UNIVERSITY OF ALBERTA
ALBERTA SCHOOL OF BUSINESS

Department of Accounting and Business Analytics

BTM 211 611

Management Information Systems

PM Assignment – Winter 2025

Alberta Aerospace Museum (AAM)
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Version [7.0]

Revision History

Date	Version	Description of Change	Author
20 February 2025	1.0	Initial version	Samia Musaddique Katingiri
20 February 2025	2.0	Completed section 2, added acronyms in section 1.4	Samia Musaddique Katingiri
22 February 2025	3.0	Completed section 3, added acronyms in section 1.4	Samia Musaddique Katingiri
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25 February 2025	5.0	Completed section 1 and section 5	Samia Musaddique Katingiri
26 February 2025	6.0	Completed section 6	Samia Musaddique Katingiri
28 February 2025	7.0	Minor edits and proof-read of the document	Samia Musaddique Katingiri

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1.0 Introduction

1.1 Purpose

The purpose of this requirements document is to provide an outline of the digital transformation of the Alberta Aerospace Museum (AAM). Seeing a spike in popularity, AAM aims to modernize its operations through a digital transformation. The museum's current system is disorganized and is highly inefficient for workflow. This Business Analytics Technology Refresh (BATR) project aims to provide successful solutions, while making sure it aligns with the long-term and sustainable goals of the AAM. Secure and organized database system, implementation of a digital loan process, introduction of a business analytics software 'Power BI' are some of the solutions the project aims to provide. All these transformations would greatly benefit AAM by enhancing workflow, improving data security and organization, and creating better experiences for the audience.

1.2 Scope

- Inclusions:
  - → Database management for artifact inventory, visitor feedback and exhibit tracking.
  - → Digitalization of loan agreements.
  - → Implementing business analytics tools to make data-driven decisions.
  - → IT infrastructure, hardware and software update for better workflow.
- Exclusions:
  - → Expansion of museum building.
  - → A completely paper-less transformation.

1.3 Document Overview

The AAM Requirements Document is a well-organized outline of the digital transformation project for the museum. This document would help stakeholders understand the execution of the project. It outlines the key business needs, strategic objectives, stakeholder environment, project deliverables and budget. Other key objectives of this document:

- Identify software solutions that can address AAM's challenges.
- Outline roles and responsibilities of people involved in the project.
- Provide a detailed budget estimate and cost analysis.
- Create a project timeline.
- Provide alternatives to software highlighting their advantages and disadvantages.
- Ensure the project is successful and meets security standards.
- Estimated duration for the BATR project is 32 weeks with an estimated budget of $163,325.04. The budget is inclusive of staffing and software cost.

1.4 Abbreviations and Acronyms

Abbreviation or Acronym	Description
AAM	Alberta Aerospace Museum
VR	Virtual Reality
STEM	Science, Technology, Engineering and Mathematics
SWOT	Strength, Weakness, Opportunity, Threat
BI	Business Intelligence
SOR	Systems of Record
KPI	Key Performance Indicators
SME	Subject Matter Experts
SDLC	System Development Life Cycle
WBS	Work Breakdown Structure
OS	Operating System
BATR	Business Analytics Technology Refresh

2.0 Organization

2.1 Description

The AAM was established in 2018, to showcase some of Canada's rich aerospace history. Located on the outskirts of Edmonton, the museum is an extensive collection of aircrafts, historic pieces from various space exploration missions, aircraft engines, and many other significant artifacts. AAM is extremely passionate about bringing aerospace history to life. The museum offers top-of-the-line interactive exhibits and services for everyone.
Some activities offered at AAM:

- Guided tours and exhibitions
- Workshops and seminars by prominent figures in the aerospace and aviation industry
- Flight simulation and motion-based Virtual Reality (VR) to experience space travel
- Educational programs include school field trips, STEM workshops, hands-on exhibits, and so much more.

AAM attracts 100,000 visitors annually, with a large turnout during school vacations and major aerospace celebrations. AAM currently has 200 employees. A relatively recent museum, AAM does not have any other locations, but aims to expand in the coming years.

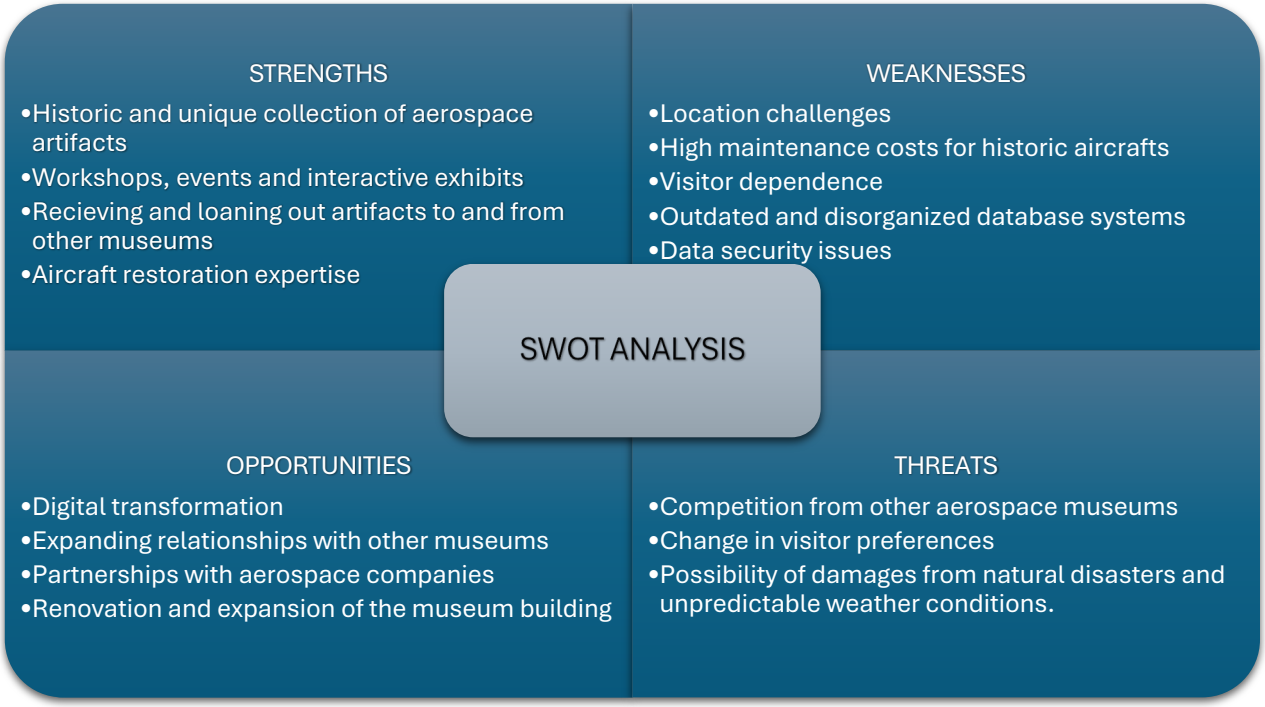


Fig 1: SWOT Analysis of Alberta Aerospace Museum (AAM). (1)

2.2 Strategic Vision

The AAM envisions itself as a leading and standard institution for aerospace education in Canada. The mission of AAM is to preserve Canada's rich aerospace history, promote knowledge and modernize aerospace sciences, and prepare future generations for innovation in aviation and space exploration. The AAM's long term vision is to be recognized not only as an aerospace museum, but also as a modern education hub that fosters technological advancement in the field, while keeping its sustainable goals in mind. (4)

- Short-term goals (0-2 years):
  - → Digital transformation of loan-processing systems
  - → Fully functional records database management system for loan agreements
  - → An organized and updated database for artifact and exhibit tracking, easy access to visitor feedback
  - → Implement security measures to protect visitor, financial and other sensitive data
  - → Upgrades to IT infrastructure to improve transaction speed and system reliability
  - → Introducing business analytics software to make reporting on the operations of AAM much more efficient
- Mid-term goals (3-5 years):
  - → Expanding museum relationships to provide the best artifacts and exhibits
  - → Renovation and expansion of the museum building, creating space for larger exhibits, more simulation centers and to host events inviting guest speakers/lecturers.
  - → Partnerships with global aerospace institutions and companies such as Canadian Space Agency, NASA, and many more.
  - → Introduction of digital visitor engagement tools like mobile apps and interactive kiosks.
- Long-term goals (5+ years):
  - → Establishing other branches in key locations across Alberta, such as Calgary, Cold Lake, Red Deer which are prime locations with the presence of aviation and aerospace industries
  - → Transition to a completely paperless operational environment
  - → AI-driven insights for personalized visitor experiences

2.3 Strategic Objectives and Initiatives

Objective	Description
Data-driven Decisions	Use data to make better, more informed decisions.
Digital Transformation	Transition from paper-based loan agreements to a digital system to process loans.
Hardware and Software Update	Replace slow and outdated computers to new ones or updating the software on old systems to improve system reliability.

3.0 Project Management Requirements

3.1 Project Background

The Alberta Aerospace Museum (AAM) is experiencing an increase in visitor engagement, leading to an expansion in the museum's artifacts. AAM's current system lacks data security, is disorganized, all loan agreements are paper based, and their technology is outdated. As solution to these issues, AAM is launching a digital transformation project. The main goal of this project is to implement and modernize a records management system, business analytics software and enhanced IT infrastructure. This will ensure efficient processes and workflow.

3.1.1 Stakeholder Profiles

Stakeholder Name(s)	Description	Critical Success Factors
- Richard Monroe - Teresa Adams - Kelly Rutherford - Henry Thompson	Board Members - President - Vice-President - Director - Trustee	Members of the Board play the decision-making and strategic role in the museum's digital transformation. Based on the project outline, they evaluate the benefits and budget, ensure the initiatives align with the museum's mission and long-term goals, and then approve the project. They make decisions and investments while considering the long-term health of the museum. For the Board Members to consider the project a success, they would need to see an increase in audience, visitor satisfaction, financial growth and more donor contributions. (5),(6)
- Christina Hadfield - Matt Garneau - Jane Payette - Renee Bodnar - Bjorn Tryggvason - Sven MacLean	Staff - Curator - Exhibit Designer - Collections Manager - Museum Educator - Visitor Services Manager - Marketing Manager	- Secure and reliable records management - Data on exhibit popularity - Efficient artifact tracking - Easy access to visitor feedback - Robust feedback system - Insights for targeted promotions
	Visitors and Audience	Visitors and audience are those who engage with the exhibits and services. For them to consider this project a success, their experience must be enhanced. Feedback systems must be seamless. Visitor transactions must be done without any delay. Such changes would be of great benefit for the audience of AAM.
Company: Microsoft Power BI	Technology Vendor and Developers	A software vendor is the company that will provide the museum with the software it requires to make better data-driven decisions. A project is successful to the vendor when the transition from the current system to the new one is done

		smoothly. All integration is done smoothly, and positive feedback is received from the users.
	Patrons	Patrons play a key role in the digital transformation of a museum by providing funding and sponsorships. Patrons need to see an increase in audience, their recognition, and appreciation of the artifacts or collections they may have donated, to consider the project a success. (6)

3.1.2 Stakeholder Environment

Each stakeholder works in different departments with unique technological and operational requirements, in Edmonton, Alberta. The museum currently may rely on basic tools for ticketing and financial tracking, spreadsheets for record-keeping, paper-based tracking for loan agreements. Staff at AAM also uses outdated Microsoft computers which are very slow, creating an inefficient workplace. Data management is inconsistent across departments, leading to miscommunication. Since the museum operates on outdated infrastructure, there is very minimal use of cloud-based tools. Applications that need to be integrated with the data analytics software are feedback system (for instance, SurveyMonkey), social media insights, financial software for revenue and budgeting, and ticketing systems to analyze visitor trends. (5)

3.1.3 Software and Alternatives

Name of Software	Advantages	Disadvantages
Microsoft Power BI	→ Cost-effective, premium version is priced at $20 user/month. → Cloud-based → User-friendly interface has easy-to-use features for everyone. → Integrates seamlessly with Microsoft computers and tools like Excel, Teams, etc. → All data by Power BI is encrypted by default using Microsoft managed keys.	→ Internet dependency → Works best only within the Microsoft environment. → Steep learning curve → Performance may be slow with extremely large datasets
Tableau	→ User-friendly interface, people without any technical skills can make high-end visualizations. → Supports various data file types, easy access of spreadsheets, databases, cloud platforms, or any repository on Tableau. → Interactive dashboards and quick-insight features → Large scalability, it can handle large datasets	→ Very high pricing compared to other tools available ($70 user/month). → Lacks data preparation tools like cleaning and aggregation. → Limited collaboration features → Does not offer advanced scheduling features
Amazon QuickSight	→ Highest version of QuickSight, i.e., AuthorPro is priced at $50 user/month. → User-friendly interface → Seamless integration → Cloud-based → Effortlessly merges with difference data sources.	→ Limited data visualization tools → Steep learning curve → QuickSight is still developing, so it may not have the best features yet.

3.2 Project Mandate

3.2.1 Key Deliverables

Deliverable	Description
A digital records management system for artifact loan agreements.	A cloud-based record management system would make the process of lending and borrowing museum artifacts so much more efficient. The system would keep track of the location of the artifact, start and expiry date of the loan agreement. This would avoid misplacing an agreement and major fines.

A centralized database for visitor feedback and exhibit tracking.	Feedback from the audience and visitors helps the AAM in making future experiences even better for them. A real-time feedback system would allow visitors to share their experiences, rate exhibits and artifacts, and provide suggestions for improvement. This feedback would be of great help to update programs and workshops.
A business analytics dashboard for data-driven decision making.	A business analytics software platform such as Power BI, Tableau or Amazon QuickSight would integrate data from multiple sources at the AAM. The software provides visual insights and summary dashboards, which would help staff make data-driven decisions. The summary dashboards would provide insights on the most popular exhibits and events, helping AAM to prioritize them.

3.2.2 Assumptions

- Existing network infrastructure of the museum can support the digital tools
- The new system will integrate seamlessly with AAM's existing operations
- Staff will be trained and adaptable to the new software system
- The project will receive necessary budget approvals from the board
- The digital transformation will abide by data privacy and cybersecurity laws
- Cloud storage will be used for data backups and management
- Computers are replaced or existing ones are updated with the latest OS

3.2.3 Constraints

- Budget limitations may affect software selection
- Implementation timeline must align with AAM's operational calendar
- Digital literacy levels may vary amongst employees
- Staff training may take longer than expected
- Data migration must be conducted without losing important information

3.2.4 Business Requirements

Requirement ID	BR-001
Requirement Name	Digital Records Management System for Artifact Loan Agreements
Requirement Description	Develop a digital records management system to store, manage, and retrieve artifact loan agreements efficiently. The system should support version control, audit trails, and access controls to ensure compliance and security.
Data Sources	→ Existing physical and digital loan agreements. → Artifact inventory database.
Business metrics or Key Performance Indicators (KPI's)	→ Reduction in time to retrieve loan agreements. → Percentage of agreements digitalized. → Number of unauthorized access attempts prevented. → Compliance audit pass rate.
Business processes	→ Digitalization and indexing of artifact loan agreements. → Access control and user authentication. → Approval workflow automation for loan requests. → Document retrieval and audit tracking.
List of business stakeholders involved and detailed type of involvement	→ Board Members: They play an important role in approving the project and making sure it aligns with AAM's long-term goals. → Staff: Curator, Exhibit Designer, Collections Manager, and Museum Educator. A digital transformation of the records management system would make it easier for them to keep track of loan agreements, artifacts and easily access all visitor feedback. → Technology Vendors: They would be supplying the relevant software and infrastructure needed for a digital transformation.
List subject matter experts (SME's)	→ Document Management Specialist → Legal Compliance Officer → IT Systems Architect → Museum Collection Manager

Requirement ID	BR-002
Requirement Name	Centralized Database for Visitor Feedback and Exhibit Tracking
Requirement Description	Implement a centralized database to collect, store, and analyze visitor feedback and exhibit engagement data to improve exhibit planning and visitor experience.
Data Sources	→ Visitor surveys and feedback forms. → Exhibit attendance records. → Social media and online reviews.
Business metrics or Key Performance Indicators (KPI's)	→ Increase in visitor satisfaction score. → Percentage of feedback collected digitally. → Number of exhibits improved based on data insights. → Increase in visitor retention rate.
Business processes	→ Collecting and storing visitor feedback. → Tracking visitor engagement with exhibits. → Analyzing visitor preferences and trends. → Generating reports for strategic planning.
List of business stakeholders involved and detailed type of involvement	→ Board Members: They play an important role in approving the project and making sure it aligns with AAM's long-term goals. → Visitors will find it way easier to provide feedback with an improved feedback system. → All staff would be involved – easy access to visitor feedback will allow them to update programs according to visitors' preferences, display highly appreciated exhibits and artifacts, create social media advertising accordingly, and enhance the audiences' experience. → Patrons: Seeing an increase in visitor satisfaction and positive feedback, patrons would want to fund/donate/loan exhibits and artifacts. → Software/Tech Vendors: They are the companies who will provide AAM with the centralized database system.
List subject matter experts (SME's)	→ Data Analyst → Exhibit Designer → Visitor Experience Specialist → IT Database Administrator

Requirement ID	BR-003
Requirement Name	Business Analytics Dashboard for Data-Driven Decision-Making
Requirement Description	Develop an interactive business analytics dashboard that provides real-time insights into key performance metrics across museum operations, visitor engagement, and financial performance.
Data Sources	→ Visitor attendance and engagement data. → Financial reports and revenue records. → Exhibit performance metrics
Business metrics or Key Performance Indicators (KPI's)	→ Increase in data-driven decision-making accuracy → Reduction in reporting time for key stakeholders → Increase in exhibit revenue based on data insights → Improvement in operational efficiency based on dashboard insights.
Business processes	→ Data aggregating and visualization → Real-time monitoring of museum KPIs → Customizable reports for different departments → Decision support based on predictive analytics.
List of business stakeholders involved and detailed type of involvement	→ Board Members: They play an important role in approving the project and making sure it aligns with AAM's long-term goals. Having summary dashboards, will make the decision-making process way much more efficient → All staff would be involved – Easy-to-understand visual insights would lead to lesser miscommunication and an efficient workflow. → Patrons: Seeing an increase in visitor satisfaction and positive feedback, patrons would want to fund/donate/loan exhibits and artifacts. → Software/Tech Vendors: They are the companies who will provide AAM with the business analytics software.
List subject matter experts (SME's)	→ Data Analyst → Exhibit designer → Visitor experience specialist → IT Database Administrator

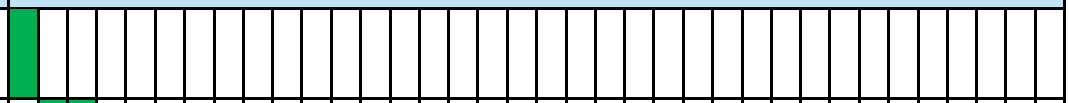
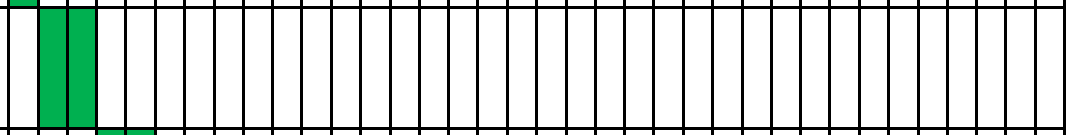
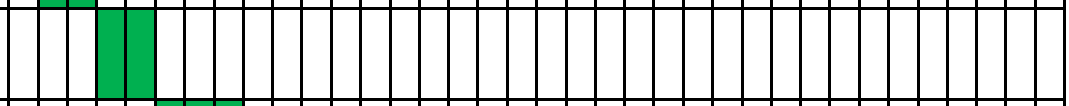
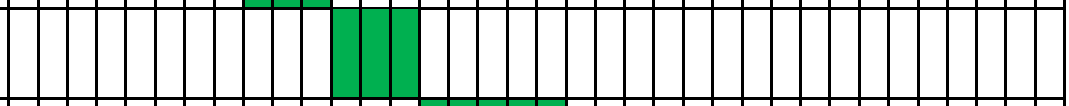
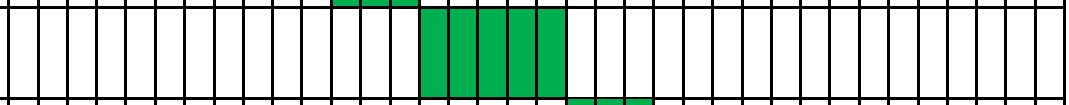
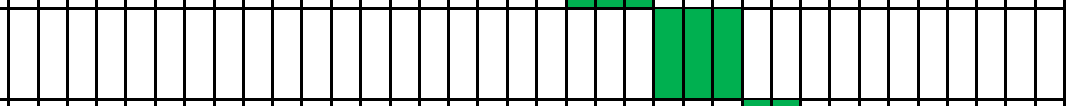
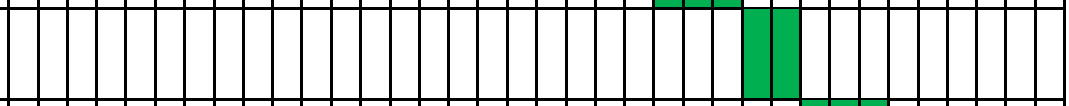
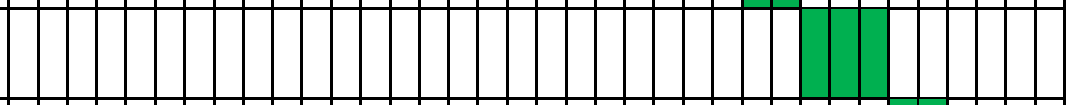
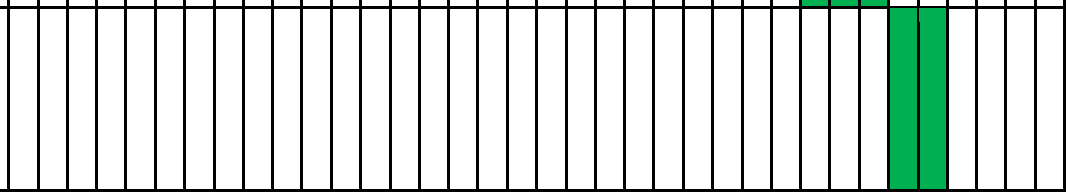
3.2.5 Data Quality Requirements

→ Data Accuracy
→ Security Compliance

4.0 Schedule and Budget

4.1 Schedule

Planning	Analysis	Design	Development	Testing	Implementation	Maintenance
Define the system to be developed (1 week)	Gather the business requirements for the system (2 weeks)	Design the hardware architecture required to support the system (4 weeks)	Build the technical architecture (3 weeks)	Write the test conditions (3 weeks)	Write detailed user documentation (2 weeks)	Build a help desk to support the system users (1 week)
Set the project scope (1 week)	Prioritize the business requirements (2 weeks)	Design system models (3 weeks)	Build the database and programs (5 weeks)	Perform testing of the system (3 weeks)	Provide training for the system users (3 weeks)	Provide an environment to support system changes (2 weeks)
Develop the project plan including tasks, resources, and time frames (2 weeks)	Perform a risk analysis (3 weeks)	Design the software architecture required to support the system (4 weeks)	Build the software architecture (3 weeks)	Document bugs and errors (2 weeks)	System gets deployed and user acceptance (1 week)	Handling residual errors and resolving issues that persist after the testing phase. (2 weeks)

#	Tasks	Duration (1 column = 1 week)
1	Define the system to be developed	
2	Develop the project plan including tasks, resources, and time frames	
3	Gather the business requirements for the system	
4	Perform a risk analysis	
5	Design system models	
6	Build the technical architecture	
7	Build the database and programs	
8	Write the test conditions	
9	Perform testing of the system	
10	Write detailed user documentation	
11	Provide training for the system users	
12	Handling residual errors and resolving issues that persist after the testing phase.	

4.2 Project Staffing Roles

Task #	Role Name	Description/Purpose	Hourly Rate
1	Project Manager	The Project Manager is responsible for the planning and execution of a project, ensuring it is completed on time and within budget, and meets the requirements. They manage teams, track progress, submit progress reports, coordinate with	$36+(4 x $50)+$96)/6 = $55.34
2			
3			
4			
11			

		stakeholders and train staff.	
1 3	Business Analyst	A Business Analyst uses data to help a business improve in it efficiency and performance. They work with stakeholders of the business to understand their needs and develop solutions accordingly.	$40+(4 x $47)+$58)/6 = $47.67
5 6	Software Developer/Engineer	Software Developers/Engineers oversee software programming, building models and software designs for projects.	($30+(4 x $64)+$90)/6 = $62.67
7	Database Administrator	They design, develop, manage, and organize data in a database. They also develop and introduce related policies, standards and models.	($31+(4 x $58)+$82)/6 = $57.50
7	Data Analyst	Data analysts collect, clean, analyze and interpret data to gain meaningful insights and identify trends/patterns. Based on these insights, they generate reports for informed decision-making	($41+(4 x $52)+$82)/6 = $55.16
9	Security Analyst	Security analysts assess administrative, physical and technical security risks to data, software and hardware. They strive to detect, prevent, or minimize the effects of security breaches and concerns	($44+(4 x $55)+$80)/6 = $57.34
8 9 12	Quality Assurance	Quality assurance analysts develop and introduce policies and procedures. They strive to ensure customer satisfaction, peak performance, and overall quality of software products and information systems.	($30+(4 x $45)+$63)/6 = $45.50
8 9	Tester	Systems testers create and execute test plans. They gauge how computer software, information systems, and telecommunication systems are	($27+(4 x $40)+$55)/6 = $40.33

		working.	

4.3 Budget

Staffing Cost Sheet

Role	Qty	Hourly Rate	Total Hours	Total Cost
Project Manager	1	$55.34	616	1 x $55.34 x 616 = $ 34,089.44
Business Analyst	1	$47.67	168	1 x $47.67 x 168 = $ 8008.56
Software Developer/Engineer	2	$62.67	336	2 x $62.67 x 336 = $ 42,114.24
Database Administrator	1	$57.50	280	1 x $57.50 x 280 = $ 16,100.00
Data Analyst	1	$55.16	280	1 x $55.16 x 280 = $ 15,444.80
Security Analyst	1	$57.34	168	1 x $57.34 x 168= $ 9633.12
Quality Assurance	1	$45.50	448	1 x $45.50 x 448= $ 20,384.00
Tester	1	$40.33	336	1 x $40.33 x 336 = $ 13,550.88
Total	9	$421.51	2632	**$159,325.04**

Software Cost Sheet

Qty	Product Name	Description/Purpose	Unit Cost	Total Cost
200	Microsoft Power BI	‘Power BI is a collection of software services, apps, and connectors that work together to turn your unrelated sources of data into coherent, visually immersive, and interactive insights. Your data might be an Excel spreadsheet, or a collection of cloud-based and on-premises hybrid data warehouses. Power BI lets you easily connect to your data sources, visualize and discover what's important, and share that with anyone or everyone you want.’ (8)	$20.00 user/month	200 x $20.00 = $4000.00
Total				**$4000.00**

4.4 Schedule and Budget Summary

- The estimated duration for the BATR project is **32 weeks**.
- The estimated budget for the BATR project is $159,325.04 + $4000.00 = **$163,325.04**

5.0 Academic Process Review

5.1 Overall Approach

As someone who is a computing science major, this project was one of the most interesting projects I worked on. A lot of my projects are code-based, but BATR project was a very unique assignment for me.

My overall approach for creating the requirements document was analyzing the case study very carefully. It helped me understand all the requirements and expectations of AAM from me, a business analyst. I focused on understanding the needs of the staff, who are stakeholders of the AAM. From this analysis, I made a list of their major requirements.

I had to make quite a few assumptions when it came to choosing stakeholders, system functionalities, etc. I based my assumptions on research. I looked at several existing aerospace museums' websites. It really helped me gain insight on the different events they host, the types of artifacts they house and information on the Board of Members.

I did not ask questions in the lectures, however a lot of points discussed in class and the lab videos did help me a lot while compiling my requirements document. I got a lot of thoughts and ideas mostly by research and, from my dad who's in the IT industry. I had discussions with him, we exchanged ideas, which really helped in creating the requirements document for AAM as a student in BTM 211 611.

5.2 Self Reflection

After completing the assignment, I believe I met the assignment objectives quite closely. My approach of understanding the case study, making notes from it, doing extensive research, and visiting the websites of such aerospace museums in real life, helped me put all my ideas together quite well, in my opinion.

However, I think engaging and asking questions in lectures would have also helped me.
The requirements document is a very important outline to a project for an organization/business. It is very important to have a structure, a deadline, a budget and acknowledgment of the stakeholders. This really helps in making sure the project goes smoothly, everyone understands the project scope, and that there'll be no miscommunication. Requirements document is essential for any project to be successful.

6.0 Works Cited

Website

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Lecture Notes

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