

MASTER OF SCIENCE IN INFORMATION TECHNOLOGY (MSIT)

CAPSTONE HANDBOOK

INTRODUCTION

Congratulations on nearing the completion of your studies as a master's student! Your capstone project will be a culminating experience that synthesizes a variety of skills, knowledge, and expertise that you have gained throughout the course of your studies while also demonstrating that you can lead an independent project. You will design a project proposal that identifies a project and an implementation plan to solve the problem. Your plan will include: scope of the project, timeline, stakeholders involved and the staff needed to develop and implement the resolution.

This handbook is designed to provide resources to guide you through the successful completion of an MSIT Capstone Project. The Capstone Project is the last course in the MSIT program and is a requirement for all MSIT students completing the MSIT program at UoPeople. Throughout the Capstone Project, students are challenged to take ownership of their educational experience; communicate logically and effectively; evaluate how content is shaped by the context in which it was created; formulate and develop meaningful claims supported by reason and evidence; and integrate diverse knowledge, perspectives, and skills.

The MSIT enhances career options for current and future IT professionals in the areas of management, performance and integration of information technology systems. Students must successfully complete a total of 12 courses, each lasting 8 weeks, for a total of 36 credit hours to successfully complete the MSIT program.

MSIT Program Learning Outcomes (PLOs) and Course Learning Outcomes (CLOs)

Upon completion of the capstone course, students will be able to demonstrate the following skills:

PLO 1: Apply the principles of information technology, computer science and other disciplines to the analysis of complex computing problems.

- CLO 1: Apply the concepts of information technology, computer science, and allied disciplines to solve complex problems.

PLO 2: Design and evaluate solutions to complex computing problems using industry-recognized best practices and standards.

CLO 2: Design a solution using emerging tools and technologies to solve a business problem.

CLO 3: Evaluate the solution in context of the objectives defined for the project.

PLO 3: Analyze user needs in the development and implementation of computing-based solutions.

CLO 4: Analyze user needs for system design and development, based on a business problem

PLO 4: Assess the ethical considerations in the development, implementation, evaluation, and management of IT systems.

CLO 5: Critically analyze the ethical considerations when managing IT systems.

PLO 5: Construct clear, well-organized arguments supported by credible research-based evidence.

CLO 6: Demonstrate the ability to write well-organized arguments supported by high-quality, credible, relevant sources.

Overview of Capstone Project

Students work individually to develop or implement a real-world IT solution integrating the knowledge acquired in preceding MSIT courses. Components that are emphasized include technical design, research, documentation, project management, leadership, and communication skills including meeting all five MSIT program learning outcomes. The capstone addresses a topic of information technology and is evidence that the student can integrate skills and competencies from across the curriculum to IT research and/or practice for which you sign up. The course instructor will provide additional guidance for all students in the class.

Capstone planning typically begins when students are taking the last course before the Capstone course. The capstone proposal must be submitted in week 1 and get approved maximum by the end of week 2 -- An earliest approval is better, because the students can start working on their CP immediately after approval, thus getting more time to work on their CP. The final result will be an IT solution addressing a typical business or organizational need, such as data management or system implementation, which will be evaluated by the course instructor. The course project will contain three parts.

If your instructor is unwilling to approve your proposal by the second week of class, you may be dismissed from the course. Therefore, you should work quickly and diligently to address any concerns the instructor may have, bearing in mind that the instructor holds the final authority on whether your proposal is acceptable or not.

You are encouraged to use documents and forms you are familiar with or the forms publicly available at various internet sources (please respect any intellectual property/copyright restrictions) in addition to the Implementation Plan Template.

Components of the Capstone Project

1) The problem statement and overview of the solution:

Each student is required to submit a **problem statement** for the selected CP. The problem statement should clearly define the scope and expected content of the CP. It should address novelty, requirements, limitations, evaluation standards, objectives, and any other specific relevant CP issue. Each student is expected to begin by describing a significant IT problem, and also by giving a concrete example of the problem. This works as a "hook" to grab the audience's interest and persuade them of the value of the CP.

Having hooked the audience into the problem, paint a picture of what the world will be like when you solve the problem. Your **proposed solution** should relate the current situation to the desired result and describe its benefits. Therefore, you will begin with your proposed solution by briefly describing this desired result. Now that you have described the result, think of your iterative enhancement plan as showing your audience the steps by which you will lead them to that result.

In a nutshell, write a two- to three paragraph document and submit it in a way so that the **finally approved Project proposal submission be done by the end of week 2**. The first paragraph should be a **problem statement** for your CP and the second paragraph should be an **overview of the solution** for your CP. Each of the paragraphs should be brief -- a 200-word paragraph is typical. Aim for simplicity and precision in your writing. Your project will also include **Specific Learning Objectives** an explanation on how the project will show that you have the skills and knowledge to meet the MSIT Program Learning Outcomes from the work that you are doing. This will be done in the form of a rubric.

2) The implementation report

The implementation phase of the CP will start as soon as the project proposal is approved. The workforce development initiatives that were carried out during the implementation phase must be fully described in the implementation report. The goal is to create a brief document that only includes the information necessary to tell Tran-SET of the activities that were carried out. All the students are required to submit an implementation report by the end of week 7. The implementation report must demonstrate the progression of tasks as per planning. It must cover the description of tasks and deliverables obtained at the end of each phase as determined in the planning. This part must not have any reflection activities but purely project-development based technical details.

3) The capstone and program reflection:

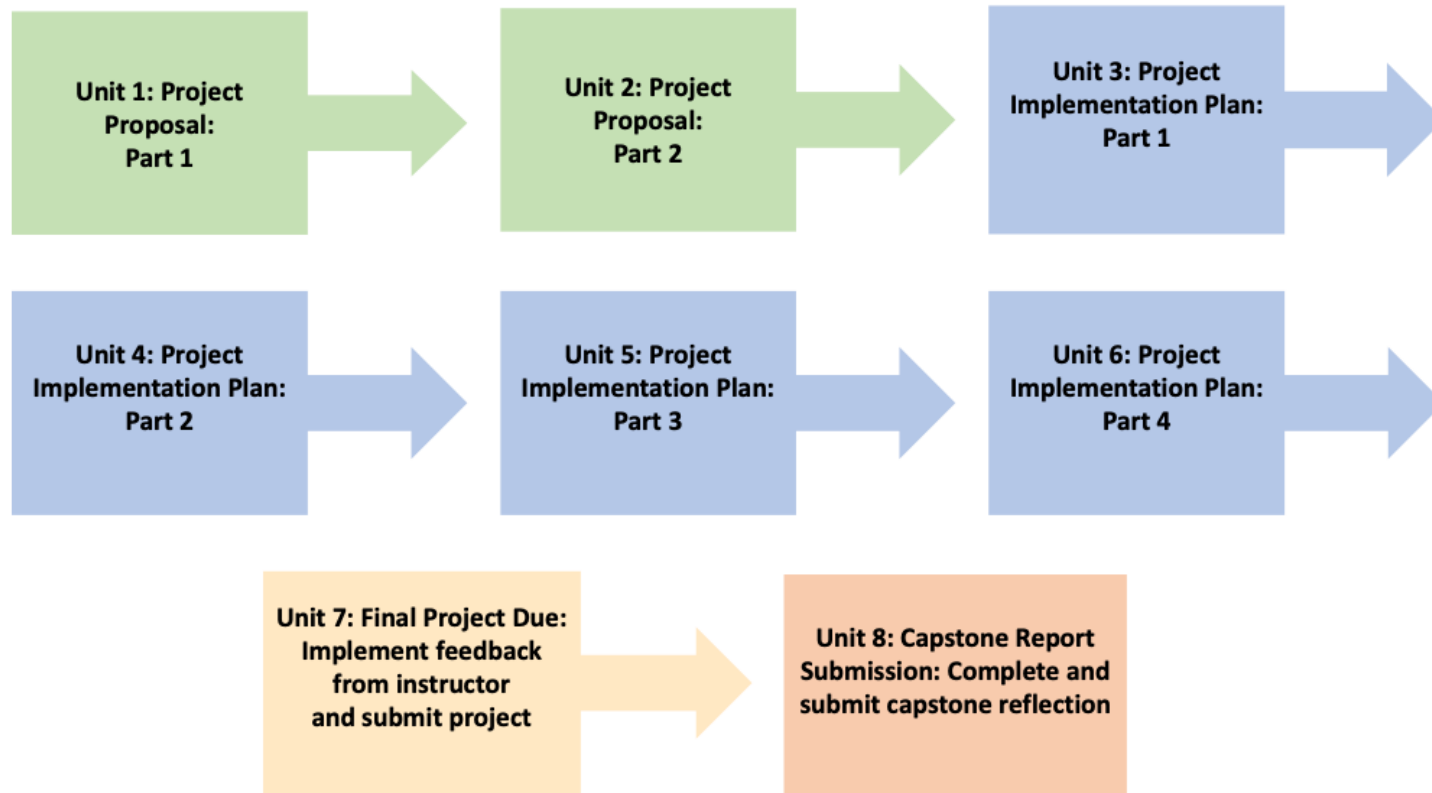
The MSIT 5910 that is the capstone project is the culminating experience of the program. It is designed with the participant's specific goals to apply what they have learned in their program of study. The purpose of the reflection paper is to reflect on your experiences in the MSIT program and its impact on your thinking and engagement with DEI in the workplace, the university, and beyond. The expectation is to integrate what you have learned regarding diversity, equity, and inclusion (DEI) into your reflection paper.

A reflection paper typically cites your reactions, feelings, and analysis of your capstone and program experience. This reflection allows you to gain a deeper understanding of your values, goals, and actions in light of this program. The final reflection paper should be approximately 3-5

pages (750-1000 words) long. If you have attended workshops that included readings, feel free to integrate the material into your reflection. In addition, we hope that you will relate the content of the workshops to your observations of your environment, work, family, society, and yourself. The paper shall be submitted and evaluated in week 8.

Capstone Project Flow

During its life cycle, the CP shall complete the following units:



Finding Appropriate Projects

Many types of projects might qualify as a good capstone project. One common trait of such projects is that they must provide a good mix of learning and doing. You must do a single project, not several small ones strung together. One of the aims of a Capstone Project (CP) is for you to learn how to manage a considerable piece of work and to deal with the obstacles and challenges that routinely arise in long projects, not short ones. Start by thinking about the deliverable you would like to produce or the experience you would like to gain.

Examples of deliverables include usability studies, website or app design/development, dashboards of vital information, program development, business analysis or market research, information system redesign, collection overhauls, and functional or technical requirement documentation.

Examples of projects may include but are not limited to:

- Implementing an Information project management strategy or process for an organization
- Designing a database and generating analytical reports
- Analyze an existing network system and provide a plan for a new model
- Improving data security
- Designing a software application
- Implementing artificial intelligence (AI) for an organization
- Designing an ecommerce system
- Implementing a home surveillance and automation system
- Designing and implementing a business management application
- Use an open-source dataset to create visualization
- Use an open-source dataset to create dynamic dashboards
- Creating a module for any open-source programming language/database/application's extension (example, Python, MySQL, Moodle,etc.)
- Create a useful API for interconnectivity between applications with necessary documentation.

Capstone Project Proposal

You must submit the CP proposal in Unit 1 of MSIT 5910 and receive feedback from your instructor. The final draft must be submitted by the end of unit 2. The proposal should include:

1. **Problem Statement:** Identify a problem, then analyze a problem, and explain why this problem is significant.
2. **Overview of Solution:** provide a descriptive overview of the solution to the problem. This should be a high-level solution and incorporate how the solution will enhance the organization. You must integrate innovative ideas and emerging technologies as part of your solution to the problem.
3. **Specific Learning Objectives:** an explanation on how the project will show that you have the skills and knowledge to meet the MSIT Program Learning Outcomes from the work that you are doing.

Project Implementation Plan

The project implementation plan will outline how you will attain your goal: the problem solution. This part of your report may include a budget, resources, tools, scope, timeline, defining deliverables, among other components.

4. **Major Tasks and Schedule:**
 - a. Assumptions and constraints
 - b. Task List
 - c. Schedule
5. **Security and Testing**
 - a. Security
 - b. Development and Testing
6. **Identify Resources Needed:** What are the tasks that need to be accomplished to achieve a solution to the problem? Who will be responsible for each task? What tools are needed to achieve the goal or solution? a. Hardware b. Software
c. Training
7. **Project Activities and Methods:** a set of work activities, or the tasks you will complete on the way to the final deliverable. The methods you will employ, to the extent that they are known (e.g., focus group interviews, research, database searches, prototyping, experimentation, use of test cases, or surveys) along with a set of functionalities that shall be developed and tested to make the project successful.
8. **Project Deliverables:** a list of deliverables/outcomes (demonstration or documentation).

9. **Rollout and Maintenance:** How will you know that the new system is ready to be made operational? What criteria will be used to move your development system to being operational? What metrics will you use to measure performance? What ongoing maintenance will the new system incur?

The Capstone and Program Reflection

CP reflection is an explanation of how the project fits as a reflection of your MSIT degree (make sure to list courses that prepare you for this project). As you reflect on your journey through the MSIT program and the Capstone Project, consider the following:

- What unforeseen problems or challenges did you face during your capstone experience? How did you overcome these challenges?
- Do you see a relationship between your capstone project and the MSIT program?
- How will you apply what you have learned beyond your academic experience with UoPeople?
- What ethical challenges did you encounter during the development of your project implementation? Explain.
- How did this capstone demonstrate your strengths as a specialist in the IT field?
- What do you see as strengths in the capstone and what are areas that can be improved upon?