TO: Dawson Williams [CEO] (dawsonwl@TechU.edu)
FROM: Lauren E. McFall [CIO] (lemcfall@techu.edu)
RE: Improved Operational Efficiency and Competitive Strategy Proposal
DATE: March 27, 2025

1. **Executive Overview & Introduction**
   This report outlines the strategic approach to drive TechU.com into improved operations, while enabling a more effective competitive strategy. TechU.com was established in 2015, and has been a leader in providing both working professionals and those who want to advance in their careers with accredited, flexible certification programs.

   With TechU.com being in the world of Technology – we are faced with an ever-evolving landscape, threats of new schools, rivalry of competitors, and even substitute courses. Leveraging AI/ML, as well as a few other advanced concepts will be pivotal in optimizing operations and securing us a more competitive market position. Our goal is to use these innovations to improve efficiency across the organization, enhance student engagement and content, and maintain and grow in IT education, while preparing our students for their future careers in IT with our expanse of courses, professors of practice, flexible education, and even hands-on experience.

2. **Section 1: Strategic Direction of TechU.com**
   By driving our technology choices through an advantage-based, model-based, and relationship-based strategic direction, we can ensure that our AI/ML initiatives align with our mission to enhance efficiency, drive improved operations across the organization, improve student outcomes, and effectively maintain a competitive edge. We were cutting edge by offering remote learning through our first mover advantage, but we need to evolve in order to reclaim and sustain our edge.
   We face scalability challenges, we are spending time and money with hard copies of software that we send out, and we lack some of the cutting-edge technology that today's students want to utilize, and that will be helpful with their careers in technology. This is exceptionally important, as we are teaching them about technology, therefore we should be technologically adept. We have a unique market position where we are flexible enough that we can offer full remote learning, but for students who want a more hands-on approach, we have campus space/training sites that can be utilized. We already offer services for internships and placement, but our students need to stand out against our competitors.

   - We can offer more personalized learning experiences through AI-driven learning paths
   - By automating administrative tasks, improving cost structures, and by optimizing training resource allocations, we can achieve more efficient operations
   - Advanced Analytics identifying market trends, student success rates, and areas for our various programs improvement can all be achieved through data-driven decision-making
   - By truly immersing ourselves into updated technology, we can expand our offerings while giving students a reliable and helpful tools to simplify their education process

3. **Section 2: Impact of New Technology for TechU.com**
   We want our students to have every advantage offered to them possible. By giving them the right tools to pursue their education, we are already helping them by setting them up for success. Switching to a SaaS and Microservices Architecture and utilizing Mobile Communication/Computing and Big Data can help us achieve those goals.

   - Updating our programs to offer cutting edge AI/ML-integrated training environments can help better prepare our students for real-world IT challenges, while offering us competitive differentiation
   - Shifting our legacy system to a microservices architecture will help with our scalability, our reliability, performance, and even our security
   - SaaS can also help with scalability, as well as with accessibility, it is cost efficient, maintenance and updates would be more seamless, and this would work with our integration of AI/ML for enhanced functionality
   - Big Data will allow for AI-driven analytics to process large data sets - this enable us to make data-backed decisions, identify personalization for our courses, we would be able to optimize resource allocation, and it will give us more insight on industry trends and job market demands
   - Mobile Communication would enable our students and instructors to access learning resources – anytime and anywhere. We would be able to provide more personalized content, notifications could be enabled for reminders, etc. ML algorithms could analyze student/instructor to better understand engagement levels and even suggest improvements.

4. **Section 3 - Topic 1: Software as a Service (SaaS)**
   SaaS is a cloud computing service model allowing use for software applications over the internet, rather than installing it, and would improve our current infrastructure immensely. With us taking this approach, a cloud service provider would handle the infrastructure, security, and updates. Along with the provider doing that work, it would also enable automatic updates and maintenance – the ensures continuous improvements, updated security, and less downtime.

   EdTech SaaS Platforms are option for us to adopt. These platforms provide educational tools and services via subscription. This would remove our current, costly infrastructure. (Tyson, 2025) Learning Management Systems (LMS), virtual classrooms, and other training tools would offer flexible and scalable solutions to our students. SaaS would allow us to remain competitive because it would enable our students to have engaging courses, progress could be effectively monitored, this would allow for more flexibility which expands our market, devices would not be limited, we can customize the system and leverage AI, and provide an overall better learning experience.

   Specific SaaS platforms we could consider are Google – as they have specialized solutions for education and a strong mobile presence and Salesforce – it is customizable for the education industry, it utilizes AI, and provides strong data analytics and visualizations. (BasuMallick, 2022)

We want students to have a seamless and solid experience while taking their training, and we want to be able to grow this – SaaS allows for scalability and accessibility. Students and instructors a like would be able to access their courses from any device, creating more engagement. AI can add to this, by offering dynamic content that would be tailored to the student's needs. This enhanced learning would be able to offer course recommendations and help with a student's learning path. ML-driven course recommendations will assist students with planning, scheduling, and even completion rates. SaaS is also cost efficient, and we would pay for what we need, but infrastructure and maintenance costs would be reduced on our end as they are included with the platform.

5. **Section 4 - Topic 2: Microservices Architecture**
   Microservices Architecture in combination with SaaS complement each other very well. By bringing them both to TechU.com, we would have a more scalable, flexible, and modular cloud-based platform.
   SaaS would deliver our application over the cloud, while the Microservices would break down the application into individual services - each service operates autonomously and performs a specific task, then communicates to other services. By adopting a microservices architecture, we would allow ourselves the freedom to take the various components and develop, deploy, update, etc. all independently. Along with this, we would also have decentralized data management, which would help to reduce the risk of data inconsistencies.
   We would be able to keep students and instructors engaged with more reliability and flexibility. If one part of the application goes down, the entire organization would not. We would have faster development, faster updates, and deployment with continuous integration, which would also reduce downtime. By using AI driven resource allocation, we would be able to ensure efficient computing and a reduction in latency. With all of these individual pieces, we would be more agile, and be able to continuously make improvements.

   If we utilize Google, they have their own microservices architecture – Google Kubernetes Engine (GKE). This would also be convenient since they both come from the same company and we could bundle, but also, we know that they would be supported together. (*SaaS Microservices Architecture: Key Considerations for Success*, 2025)

6. **Section 5 - Topic 3: Mobile Communication and Computing**
   Mobile computing will be especially beneficial for our students and instructors. It will enable them to have more flexibility and accessibility – they will have access to their materials anytime and anywhere. For instance, we have many students that use public transportation – they would be able to access their course, reading material, etc. from their device, and get some work done on their commute! In the United States, almost all Americans own a mobile phone – in fact, 98% do. (Bazen, 2023)

   We would be able to implement AI-student support with chatbots/virtual assistants that could over 24/7 help. Students could have the option of enabling notifications/alerts to provide reminders, class alerts, etc. Students would have access to their discussion boards, email, etc. from anywhere, allowing for more communication and collaboration,

and even with other students/past students. By utilizing mobile communication/computing, TechU.com would be able to provide students and instructors access with maximum flexibility for on-the-go education.

Again, going along with Google – Workspace apps such as email, Docs, Sheets, Meet, Drive, and Chat would allow for this. Also, if the students have a tablet, phone, etc. Google syncs data across them.

7. **Section 6 - Topic 4: Big Data**
   Big Data would be extremely beneficial and innovative with the data and analytics we would be able to gather. This data would be useful for many departments at TechU.com – we could understand student's performance, how much they engage in the course, and at-risk students so we could offer assistance before a negative outcome. Students would be able to have a more personalized learning path and recommendations. Administrators could optimize our course offerings – add and update what needs to be updated, and offer quick feedback/response times. Our finance department would understand student's standings, if assistance is needed there, and be able to educate students better on financial matters such as a student loan. Our marketing team can use this data for target marketing towards prospective students, to help with current student engagement, they would be able to gauge how students/instructors are feeling about the course, which would lead to more information on how to make improvements, and we could understand the market trends better to be more aligned with the current job market/environment. This is also a step toward operational efficiency by helping with resource allocation. Google would allow for this implementation as well with BigQuery, BigTable, and Looker. (Google Cloud, 2023)

8. **Section 7: Additional Technology**

   There are additional technologies that could be useful to TechU.com, but in our current pipeline, are not high on our requirements list because they are already intertwined with a higher-ranking technology, or they would fit better elsewhere, or they need a restructure first.

   - PaaS – while this is valuable for software development, we are focused on IT training. This is more for building, testing, and deploying applications, rather than a complete software solution. In our industry, SaaS is more of a turnkey solution that would be more flexible, easy to use, scalable, efficient, and effective for us – there is operational simplicity to it where we would not have the complex infrastructure management, and could focus elsewhere. Also, since we are in the training industry, this is more user focused.
   - DevOps – DevOps is essential, but to our SaaS provider. By utilizing a SaaS provider, they provide the builds, the testing, upgrades, etc.
   - Communication/Collaboration – This aligns with every topic that we prioritized. Students need to communicate with their instructors, Instructors need to collaborate with the university to ensure their course is to their liking, students need to collaborate and communicate with each other. This all comes with our online

courses being hosted/having class, having in person class, really utilizing Mobile computing, etc.

- Augmented Reality – AR would be amazing and innovative for TechU.com in a future pipeline. Our top priority is getting the current restructure completed. AR is a large investment piece that can be implemented at a later date, once we know that the redesign is successful, and need a true differentiation strategy.

9. **Section 8: Next Steps**

We would be able to take this project on in a phased approach:

1. Planning/Strategy (~Months 1-3)
    a. Identify the stakeholders/project management/implementation team
    b. Clearly define the objective – Align SaaS, Microservices Architecture, Mobile Communication/Computing, Big Data, AI/ML initiatives with TechU.com's strategic goal. Gather requirements, must haves, potential gaps, budget allocation, timeline, etc.
    c. Assess the current infrastructure, identify gaps – look at cloud infrastructure and identify any potential gaps we could see
    d. Identify Vendors – SaaS, Microservices, etc.
    e. Ensure security, regulatory, data privacy, etc. are all in compliance with the plans/selections

2. Infrastructure Migration (~Months 4-9)
    a. Transition existing learning platform to SaaS model, or update current learnings, enable AI, as well as other apps
    b. Deploy Microservices Architecture - rearchitect systems to modular, independent services – Implement containers (e.g. Kubernetes) for scalability, and enable continuous integration/continuous deployment for faster deployments
    c. Mobile Communication/Computing Optimization – Develop/enable mobile-friendly SaaS interface and enhance learning by enabling notifications, AI-driven chatbots, chat boards, etc.
    d. Big Data Integration -Implement AI-driven analytics for engagement, success tracking, course optimization, etc. and deploy predictive analytics to identify areas of improvements, at-risk students, etc.

3. AI/ML Implementation (~Months 10-15)
    a. AI Powered Student Engagement – Launch ML driven, personalized learning paths and courses, and any additional AI chatbots/virtual tutors

    b. Automate administrative tasks (admissions, finance, course recommendations) as well cybersecurity monitoring
    c. Business Intelligence/Big Data – Enhance data-driven decision making with real-time dashboards
    d. AI trend analysis and strategic planning

4. Testing, Optimization, and Scaling (~Months 16-18)
    a. Pilot testing for platforms
    b. Monitor system performance – optimize for efficiency
    c. Obtain feedback from students and instructors
    d. Expand features based on demand/feedback

5. Full Deployment and Continuous Improvement (~Months 19+)
    a. Fully migrate all learning/operation systems
    b. Scale capabilities with ongoing enhancements and trainings
    c. Monitor performance metrics
    d. Expand Mobile
    e. Utilize Big Data to refine and optimize course offerings

With an unlimited budget, we have an opportunity to enhance learning across the board for our students and instructors, as well as across the industry. This is a unique opportunity to drive industry-leading innovations that will solidify TechU.com's position as a premier destination for IT training. I look forward to discussing this strategy in further detail and gaining alignment on next steps.

Best Regards,
Lauren E. McFall
Chief Information Officer
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