The Digital Den Project: Designing the Classroom of the Future

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Project Management Section 02

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**Executive Summary**

**Abstract**

The Digital Den Project aims to develop a state-of-the-art classroom at Middle Georgia State University, designed to enhance student engagement through the integration of advanced technologies and modern learning tools. This project includes implementing AI driven software, interactive smartboards, and assistive technologies to create an accessible and interactive learning environment. Funded with a $1,000,000 budget, the classroom will incorporate 50 computers to accommodate students, with the addition of smart boards that help offer personalized lectures for students to drive their success. The project aligns with state and federal standards and plans to provide an educational experience that prepares students for future professional environments, while also ensuring a safe environment. That follows standard laws and ethics (Aey, 2018). Key project milestones include designing the classroom’s layout, procuring necessary hardware and software, and implementing a structured quality management system to maintain standards throughout development.

**Purpose / Problems**

The purpose of the Digital Den Project is to address the limitations of traditional classroom setups by developing a technologically enriched learning space. Current learning environments are somewhat limited or awkward in their technology use, a fact that was made apparent by the Pandemic when schools transitioned to online learning (Magazine & PLACEHOLDER, n.d.). By incorporating AI and interactive technologies, the Digital Den aims to create a future ready space that fosters participation, personalized learning, and technological fluency, all of which are essential for modern education.

**Literature Review**

The Digital Den Project draws upon multiple frameworks and theories related to project management, technology in education, and quality control standards. Research from Deming’s 14 Points on Quality Management and Lean Six Sigma provide the project’s foundation for quality assurance through the usage of quality planning and ensuring maximum efficiency in resource consumption (Socconini, 2023). The project also utilizes tools such as MagicSchool AI for helping instructors personalize their content (MagicSchool, n.d.), and smart board implementations to help students become more involved in the classroom. The expected outcome of this project is that technology can be revolutionized in a classroom environment and provide students with a nourishing learning environment to help them achieve success. Additionally, accessibility standards, such as those outlined by the ADA, guide the design to ensure an inclusive experience for all students.

**Discussion**

This project involves extensive planning and resource management, from designing the physical layout to selecting technologies that align with educational and accessibility requirements. The use of AI, such as MagicSchool AI, enables personalized learning by guiding students in their studies and tracking usage to prevent dishonest practices (MagicSchool, n.d.). Interactive smart boards enhance classroom discussions, allowing instructors to seamlessly share their screens. The project team follows a structured communication and feedback loop, ensuring that stakeholder input is incorporated into key project decisions. Regular inspections and adherence to quality control frameworks like Six Sigma ensure that both software and hardware are robustly tested before implementation. Constraints include budgetary limitations and a two-month completion timeframe, which are managed through effective procurement and vendor selection.

**Results**

The project is anticipated to deliver a fully functional, modern classroom equipped with AI-driven support tools and collaborative technologies that actively engage students. Expected outcomes include enhanced student performance, higher levels of participation, and improved retention of course material due to the interactive nature of the environment. Data will be collected on student performance in the Digital Den to evaluate its impact relative to traditional classrooms. Additionally, surveys from students and faculty will provide feedback on the usability and effectiveness of the new technologies. The project’s anticipated return on investment (ROI) will be demonstrated through both educational outcomes and potential societal benefits, as improved learning environments are shown to increase enrollment and academic success rates.

**Conclusion**

The Digital Den Project represents an innovative approach to modernizing the educational experience at Middle Georgia State University. By integrating AI, accessibility standards, and interactive tools, the project addresses the evolving needs of both students and instructors in today’s digital age. The team’s commitment to maintaining quality standards, timely completion, and budget management showcases a robust project management approach. The successful deployment of the Digital Den will set a precedent for future educational spaces, demonstrating how technology can be leveraged to create inclusive, engaging, and effective learning environments. Future considerations for this project include the potential scalability of its features across other institutions and additional funding to further enhance the classroom’s capabilities. Overall, the Digital Den stands as a model for the integration of technology and education, fostering an environment that encourages academic achievement and equips students with skills relevant to the digital workforce.

**Project Scope Statement**

The project scope statement acts as a guideline for all the components of a project and its life cycle (Schwalbe, 2023). A good project scope statement has several different components including the product scope, goals of the product, deliverables of the products, and any limiting factors that impact the project (Schwalbe). This definition of a project scope statement will be utilized as the project is broken down and analyzed using both the discussed factors of the project and the WBS created to demonstrate the product steps (Figure 1: Diagram of the WBS).

The name for the classroom is the “Digital Den” because it incorporates the latest technology for students and educators while promoting the experience of a communal space. The scope of the “Digital Den” project is the design of a new classroom that uses revolutionary technology to improve the classroom experience. This project will change both the physical and logical design of the classroom to provide a more learning enriched environment. There are several major designs of the classroom that this project aims to fix including the following: improved physical classroom design aimed at creating a more accessible and engaging environment (The Network, 2024); revolutionary software including smartboards with built in AI and functions to allow students to follow the professor’s lecture on their own computer; artificial intelligence built into the student desktops within the classroom; and extra software such as Microsoft Office that students may use to further their knowledge in a course.

For this project to be considered a success, the entire physical and logical design must be completed and utilized within the time frame set up within the Gantt chart (Figure 4: Gantt Chart for Digital Den). Furthermore, the software should be fully functional and offer students a more modern approach to learning through the new technologies implemented into the classroom.

**Project Deliverables**

Project deliverables are simply the outcomes produced from a project (Malsam, 2023). Anything produced from this project, whether it be the room design or the implementation of features, would be an example of a project deliverable as it is the direct outcome of the product.

This project will deliver a new classroom design utilizing features like artificial intelligence, smartboard technologies, teacher aides, and Microsoft Office to create an environment where students become more engaged and gain a more enriching learning experience. The artificial intelligence helps act to guide students in making good study habits outside the classroom, while the teacher aides and smartboards help students to learn in the classroom environment.

Artificial intelligence called MagicSchool AI will be implemented within each computer in the classroom to help guide students through their coursework. Utilizing this artificial intelligence will help limit what students can use this software aid for and reduce the likeliness of dishonest academic use, while also providing a record to the instructor of what the students searched using the AI engine (MagicSchool, n.d.). After implementing the features of MagicSchool AI, the team decided to utilize these additional controls to conserve academic honesty within the classroom.

The hallmark design of the Digital Den project are the dual smartboards utilized within the classroom. These digital boards feature touch screen technology and comcasting that allow instructors to share their screens from their personal laptop to the boards for students to follow along with Vibe Smart Board (*Vibe Smart Whiteboard S1 | All-In-One Collaborative Whiteboard for Business | Vibe*, n.d.). Additionally, students will also be able to connect to the board wirelessly to follow along at their desks for better viewing access to create a more personalized experience. The class is further impacted by the Classroom Teacher Aid that allows instructors to personalize their lectures to help keep students involved in the class and keep them engaged with the topics presented (*Classroomscreen Pricing | Create Fun and Engaging Lessons*, n.d.).

**Constraints and Assumptions**

Project assumptions are used to define any idea or component of a product that is assumed to be part of some given conditions (Malsam, 2022). The Constraints act as any limiting factors that obstruct the project. The only major constraint that this project possesses is that the classroom must be designed with a budget of $1,000,000. As for assumptions, the only thing assumed within the project is that the building that the project classroom was added to is already built. The entirety of the classroom, from floors and walls to any interior design, must be created and planned out. This includes any cabling and electricity, foundation work, any all interior design, all of which is detailed in the cost procurement section.

**Project Scope Statement**

|  |  |
| --- | --- |
| **Project Name** | Digital Den |
| **Project Objective** | The objective of this project was to build a technologically advanced classroom that utilized modern technologies to improve the current classroom. The team particularly wanted to emphasize using smart screen technologies and an implementation of AI to demonstrate some of the modern applications of information technologies that could be applied to the classroom. |
| **Project Deliverables** | * Classroom Design and Blueprints * Construction of the classroom * Installation of all physical features within the classroom (smartboards, desks, computer, etc.) * Software installation and testing * Documentation of the entire process and a means of storage for retrieval should the project be revisited |
| **Assumptions** | * All infrastructure and room design equipment will be available within the project timeline. * Vendors or outside entities will be able to provide resources and labor within the project timeline. * All aspects of the classroom are in compliance with regulations; ex. American with Disabilities Act (ADA). * Students and staff will actively utilize the technology provided. * All technology, computers, smart boards, etc, will be sustainable and accessible on the institution's network. * The Digital Den project will follow any laws pertaining to their instance by the guidance of their legal team. * The project will utilize the most effective costs when possible to reduce the amount of investors’ resources used to maximize efficiency. * All steps of the plan will be documented to ensure protection in the instance of legal issues or in proving what has been completed. * The team will create a means to store the project for future retrieval. |
| **Constraints** | * Allotted budget $1,000,000 * The project must be completed in 2 months. From September 5, 2024 to November 19, 2024. * The classroom must accommodate individuals with disabilities; physical, mental, or visual impairments. * Must fit up to at least 50 students and include additional space for an instructor and their teaching platform. * Computer hardware must have a lifespan of at least 5 years. * Venders or other outside entities must be available during the entire project timespan. Reasoning includes initial implementation and adjustments. If vendors are not actively available, other candidates will be chosen based on a stakeholder agreement through a meeting. * Minimizing disruption of other activities going on at the same time. * Stakeholders must be made aware of any components of the project exceeding the prior review threshold determined within the “Project Procurement” section of the Digital Den plan. (**PLACE TABLE FROM PROJECT PROCUREMENT HERE)** * Team must keep a constant communication with stakeholders (includes team members) to ensure that everyone is informed on what is happening with the project to ensure all members are properly aware of the project’s progress. * The team must set out a bid for all of the products obtained for the Digital Den project (detailed more in **PLACE TABLE FOR PROJECT PROCURREMENT HERE)** * The team must maintain quality throughout the project by utilizing its hybrid use of the Six Sigma and Deming’s 14 Points on Quality as detailed in the Quality Management section of the document. |

**Table 1: Project Deliverables and Outcomes**

A diagram of a company

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**Figure 1: Diagram of the WBS (Outline credit, (Schwalbe, 2023))**

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**Figure 2: Key Objectives at the beginning of the project**

A screenshot of a computer program

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**Figure 3: Current Set of Key Objectives and Their Completion Status**

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**Figure 4: Gantt Chart for Digital Den.** This is the original expected timeline of the project. <https://docs.google.com/spreadsheets/d/15wtKz5IOeBaw54fVKDUB_6IEMBOgKIkP2A2fSBb1CQU/edit?usp=sharing>

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**Figure 5: New Gantt Chart with the Current Estimated Completion Dates.**

Link for Easier Viewing: <https://docs.google.com/spreadsheets/d/1wNs3UvScn_Oyt10465fGdfRNTvRHA8IBnMofwk5C-k8/edit?usp=sharing>

**Stakeholder Register**

A stakeholder register is a descriptive table that lists the people involved in a project and attributes corresponding to these people (Taylor, 2023). These attributes explain different aspects of the stakeholder including their affiliation with the company, their relationship to the project, and their contact information (p. 1). This information is useful for gathering a list of individuals or companies that support a project so that any affiliations with the project are documented.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Title** | **Internal/External** | **Project Position** | **Contact** |
| Alex Cooper | Project Management Specialist | Internal | Project Manager | alex.cooper@mga.edu |
| Myron Morgan | Software Quality Assurance Analyst | Internal | Software Manager | myron.morgan@mga.edu |
| Devanshi Patel | Network Administrator | Internal | Networking Manager | devanshi.patel@mga.edu |
| Bailey Smith | Management Analyst | Internal | Project Coordinator | bailey.smith1@mga.edu |
| Braydan Thomas | Information Security Analyst | Internal | Software Security Manager | braydan.thomas@mga.edu |
| Zachary Weldon | Human Resource Specialist | Internal | Consultant | zachary.weldon@mga.edu |
| Doctor Spangler | CEO | Internal | Board Member | Scott.spangler@mga.edu |
| Doctor Koohang | Investor | External | Consumer | Alex.koohang@mga.edu |
| Legal Team | Legal Experts | Internal | Legal Consultants on Project | TheLegalGuys@gmail.com |
| Auditor | Goal Check | Internal | Ensures that Goals Are Met | TheGoalGuy@gmail.com |
| Quality Assurance Squad | Quality Assurance | Internal | Quality Assurance Regulators | TheQualityAssuranceGuys@gmail.com |
| Competing Team 1 | Competitor | External | Threat | Threat1@gmail.com |
| Competing Team 2 | Competitor | External | Threat | Threat2@gmail.com |

**Table 2: Stakeholder Registry (table outline credit (Schwalbe, 2023))**

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The explanation for each role is implemented in the last column of the chart.

**Figure 6: Stakeholder Registry** **Power and Interest Table**

**See Link:** [**https://docs.google.com/spreadsheets/d/1mDbGywFxvMKjTr0j2e-8Kpdrj1nx1WGPL\_u2BgZ-4Mk/edit?usp=sharing**](https://docs.google.com/spreadsheets/d/1mDbGywFxvMKjTr0j2e-8Kpdrj1nx1WGPL_u2BgZ-4Mk/edit?usp=sharing)

**Stakeholder Cube**

To keep track of power, influence, and interest of the stakeholders we have implemented a Stakeholder Cube. A Stakeholder cube is a three-dimensional model that combines a power-influence grid, a power-interest grid, and an impact-interest grid into one functional model (*A Guide to the PROJECT MANAGEMENT BODY OF KNOWLEDGE*, 2017 pp. 512-513). The power in the stakeholder cube is “the stakeholder’s ability to make things happen the way they want.” (Drumm, 2024) or how much authority they hold in a project; and a stakeholder’s influence is the overall control that they have on the project’s outcome.. Finally, a stakeholder's interest relies on what the stakeholder has to gain or lose from the stake they put in to the project (p. 1).

**Stakeholders**

**Alex Cooper (Project Manager)**

Alex Cooper acts as the project manager for the project. The project manager is the main overseer of the entire project, and this person is responsible for monitoring the project and ensuring that the project is successfully completed (Rittenberg et al., 2024). Alex Cooper’s main purpose is to ensure that the rest of the team performs their tasks well and that the project remains on the projected path to success. He will oversee the team and offer recommendations where appropriate to improve workflow and ensure that the team is well equipped and capable of creating the project. In addition, he will be responsible for ensuring that any external contributors are upholding their contractual obligations to the project and will deliver their products on time.

**Myron Morgan (Software Manager)**

Software managers are responsible for ensuring that software is tested and implemented properly, and that the software is maintained throughout its life cycle (geeksforgeeks, 2024). As the software manager, Myron Morgan is responsible for ensuring that any software implemented meets the company’s standard, and that all third-party software providers implement their product appropriately to the project. Furthermore, he will ensure that the software is regularly patched and that he can implement appropriate fixes or changes in the event of unforeseen downtime or provide support after the end-of-life period of the software has been reached.

**Devanshi Patel (Network Administrator)**

The purpose of a network manager is to maintain a network and all the components that compose the network, all while ensuring that the software functions properly in performing routine tasks (Ahmad, 2023). As network manager, Devanshi Patel will ensure that all the physical and logical design of the network is maintained and that all the components of the classroom’s network maintain a secure environment. To properly maintain this role, she will regularly monitor the devices in both the physical and virtual environment to ensure that they are well maintained. In the virtual environment, Devanshi will ensure that the network offers uninterrupted connection and that the features of the network are regularly updated. In addition, Devanshi will ensure that the servers are kept secure, and that there are no abnormalities in the system function or in network traffic.

**Bailey Smith (Management Analyst)**

The project coordinator’s purpose is to act as an advisor to the project manager, and this individual is responsible for doing some of the subtasks of a project manager such as communicating with stakeholders; managing records for the project; monitoring the project to ensure it maintains the triple constraints; and communicating with the team members of the project regularly (Bridges, 2023).. As project coordinator, Bailey Smith will be responsible for ensuring that the project manager remains informed on the team’s choices and that all external stakeholders are monitored and informed of the project’s status. In addition, Bailey will handle any other minor tasks that the project manager assigns to him to ensure that the project manager can focus on more demanding objectives.

**Braydan Thomas (Information Security Analyst)**

A software security manager is responsible for monitoring the network security and maintaining both prevention and response programs if a security breach occurs (Patrizio, 2023). Braydan Thomas will be responsible for monitoring the network as it is deployed to ensure that the network is maintained properly and that no abnormalities occur. This does not overlap with the role of Devanshi Patel as she can only monitor the network for abnormalities, but Braydan Thomas is trained to deploy preventative measures and properly respond to security incidents. In addition, Braydan is responsible for setting up cyber campaigns to teach employees the importance of cyber awareness and how it plays into maintaining a secure network environment.

**Zachary Weldon (Human Resource Specialist)**

Consultants are intended to provide additional insight into a project and provide feedback and ideas for project improvements. This role also acts as the researcher in that they are responsible for gathering information on a project or similar projects to be able to provide feedback (MConsultingPrep, 2022). As a consultant, Zachary Weldon’s responsibility is to observe the ideas and designs of the other internal members of the project and offer feedback. He is also responsible for drafting the documents that detail the project and acting as the “front side” support for the project. This entails pitching the project idea to external stakeholders or individuals within the market.

**Doctor Spangler (CEO)**

The CEO acts as the head over the entire company and establishes the goals of the company (CareerExplorer, 2024). As CEO, Doctor Spangler has the residing power to determine what the project covers and the funds that will be allocated to the project. He is the main entity that the project is reported to for ensuring that the project is properly maintained and ensuring that the project is presented with a clear purpose.

**Doctor Koohang (Investor)**

Doctor Koohang is a major investor into the project as he supplies Doctor Spangler with a large sum of money to allocate towards this project. An investor is any individual that offers money to a business or organization to make a profit (Hussain et al., 2024). These individuals are essential for a project as they ensure that the mandatory resources required for the project are available (p. 1). Furthermore, Doctor Koohang represents a body of other investors that could play a critical role in the funding of this project if it is received well.

**Legal Team**

The Legal Team is also considered a stakeholder within the project as they act as a body within the project to ensure that all portions of the project follow local, state, and federal regulations. The legal team is utilized here as a stakeholder specifically because they play a major portion in the project to ensure that it isn’t shut down or failed because it couldn’t follow guidelines. This concept makes a legal group essential to the entire life of the project.

**Auditor**

One of the biggest constraints on the project throughout its life has been time. To help maintain the projected dates set up by the project, an auditor was also added to the stakeholder registry. This person acts as a major influence on the project by helping the team to follow their preset deadlines and prevent portions of the project from being dragged out for an unnecessarily long time, allowing more time for other portions of the project to be completed. Additionally, the auditor kept track of major milestones in the project to help relay to the team where they were at in the time schedule to give them an idea of their time constraints.

**Quality Assurance Squad**

The quality assurance team acts as an extra stakeholder to the project as well because they ensured that the Six Sigma and Deming’s 14 Points plans adopted by the team were maintained throughout the project’s life. This group analyzed the project at each major milestone to ensure that these practices were being maintained throughout the project and ensured that any changes were made to reflect these qualities. Additionally, the quality assurance team offered feedback to the rest of the team to ensure that the members were working on quality control themselves and adopting the plans that the company wanted to be fulfilled.

**Competing Team 1 and Competing Team 2 (Competitors)**

Competitors are any opponents that could hinder or prevent a project from succeeding or being chosen (Market Business News, n.d.). Team 1 and Team 2 are grouped together here as they are both equally powerful competitors. Furthermore, Dr. Spangler also acts as the CEO for these two teams; and he will choose the best project for completing his tasks. Therefore, they are in direct competition with the Digital Den for a superior system implementation.

**Charter for the Digital Den Classroom**

|  |  |
| --- | --- |
| **Statement of Work** | The goal of this project is to design a classroom of the future that will help foster student engagement and enhance the student learning experience. With the assistance of our outside vendors, Digital Den will implement state of the art technology to not only improve the efficiency of student learning, but also increase the effectiveness of professors and their teaching methods. The classroom will include interactive tools, smart learning devices, and user friendly software. Devices like smart boards allow students to actively participate in studies. Projectors and smart boards will encourage students in group discussions and presentations. User friendly software ensures that programs are made to navigate easily for both teacher and students and will encourage independent learning. |
| **Deliverables** | A fully equipped prototype classroom integrating advanced technologies. Digital Den will implement training materials consisting of guides and videos to help students and faculty. These resources will serve as an aid to teach about new technologies and tools. Adobe Experience (2022) notes, “Your organization is responsible for delivering tangible and intangible products or services to clients and stakeholders at predetermined intervals” (p.1). A conclusive report on the effectiveness of the technology during testing, includes feedback from students and faculty. Feedback is especially important because it allows the team to make alterations, thus enhancing the project's overall success. |
| **Business Case Overview** | The business case is the document that justifies creating the Digital Den and how the resources allocated to the project are viable for development (Bridges, 2024). The business case for the Digital Den is intended to provide justification for the resources and labor estimates gathered in the cost procurement document. “The research you’ll need to create a strong business case is the why, what, how and who of your project (Bridges, 2024).” The sections will be broken down into several components consisting of the purpose of the project, the products acquired for the project, and the projected impact of the benefits of product implementation. This document is divided into several critical sections. First, it clearly states the purpose of the project, overacting goals, and the problem the Digital Den aims to address. Next, the business case will detail the products and resources to be acquired for the project. Then finally, the business case will project the impact and benefits of implementing these products and resources. “When you put in the work on a strong business case, you’re able to get your sponsors or organizational leadership on board with you and have a clear vision as to how to ensure the delivery of the business benefits they expect (Bridges, 2024).” |
| **Team Agreements** | Alex Cooper (Project Management Specialist):  The Project Management Specialist is the head coordinator for projects. The duties of a Project Management Specialist include coordinating the main details of a project including the budget, schedule, and scope [(*Project Management Specialists*, n.d.)](https://www.zotero.org/google-docs/?ZYU4r2). The Project Management Specialist also is the point of communication for the client and communicates the needs of the client to the project team. An important duty for the Project Manager is to delegate tasks to the appropriate team member to ensure that all tasks are covered.  Myron Morgan (Software Quality Assurance Analyst):  Based on the details outlined in the team charter, the role of Software Quality Assurance Analyst corresponds with the listed objectives because the position entails maintaining the quality of the software used. The goal of Digital Den is to provide students with an enhanced learning experience. Coursera suggests, quality assurance analysts are responsible for testing and analyzing the quality of software and systems (Coursera, n.d). While utilizing advanced and up to date technology, ensuring that chosen software is running efficiently is an important aspect of the learning and teaching process.  My teammates and I have agreed to uphold such values as integrity, diversity, and sustainability. As described below, the listed values depict an inclusive work environment in which all members can freely contribute information without resentment.. For instance, if an idea is not used it means it did not meet the current situation. Understanding that all information is useful information is important because ideas that are recycled.  Devanshi Patel (Network Administrator):  Network Administrator ensures stable operation of the computer networks. Network Administrators play an essential role in the Digital Den by managing and performing necessary needs of all network-connected devices (InfoSec Train, n.d.). Network Administrator ensures that all devices such as smart boards and projectors are seamlessly connected, if there is any network related problem arise during or after the implementation of the project then Network Administrator gives quick resolution by troubleshooting.(Coursera, n.d.).  Bailey Smith (Management Specialist):  With all the information that is received, this role involves keeping that information in order and to be changed accordingly. Stated in RMLD.com (2024), management specialist requires “Creating, editing, tracking, closing, analyzing and reporting work orders” (p.1).  Braydan Thomas (Information Security Analyst):  IT professionals are responsible for maintaining and troubleshooting computer networks to improve security policies and meet organizational requirements. They have an essential role in maintaining and troubleshooting computer networks to enhance the network’s security policies (Roles and Responsibilities of a Network Administrator, n.d.). IT professionals regularly update software, configure hardware, and ensure that all network components operate efficiently. They collaborate with other departments to understand the organization’s needs, provide technical support, and develop strategies to align the network infrastructure with business goals. Furthermore, they often train the staff on cybersecurity best practices and ensure compliance with industry regulations to safeguard sensitive data.  Zachary Weldon (Human Resource Specialist):  The primary focus of this position is to create a learning experience for the team and foster a growth mindset within himself and his fellow team members. These goals correspond with the four core values of Middle Georgia State University; which are stewardship, engagement, adaptability, and learning (*Mission, Vision and Values: Middle Georgia State University*, n.d.). |
| **Core Values**  **Team**  **University** | - Integrity: This is about leading a team with energy and confidence, setting an example for them to follow.“It takes a long time, effort, tough decisions and sacrifices to build the reputation of ethical leader with integrity”(Beslac, 2018). But when lacking integrity as a leader, the whole team falls apart.  - Diversity: “refers to the variety of perspectives, experiences, skills, and knowledge that people bring to a project”(“How Do You Include Diversity in Project Management?” n.d.).  - Sustainability: “Is meeting the needs of the present without compromising the ability of future generations to meet their own needs” (Browne, 2022). |
| **Enterprise Environmental Factors** | Enterprise environmental factors (EEF) can include product standards, quality standards, government standards, codes of conduct, risk databases, work authorization systems, etc. (UpGrad, n.d). UpGrad (n.d) suggests, “...most enterprise environmental factors are known to cast a negative impact or pose a threat to the project. These factors, conditions, or influences may be internal i.e. within the organization, or external i.e. outside the organization but need to be factored in by the project management” (p.1). It is important for project managers to be cautious during the project planning process because they must take into account all aspects that could drive or be a disruption. To effectively build a classroom such as Digital Den, government standards must be taken into account as well as stakeholders. Having stakeholders ensures that different perspectives are given and the proper resources are allocated. This can be considered an internal and external influence because stakeholders are taking risks by finding the project, therefore, it is important that managers mitigate factors for success. |
| **Organizational Process Assets** | The university's existing policies regarding project management, procurement, and technology implementation will guide the process. UpGrad notes that an asset is considered any useful entity, object, or property owned by a person or organization (Upgrad, n.d). This suggests that OPA’s are essentially the policies and processes that organizations use to help manage projects. In the case of Digital Den, OPA’s are significant due to providing standards for procurement plans, budgeting, room design, and ensuring the validity of outside vendors. Project Practical (2020) notes, “Organizational Process Asset (OPA) refers to all the implicit input or assets on processes used by an organization in operating their business. This may include business plans, processes, policies, protocols, and knowledge” (p.1). This emphasizes employee alignment with corporate culture, continuous improvement, and clear expectations throughout the project lifecycle. |
| **HR Plan** | Human Resource planning involves the organization of a team’s roles and relationships in project management [(*Human Resource Planning (HRP) Meaning, Process, and Examples*, n.d.)](https://www.zotero.org/google-docs/?P7qQ4w). Our team’s organization meets the criteria laid out in the structural framework of Boman and Deal’s four organizational constructions. In the structural framework the lateral coordination is a less formal and more flexible form of organization and is the form that our team follows [(Bolman & Deal, 2017)](https://www.zotero.org/google-docs/?1Dcy1K). The most effective aspect of the lateral form for our team is our regular meetings that we host via Discord. These meetings allow us to make sure that we are making good progress on all assignments while holding each other accountable. During these meetings we also coordinate our roles which is another aspect of the lateral form [(Bolman & Deal, 2017)](https://www.zotero.org/google-docs/?B92qma). We ensure that everyone is aware of their goals for the week and if necessary we assign task forces for the assignment. By coordinating roles and creating task forces we have been able to adapt to the workload of the assignments and ensure that everyone is doing their part. |
| **Closing** | The team plans to store and utilize the knowledge presented here and in their previous documents to help create a timeline of the knowledge gained. When the project was started, the team didn’t have much previous experience in this field, and data on time estimations and cost were purely speculative. When the team creates the lessons learned plan, they will take the different time and cost estimations, as well as their original and changed plans to determine the variation in the project and estimate how much more feasible the project became over the span of the project’s life. |

**Table 3: Team Charter**

**Work Breakdown Schedule (WBS)**

A work breakdown structure (WBS) is a type of document that breaks down and defines the project scope (Schwalbe, 2023). The main goal of this document is to provide a description for all the components of a project like resources, time, and finance so that a business has an understood plan for conducting the project. This Work Breakdown Structure will make use of the table style WBS as it is much easier to read the sections that are broken down. Each bolded section is a major category within the WBS, and each subsection under the bolded section defines a further process. Some subsections have categories within that further break down a process.

**The Digital Den**

**Initialization1.0**

Design a Team1.1

Brainstorm Project Ideas1.2

Kick-off Charter (Milestone 1)1.1

**Initialization2.0**

Determine Required Resources, Estimate Costs, SWOT Analysis2.1

Create Scope Statement to Determine Project Limits 2.1.1

Determine Costs of Required Resources2.1.2

Draft Classroom Design2.2

Create Scope Statement to Determine Project Limits 2.2.1

Research Prices to Determine Best Product Value2.2.2

Create a Bid for Potential Third Party Vendors2.2.3

Purchase Products to Build Classroom2.2.4

Take Inventory of Product (Milestone 2)2.2.5

**Designing3.0**

Construct Physical Space for Classroom3.1

Create Networking Design for Cabling within the Classroom3.2

Purchase Third-Party Software3.3

Test and Implement Software3.3.1

**Classroom Creation4.0**

Implement Physical Structuring of Building4.1.1

Construct Walls and Floor Outline Based on Given Dimensions4.1.2

Implement Safety Features (Milestone 3)4.1.3

Implement Networking Plan and Electrical Work4.1.4

Implement Floor Structuring4.1.5

Construct Roofing4.1.6

Construction of Interior Design (Milestone 4)4.2.1

Implement Accessibility Features in Accordance to American Disability Act4.2.2

Placement of Desks and Chairs4.2.3

Place Computers into Adequately spaced Environment4.2.4

Place Teacher's Desk and any Virtual Equipment4.2.5

Place Smart Boards Strategically4.2.6

**Testing and Feedback5.0**

Design a Tabletop Exercise to Test Expected Outcome of Software Elements5.1

Conduct Testing in Physical Environments to Ensure Electrical and Networking Functionality5.2

Obtain Feedback for Implemented Features5.3

Implement Bug Fixes for Software and Refine any Physical Design5.4

Further Testing of Software to Determine Any Final Bugs or Feature Updates Necessary5.5

Final Bug Fixes Implemented and Full Implementation of System (Milestone 5)5.6

**Closing6.0**

Presentation to Class6.1

Storage of Project for Later Retrieval6.2

**Figure 7: Tabular Breakdown of WBS (Template Design Credit (Schwalbe, 2023))**

**Budget Breakdown for Project**

Cost analysis is important to a project as it provides an estimate of the cost to complete a project and compares the cost estimate to a projected profit (Indeed Editorial Team, 2024). The cost analysis chart provided in Table 4, Table 5, and Table 6describes the general costs that will be generated from undertaking the project. These numbers should not be viewed as the exact cost as they are only estimates based on typical pricing of resources and wages for jobs.

|  |  |  |
| --- | --- | --- |
| **Resource Cost Analysis** | | |
| **Item** | **Quantity** | **Cost** |
| Cat6 Cable (N. McCord, personal communication, September 23, 2024) | 60 cables/ 20 faceplates | $15,360 |
| Corded Mouse (*Verbatim Corded Optical Mouse - Black*, n.d.) | 55 | $408.10 |
| Computer Monitor (*ViewSonic VA2456-MHD - 1080p IPS Monitor with Ultra-Thin Bezels, HDMI, DisplayPort and VGA - 250 Cd/M2 - 24" - VA2456-MHD - Computer Monitors*, n.d.) | 50 | $5,999.50 (Backup Monitor) |
| Wired Keyboard 4 (*Verbatim Wired Keyboard*, n.d.) | 55 | $515.35 |
| Classroomscreen Teacher Aid (*Classroomscreen Pricing | Create Fun and Engaging Lessons*, n.d.) | 55 accounts | $944.50 |
| Vibe Smart Board (*Vibe Smart Whiteboard S1 | All-In-One Collaborative Whiteboard for Business | Vibe*, n.d.) | 2 | $6,398 |
| Electric Wiring (Boris, 2024) | spans 2400 sq. ft. room | $24,000.00 |
| Microsoft 365 (*Compare All Microsoft 365 Plans | Microsoft*, n.d.) | 55 accounts | $1,000 ($22.00 per user per month) |
| Tables (*Economy Training Table - 60 x 24" H-6932 - Uline*, n.d.) | 26 | $5.850.00 |
| Chairs (*Plastic Stackable Chair - Black H-5678BL - Uline*, n.d.) | 52 | $3,380.00 |
| ViewSonic Monitor (bulkofficesupply, n.d.) | 51 | $6,177.12 |
| XPS Desktop (*Dell XPS Desktop - Computer Desktops | Dell USA*, n.d.) | 51 | $65,854.77 |
| Lenovo ThinkStation (Lenovo, n.d.) | 51 | $79,509 (Backup Computer Option) |
| MagicSchool AI (MagicSchool, n.d.) | 55 accounts | $5,497.80 |
| Dynamic 365  (*Finance Management Software Pricing | Microsoft Dynamics 365*, n.d.) | 1 account | $2160.00 |
| Fire Extinguisher (Uline, n.d.) | 1 | $605.00 |
| 2”x4”x12’ (The Home Depot, n.d.) | 154 14\* | $1,111.88 ($7.22 per board) (*Free Framing Calculator | Construction Calculators*, n.d.) |
| Nails (Lowes.Com, n.d.) | one 25lb. bucket | $49.98 |
| Drywall Sheets (3/8”x4’x8’) 17\* | 80 sheets | $1,120.80 |
| Door with Frame (*Checkout | CDF Distributors*, n.d.) | 1 | $1,980.33 |
| Carpet (Lowes.Com, n.d.) | 118 sheets | $6,315.84 |
| Primer (Lowes.Com, n.d.) | 13.7 gallons (*Paint Calculator*, n.d.) | $192 |
| Finish Paint (Lowes.Com, n.d.) | 24 gallons (*Paint Calculator*, n.d.) | $623.52 |
| Concrete Mix (*Quikrete 80 Lb. Concrete Mix 110180 - The Home Depot*, n.d.) | 4,000 Bags (*Concrete Slab Calculator*, 2023) | $24,800 |
| Fire Sprinkler (thepricer.org, n.d.) | 1,000 sq. ft. coverage | $36,000 ($15 top per sq. ft.) |
| HVAC System (homeguide.com, 2023) | 1 system | $52,800 |
| Ceiling tiles (porch.com, n.d.) | 2400 | $2,496 |
| **Total** |  | $265,640.99 |

**Table 4: Project Cost of All Hardware and Software**

**Cost Analysis Breakdown**

The cost analysis chart was broken down into three sections: one section for the resources; one section for insurance; and one section for contractors that are used. This separation is made to simplify the calculation of each category and allow for the categories to address the project’s particular needs. The measurements of the room are 60’x40’x12’, which is equal to 2400 square feet. This measurement was chosen after the team went into the field and measured the common classroom size to determine the best way to accommodate a classroom of 50 computers with the additional features that the Digital Den offers. Using the measurements of similar classrooms (900 sq. ft.) (Haapanen, 2024), the team designed a room of proportional sizing to include every part of the Digital Den plan.

Another important consideration that was factored into the project was state mandates. The state of Georgia has a particular set of rules that must be followed for a building to be legally classified and used commercially. These mandates include such things as mandatory air conditioning (Barge, 2014), fire alarms, fire sprinklers, and construction stability requirements (*Georgia State Amendments to the International Building Code*, 2018).

**Resource Cost Breakdown**

To make this breakdown easier to follow, this section will be broken down into three categories: room construction, hardware for the room, and software for the room.

Beginning in Table 4 with room construction, the foundation was priced utilizing a typical cost of concrete from a standard hardware store (*Quikrete 80 Lb. Concrete Mix 110180 - The Home Depot*, n.d.). Then, an online calculator was used to determine the number of concrete bags needed to complete the foundation (*Concrete Slab Calculator*, 2023). Next, the walls were set up using another online seller for fire resistant drywall (Lowes.com, n.d), and the quantity of 2’x4’x12’ boards was determined using a calculation that roughly estimates a 2’x4’ should be placed every 16 inches (*Free Framing Calculator | Construction Calculators*, n.d.). To figure out the number of tiles needed to cover the ceiling, the team utilized the high-end average cost of tiles ($1.04 per square foot) (porch.com, n.d.), and multiplied this number by 2400 square foot to determine the pricing. The carpet and all the paint supplies utilized a similar calculation as the pricing on each of these items was determined based on the area of the room. The door, provided by CDF Distributors, was designed to open from the inside only or be unlocked from the outside. This design is intended to keep students safe from any potential threats, as well as keep classroom equipment within the classroom (Timm, 2024). The HVAC system along with its coverage was purchased based on the set of requirements set forth by Georgia’s educational building guidelines (*Georgia State Amendments to the International Building Code*, 2018). Finally, the fire sprinkler and fire alarm systems along with their area coverage were also designed based on the Georgia educational building design requirements (p. 6-7).

The hardware in Table 4 was purchased based on the reasoning of the classroom’s needs. The main hardware feature of this classroom is the two Vibe Smart Boards (Table 4: Resource Cost Analysis). These smartboards act as a large desktop or tablet on wheels that utilizes the ChromeOS systems (*Vibe Smart Whiteboard S1 | All-In-One Collaborative Whiteboard for Business | Vibe*, n.d.). These boards possess a built-in touch screen for navigation, cameras to allow users to communicate in meetings, and a screenshare system for users to broadcast their devices to (p. 1). The approach of this design is to encourage students to become more involved with the class. In many cases, students perform better when they engage with the class (Reuell, 2019). These smartboards are intended to improve performance by giving students a place to write answers on and promote their ideas from. Additionally, the ability to screencast can help students share their ideas and enrich the learning experience by giving other students different perspectives on learning concepts. The desks, measuring 60”x24”, are spacious enough to allow 2 students per desk. From this assumption, 25 tables along with an additional table for the instructor will be required for the classroom. The chairs, computers, and computer accessories were also all purchased with the idea that 50 students plus one instructor would be utilizing the room and would require adequate accommodation. Any additional units calculated into the cost are provided to ensure replacements when necessary. The Dell XPS computers were chosen based on their economic pricing and overall performance. These computers feature an i7 14700 processor that is fully capable of typical classroom functions such as database systems, programs, and limited visual designs (Howarth, 2024). In addition, these particular desktops are equipped with a GeForce RTX 3050 graphics card that offers both high quality visual displays and a very economic price (Chacos, 2022). Finally, the ViewSonic monitors were chosen as a cheaper alternative simply because the abilities of the monitor is irrelevant as long as the computers have sufficient resources to complete any tasks that students have (Silwal, 2022).

The last section of the cost procurement plan is the classroom software. The standard software that the Digital Den will utilize is Microsoft Office (Table 5: Resource Cost Analysis). Microsoft Office acts as a resource for students to do many things such as create documents in Word; develop presentations in PowerPoint; check emails with Outlook; and much more (Rouse, 2020). The team decided to purchase 55 MS Office accounts, 51 for the students and instructor, and four additional accounts for any testing of services or additional accounts required. Currently, the main feature of Digital Den is its usage of artificial intelligence to change how the classroom functions. The provider of this technology will be MagicSchool AI (Table 1: Resource Cost Analysis). MagicSchool uses a form of artificial intelligence that is specifically made for classroom usage to enrich the learning environment both for students and for the instructors (MagicSchool, n.d.) This artificial intelligence is designed to reduce the burden on instructors by providing extra resources and learning opportunities to students through the use of generative AI (p. 1). The use of generative AI in the classroom is intended to offer students a controlled environment in which they may receive ideas or guidelines on homework without offering a solution to the work. After calculating the entire cost of all these resources, the estimated price of the materials will be $263,480.99 (Table 1: Resource Cost Analysis).

|  |  |  |
| --- | --- | --- |
| **Insurance Cost Analysis** | | |
| **Insurance Type** | **Coverage** | **Cost** |
| Technology Insurance (*Computer and Special Equipment Insurance*, n.d.) | All Computers | $784.30 Annually |
| Room Insurance (Kasperowicz, 2024) | Repairs of Room | $5,743 annually |
| Health Insurance for Students (Shinn, 2024) | Health of Students | $2,924 annually |
| Workers Compensation Insurance (Metz, 2024) | Injuries Caused to Employees | Aprrox. $.89 per $100 of Payroll |
| Tuition Insurance (Martin, 2023) | Covers Students Withdraw | 1% of Tuition ; $57.53 (*2024 Average College Tuition By State*, n.d.) |
| Professional Liability Insurance (Kagan, 2024) | Negligence and Mistakes Caused by Business | $1200 |
| Regulatory Inspection (Aey, 2018) | Inspection for Conducting Business | $900 |
| Chubb (*Get a Business Insurance Quote | Chubb*, n.d.) | Business | Options: $2,000,000 or less; or over $2,000,000 |
| The Hartford (*The Hartford Insurance*, n.d.) | Business | $67 monthly for general liability; $804 annually |
| Allianz Global Corporate & Specialty (*International Health Insurance | Personal | Allianz Care*, n.d.) | Business | $1,000,000 general liability insurance policy $40 - $150 per month; $1800 |
| **Total** |  | $14,212.83 |

**Table 5: Insurance Cost Analysis**

**Insurance Cost Breakdown**

Insurance is a major necessity of a school. Table 2 lists all the types of insurance that the Digital Den project would need to function properly. Insurance would protect against things like theft, property damage, employee injuries, student injuries, and other problems that may arise (Hotchkiss Insurance, 2023). The first two types of insurance to note are computer insurance and room insurance (Table 5: Insurance Cost Analysis). The insurance that would be purchased for the computers also covers any other technology utilized within the room and would cover this equipment in events like theft, fire, or general damage. This insurance is determined by charging $1 per $100 worth of insured equipment (*Computer and Special Equipment Insurance*, n.d.), hence the estimated cost of $784.30 (Table 5: Insurance Cost Analysis). Dwelling insurance is utilized to cover the cost of damages caused by natural disasters and other unforeseen circumstances (Kasperowicz, 2024). The insurance on the room was determined by taking the average cost of a $1,000,000 property in Georgia (p. 1), and utilizing this estimation to estimate the cost of insurance for the Digital Den room.

Student health insurance and worker’s compensation insurance plans have also been added to the classroom’s costs as these two types of insurance cover the health of the individuals that participate in the Digital Den (Table 5: Insurance Cost Analysis). The student health insurance is utilized to provide students without their own insurance some form of coverage if they become ill or injured (Shinn, 2024). This insurance is added to the project as the health of the student is highly important to the wellbeing of the Digital Den project. Worker’s compensation is utilized to pay for any medical needs of an employee if they are injured at work (Metz, 2024). This insurance is an obvious necessity to protect the Digital Den in case an employee is harmed within the classroom. The cost for this insurance depends upon how much an education facility pays its professors and staff, with an estimated cost of $.89 per $100 of payroll (p. 1).

Tuition Insurance will be calculated into the insurance plan as this insurance covers any students withdraws that occur throughout the semester (Table 5: Insurance Cost Analysis) (Martin, 2023). This insurance will allow the business to recover some of the costs to enroll students into the class. The cost for the tuition insurance was calculated by determining the average cost of tuition in the state of Georgia to provide an estimate (*2024 Average College Tuition By State*, n.d.). Professional Liability Insurance was also calculated into the total cost as this insurance protects the college from any lawsuits or other costs incurred due to their employees (Kagan, 2024). This insurance will benefit the college as it provides coverage for any mistakes made by its employees. Lastly, the last portion of insurance included here is the cost to have an inspector come check the design of the building to ensure that everything follows regulation. This cost was included into Table 2 as the inspector is regulatory to ensure that the building follows the rules set out by state laws and regulations (Aey, 2018).

**Insurance Agencies Breakdown**

Chubb Insurance Company offers a multitude of insurance options. These options include auto insurance, home insurance, and business insurance. For the sake of the technology classroom, the most ideal option would be business insurance. The Chubb Insurance Company notes that the two options for coverage are businesses that have revenue ranging from 2 million dollars or less up to 2 million dollars or more (Chubb, 2024). Regarding revenue, the amount of money that Digital Den is allotted is $1,000,000.

The Hartford Insurance Company offers a plethora of insurance options. These options consist of home, auto, and business. As previously mentioned with Chubb Insurance, the ideal option would be business insurance. They offer customized services for industries like construction, healthcare, and technology, with a focus on all- inclusive protection. Hartford Insurance Company estimates on average $67 monthly for general insurance (The Hartford, 2024). Given the allotted budget, this estimated monthly cost will be taken into consideration.

Allianz Global Corporate & Specialty offers the similar insurance options to the previous insurance companies. AGCS specializes in helping businesses manage complex and global risks. They focus on providing solutions, ensuring protection against potential losses from natural disasters, business interruptions, cyber threats, and other risks (AGCS, 2024). The estimated cost for insurance is around $40 - $150 per month. This is considering their general liability policy which is up to $1,000,000 of covered assets (p. 1). Considering Digital Den prioritizes its technology and software, protection against cyber threats and natural disasters would be ideal.

|  |  |  |
| --- | --- | --- |
| **Contractor Cost Analysis** | | |
| **Type** | **Contractor** | **Cost** |
| 4Front Energy (4Front Energy, 2022) | Jose Sarria Electric | $9,600 |
| Wiring (Jose Sarria Electric, 2024) | Jose Sarria Electric | $4,680 |
| Concrete (*Concrete Prices 2024 - How Much Is a Yard of Concrete?*, n.d.) | Concrete Contractor | $21,600 |
| Ceiling (*Learn How Much It Costs to Install a Ceiling - Compose*, n.d.) | Ceiling Contractor | $7,200 |
| Fire Alarms (Sellors, 2024) | Fire Alarm Company | $10,700 |
| Lawyer (*Lawyers*, n.d.) | Local Law Firm | $4,573.52 |
| Paint (*How Much Does Commercial Painting Cost?*, 2024) | Paint Company | $14,400 |
| Carpet | Carpeting Company | $28,800 |
| Compliance Officer (*Compliance Officers*, n.d.) | Digital Den | $18,331.20 |
| Management Analyst (*Management Analysts*, n.d.) | Digital Den | $28,408 |
| Brokerage Advisor (Financial Samurai, 2017) | Digital Den | $117,000 |
| Digital Den Team Cost (Cooper et. al., 2024) | Digital Den Staff | $116,536 |
| Additional Funding | Delays of Project | $50,000 |
| **Total** |  | $431,828.72 |

**Table 6: Contractor Cost Analysis**

**Contractor Cost Analysis**

The contractor cost analysis was created to clarify what contract work would be needed to complete the Digital Den. The wiring installation will be contracted to Jose Sarria Electric (Table 6: Contractor Cost Analysis). The pricing for the wiring was calculated at $1.95 per square foot over the 2400 square foot room (Jose Sarria Electric, 2024), which was estimated to cost $4,680. Lighting, which was estimated to cost up to $4 per square foot, was contracted out to 4Front Energy for approximately $9,600 (4Front Energy, 2022). This estimate includes all the necessary wiring to have the lights fully function. The next major contract would be given to a contractor to pour concrete for laying the foundation, which was estimated at $9 per square foot (*Concrete Prices 2024 - How Much Is a Yard of Concrete?*, n.d.), for the calculated price of $21,600 (Table 6: Contractor Cost Analysis). The next major category was ceiling installation, which was estimated to cost up to $3 per square foot (*Learn How Much It Costs to Install a Ceiling - Compose*, n.d.), for the total of $7,200 (Table 3). Fire alarms also had to be installed, so the Digital Den contracted that installation out to a local company that charged $3 per square foot of sprinkler coverage plus an additional $3,500 for the alarm (Sellors, 2024), with the total price coming to $10,700. The contract for painting the room was also contracted out, and the business that the contract was given to estimated a cost of $6 per square foot (*How Much Does Commercial Painting Cost?*, 2024), totaling to $14,400 (Table 6). The final contract that needed to be created was for carpeting. The cost to carpet the 2400 square foot classroom was estimated at $12 per square foot (*How Much Does Commercial Painting Cost?*, 2024), for a total estimated cost of $28,800 (Table 6).

Another small group of employees that were added onto this cost include the compliance officer, management analyst, and brokerage advisor. These three positions are grouped together as they all work together to ensure that the classroom created by the Digital Den maintains proper practices and that all procurements made by the team are done with a sound estimate in mind. The compliance officer is responsible for ensuring that the team follows all standard procedures under the law and creates plans for helping the team maintain these procedures(*Compliance Officers*, n.d.). The management analyst was added on to the original plan to help the team with procurements when they set up bids for contracting. This individual is responsible for aiding the team in analyzing data on the project and recommending solutions or reasonable bids for resources that the project requires (*Management Analysts*, n.d.). The final individual within this category that needs to be discussed is the brokerage advisor. A brokerage offers assistance to a company by helping them find the best partners to invest in to maximize the efficiency of their available resources (Hayes, 2024). A brokerage would offer a major benefit to the project to help the team connect with third party members to reduce the amount of investors’ cost and maximize a return on investment. In consideration of this potential return, the team has deemed the total potential profit from having a brokerage to be more beneficial than the cost incurred to hire the brokerage.

There are a few more costs that need to be addressed within this section. First the cost of a lawyer was estimated to be $4,573.52 based on the average pay of a lawyer in Georgia (*Lawyers*, n.d.). The lawyer would provide all of the legal proceedings necessary to construct the Digital Den and get approval for its operational use. The other major cost that must be mentioned here is the cost of utilizing the project members for this project. Utilizing the data from Table 2: Team Member Wages on the *Kick off Charter* (Cooper et. al., 2024), the projected cost for utilizing the Digital Den team over the project’s 10 week lifespan will be $116,536 (Table 6). This calculation includes the cost of the team to create the project and perform any additional services to ensure project success.

|  |  |
| --- | --- |
| **Total Estimated Cost** | |
| **Type** | **Cost** |
| Software and Hardware (Table 4) | 265,640.99 |
| Insurance (Table 5) | $14,212.83 |
| Contractors (Table 6) | $431,828.72 |
| Total | $711,682.54 |

**Table 7: Total Costs**

**Additional Considerations**

All goods will be purchased domestically to avoid additional issues such as customs, order tracking through multiple countries, country issues, and other delays caused by international shipping of goods (*What Is the Procurement Process*, n.d.). Without these things to consider, the expected time it takes to receive the goods for the Digital Den project is much sooner than international acquisition of goods.

The next major consideration is delays on goods. The original schedule for the Digital Den plan had an extra week that was not built into the schedule to help with any delays such as shipping or issues with completing tasks. This can provide a small buffer for waiting for the shipping of goods, but this time is ideally meant for any delays of the project members. Some hardware, such as the monitors and computers, do have alternative options built into Table 4 if the initial resources cannot be provided on time. This includes the Lenovo ThinkStation that is roughly $15,000 more than the original Dell computers (Lenovo, n.d.), and the alternative ViewSonic monitors that are slightly cheaper than the original selection (*ViewSonic VA2456-MHD - 1080p IPS Monitor with Ultra-Thin Bezels, HDMI, DisplayPort and VGA - 250 Cd/M2 - 24" - VA2456-MHD - Computer Monitors*, n.d.). The Software for this project is dependent on the computer hardware, so it is imperative to have backup options for these devices if they cannot be provided within the timeframe provided by the project. If any of the materials that are required for the project are delayed, the contractors will have to delay completing the job, but the Digital Den project has allocated an additional amount of $50,000 (Table 4: Resource Cost Analysis) to pay contractors to complete their work faster so that the project is still finished on time. This amount is based on 5% of the project’s total allocated funds to provide a buffer in the event of any unforeseen circumstances (Patil, 2024).

**Return on Investment and Enterprise Resource Planning**

The return on investment, or ROI, is a metric that shows how profitable a project was by weighing the revenue earned against the investments put into the project. There are two primary forms of ROI: anticipated ROI and actual ROI (*How to Calculate ROI to Justify a Project | HBS Online*, 2020). The anticipated ROI is typically calculated before kickoff. This calculation is used to gain a better understanding of the risks in a project, so it is often put through many different scenarios to produce a range of anticipated ROIs (*How to Calculate ROI to Justify a Project | HBS Online*, 2020). The actual ROI is calculated at the end of a project so the actual costs of investments can be used in the calculation. ROI is calculated using the following formula: “ROI = (Net Profit / Cost of Investment) x 100” (*How to Calculate ROI to Justify a Project | HBS Online*, 2020). For general contractors of a construction project the ROI is typically low, around 1%-5% (*How to Measure and Maximize ROI in Construction*, n.d.). The ROI is not strictly measured in financial value, and it can also be measured by its societal impact. For this project, the Digital Den will have a positive impact on the local area by providing an improved educational experience for students and professors that utilize the classroom. The ROI will be demonstrated to investors by providing a breakdown of the investment costs and comparing it to the revenue gained from the contracted work.

The Enterprise Resource Planning is a type of software that aids a business in managing finances across different areas such as procurement, project management, accounting, and more (*What Is ERP?*, n.d.-a). The Digital Den project plans on using Microsoft’s Dynamic 365 Finance to keep track of all financial records. By using Dynamic 365 the project will be able to track information from our supply chain, human resources, manufacturing, and finance all in one place (*What Is ERP?*, n.d.-b). The cost of Dynamic 365 will be $2160.00 for a year (table 1). This will allow the project to keep track of its investment costs as well as its revenue which will aid in presenting its ROI figures to the stakeholders and clients.

**Quality Management Plan**

Quality management plans are sets of guidelines that businesses follow to ensure that the quality of a project is maintained throughout its development (Senapathy, 2024). The quality management plan that this project utilizes is Deming’s 14 Points on Quality Management. Deming’s 14 Points on Quality Management are demonstrated in the following image.

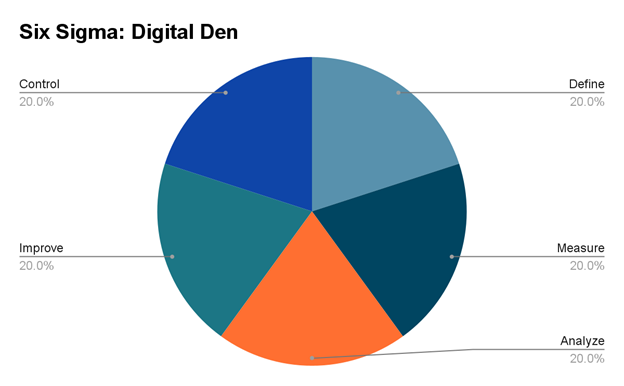
A diagram of a company's process

Description automatically generated with medium confidence

**Figure 8: Deming’s 14 Points on Quality**

Image credit: (*Deming’s 14 Points: Total Quality Management Principles | ASQ*, n.d.)

This plan was chosen as it promotes a growth mindset within the company and promotes a unified approach that displays the significance of working together. The growth mindset is a belief pattern that supports the idea of continual improvement (*Growth Mindset | Psychology Today*, n.d.). In the realm of this project, the growth mindset indicates the ability of the project to continually evolve into a better project with a defined purpose and user benefits. In the following sections, each part of Deming’s 14 Points will be applied to the Digital Den project to determine how the project will maintain quality throughout its lifecycle.



**Figure 9: Six Sigma Graph**

This graph shows an equal distribution of focus for each aspect.

**Purpose**

The Digital Den project was created to improve the traditional classroom and provide new technologies for students to improve their performance. The share screen technologies and built-in AI provide powerful tools that students may use to develop their skills and generate ideas for their work. This technology is expected to provide improved grade averages for students and help them retain their knowledge even after they have passed their courses.

**Philosophy Adoption**

The second step of Deming’s 14 Points is to receive the new philosophy (*Deming’s 14 Points: Total Quality Management Principles | ASQ*, n.d.). This involves implementing changes to improve the current methods utilized so that projects can become more adaptable (“Operational Scorecard, MIS System, Total Quality Control, Balanced Scorecard Framework,” n.d.). The Digital Den implements adaptability through its usage of screen sharing technologies. Students may struggle with coming to class due to personal issues, work issues, or natural disasters. To meet these challenges, the Digital Den seeks to implement screen sharing technologies into the courses that will be offered within the class shell to provide students with additional learning opportunities. The intended goal of these technologies is to offer additional resources for students to have more opportunities for advancement.

**Removing Inspections**

The third point of the 14 Points is to remove the use of inspections to promote quality (*Deming’s 14 Points: Total Quality Management Principles | ASQ*, n.d.). The intended meaning here is that the product should be created with such high standards the first time that further testing of quality should be minimal or zero to save time and money (Neave, 1987). Product testing may not be fully eliminated, but the product should be carefully molded during its production to ensure that it doesn’t fail and require multiple fixes to function properly. To achieve this intended goal, the software that is utilized by the Digital Den has been studied in similar environments to understand how it functions and how well it can accomplish its purpose. As an example, the reason that screen sharing was used for the Digital Den was due to the broadcasting abilities that are possible with screen sharing (*A Teacher’s Handbook on Screen Sharing, Mirroring, and Casting*, 2022). Screensharing is not limited by proximity like screen casting would be.

The software that will be implemented into the project such as Magic AI and the Microsoft Office products will be tested by the project’s software quality assurance analyst to ensure that they function properly for the future students of the Digital Den. Once the software has been thoroughly tested to guarantee that there are no loopholes or bugs within the software, then the products can be implemented into the classroom environment. **In the field, the team has noted some issues with touch screen smart boards and a lack of quality. In one instance, a classroom utilized a smart board that did not respond well to touch and often lacked the complete functionality that the smart boards need to offer touch screen capabilities.** When the team acquires the smart boards, the boards will be inspected to ensure they work properly and meet a working standard to ensure that full functionality will be present throughout the technology’s life cycle.

Testing in this particular environment is not completely avoidable as the team is procuring third party software, but testing can be reduced by verifying with the software provider that full functionality and support is guaranteed. In addition, understanding how the products typically function in the field can provide insight into the intended purpose of the product to provide maximum usage out of it.

**Work with One Provider**

The purpose of working with one provider is to provide cheaper products by developing a relationship with the provider (Neave, 1987). The idea here is not to focus on buying the cheapest products possible to satisfy a need, but to develop a partnership with businesses that produce high quality products and have similar business practices (p. 565). The overall cost of the products can be reduced both by creating partnerships with the company and by not having to spend resources each time products are procured to ensure that the products meet a standard. One such way to determine that a provider is maintaining their quality is to perform audits. Auditing third party providers is essential to determine if they maintain the standards that the project possesses (Tamboly, 2024). The team working on the Digital Den has contracted out to the same provider for products when applicable. For example, Home Depot would be utilized to procure the materials needed to construct the Digital Den’s physical location. The intended goal is to promote relations with Home Depot for any future projects to further reduce costs. A similar plan was intended for the desktops that would be implemented into the project as the provider, Dell, would potentially be more willing to contract work out to the team’s future projects.

**Always Improve**

Continual improvement on a project is critical to the project’s success as this promotes an evolving quality as more information is revealed (“Operational Scorecard, MIS System, Total Quality Control, Balanced Scorecard Framework,” n.d.). As a product is utilized over time, unexpected problems can be found by users (p. 1). This is a normal part of product development as it is simply impossible to know all the possible issues of a software. The Digital Den will promote a continually improving environment by revising older plans as the team’s visions change. Originally, the team wanted to do hologram systems as this would provide a revolutionary advancement to classroom technologies. When this software was deemed too expensive and impractical, the team had to revise their plans of software and hardware implementation to meet their new goals.

**Onsite Training**

On the job training is simply training offered to employees so that they understand what they are doing (Neave, 1987). Training is typically tailored to fit business needs by providing employees with the necessary skills to complete their job. This training begins with the basics needed to do a job, but these basics evolve into much greater things as this training can prepare employees for leadership positions (Campbell, 2023). This project will also seek to provide resources to train school faculty in using the new software utilized by the Digital Den. Trainers may be utilized to help teachers and other faculty become familiar with software capabilities so that they can provide the maximum benefits to students within the classroom. This training that is offered to faculty has a bigger goal than just teaching the basics of software though. All training that faculty would receive is intended to help them better themselves and become leaders for their peers. This idea of providing training with the expectations of creating leaders helps to present the seventh point of Deming’s quality management system, leadership.

**Leadership**

Leadership is required for providing faculty with a person to report to that can drive them to success (Neave, 1987). Leadership is used to better employees and provide feedback on their actions to make the employee better. The goal of any leader should be to help their colleagues become successful and create leaders out of them. The training program that the project leaders of the Digital Den have chosen for creating leaders is the Dale Carnegie program. This learning course is designed to create leaders that can handle dynamic problems, manage stressful work environments, and create a better quality of life for other employees (*The Dale Carnegie Course – Dale Carnegie Training of Central Wisconsin*, n.d.). The purpose of creating leaders with this plan is to provide instructors who excel at dynamic change, which is essential for a classroom that uses technologies that aren’t typically utilized within the classroom. This helps create opportunities for future software implementations as these leaders will be able to adapt to new challenges and drive their other colleagues to success.

**Alleviate Fears**

Fear is the opposite of what quality management represents as fear suppresses a growth mindset. Colleagues that fear leadership have a negative impact on the project as they will be too afraid to develop and portray leadership qualities (Neave, 1987). Leaders should not insight fear as this does not allow colleagues to reach their true potential. To help the staff of the Digital Den become more comfortable with their leadership, the Digital Den project proposes additional training to help members become comfortable with their leaders. One such way that may help colleagues become comfortable with leaders involves informal team exercises. A great example of this is the marshmallow challenge. The purpose of this challenge is to provide colleagues with a chance to demonstrate how they would solve problems utilizing available resources (Fabor, 2023). The marshmallow challenge provides a team with a limited number of resources that they must use to balance a marshmallow (p. 1). Games like these help individuals to build connections and create a sense of trust amongst team members. The intended outcome would be that colleagues can rely on their leadership to help them achieve success and that leadership acts as an ally to help their team.

**Eliminate Group Barriers**

This step involves breaking apart the traditional group mentality. The specific word used in Deming’s 14 Points is “silos” (*Deming’s 14 Points: Total Quality Management Principles | ASQ*, n.d.). The term silos presents the connotation of isolation, or the idea that there is no interaction between groups. Groups that create and carry out the project should not be isolated as it is the goal of all members of the project to see it succeed. Therefore, all members of the project should work together toward one goal to ensure that the project has the highest form of success that it can achieve (Neave, 1987). The Digital Den has created plans in such a way that any member of the team can step in to help others that are overwhelmed or untrained on properly performing their task. For example, if one member of the team is incapable of checking all of the software that the project utilizes, then other members of the team have proper training to step in and offer additional aid to complete this task. This also acts as another form of time management as that employee would act as a backup option to help the software analyst and thus prevent any delays.

**Slogans and Target Goals**

The concept that this point presents is to not provide too much expectation for an employee without providing the proper resources or else the employee may become overwhelmed (Neave, 1987). A project should avoid providing pointless phrases and harsh goals that could hurt an individual’s overall productivity. To avoid this, leadership should offer reasonable goals and all the materials that employees need to be successful. The Digital Den has ensured that all of these resources are available by providing training resources for leadership and revising goals to ensure that all expectations are reasonable and not pushing employees to hard. Additionally, if members of the project feel overwhelmed, they have other members that are equipped to help with their workloads to promote a more team-based environment that nurtures success.

**Remove Numerical Goals**

This idea presents the need to remove explicit numbers that provide a goal and focus on developing leadership to guide colleagues into improving quality (“Operational Scorecard, MIS System, Total Quality Control, Balanced Scorecard Framework,” n.d.). In other words, the goal is quality over quantity. When numerical goals are set in place, one issue that may arise is corner cutting to achieve goals, which can harm the overall product quality. To prevent this, the Digital Den has set rigid time goals and milestones that are earlier than expected delivery dates to prevent a reduction in quality (*7 Ways to Improve Project Quality*, 2023). This focus on leader set goals will help the project maintain a smooth path that prevents quality reduction and ensures that leadership maintains a rigid goal to keep other team members on track to accomplish their goals.

The LEAN Six Sigma plan discussed further in the quality management plan also offers additional resources to prevent quality reduction. LEAN Six Sigma adopts several process in manufacturing such as a Just-In-Time producing system and proper resource management to prevent quality reduction and ensure maximum time efficiency (Socconini, 2023). This process will further benefit the team in ensuring quality by preventing waste of resources while ensuring that everything is present for the team when they need it. Additionally, using resources efficiently will prevent waste of stakeholder investment, allowing the team to return as much profit as possible back to the stakeholders.

**No Merit System**

One major issue that can affect employee production is a merit system such as annual raises for performance (Neave, 1987). This reward by doing potentially discourages other employees that may not have performed as well, and this may prevent those employees from improving their status. Instead, a company should focus more on praise of the work that employees do so that they may take pride in their work and continually seek to improve (p. 568). The Digital Den project doesn’t offer bonuses money to employees, and the project highlights the major goals of all team members without singling out any individual. This helps to eliminate the perception of bias and reminds all team members that each of their contributions is significant to the success of the project.

**Educate and Self-Improve**

This idea is similar to the training point, but the main focus here is that employees should always be knowledgeable and aware of new concepts and materials that change the work environment (Neave, 1987). Within the Digital Den, members are expected to be aware of the purpose of software utilized within the project and be able to explain the software’s uses. To ensure that members are kept up to date with the latest technology, exercises will be conducted to test the team’s awareness of the software that they promote, while also providing the team with information on new technologies as they become available to the market. The training programs that were mentioned in the sixth point could also benefit team members here as the training would stand as a reminder of the resources that are expected to be implemented within the classroom environment.

**Implement These Principles for All Members**

The final step of Deming’s 14 Points of Quality Management is guiding all members into using this quality management plan and ensuring that each point in this plan is constantly implemented (Indeed Editorial Team, 2024). Management must keep the team on track and guided under the 14 Points to help achieve success throughout. To maintain this goal, the team has set quality milestones that must be met before moving to the next step of the project. As an example, once the team has created an acceptable cost procurement plan, they may then move on to purchasing the equipment to create the project. Revisions may be required as the project moves into the later stages of development, but this is necessary to ensure that the overall project quality is upheld.

**Alternative Plan: Six Sigma**

**How Will Success Be Measured**

One of the first methods that were created for measuring success in the Digital Den project was milestone planning. In this instance, the team had created major milestones such as acquiring all the hardware to construct the project, implementing the software, and presenting the project to help the team maintain a timeframe for finishing the task. Another major component to the team’s success was providing information to all members of the team so that everyone is aware of the different parts of the project so that silos are broken down and uniformity exists. To measure the overall success of the project after its deployment, the team plans to gather data on students that participate in the Digital Den classroom and compare their performance in class with students in the traditional classroom. This comparison along with a cost analysis on the traditional classroom will help determine the overall success of the project. If the project doesn’t perform as expected, further refinement may be done to add new technologies or plans into a curriculum to further engage students to aid in their success.

**Quality Management for Digital Den**

Created by Motorola engineer Bill Smith, Six Sigma is a methodology used to improve quality and manufacturing processes. The goal of this methodology is to assist project managers and their teams by minimizing the possibility of defects and variations. Suzie Creighton notes, “This increase in performance and decrease in process variation helps lead to defect reduction and improvement in profits, employee morale, and quality of products or services” (Creighton, 2022). Utilizing Six Sigma or Lean Six Sigma depends on the organization's goals and what they prioritize. For example, A Mile Institute suggests, “The length of a Six Sigma project is nearly 2 to 6 months and for a lean, the project length is 1 week to 3 months. This is because Six Sigma projects have higher intricacies as compared to the Lean Six Sigma projects” (A Mile Institute, 2018). Based on this information, the time frame that Six Sigma suggests for completion is ideal for Digital Den. Given that this project started in early September and is set to last until mid-November; it is expected to be completed within 2 and a half months. While Six Sigma does not directly focus on equally distributing the five areas, Define, Measure, Analyze, Improve, and Control, in terms of this project the graph below indicates that each aspect will be considered equally.

**Quality Assurance Table**

|  |  |
| --- | --- |
| Task | Description |
| Design | Design additions and alterations will be discussed weekly as certain additions or changes may impact key milestones and overall deadline of the project. |
| Inspections | It is crucial to the success of the project that inspections are conducted to ensure compliance with mandatory regulations. For example, Digital Den must follow rules regarding the American with Disabilities Act (ADA) and fire safety guidelines. As well as technological aspects, it is especially important to check if software meets the recommended standards. Inspections must be conducted as needed. |
| Supplier Audits | Ensuring the quality of third-party vendors is important because they supply the materials and equipment needed to construct Digital Den. Delteck notes, “supplier audit will identify any gaps in the supplier quality process, manufacturing process, engineering change process and shipping process, allowing a manufacturer to close the loop on any deviations, nonconformances or delays” (Deltek, n.d.). This indicates that having quality third party vendors allows the project process to remain in the allotted time frame and meet the set objective. |

**Table 8: Quality Assurance, LEAN Six Sigma**

**Quality Control Table**

|  |  |
| --- | --- |
| Control Type | Description |
| Hardware/Software Testing | It is essential that milestones for testing are met. Computer hardware and software must be tested to ensure that it meets the recommended standards. IEE Computer society states, “Software testing reduces project risks related to software quality, security and performance. For example, software defects can lead to system failures, data breaches, slow performance and other significant impacts” (IEE, 2024). Computer hardware must be evaluated for sustainability, and the institution's approved software must be properly implemented. |
| Acceptance Criteria | This phase wraps up the project process as the final list of goals or objectives of the project are to be checked off. Key questions to consider are, does the classroom meet compliance and regulations? Does it accommodate 50 computers/students? Is the technology implemented sustainable? etc. |

**Table 9: Quality Control, LEAN Six Sigma**

**Deviation and Variations Table**

|  |  |
| --- | --- |
| Problem | Resolution Description |
| Defect or Variation in a Deliverable | When a defect is found in a deliverable, a clear process is followed to minimize the risk of it occurring a second time. The defect is documented with details about what went wrong. Regarding the software that is to be implemented into Digital Den’s devices, Visible notes “Defect management is not only essential to ensure a high-quality product but also helps to save time and costs associated with fixing defects” (Visible, 2024). An analysis is done to figure out why the problem occurred. Once the cause is identified, steps are taken to fix the issue; this may consist of reworking the deliverable or adjusting the process. The deliverable must be tested again to ensure that the issue is resolved. |

**Table 10: Deviation and Variations, LEAN Six Sigma**

**Project Procurement Plan**

The project procurement plan is the document outlining all the components needed to complete the project, the vendors that will be used for the project, and the delivering processes that the products will use (Brush, n.d.). The purpose behind the procurement plan is that it details all the processes required to get vendors approved and detail the contracting process behind the vendor plans (p. 1). Once the procurement plan is set up, the team will be able to demonstrate how the vendors will be utilized to complete the project.

**Summary of the Procurement Plan**

The Digital Den project has work contracted out to multiple different parties so that the project can be completed professionally and within a timely manner. The intended goal is to have contractors working side by side to streamline the construction process and ensure that each component of the project, both physical and logical, can be synchronized to maximize time efficiency and product usage. The team has chosen to work with multiple vendors within the United States so that their work can be completed under national laws and regulations to help avoid any additional costs and considerations of utilizing foreign resources and the federal laws associated with these resources. The Digital Den project has also allocated an additional $50,000 as stated in the contractor cost analysis within the project cost analysis documents (Cooper et al. 2024). This additional money was set aside in the event that additional contractors were required to prevent delays. Additionally, the project has offered additional responsibilities to some of its members for quality checking components such as network structuring and code structuring to help reduce the costs of the entire project. The intended outcome is that the Digital Den will improve the traditional classroom environment and provide an enriching learning environment, all while keeping an affordable cost and maintaining regulations to make the project efficient and safe.

**Procurement of Resources**

The following chart will provide a brief description of the products and vendors that will be utilized to complete the Digital Den and the requirements needed to procure the resources. Note that for procurement type, almost every procurement type is classified as national competitive bidding (NCB). This bidding type is used when a project is only interested in contracting within its country, as opposed to international competitive bidding (ICB) which allows contracting work to international bidders (WallstreetMojo Team, 2024). Additionally, a prior review threshold is any limitation is any limit that the project cannot surpass without additional considerations by project leadership (Radhakrishnan, 2024). These limitations are set to prevent surplus costs and aid in monitoring and preventing additional delays (p. 1).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Resource Table** | | | | |
| **Resource** | **Procurement Type** | **Purpose** | **Prior Review Threshold** | **Additional Considerations** |
| Foundation Laying | NCB | Groundwork of Project | $25,000 | Potential Cost Increase Dependent on Laying Wiring in the Floor |
| Wall Framing | NCB | Exterior Framing of Project | $25,000 | Requires Foundation |
| Wiring | NCB | Power to Facilities | $15,000 | May Be Completed with Foundation Laying |
| Lighting | NCB | Illumination of Classroom | $15,000 | Constructed Simultaneously with Wall Frame and Ceiling |
| Ceiling | NCB | Protection of Supplies from Elements | $15,000/ 6 Weeks Total Physical Construction Time | Final Step for Physical Outline of Room; Analysis of Project Progress Here |
| Fire Prevention Services | NCB | Regulatory Compliance for Fire Hazards | $13,000 | Must Follow Local Regulations Involving Safety |
| Paint | NCB | Wall Coverage/ Cosmetic | $20,000 | None |
| Carpet | NCB | Noise Suppression | $35,000 | Must Provide a Level of Sound Suppression |
| Classroom Software | NCB | Provide Learning Environment | $5,000 (7442)/ 2 Weeks Total Implementation Time | Another Major Milestone; Additional Resources from Project Team Will be Provided |
| Specialized Hardware | NCB | Displays Software and Facilitate Learning | $50,000 (78,429) | Resources from Project Team Are Provided to Aid in Install |
| Additional Supplies | NCB | Furnish the Room with other Necessities | $12,000 (10758) | Additional Costs Could Incur Based on Delivery/ Install |
| Technology support | In-House | Provide Support for Additional Code and other Services | $50,000 | Provided by Team Members; Additional Costs and Resources after Project Life Are Required |

**Table 11: Resource Procurement Analysis**

The prior review thresholds for each resource were determined based on the costs estimated for the product in the project cost analysis document. In most cases, the threshold was set above the cost of product installation as the amounts discussed for installation as the amounts suggested were only average estimates and should only be reconsidered if the amount is grossly over budget. For the classroom software and specialized hardware, the threshold was set below the projected cost so that the team and any involved stakeholders may further discuss the costs to ensure that all parties agree on the expected costs of these products. This was done specifically so that additional considerations could be made on the software and hardware used to analyze the specific needs of each component and determine that the products are essential to the Digital Den Project. Finally, the resources within the table that are given time frames to complete are granted these as they act as major milestones within the project’s completion. For example, if the finishing procedures are not being implemented on the ceiling within 6 weeks of the physical construction of the classroom (Table 11: Resource Procurement Analysis), then the entire project’s timeframe may need to be reevaluated to determine the feasibility of the project.

**Expected Dates and Authorizations for the Procurement Plan**

The following table will break down the project dates for acquisition of the resources, the starting dates for bidding, and the funding authorizations for the project. The dates provided for bidding and acquisition are estimated based on the projected dates for completion and may vary slightly based on any requirements for the project or external factors.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Bidding and Monetary Authorizations** | | | | |
| **Product** | **Projected Bid Opening** | **Contract Acquisition Date** | **Monetary Authorization by Stakeholders (Before/After Acquisition)** | **Preferred Contractor (If Applicable)** |
| Foundation Contractor | 9/9/2024 | 10/1/2024 | Before |  |
| Wall Frame Contractor | 9/9/2024 | 10/1/2024 | Before |  |
| Wiring Contractor | 9/16/2024 | 10/3/2024 | Before | Jose Sarria Electric |
| Lighting Contractor | 9/16/2024 | 10/3/2024 | Before | 4Front Energy |
| Ceiling Contractor | 9/16/2024 | 10/3/2024 | Before |  |
| Fire Prevention Contract | 9/25/2024 | 10/5/2024 | Before |  |
| Paint Contract | 9/25/2024 | 10/7/2024 | Before |  |
| Carpet Contract | 9/25/2024 | 10/7/2024 | Before |  |
| Software Contracts | 10/1/2024 | 10/22/2024 | Before |  |
| Hardware | 10/1/2024 | 10/20/2024 | Before |  |
| Additional Supplies | 10/1/2024 | 10/15/2024 | Before |  |
| Technology Support | N/A |  |  |  |

**Table 12: Breakdown of Bid Dates and Acquisition Estimates**

This table describes the different types of contracts that will be setup based on the project’s needs. The dates implemented here are projected based on the expected project work dates set by the WBS that the team made in the Scope Statement. These times are subject to change based on the outcome of the project, and the delivery of goods. Additionally, another tab was added to discuss when the team should be allowed to purchase these items based on the stakeholder’s financial resource allocation. The project must receive consent from its stakeholders prior to spending their resources so that stakeholders may have an active role in how their resources are being allocated.

The final consideration that the project should account for are any issues such as delays in the delivery or additional time for bidding. If the contractor that won the bid delays work, the team will decide amongst the other top bidders to determine who the work will be contracted out to. Time is a major constraint in this project and cannot be wasted on contractors that severely delay work. Another major issue that may come up is stakeholder approval for monetary usage. To avoid this problem, the Digital Den Team will provide a projected cost estimate to prevent the expected cost payout from being delayed. If the cost to hire a contractor goes significantly over the projected cost, then the stakeholders can determine if they want more of their resources to be allocated toward the portion of the project. Finally, if the bidding time is not sufficient to find a contractor, then extra time has already been built into the schedule to act as a buffer to prevent major delays.

**Project Management Consultants**

A project management consultant should be utilized for the project as they have background knowledge on how projects should be carried out (Sharma, 2023). These individuals offer additional insight into the different aspects of project management such as following scope and time constraints, offering additional recommendations that the project could utilize to be more successful (p. 1). The following table will discuss some possible consultants and detail a threshold amount where the stakeholders must agree on funding the cost.

|  |  |  |  |
| --- | --- | --- | --- |
| **Consultant Table** | | | |
| **Consultant** | **Purpose** | **Threshold** | **Comments** |
| Project Management Consultant | Offer Additional Insight into Project Process and Create Improved Solutions (Sharma, 2023) | $25,000 | Mandatory consultant that should be utilized by the team to improve project performance |
| Compliance Consultant | Ensures that the Digital Den Company Follows Standard Procedures and Laws (Remlin, 2024) | $20,000 | Recommended as this position could offer additional insight into legal matters and work closer with the team than a lawyer |
| Financial Consultant | Assists in Controlling the Project’s Financial Components (Schwartz, 2023) | $15,000 | Optional: may be beneficial based on budget considerations and recommendations for stakeholder investment |

**Table 13: Consultant Breakdown**

Each consultant listed here has been considered beneficial resources that could help the project based on the project’s needs. A project management consultant could give the Digital Den team additional considerations based on communications with other members within the company and prior knowledge of projects and the resources they require to succeed (Sharma, 2023). This consultant could benefit the Digital Den project immensely as the team has limited knowledge on the entire project process, and could benefit from professional experience of another individual. The threshold for this position was calculated based on the average cost at $19,376.40 for the duration of the project (*Project Management Specialists*, n.d.). Another estimated cost suggested that the cost of a consultant could be as much as 15% of the project’s cost, totaling to $82,191.50 (*Project Management Fees | Hourly & Consulting Rates | Salaries – OCM Solution*, n.d.). A $25,000 threshold is utilized to notify the Digital Den team to discuss financial options with investors if the cost for advisement reaches such a large amount.

Compliance Consultants are suggested for the project as they can work with the team directly, providing additional resources for the team to ensure that every part of the project is within legal jurisdiction (Remlin, 2024). This consultant would compliment the Digital Den’s legal department as the lawyers would give the project insight into the legality behind an action, and the compliance consultant would ensure that legal practice is being maintained throughout the project’s life (Smith & Lumsden, 2022). The expectation of having a compliance consultant is that the Digital Den will be able to maintain a standard of practice that will keep the project on a proper path toward completion, while also preventing any circumventing of proper practice to meet deadlines. The expected cost for this position will be $13,093.81 (*Compliance Officers*, n.d.). The final consultant that may be beneficial to the project is a financial advisor. This individual will offer additional advice into proper financial investments and allocation of funds so that the project may be completed as efficiently as possible (Schwartz, 2023). This position may offer additional benefits for the project and may potentially reduce overall project cost for the Digital Den. This position is considered optional as it creates an additional cost of $7500 (Coombes, 2024), and this additional cost may reduce the total benefit that the project could receive. Additionally, the Digital Den has tried to be conservative with their allocated funds to maximize the total benefit of the project, thereby limiting the need of additional financial recommendations.

**Expected Consultancy Plans and Outcome**

The final section of the procurement plan is the consulting assignment. Consulting assignments are the portions of the project that a consultant will complete to benefit the project (*What Is a Consulting Assignment?*, n.d.). The type of consultants utilized in this project were detailed in Table 3, and each task is associated with a particular consultant.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Consultancy Planning** | | | | |
| **Number** | **Goal** | **Consultant** | **Due Date for Proposal** | **Execution Time** |
| **1** | Create a formal plan of execution that will guide the Digital Den toward project success | Project Management Consultant | 9/9/2024 | Implemented throughout project life |
| **2** | Inform team members of implementation opportunities to improve project and refine project scope and time management | Project Management Consultant | 9/9/2024 | 1 week |
| **3** | Gather team feedback on improvement process and allocate additional resources for team collaboration | Project Management Consultant | 9/16/2024 | 2 weeks |
| **4** | Consult the team on standard business practices and offer a plan of execution for standard procedures | Compliance Consultant | 10/3/2024 | Implemented throughout project life |
| **5** | Communicate financial information with investors to ensure agreement for funding | Financial Consultant | 9/30/2024 | Dependent on financial requirements; typically executed when thresholds are reached |
| **6** | Collaborate with the Digital Den team to ensure proper allocation of funds | Financial Consultant | 9/30/2024 | 1 week |

**Table 14: Consultancy Plans and Deadlines**

The goals created here are relevant to the different sections of the execution plan detailed in the project scope statement. Goals 1 and 2 need to be completed before the planning phase begins to ensure that the team is in agreement of how the project will be executed and what steps will be necessary to ensure success. Goal 3 is set a week after the first two goals are set so that the team can offer their thoughts on the consultants’ guidelines, and determine if their values and objectives align with the advice of the consultants. Goal 4 is expected to be implemented by the Planning phase and referenced throughout the rest of the project to ensure that the team follows standard practices and upholds all necessary procedures. Finally, Goals 5 and 6 were created to ensure that all stakeholders have agreed on fund usage so that all resources are used appropriately, thereby avoiding misuse of funds or confusion of usage.

**Communication Plan**

A communication plan is a document that outlines how the team will take the knowledge and resources they have gained and share it with their other teammates, stakeholders, supervisors, and additional peers to relay necessary information regarding the project (Curry, 2022). Other things that the communication plan considers include the medium for communication, who oversees the information record keeping, and who may provide this information to external individuals (p. 1). These factors help to create a regulated plan for distribution of information to prevent accidental oversight and allow the entire team to maintain a clear understanding of who performs communications and what plans are set in place for the team to gather for creating ideas. Additionally, this document is important to the project as it provides a set of guidelines for a contingency plan in case of incidents with team members or natural disasters (Motion Blog, 2023). These plans help the other team members and stakeholders by providing a delegation of resources and authority when the original plan is interrupted. This is simply utilized to prevent any delays in project planning and help provide backup assistance for other team members if they are struggling to complete their tasks.

**Leadership**

Leadership within the Digital Den is delegated based on an agreed consensus within the planning phase. Alex Cooper is the Project Manager of the Digital Den, and is therefore responsible for the overall procedures undertaken within the group and guides the team to success. Because of the sheer workload that this project presents, Alex Cooper receives additional support from his teammates in carrying out the communications amongst the team and stakeholders, as well as additional members to provide support for his role in his absence. Myron Morgan is trained to cover Cooper’s position if he is unable, and acts as a backup for communicating standard procedures to the rest of the team where necessary.

Zachary Weldon is responsible for communicating any of these procedures to stakeholders and offering additional insights to the team where necessary. Zachary is trained to make information public where necessary and offers insight into the team’s plans using his best discretion. The main external targets that must receive communications are the CEO of the company (Doctor Spangler); any stakeholders that support the company; the team itself; and lastly the public as the information is dispersed into the public domain.

Braydan Thomas fulfills the responsibility of the media manager and oversees any media communications to external stakeholders. In other words, Braydan Thomas assists Zachary Weldon in distributing communication updates over digital media. The digital media that the project will utilize include email platforms using distribution lists, Microsoft Teams for communicating with investors and other high-level stakeholders, and potentially social media platforms like YouTube to provide a place for individuals to return and regain information regarding the project.

Finally, Devanshi Patel and Bailey Smith will work together to provide any additional support for the previously mentioned positions. They have more insight into the entirety of the project than any one leader as they have a small power position in each aspect of the project. This position allows them to provide additional aid to their team in ensuring that the project maintains all deadlines and standards, as well as supporting the team in researching the resources of the project throughout its life.

A diagram of communication plan

Description automatically generated

**Figure 10: Team Communication Plan and Contingency List**

Figure 6 demonstrates the communication strategy of the entire team along with their stakeholders. This plan is used to graphically illustrate the content that is presented within the communication document.

**Communicating Updates**

The mediums that will be used for communicating this information to an external audience will be determined based on the target audience. This procedure is utilized to best influence the targeted audience into agreeing with the teams methods and simplifying the project’s purpose (Indeed Editorial Team, 2024). The CEO over the team will be presented with the information through documentation of the research at each major milestone. The milestones are represented by the graph that the team created in their Scope Statement. For example, when the team receives all the resources necessary to start on the physical portion of the project, they will provide all documentation of the event and any previous documents with updated information to match any changes made to the plan so that the CEO may recognize the pace of the project and ensure that the entirety of the project remains within its time, cost, and scope constraints.

Another major body of internal stakeholders that must be considered is the team working on the Digital Den. These stakeholders receive daily updates on the work of each member through Discord, and a major conference call is held every week to discuss the current state of the project and offer recommendations for improvement. Every member of the team possesses a copy of the document to ensure that all members of the team are aware of any additions or changes that are made. This also grants the team an additional indirect medium of communication in which they are free to offer insight into changes that may benefit the project.

External stakeholders are treated differently based on their relationship to the project. Investing stakeholders should be informed on how their resources are being utilized to fulfill the project’s purpose (Anderson, 2023). These stakeholders should be told the purpose of all major parts of the project, and any milestones within the project should be clearly stated so that these individuals may understand how their resources are being allocated and properly used. To best present this information to the project’s investors, this information will be presented monthly in a newsletter to investors that details the work being done and how much money was spent in the previous month. Additionally, a live video will be provided to investors at the end of each quarter to aid in visualizing the progress that the project has made and offer additional time for feedback from the investors to improve the project.

The other major set of external stakeholders that the project will answer to are governing bodies. To understand how these bodies impact the project, the type of work that the project will create, the resources that the project will utilize, and the impacted governing bodies need to be considered (Simpli RFP, 2024). For example, the Digital Den impacts local, state, and federal governing bodies. Local governments would receive additional funds from the Digital Den project as it would potentially increase the number of students within the local college. This increase in people would allow more jobs to be fulfilled and help drive the need for additional job creation to provide services to the increased number of students (*The Local Impact of Higher Education*, 2024). At the State and Federal level, the larger governing bodies offer financial aid to students which could be impacted by the Digital Den project as it could generate additional technology scholarships based on the project’s implementation success (Bowles, 2022). Additionally, each level of government can potentially offer additional laws that limit different aspects of the project and its technology usage (p. 1). Government institutions will be updated on the project’s course at regular intervals by the Digital Den’s legal team. Zachary Weldon and Braydan Thomas will work with the legal team to ensure that all governing bodies receive the proper information that they need while also ensuring that the Digital Den project abides by government standards. These updates will be communicated by the legal team at every major step in the project so that the ruling bodies are assured of the proper conduct within the Digital Den.

**Plans for Natural Disasters**

The team has also considered continuity plans in the event of natural disasters. These plans are implemented to help the team by providing an alternate means of communication or satisfying the needs of the project when the normal operations are interrupted by unavoidable disasters (Intelice Solutions, 2017). The standard disaster plan consists of an alternative means for communication, training for team members in the event of a disaster, and any other backup plans to protect the project and its assets following disaster (p. 1). To prevent interruptions during natural disasters such as hurricanes, each member of the team has additional internet or cellular provisions for communicating on the project and updating members on the integrity of project resources and the safety of its team members. Additionally, the team has been trained in scenarios involving natural disasters and how they should conduct themselves to ensure their own survival and the survival of the project. Once the team is safe, they can conduct additional cellular meetings using platforms like Microsoft Teams or Discord to provide additional resources for the project. Finally, if any resources utilized to create the project are damaged or destroyed (personal computers, documents, plans), all team members have backup computers with cloud functionality to recover documents and preserve the business plans within the documents.

**Receiving and Implementing Feedback**

The final step in the communication plan is how the team will receive feedback from its stakeholders and store the feedback for changes on the project. The process of taking feedback from individuals and storing it for usage in improving the project is called a feedback loop (Dorn, 2019). These feedback loops receive any form of feedback and creates a plan of implementation to add something or change something within the project for its final deliverable (p. 1). The significance behind these changes are that it shows the stakeholders that the team values their opinion and wants to make changes based on their input. To properly implement this, the team will hire an additional secretary to take notes during the quarterly meetings with stakeholders so that their thoughts may be recorded and revisited from a differing perspective. Ideally, the team would also like to implement recording software to help retain the stakeholders’ input. However, there may be limitations that prevent the recording of the conferences, such as individuals not consenting to being recorded. This will be worked around by having the secretary present to collect data, along with influencing the members of the team to be proactive in note taking for any important concepts that stakeholders may bring up.

Finally, all feedback received by Digital Den’s peers will be recorded and implemented in some way into the final project. The members of the Digital Den strive to incorporate the ideas of its supporters into the project. This will best be implemented throughout the remainder of the project’s life as the team researches more into the project and creates changes for the Digital Den.

**Overview of the Risk Register**

The chart below highlights the risks that can negatively impact the success and efficiency of the Digital Den classroom. The information contained in the table entails the risks along with the descriptions of what the risks are and what they do. Each risk will be organized as either a business risk, technical risk, organizational risk, or a project management risk [(Schwalbe, 2014)](https://www.zotero.org/google-docs/?MHeKAw). The priority scale ranges from low priority, to moderate priority, to significant priority, to high priority. To effectively respond to a risk, each risk will be categorized into a risk response type. The risk response types will be avoidance, acceptance, transference, and mitigation [(Schwalbe, 2014)](https://www.zotero.org/google-docs/?Z10Vzn). Risks that fall in the moderate or high priority range will be met with effective response tactics to help ensure business continuity. Technical Document in Risk Management (2021) notes, “A risk register is an inventory of identified risks in an organization, with detailed steps and explanations on how to mitigate them. Also referred to as a risk log, this document helps businesses record and monitor the probability of each risk” (p.1). The mitigation tactics column will also note who is in charge of mitigating which risk or risks.

**Risk Register Chart**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Risks** | **Risk Type** | **Description & Impact** | **Priority** | **Risk Response Type** | **Response Tactics** | Member |
| Power outages | Technical | Temporary loss of power or electrical overloads | Low | Avoidance & Mitigation | Backup generators | Devanshi Patel |
| Data management | Technical & Organizational | Weak policies on storing and maintaining data | Low | Avoidance | Utilize a principle of least privilege | Bailey Smith |
| Environmental Factors | Organizational & Technical | Dust buildup or overheating | Low | Avoidance | Regular cleaning and maintenance | Zachary Weldon |
| Software Licensing Issues | Technical | Expired or insufficient software licenses | Low | Avoidance | Proper monitoring and frequent license updating | Myron Morgan |
| Supplier delay | Business | Delay of vendor supplies | Moderate | Mitigation | Extra time planned for delays | Alex Cooper |
| Incompatible Software | Technical | Software updates or version mismatches | Moderate | Avoidance | Checking for compatibility prior to installation or knowing the version history | Myron Morgan |
| Communication Breakdown | Organizational | Lack of communication amongst team/vendor | Moderate | Avoidance | Utilize multiple platforms for sharing ideas and host regular meetings | Alex Cooper |
| Hardware Failure | Technical | Devices like projectors, interactive boards, or computers may malfunction. | Moderate | Mitigation | Troubleshoot all devices | Devanshi Patel |
| Lack of Training | Organizational | Teachers or students misuse equipment, creating inefficiency | Moderate | Avoidance | Create training programs/ promote gamification | Zachary Weldon |
| Scope Creep Risk | Project Management | Delays caused by time scope creep | Significant | Avoidance | Maintain initial plans and keep within time scope | Alex Cooper |
| Cybersecurity Threats | Technical | Hackers or malicious software can compromise connected devices or sensitive data | High | Mitigation & Acceptance | Implement firewalls, VPNS, IDS, and frequent vulnerability patches. Utilize the principle of least privilege. | Bray’dan Thomas |
| Network Connectivity Issues | Technical | Unstable or unavailable Wi-Fi Network issues (Solutions, n.d). | High | Mitigation | Troubleshoot and ensure proper configuration for networks. strong hotspot as a backup | Devanshi Patel |
| Data Breaches | Technical | Unauthorized access to sensitive data  Potential loss of intellectual property and privacy (Poggi, 2023). | High | Mitigation | Data encryption minimization of attack surface  Wiping archaic data Regular monitoring | Bray’dan Thomas |

**Table 15: Risk Registry**

**Discussion of Risks**

To best compartmentalize the types of risks that the Digital Den project may face, the team has separated the risk types into three categories: organizational, technical, and business. In the following paragraphs, a brief overview will be provided on each section to give clarity of how they impact the project.

The first major category to discuss are technical issues. These issues can arise from any range of problems such as power outages, cyber threats, hardware or software errors, or any other issue that affects the technical aspect of the project. To combat natural disasters such as power outages, the Digital Den project has drafted plans to implement backup generators and draw on extra network services such as cellular data to ensure that work can still be accomplished by faculty and students. Other major technical factors that could damage or inhibit the learning environment include dust buildup on the technology and data mismanagement caused by weak or ineffective processes in place for acquiring, validating, storing, protecting and processing data (fundipedia.com, 2019). To prevent both of these issues from occurring, the team has implemented a regular cleaning and analysis check to ensure that the physical environment is cleaned and ensure that the logical environment is clean by creating regular backups and organized storage spaces for the project. The other major issue that becomes present are software issues, such as are created with incompatible software or licensing issues that could prevent the use of the software. The best way to combat these issues would be to thoroughly test all software to ensure that it functions properly with the devices in place and monitor all licenses that the team purchases to maintain an active status on those licenses. The last major group of technical errors to highlight are security threats, including Data Breaches and any other Cybersecurity threats that may arise. To prevent these threats from impacting the project, the team will implement strong encryption on their software and utilize proper defenses such as firewalls and VPNS to ensure that security is maintained. Poggi (2023) notes, “A successful phishing attempt can lead to unauthorized access to systems containing personal data, student records, or even intellectual property. This is achieved by tricking educators, students, and administrators into revealing sensitive information” (p.1). Knowing this, the members of the Digital Den would like to work with stakeholders in receiving additional funds for the post project to help educate employees on proper practices to reduce cyber threats.

The next major category of issues that the project could encounter are organizational issues which occur because of a lack of strong management practices. This overlaps with the data management and environmental cleanliness issues mentioned in the previous paragraph as a lack of proper practices in both cases could inhibit the full functionality of the project’s components. The two other major issues that can arise from a lack of proper leadership include improper training of staff and communication barriers caused by improper data handling. The Digital Den would address both of these issues by breaking down siloed information through having multiple forms of communication and utilizing regularly scheduled meetings to ensure all information is up to date and all needs are met. Northpass (n.d) suggests, “it’s imperative that your end users understand how to use the product. Without clear training regarding system implementation steps, users will likely have a difficult time with the implementation process” (p.1).  Additionally, improper training can be prevented by creating simulations through tabletop exercises or other forms of gamification to create a fun and competitive learning environment.

The final section of the risk assessment plan is the business aspect of risks, such as scope creep in the project and supplier delivery delays. The team has attempted to reduce scope creep by sticking to the original work breakdown structure and not implementing new ideas while carrying out the initial plans. Mitigating time spent brainstorming new ideas after the finalization of the project planning phase can limit new opportunities, but it also ensures that project isn’t taken beyond the time scope available to it. Vendors can cause risks for the project too if supplies are delayed from the expected delivery time. To reduce this issue, the project has built in slack time to wait for supplies and create a plan to expedite installation of late supplies.

**Risk Assessment Matrix Chart**

The risk assessment matrix is used to signify the probability and potential impact of each risk [(Schwalbe, 2014)](https://www.zotero.org/google-docs/?st4KOr). The likelihood of each risk is organized from very likely, likely, possible, unlikely, and very unlikely. The impact of the risk is measured from minor, moderate, significant, to severe.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Minor** | **Moderate** | **Significant** | **Severe** |
| **Very Likely** |  |  | Network Connectivity Issues | Cyber Threats |
| **Likely** | Software Licensing Issues | Software Incompatibility & Hardware Failure |  | Data Breaches |
| **Possible** | Lack of Training | Supplier Delay | Power outages |  |
| **Unlikely** | Data Mismanagement | Communication Breakdown |  |  |
| **Very Unlikely** |  | Lack of Training | Scope Creep |  |

**Table 16: Risk Assessment Matrix**

**Lessons Learned**

**Alex Cooper**

Once a project is done there are still steps that need to be taken before the project can be declared finished. In fact, one of the most impactful parts of a project are the final steps taken after all tasks are completed. The lessons learned from a project can be the greatest assets that a project produces. The lessons learned can be any knowledge gained while performing a project (Rowe & Sikes, 2006). Creating a knowledge bank from the information gained during the lessons learned process can create an invaluable resource for an organization or group. The lessons learned process can take place all throughout the project and should be analyzed to include metrics for future associates to study. This paper, along with feedback received on each assignment will be used as our lessons learned for this course.

One of the latest lessons learned is something that we should have included from the start of the project, a lessons learned plan. It is best to have the lessons learned process running all throughout the project and to be constantly reviewing the lessons (ProjectManager, 2013). “The purpose of a lessons learned process is to define the activities required to successfully capture and use lessons learned.”(Rowe & Sikes, 2006). While our team did not have a formally recognized lesson learned process, we made sure to gain feedback during each meeting to see where we could improve for the next assignment. This information would have been more useful if we followed a lessons learned process. The lessons learned process could have been broken down into five steps: identify, document, analyze, store and retrieve (Rowe & Sikes, 2006). Even though we did not implement this lesson learned process from the start of the project our team will still be able to implement it in the closing stages of the project.

The first part of the lessons learned project is identifying the lessons learned. To help identify the lessons learned there should be lessons learned sessions that take place throughout the project (Rowe & Sikes, 2006). These sessions will allow for the team to give valuable input on the handling of the project. A project survey is a great way to organize this input. The project survey should cover basic project categories such as “management, resources, technical, communication, business processes, requirements, design and build, testing, implementation and external areas.”(Rowe & Sikes, 2006). The lessons learned session should be used to answer the following three questions: what went wrong, what went right, and what needs to be improved (Rowe & Sikes, 2006). Using this information should help any team identify what lessons can be learned at each stage of the project.

Using the information in the previous paragraph I will identify lessons learned for my group’s project. The actual management of the project overall went well for our group. Our greatest problem was that not all of us were working at the same pace. While we did delegate the work out as evenly as possible there was still a gap in work effort and completion at some stages because members were able to get more work completed at an earlier date. Our communication was perhaps our greatest strength during this project. Our team utilized a Discord group chat as our main form of communication and used both Google Docs and Sheets and Microsoft 365 as our shared online workspaces. Using Discord was convenient because all members already had an active account and it allowed us to hold virtual voice meetings as well as share links and files all from a single space. While using both Google Docs and Microsoft 365 worked out for us it also caused some confusion and redundancies at certain points in the project. Our greatest weakness was perhaps the confusion from some of our members on what needed to be accomplished for our weekly assignments. When we delegated each member to work on a certain assignment or certain aspect of an assignment there was some confusion on what needed to be completed which led to a slight delay on the assignment completion although nothing was ever drastically pushed back.

The next step in the lessons learned process is documenting the lessons learned. A lessons learned log is an effective way of keeping track of all lessons learned from the lessons learned sessions (ProjectManager, 2013). Using the lessons learned log will help keep track of what lesson was learned, was the lesson positive or negative, and what overall impact the lesson had on the project. All information does not need to directly come from a lessons learned session, it can also come from comments sent during communication and feedback from shareholders. It is important to try to capture these lessons in real time to ensure that all details of the lesson are accounted for (ProjectManager, 2013).

The third step in the lessons learned process is to analyze the lessons learned. When identifying the lessons learned a group is looking at the success or failure of an aspect of the project, when analyzing the lessons learned a team will look at why that aspect of the project succeeded or failed. This analysis will allow the knowledge of the success or failure to transferred to a future project. This is an important step because it actually allows the group to do something with the lessons learned (Rowe & Sikes, 2006). The analysis of a lesson learned should have input from the entire team to have a diverse body of knowledge.

The fourth step in the lessons learned process is storing the lessons learned. The lessons learned log is a single source of information kept from lessons learned sessions and other feedback (ProjectManager, 2013). The lessons learned log is the perfect place to store lessons learned and the log, along with other project documents, should be stored in a safe and accessible place such as a project library or shared drive (Rowe & Sikes, 2006).

Our team did not create a lessons learned log during this project but that will be an improvement made for my next large project. To keep track of the lessons learned during this project we will use our team 11 lessons learned assignment along with the feedback given on each assignment. The team 11 lessons learned assignment along with all other assignments will be saved to my computer and backed up to an external storage device for future reference. I also plan to save any feedback videos and comments given to us by Dr. Spangler in the same folder. By having all feedback, assignments, and the lessons learned assignment in the same folder it will be easy to share this knowledge bank with anyone. I can simply share the lessons learned document or the entire folder.

The fifth and final step in the lessons learned process is retrieving the lessons learned. This step is the main reason for a lessons learned process to be created. There is no point in having the lessons learned knowledge bank if it is not used for future lessons. By looking back at the lessons learned during each step of a new project the group can avoid making the same mistakes made in the past and can improve on aspects of the project management process for the future.

Creating and following the lessons learned process is only the first level of working with lessons learned, level two focuses on evaluating the lessons learned (Rowe & Sikes, 2006). The project manager holds the primary responsibility of identifying lessons learned and is responsible for further evaluating these lessons. It is important that the lessons learned for any and all projects are consistent with the way in which it is documented. A lessons learned input form “allows for more consistent data collection as well as provides a means for easier retrieval” (Rowe & Sikes, 2006). The template makes it easier to search for solutions by adding fields such as “category, lesson learned, action taken, how did you arrive at the action taken, root cause and key words.” (Rowe & Sikes, 2006). At level two groups should be able to make detailed reports, summaries, findings, and recommendations based on lessons learned reports.

While level two focused on further analyzing the lessons learned, level three focuses on taking the findings from the analysis and converting the data into metrics (Rowe & Sikes, 2006). These metrics should be something that is useful to the organization as a whole and can be put into graphs for easy display. These metrics are important for presenting progress and achievement to executive level leadership. When presenting the success in any corporate setting metrics are one of the most important things that you should be able to present.

The lessons learned is an important factor in the project management process. By creating a lessons learned process a group can effectively keep track of their success and failures throughout the project. Keeping track of these successes and failures is vital to approaching new projects as well as making sure to keep track of what works and what doesn’t for the current project. By keeping a knowledge bank of learned lessons for this project I will set myself up for success when it comes time to do my senior capstone as well as other future projects in my college career.

**Bailey Smith**

During these 13 weeks, the team was assigned to design the classroom of the future. The references of what the classroom of the future would look like is done by the classroom we are already in and doubling the size of the classroom. With a budget of 1 million dollars, the total number of students for our classroom is 50 plus the teacher. There are three critical points for this project to be effective which are scope, time, and cost are all divided between the group with two members with one of each of the three points. With that part taken care of, we needed to design the room with every single detail that is made to construct a classroom such as the walls, floor, electrical system, and electronic devices. This process needs to involve various stakeholders which is defined by Fernando (2024) “A stakeholder is an individual or a group of individuals with an interest, often financial, in the success of a business. The primary stakeholders in a corporation include its [investors](https://www.investopedia.com/terms/i/investor.asp), employees, customers, and suppliers.” My role as the Management Specialist is best stated by climbtheladder.com (2024) “This position involves analyzing existing business processes, identifying areas for improvement, and implementing solutions that streamline operations, reduce costs, and improve overall performance.”

To make sure that I am working well with the group, we communicate on discord and on Thursdays so that we can discuss the work with every step that is added to it. If there was anything that someone wanted to add to the already made project, we would have our projects made in google docs so that way everyone in the team can access it and at the same time edit the project with whatever would be useful. Everyone in the group was very willing to help with this project and we had a good circle of trust that way, as everyone was enthusiastic about the project as much as the others. Went we first started it was a little hard for me to help with the team as I was more of an editor according to the team. But with some communication I was able to help more with the group as the leader Zarchary had proposed to help similarly to what I did before so we can split the work up more among the team and not have some roles to be less than others. With this plan in motion, we were able to more intently,

**Braydan Thomas**

What I learned from project management is that this is not only focused on teamwork with other people but needs to organize regular meetings and time management. This also includes saving all the knowledge you find on the project. To effectively save knowledge, use organized note-taking tools like Notion or OneNote and create digital flashcards with apps like Anki for active recall. Visual aids such as mind maps or summaries help connect complex ideas, while a spaced repetition schedule supports long-term retention.

Sharing this knowledge with classmates fosters a culture of collaborative learning. Study groups can help reinforce material, while presentations and workshops allow peers to learn complex topics more easily. Online platforms, such as shared Google Drives or class learning management systems, make resources accessible. Encouraging discussions and feedback adds new perspectives, enhancing understanding for all.

Overall, these methods build success by promoting comprehensive learning, and sharing knowledge benefits classmates, creating an academic environment where everyone can thrive and build on shared ability.

**Devanshi Patel**

Over the past 13 weeks our team worked together and built a classroom project. In this project I had the responsibility of managing network infrastructure. Communication is crucial in this project; I have learned many lessons by working in a team. I am responsible for the wiring of the classroom, setting up computers, routers and ensuring that all the devices are working properly. Teamwork plays an important role because we need to make sure that our work aligns with other team members to achieve the goal of the project. By understanding each team member’s tasks and role the work will run smoothly. I learned that small mistakes could cause problems and in real world situations can lead to huge problems. Saving Knowledge for Future Use I save all the assignments so I can use them in other courses later. It includes all the assignments we work on to accomplish this project. I save the assignments in google drive. Sharing Knowledge with Classmates The knowledge I gained from this project is valuable. I will explain the step-by-step process for this project to other students such as how to plan a budget, make layout, and work during the crises. I will show them the charts we made for better understanding. I will show them the problems we face, how to work with the schedule of each team member. By working on this project, I understand the concepts better and know how it looks like to work in real-life. Sharing knowledge with other students will help in future for similar classes.

**Myron Morgan**

Over the past 13 weeks my team and I have been planning and constructing a classroom of the future. As information technology students, the goal was to develop a modern classroom that used robust technology to help improve the efficiency of teaching and student learning. This classroom is primarily geared towards enhancing the learning experience of IT and Computer Science students as the professors can use technology to refine their teaching methods. The name of this project is Digital Den; to start this project our team was allotted 1 million dollars, and the only requirement was to have at least 50 computers to accommodate students. Considering the triple constraint time, cost, and scope, it was crucial that tasks were divided amongst the members. Considering that the team consisted of six individuals, the work distribution was dependent on who was stronger in which areas. Though everyone had to contribute their part to each assignment, if one person had a better understanding of certain content, then they would steer the ship for that assignment. Throughout the duration of the project, it is important to understand that one person should not guide the entire project. Giving each person an opportunity to coordinate an assignment helps build trust and a sense of responsibility.

Each member in the group was appointed in key positions to oversee various elements of the project process. Alex Cooper is the Project Manager, Devanshi Patel is the Network Administrator, Zachary Weldon is the Human Resource Specialist, Bray’dan Thomas is the Information Security Analyst, Bailey Smith is the Management Specialist, and I am the Software Quality Assurance Analyst. While serving in these roles each member provided the proper services needed to ensure efficiency within Digital Den. For a brief role description, as a Software Quality Assurance Analyst it entails implementing tests to troubleshoot various aspects of the software, developing automated testing procedures, and documenting the entire process (ziprecruiter, n.d). The roles listed are essential to the project process as they are based on effective communication. For example, if the network administrator does not configure the network, then there is no internet, and I cannot troubleshoot certain software. Or, if the Human Resource Specialist is not communicating to the team about potential vendors, then it could delay the process of obtaining technology equipment or room equipment. Minois (2023) suggests, “From the initial planning stages to the final implementation, clear and open communication plays a pivotal role in mitigating risks, fostering innovation, and ensuring the timely completion of projects” (p.1). This shows that setting up effective communication methods from the start can yield positive results.

Throughout this project, the team has been consistent with meeting milestones and time management. Deadlines for assignment submissions were set to Monday’s at 11:59pm. However, the team believed that early is on time and on time is late, therefore, assignments were sent on Thursday; giving us slack time. The lessons learned throughout this process are vital to the success of this project and future projects. As mentioned early on, key components like time, cost, and scope can be implemented into all project types. Even if a project does not require money to be spent, time and scope are significant factors as one dictates the other; more complex projects tend to require more time to complete. Currently, all the project information is stored in a team Google Drive folder in which everyone can download, edit, or upload information. Though this project did spark competition due to other teams taking on a similar scope, one concept that all teams can gain a mutual understanding about is siloing. Hannah Taylor (n.d) notes, “Silo mentality is when teams working within the same business withhold information from others, which amounts to information hoarding” (p.1). Siloing is a practice in which businesses or organizations isolate themselves from sharing or receiving information from similar businesses in fear of crucial information getting out. This is being mentioned because it is important that knowledge is shared amongst other groups. In this way, teams can promote collaboration and share information that may be beneficial for each team.

**Zachary Weldon**

The Lesson’s Learned document is designed to allow the team to detail all the information they learned throughout the project’s development and implement it into a document that they may access later for reference (Eby, 2021). The group document will be updated with each team member’s experiences in the project and what they learned, but this portion of the plan allows for a personal explanation of what Zachary Weldon learned during the duration of the team project.

         The first big thing that I learned from this project is the extensive planning that must be done and what can be done to take proactive measures in completing the work. The research that must be done from these projects became apparent particularly in the Cost Procurement plan when the team was finding costs for individual products and researching the cost of hiring contractors and legal experts. From this work, I was able to fully understand why the procurement process is extremely robust and comprehend why projects take such a long time to complete.

         Another major component of the project that I now recognize is the level of quality that must be maintained when creating a project. At first glance, I perceived quality to be ensuring that the triple constraints were maintained and that all members could complete their tasks efficiently. Now, I understand that quality also consists of following laws (and creating the legal team to ensure that the project maintains that status); ensuring that green energy plans are maintained based on government requirements; and that stakeholders are kept informed on what is being done. These stakeholders play a major point in the project as they are ultimately in control of what a team can do. If the stakeholders wouldn’t back a plan up, then there was now way that the team could continue with the project.

Finally, I would also like to reference the team skills that I started to develop during the project. Prior to this class, I had very limited knowledge in team based projects as most of my classes either did not have team projects or very limited projects. This project has given me insight into how to become a team player and how to use the strengths of each teammate to compliment the overall work of the project. I would credit my teammates with helping me realize this as they have been incredible in developing the project and in helping me recognize my strengths as a team member.

The purpose of documenting the lesson learned is to provide a basis to improve on when undertaking new projects in the future (Indeed Editorial Team, 2023). I have stored all of the team’s work on a Microsoft Office cloud storage, and possess local copies of each assignment in case the cloud service expires. Furthermore, each member of the team has access to all the documents and a document history through Google Docs and the ability to download a local copy for their own reference. Based on these storage sections, it should be relatively difficult to lose this information, thereby achieving the intended goal of maintaining the security of the information.

The biggest reason that I want to keep this information readily available is for my Capstone class. I have been told by other students that this class will implement all the knowledge obtained from this project and use it in a more complex project that requires field research and extensive data collecting. With this in mind, I want to make sure that I am informed on what I need to do to complete that project professionally, and that I have strong materials to reference when undertaking the project. Additionally, this project may be useful as a strong reference to future employers or other substantial entities in proving that I and my team have strong research and analysis capabilities that could make us valuable assets to a team.

The last major thing that this project could be useful for is mentoring other students. The Cambridge Dictionary defines success as “achieving of the results wanted or hoped for” (2024). I would like to add that success for me is ensuring that I have knowledge in a field, and that that knowledge may be reused if necessary to make someone better. Although we are supposed to be competitive to achieve personal success, I fully believe that guiding others toward their goal in life is what success should also consist of as this prepares a future generation of knowledgeable people that can continually improve on what has already been created. For example, there could be something in the team’s project that we didn’t understand or weren’t aware of at the time. By working with another individual to help them understand their work, the team may find a different way to do a portion of the project more efficiently. This same application may be applied to our peers within the classroom too. If they are struggling with understanding a concept, I would be willing to help my peers as this will help them in achieving their success.

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**Scope Statement**

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**Stakeholder**

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