a weekend course. We have struggled to get HBCU administrators to embrace the mainframe program in spite of our track record of success at several schools, both individually and as a team. However, TSU is the only HBCU that has launched a program of this type and has offered ongoing classes for over five years. I have taught mainframe at four HBCUs, and at all of them the students embraced the business case for the mainframe almost immediately. But the chairs, deans and faculty at these schools always pushed back. I explain why in a [blog series](#).

Despite my reservations, and knowing Thompson's penchant for attempting the implausible, I agreed to develop a curriculum for the camp. It was initially supposed to be a replacement for the COBOL class, but because I like to teach COBOL on the mainframe, and because some basic knowledge of JCL, ISPF, TSO and how to create and manage datasets is a prerequisite for running COBOL on Z, I asked him to change the focus of the bootcamp from COBOL to mainframe basics. We could later hold another bootcamp for the alums of this one that focused on COBOL, which we did.



Selecting Bootcamp Participants

The selection of the participants was all Thompson's affair. He has worked in this space for as long as I have and knows the characteristics of a potential mainframer: maturity, ability to focus, a grasp of the business case for the technology, etc. You need to be a good student, but not necessarily a great one. Thompson set the bar at a minimum GPA of 3.0, but made exceptions where warranted. Most of the students would come from TSU's computer science and information systems programs, but the camps were interdisciplinary in nature. A social work major, an accounting major and a physics major were among the participants. We initially selected 25 students for the camp, but two had to withdraw for personal reasons.

Of the remaining 23, 18 were men and five were women, a ratio not uncommon in this space. Also participating were Thompson's son who works at IBM, and daughter who works at Citibank. Both are alums of TSU, have worked in the area of mainframe technology and are very passionate about it. They included themselves in the class because they both have been successful in their endeavors, are still young in their careers, and were much closer in age to the participants than Thompson or me. They added tremendously to the overall seriousness and professionalism of the camp.

Because almost all of the students had full-time jobs, in addition to the camp running over into the beginning of spring semester, we decided to hold the camps on Saturday and Sunday: 10 a.m.–2 p.m. ET. Not a lot of time, but our strategy was to cover what we could in that time frame. It ended up being enough (as we will see shortly). The entire camp was offered online via Zoom. This flexible training format helped open the bootcamp to working professionals who would otherwise be unable to attend—a particularly important factor when we're trying build out a more extensive talent pipeline.

Attendance was nearly 100% for the duration of the camp. I assigned six mandatory labs and two bonus labs. The mandatory labs covered how to get on the system, how to copy libraries, some practice in TSO, how to create data sets and two JCL labs. The bonus labs were practice in USS and how to transfer files via FTP. Eighteen of the students completed the mandatory labs, and seven completed the bonus labs. One of the highlights of the camp was a 90-minute Q&A with Chris O'Malley, president and CEO of Compuware. He was scheduled for 15 minutes, but the Q&A was continued at his request. He was amazing (if you know him, this will not surprise you), and the students were, needless to say, awestruck but asked some very probing questions.

Moving Young People Into Paying Careers: Prepping Professionals

We teach this technology not as an academic exercise—though it's great for that. We teach it to move young

people, with a focus on young African American people but by no means exclusively so, into well-paying careers. So, all the while behind the scenes, Thompson and I prepped these students for the interviews that we were fairly confident would come. MCEC has an elaborate portfolio process where they profile candidates for jobs

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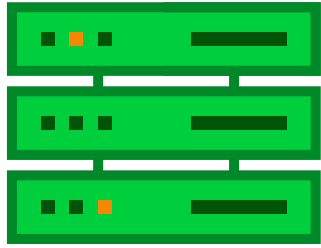


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This bootcamp model works, and companies can no longer say they don't know where their mainframe skills will come from because they can call us. We are now venturing into the public sector because everyone that uses mainframe has the same problem: 'Where will we find these skills?'

with their resume, major, GPA and expected graduation date. This allows companies to “one-stop shop” from a group of candidates. MCEC has the reputation of carefully screening and prepping their candidates, so companies can make quick decisions on whether to interview them or not. We also had a series of “corporate readiness” sessions with the students, most of whom had no exposure to a professional corporate environment, to prep them on what to expect and make suggestions on how to survive the interview process to get to the final round.

Thompson and I have successfully placed many students at a number of organizations over the years, so we had a pool of companies looking for candidates for entry-level mainframe positions. I would say the results were amazing, but they were entirely predictable (though not predicted by us): of the 15 candidates we deemed “ready to go,” all secured positions (i.e., internships, apprenticeships or regular hires) with seven different companies. Such

a success rate was unheard of at TSU, and with few exceptions at most HBCUs for those type of positions. We subsequently followed up with another four-weekend bootcamp, this time in COBOL—the difference being that all the participants had offers in hand while attending.

So, this bootcamp model works, and companies can no longer say they don't know where their mainframe skills will come from because they can call us. We are now venturing into the public sector because everyone that uses mainframe has the same problem: “Where will we find these skills?”

DR. CAMERON SEAY is a technology evangelist with a focus on mainframe technology. He is currently an adjunct professor at East Carolina University. He holds master's degrees in business, economics and computer information systems and a doctorate in educational psychology from Georgia State University.

How to Simplify the Lives of Non-Mainframe Trained IT Employees

BY TREVOR EDDOLLS

So many of the people who work on mainframes have been doing so for 40 years—and that means they’ve had plenty of time to get the hang of how these subsystems work. They like using green screens because they can get their work done very quickly using them.

While that’s fine if you’ve been in the business for a long time, several products are also available to encourage newer people into the world of the mainframe:

➤ **IBM z/OS Management Facility (z/OSMF):** This provides system management functionality in a task-oriented, web browser-based UI with integrated user assistance. It also simplifies some areas of z/OS system management by streamlining some traditional tasks and automating others.

➤ **Microsoft Visual Studio Code (VSCode) and other extensions:** VSCode can be used, as you’d expect, for debugging as well as syntax highlighting, intelligent code

completion, snippets, code refactoring and embedded Git. Because VSCode is so well known, there shouldn’t be any difficulty finding people who can work using it. Many extensions are out there as well for additional functionality.

➤ **Zowe and open source:** Zowe provides another way for people without mainframe experience to treat mainframes like any other servers. It’s an open-source software framework that provides easier interoperability and scalability between products and solutions from different vendors.

➤ **Z Open Automation Utilities (ZOAU):** ZOAU provides a runtime to support the execution of automation tasks on z/OS through Java, Python and shell commands. For programmers who are used to working with Linux and Unix, and who are very familiar with using UNIX System Services, ZOAU provides a very similar way for them to access traditional z/OS resources.

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This e-book was published by



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