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| **Project title** | **Project Report and Presentation** |
| **Course Code** | **DSE211/03** |
| **Course Name** | **Application Development Capstone** |
| **Project Start date** |  |
| **Project Submission Date** |  |

As part of your final capstone project, you and your team are required to develop a fully functioning and tested web or mobile application. Upon completion, you must prepare a comprehensive project report and deliver a presentation that highlights your development process, key features, testing results, and overall project outcomes. This will demonstrate your ability to apply the skills and knowledge you have acquired throughout the capstone course.

### **Project Report Components**

#### **1. Executive Summary**

* **Purpose:** Provide a brief overview of the entire project, summarizing the main objectives, the application developed, and the outcomes achieved.
* **Activity:** Write a concise executive summary (1-2 pages) that includes:
  + The purpose of the project and its significance.
  + A summary of the application developed (e.g., web or mobile, its primary functionality, and target audience).
  + Key achievements, including any challenges overcome and lessons learned.

#### **2. Introduction**

* **Purpose:** Introduce the project, providing background information and context.
* **Activity:** Include the following in your introduction:
  + **Project Background:** Describe the problem or opportunity that led to the development of the application.
  + **Project Objectives:** Clearly state the objectives of the project. What did you aim to achieve by developing this application?
  + **Scope:** Define the scope of the project, including the functionalities included and any limitations or constraints encountered.

#### **3. System Architecture**

* **Purpose:** Detail the technical architecture of the application, including the design and development process.
* **Activity:** Include the following sections:
  + **Overview of Technologies:** List and describe the technologies, frameworks, and tools used in the development of the application (e.g., frontend and backend frameworks, database systems, development environments).
  + **System Architecture Diagram:** Provide a diagram that illustrates the overall architecture of your application, including the interactions between the frontend, backend, database, and any external APIs or services used.
  + **Database Design:** Include the final database schema, with explanations of the key tables, relationships, and how data is stored and retrieved.

#### **4. Application Features**

* **Purpose:** Highlight the key features and functionalities of the application.
* **Activity:** Document the following:
  + **Core Features:** Describe the main features of the application, including how they address the needs of the target users.
  + **User Interface:** Provide screenshots or wireframes of the final UI, explaining the design choices made and how they contribute to the overall user experience.
  + **User Stories and Use Cases:** Include user stories and use cases that were implemented in the final application, showing how the application meets user needs.

#### **5. Testing and Quality Assurance**

* **Purpose:** Demonstrate the testing processes used to ensure the application is functioning as expected and is free of critical bugs.
* **Activity:** Include the following:
  + **Testing Strategies:** Describe the testing strategies used, such as unit testing, integration testing, system testing, and user acceptance testing.
  + **Test Cases:** Provide examples of key test cases, including the test scenario, expected results, and actual results. Include any bug reports and how they were resolved.
  + **Performance Testing:** Summarize any performance testing conducted, including load testing results and how the application was optimized for better performance.
  + **Security Testing:** Document any security testing performed, including vulnerability scans, penetration testing, and the security measures implemented to protect the application.

#### **6. Deployment and Optimization**

* **Purpose:** Explain how the application was deployed to a live environment and any optimization efforts made.
* **Activity:** Include the following:
  + **Deployment Process:** Describe the deployment process, including the hosting environment chosen, the steps taken to deploy the application, and any challenges encountered.
  + **Optimization Techniques:** Document the optimization techniques used to improve the application’s performance, scalability, and security (e.g., caching, load balancing, code optimization).
  + **Continuous Integration/Continuous Deployment (CI/CD):** Explain any CI/CD pipelines set up for automated testing, building, and deployment, ensuring consistent and reliable updates to the application.

#### **7. Project Management and Collaboration**

* **Purpose:** Detail how the project was managed and how the team collaborated to complete the project.
* **Activity:** Include the following:
  + **Project Timeline:** Provide a timeline of the project, showing the major phases, milestones, and key deliverables.
  + **Tools and Techniques:** Describe the project management tools and techniques used to organize tasks, track progress, and manage communication within the team (e.g., Trello, Jira, Slack).
  + **Team Roles and Responsibilities:** Document the roles and responsibilities of each team member, highlighting their contributions to the project.

#### **8. Challenges and Lessons Learned**

* **Purpose:** Reflect on the challenges faced during the project and the lessons learned.
* **Activity:** Discuss the following:
  + **Challenges:** Identify any significant challenges encountered during the project, such as technical difficulties, time management issues, or unexpected obstacles.
  + **Resolutions:** Explain how these challenges were addressed and what strategies were used to overcome them.
  + **Lessons Learned:** Reflect on what the team learned from the project and how these lessons will be applied in future projects.

#### **9. Conclusion and Future Work**

* **Purpose:** Summarize the project and suggest areas for future improvement or expansion.
* **Activity:** Include the following:
  + **Summary of Outcomes:** Recap the key outcomes of the project, including the final application delivered and its impact on the intended users.
  + **Future Enhancements:** Suggest potential enhancements or new features that could be added to the application in the future.
  + **Final Thoughts:** Conclude with any final reflections on the project’s success and what the team has achieved.

### **Project Report Submission**

* **Deadline:** [Insert Deadline Date]
* **Format:** Submit the project report in a PDF format. The report should be well-organized, clearly written, and include all required sections.
* **Evaluation Criteria:** The project report will be evaluated based on the completeness and clarity of each section, the quality of the application developed, the thoroughness of the testing and optimization processes, and the overall presentation of the report.

### **Project Report Rubric**

| **Criteria** | **5 - Excellent** | **4 - Good** | **3 - Satisfactory** | **2 - Needs Improvement** | **1 - Unsatisfactory** |
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| **Executive Summary** | Provides a concise, comprehensive overview of the entire project, clearly summarizing objectives, application functionality, key outcomes, and lessons learned. | Summarizes the project well, with most key aspects covered. Some minor details or clarity may be lacking. | Provides an adequate summary but may omit some key aspects or lack detail. | The summary is incomplete, lacks clarity, or omits several important aspects of the project. | The summary is missing, very unclear, or fails to provide an accurate overview of the project. |
| **Introduction** | Clearly introduces the project, providing thorough background information, well-defined objectives, and a detailed scope. Sets a strong context for the entire report. | Introduces the project effectively, with good background, objectives, and scope. Minor improvements needed for full clarity or detail. | Introduction is adequate but may lack depth or clarity in explaining background, objectives, or scope. | Introduction is vague, lacking detail, or missing key information. The context for the report is weak. | Introduction is missing, unclear, or fails to provide necessary context for the report. |
| **System Architecture** | System architecture is thoroughly detailed with clear diagrams, well-explained technologies, and a solid rationale for design choices. All components are clearly connected. | System architecture is well-documented with clear diagrams and explanations. Minor improvements could enhance the connections between components. | System architecture is described, but diagrams or explanations may be unclear, incomplete, or lacking in detail. | System architecture is poorly documented with unclear diagrams, weak explanations, or incomplete components. | System architecture is missing or critically flawed, with no clear explanation or connection between components. |
| **Application Features** | Features are comprehensively documented, with clear explanations, user stories, and relevant screenshots or mockups. Functionality is well-aligned with user needs. | Features are well-documented, with most aspects clearly explained. Some features or user stories may need further detail. | Features are documented, but explanations may lack clarity, depth, or alignment with user needs. | Feature documentation is vague, incomplete, or lacks alignment with user needs. Screenshots or mockups may be unclear or missing. | Features are undocumented or critically flawed, with little to no alignment with user needs. Screenshots or mockups are absent or irrelevant. |
| **Testing and Quality Assurance** | Testing strategies are comprehensive and thoroughly documented. Includes clear test cases, results, bug fixes, and performance/security testing. Demonstrates a high level of quality assurance. | Testing strategies are well-documented with clear test cases and results. Some areas may need minor improvements or additional detail. | Testing is documented but may lack depth, detail, or clear results. Some testing areas may be incomplete or weak. | Testing documentation is incomplete, unclear, or lacks critical test cases and results. Quality assurance is weak. | Testing is undocumented or critically flawed, with no clear strategy, test cases, or results. Quality assurance is minimal or absent. |
| **Deployment and Optimization** | Deployment process is thoroughly documented, with clear explanations of hosting, optimization techniques, and CI/CD pipelines. Performance and security optimizations are well-executed and clearly described. | Deployment process is well-documented with good explanations and minor gaps. Optimization techniques and CI/CD pipelines are implemented with some room for improvement. | Deployment is documented but may lack clarity or detail. Optimization and CI/CD are addressed but may be incomplete or require refinement. | Deployment documentation is vague, unclear, or missing key components. Optimization techniques and CI/CD are poorly addressed or ineffective. | Deployment is undocumented or critically flawed, with minimal or no optimization techniques and CI/CD implementation. |
| **Project Management and Collaboration** | Project management is exceptionally well-documented, with a clear timeline, detailed roles, and effective use of collaborative tools. The team’s collaboration is well-coordinated and documented. | Project management is well-documented with a clear timeline and roles. Collaboration is good but may need additional detail or refinement. | Project management is documented, but the timeline, roles, or collaboration may be unclear, incomplete, or lacking detail. | Project management documentation is weak, with an unclear timeline, poorly defined roles, or weak collaboration. | Project management is undocumented or critically flawed, with no clear timeline, roles, or evidence of collaboration. |
| **Challenges and Lessons Learned** | Challenges are thoroughly documented with clear explanations of how they were addressed. Lessons learned are insightful and show significant reflection. | Challenges are well-documented, with clear explanations. Lessons learned are good but may lack depth or reflection. | Challenges and lessons learned are documented, but explanations may lack detail or insight. Reflection may be minimal. | Challenges are vaguely documented, with unclear explanations. Lessons learned are weak or lack reflection. | Challenges and lessons learned are undocumented or critically flawed, with no clear reflection on the project. |
| **Conclusion and Future Work** | Conclusion is strong, effectively summarizing the project’s outcomes and providing insightful suggestions for future work. Clearly demonstrates the project’s success and potential. | Conclusion is well-written, summarizing the project effectively with good suggestions for future work. Minor improvements could enhance its impact. | Conclusion is adequate but may lack depth or clarity in summarizing outcomes or suggesting future work. | Conclusion is weak, lacking clear summarization of outcomes or valuable suggestions for future work. | Conclusion is missing, unclear, or fails to summarize the project’s outcomes and potential for future work. |
| **Clarity and Professionalism** | The report is exceptionally well-organized, clearly written, and free of errors. It is presented in a professional and convincing manner, with a strong emphasis on quality and detail. | The report is well-organized, clearly written, with minor errors. It is presented professionally, with good attention to quality and detail. | The report is adequately organized and written but may contain some errors or lack some professionalism. Quality and detail are sufficient but could be improved. | The report is poorly organized, with significant errors or lack of clarity. Professionalism is lacking, and the report may not effectively communicate the project. | The report is disorganized, difficult to read, with numerous errors and a lack of professionalism. Quality and detail are minimal or absent, making the report ineffective. |

### **Project Presentation Components**

#### **1. Introduction**

* **Overview:** Provide a brief introduction to your project, including the problem you aimed to solve, the objectives, and the scope of your application.
* **Activity:** Prepare a 1-2 minute overview slide that captures the essence of your project.

#### **2. System Architecture and Design**

* **Overview:** Present the technical architecture of your application, including the technologies used and how the different components interact.
* **Activity:** Use diagrams and visual aids to explain the system architecture, database design, and any significant design decisions made during the project.

#### **3. Demonstration of Key Features**

* **Overview:** Demonstrate the core features of your application, focusing on how they meet user needs and the functionality they provide.
* **Activity:** Prepare a live demonstration or a video walkthrough that showcases the key features of your application. Highlight any unique or innovative aspects of your design.

#### **4. Testing and Quality Assurance**

* **Overview:** Discuss the testing strategies employed and the results obtained, demonstrating the quality and reliability of your application.
* **Activity:** Prepare slides that summarize the key test cases, testing results, and any bug fixes. Include screenshots or clips from testing tools to illustrate your points.

#### **5. Deployment and Optimization**

* **Overview:** Explain how the application was deployed and the optimization efforts undertaken to enhance performance and security.
* **Activity:** Prepare slides that outline the deployment process, the hosting environment, and any optimization techniques used. Include before-and-after metrics if available.

#### **6. Challenges and Lessons Learned**

* **Overview:** Reflect on the challenges encountered during the project and the lessons learned by the team.
* **Activity:** Prepare a slide that summarizes the major challenges, how they were overcome, and what the team learned from the experience.

#### **7. Conclusion and Future Work**

* **Overview:** Conclude the presentation with a summary of the project’s outcomes and suggestions for future enhancements.
* **Activity:** Prepare a final slide that recaps the key points and leaves the audience with a clear understanding of your project’s success and potential for future development.

### **Presentation Delivery**

* **Duration:** The presentation should be 15-20 minutes long, followed by a 5-10 minute Q&A session.
* **Format:** Use visual aids such as slides, diagrams, and live demonstrations to make your presentation engaging and informative.
* **Evaluation Criteria:** The presentation will be evaluated based on the clarity of communication, the quality of the content presented, the effectiveness of the demonstration, and the ability to answer questions during the Q&A session.

### **Project Presentation Rubric (Scale: 5-1)**

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| **Criteria** | **5 - Excellent** | **4 - Good** | **3 - Satisfactory** | **2 - Needs Improvement** | **1 - Unsatisfactory** |
| **Content Quality** | Presentation content is exceptionally well-organized, covering all key aspects of the project comprehensively. Information is accurate, relevant, and presented in a logical flow. | Presentation content is well-organized, covering most key aspects of the project. Information is accurate and relevant, with minor gaps in detail or flow. | Presentation content is adequate but may lack organization or depth in certain areas. Information is mostly accurate but may be missing some key details. | Presentation content is poorly organized, with significant gaps in key aspects of the project. Information may be inaccurate, irrelevant, or lacking clarity. | Presentation content is disorganized, incomplete, or inaccurate. Key aspects of the project are missing or poorly presented. |
| **Clarity and Communication** | The presenter(s) communicate ideas clearly, confidently, and effectively. The presentation is easy to follow, with appropriate pacing and clear articulation. Visuals and language are used effectively to enhance understanding. | The presenter(s) communicate well, with minor issues in clarity or pacing. The presentation is generally easy to follow, with good use of visuals and language. | The presenter(s) communicate adequately but may struggle with clarity, pacing, or articulation. The presentation may be somewhat difficult to follow, with visuals that could be improved. | The presenter(s) struggle with communication, leading to unclear or confusing delivery. Pacing may be too fast or too slow, and visuals may be poorly utilized. | The presenter(s) fail to communicate ideas clearly, with significant issues in clarity, pacing, and use of visuals. The presentation is difficult to follow and understand. |
| **Technical Accuracy** | All technical aspects of the project are explained accurately and in detail. The presenter(s) demonstrate a strong understanding of the technology and tools used. | Most technical aspects are explained accurately, with a good level of detail. The presenter(s) demonstrate a solid understanding of the technology and tools used, with minor inaccuracies. | Technical aspects are adequately explained but may lack detail or contain some inaccuracies. The presenter(s) show a basic understanding of the technology and tools used. | Technical explanations are vague, inaccurate, or incomplete. The presenter(s) may show limited understanding of the technology and tools used. | Technical explanations are missing, critically flawed, or highly inaccurate. The presenter(s) show little to no understanding of the technology and tools used. |
| **Demonstration of Application** | The demonstration is well-prepared, smoothly executed, and effectively showcases the application’s core features and functionality. The presenter(s) handle any technical issues confidently and maintain audience engagement. | The demonstration is well-executed, with minor technical issues or gaps in showcasing features. The presenter(s) handle any issues well and keep the audience engaged. | The demonstration is adequate but may lack preparation or smooth execution. Some features may be poorly showcased, and technical issues may affect the flow. | The demonstration is poorly executed, with significant technical issues or gaps in showcasing features. The presenter(s) may struggle to engage the audience or manage technical difficulties. | The demonstration is missing, poorly prepared, or fails to showcase the application’s features. Technical issues severely disrupt the flow, and the presenter(s) fail to engage the audience. |
| **Engagement and Interaction** | The presenter(s) actively engage the audience, encouraging questions and responding confidently and accurately. The presentation is interactive, with meaningful audience participation. | The presenter(s) engage the audience well, with good encouragement of questions and accurate responses. The presentation is interactive but may need slight improvement in audience participation. | The presenter(s) make some effort to engage the audience, but interaction may be limited or less effective. Responses to questions are adequate but may lack confidence or accuracy. | The presenter(s) struggle to engage the audience, with minimal interaction or poor responses to questions. The presentation lacks meaningful audience participation. | The presenter(s) fail to engage the audience, with no interaction or inadequate responses to questions. The presentation is entirely one-sided and lacks audience participation. |
| **Visual Aids and Presentation Design** | Visual aids are highly effective, professionally designed, and enhance the overall presentation. Slides are clear, well-organized, and free of errors. The design is visually appealing and supports the content well. | Visual aids are effective and well-designed, with minor improvements needed in clarity or organization. Slides are generally clear, with few errors and good visual appeal. | Visual aids are adequate but may lack effectiveness or professionalism. Slides may have some errors, clutter, or lack visual appeal, but still support the content. | Visual aids are poorly designed, unclear, or cluttered. Slides may contain significant errors or distract from the content, lacking overall visual appeal. | Visual aids are missing, poorly designed, or highly ineffective. Slides are unclear, unorganized, and detract from the presentation’s content. |
| **Professionalism and Preparation** | The presentation is highly professional, well-rehearsed, and reflects thorough preparation. The presenter(s) demonstrate confidence, professionalism, and excellent teamwork. | The presentation is professional and well-prepared, with good rehearsal evident. The presenter(s) demonstrate confidence and professionalism, with minor issues in teamwork or preparation. | The presentation is adequately professional, but may show signs of limited preparation or rehearsal. The presenter(s) may lack confidence or professionalism in some areas. | The presentation is unprofessional or poorly prepared, with significant issues in confidence, teamwork, or delivery. The presenter(s) may appear unprepared or disorganized. | The presentation is unprofessional, unprepared, and lacks organization. The presenter(s) demonstrate little to no confidence, professionalism, or teamwork. |