MISM/MSISPM
Capstone Project
Guide

2023
Spring Semester

Heinz College
School of Information Systems & Management

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IMPORTANT:

TEAM MEMBERS READ THIS HANDBOOK IN ITS ENTIRETY

1. EMAIL YOUR SIGNED ACKNOWLEDGEMENT OF RECEIPT FORM (see page 3) TO THE ISM ACADEMIC COORDINATOR – brittanf@andrew.cmu.edu .

2. RETRIEVE THE TEAMS ORACLE CHARGE STRING AFTER TURNING IN ACKNOWLEDGEMENT OF RECEIPT FORM.

3. COMPLETE YOUR FIRST TEAM ASSIGNMENT (see Appendix 2) AND TURN IT IN TO YOUR PROJECT ADVISOR AND PROGRAM DIRECTOR AFTER YOUR CLIENT KICK-OFF MEETING

4. SIGN YOUR EDUCATIONAL PROJECT AGREEMENT (EPA)

5. BEGIN DISCUSSING MIDTERM AND FINAL PRESENTATION DATES WITH THE CLIENT. TIME SLOTS FOR MID AND FINAL PRESENTATIONS ARE THE SAME AND CAN BE FOUND AT THE BOTTOM OF PAGE 12.

Acknowledgement of Receipt (S23)

It is the responsibility of team members to be aware of all rules and regulations governing the capstone projects. Read over this handbook carefully. The team project manager and team financial manager must sign and turn in a copy of this form to the Academic Coordinator by email – brittanf@andrew.cmu.edu by the end of the first week of classes.

Client Name: _____

Team Project Manager: _____

Signature	PRINT NAME & Andrew ID	Date

Team Financial Manager: _____

Signature	PRINT NAME & Andrew ID	Date

1. GOALS

The Capstone Project provides an opportunity to apply the skills developed in the classroom to a real-world scenario. In doing so, students begin to make the transition from the academic world to the environments in the marketplace. In these environments, the challenges of team building, resource development, client relations, limited information, and pressing deadlines are as real and important as the technical and managerial components of any task.

The Capstone Project is a semester-long, intensive, team-based experience focusing on areas of expertise in the MISM and MSISPM program. A typical project includes design and development of a security or information system or data analytics pipeline for an external client – often a corporation or public agency. Each project results in a final report and presentation as well as a demonstration, a prototype, or a significant portion of a larger system

2. PROJECT EXPECTATIONS & MILESTONES
2.1 Expectations

Project teams must submit a **separate executive summary** for dean review to a link sent out by the academic coordinator.

Final deliverables (report, presentation materials, presentation recording, code (if applicable), etc.) must be submitted **separately** to the project client and to the academic office. To submit deliverables to the academic office, the project manager must create a CMU Box file and grant editor access to the program director, faculty advisor, and academic coordinator.

The digital report (PDF Format) must have all the charts, tables, and graphics incorporated into the document. If the client deliverable also includes a prototype system, a copy of the system and other project artifacts must also be provided at submission.

The final project report **MUST** include:

- Executive Summary
- Project Objectives
- Value and Business Impact
- Project Methodology
- Data Analysis
- Conclusions and Recommendations
- Lessons Learned
- Suggestions for Future Work

The length of the final report will depend upon the project scope and deliverable. **Project teams should clarify this with their faculty advisor as soon as possible.**

2.2 Milestones

While projects may differ considerably in format, there are common milestone events for all project teams:

- ## Spring Projects

  Late January:
  Kick-off meeting with client (refine problem statement, scope, and work plan) and watch the "Logistics and Educational Project Agreement Review Video" found in the S23 Capstone Resources BOX file.

  Early March (end of Mini 3):
  Midterm presentation to client, Faculty Advisor, Program Director, and Associate Dean (update on progress) - **Monday, February 27th - Friday, March 3rd**
  Peer review of individual team members / student consultations with advisor

  April/May:
  Creative Videos Due by **April 14, 2023 by Noon**
  Final presentation to client and ISM student body - **Monday, April 24th – Friday, April 28th and/or Monday, May 1st- Thursday, May 4th**

  End of Semester (end of Mini 4):
  Completion and distribution of final deliverables, peer review of students, student evaluation of faculty advisor (See section 2.1) - **Friday, May 5th by Noon**

2.3 Peer Review of Team Members and Individual Consultations

Peer review – Giving and receiving constructive feedback in a professional manner is an activity that professionals are increasingly being asked to undertake and is essential to the development of individual team members. For those doing well, it provides validation and an opportunity to discuss continued growth. For those doing poorly, it provides awareness and the opportunity to improve their performance during the remainder of the semester.

Peer review will be facilitated by the faculty advisor and will include written evaluation of team members as well as self-evaluation. While the methods and frequency may vary (some will process peer reviews monthly while others may use only one final review), each team member will have the opportunity to experience the process.

While grades will be assigned by the faculty advisor, peer review results will be taken into consideration. The results will also provide the advisor with feedback for individual consultations with team members.

Peer reviews **must** be turned in directly to the project advisor by each team member **within 24 hours after final presentation delivery**. Appendix 1 is provided as the peer review form to use for this exercise (note, your faculty advisor may choose to use a different form).

2.4 Student Evaluation of Advisor

Students will evaluate their project advisors just as they do in other Heinz College courses.

3. PROJECT ROLES

3.1 Administrative/Faculty Roles

The following have administrative oversight over all teams:

3.1.1 Faculty Advisor
- Appoints financial manager
- Monitor team's progress
- Acts as liaison between the team and client
- Assigns final grade to student

3.1.2 Academic Coordinator & Program Director
- Provide administrative consultation regarding all policies and procedures
- Provide Oracle Account String to Financial Manager and Faculty Advisor (after receiving the team roles & project description)

3.2 Student Roles

The following roles will be filled by team members:

3.2.1 **Project Manager** (in cooperation with all team members)

Provides Leadership:
- Establishes spirit of collaboration and teamwork
- Communicates the team vision
- Resolves problems as they arise
- Focuses and motivates the team on weekly progress and final objectives Manages project and team contributions:
- Prepares the project plan in collaboration with the team members
- Establishes the project schedule
- Identifies formal and informal team roles for each member of the team
- Schedules team meeting
- Oversees and manages schedule for deliverables and task milestones
- Oversees peer review process
- Organizes the team **mid-term** and **final** presentations
- Gathers team members' collective input and submits the **Critical Thinking Piece** exercise (see Appendix 2) to the project advisor and program director.
- Manages Team Communications:
- Schedules weekly meetings with the faculty advisor
- Establishes regular communication with the client
- Organizes visits to the client site, as needed
- Ensures team communications reach each team member
- Schedules all room reservations

3.2.2 **Process Organizer** (in cooperation with all team members):
- Organizes all team meetings
- Schedules team meetings and communicates schedule to team members
- Locates and acquires site for team meetings
- Ensures all team members are informed
- Motivates team members who are absent or tardy from team meetings
- Sets up team bulletin board with help from Heinz Computing Services
- Records and communicates decisions made at each meeting to team and client
- Schedules and prepares peer reviews in conjunction with faculty advisor

3.2.3 **Chief Systems Administrator** (in cooperation with all team members):
- Works with Heinz Computing Services with server configuration
- Establishes rules for access to servers, databases, and applications in consultation with the rest of the team
- Establishes security and backup procedures to protect from unauthorized access, intrusion, or disaster

3.2.4 **Financial Manager** (ASSIGNED by faculty advisor; in cooperation with all team members)
- Confirms the project budget with the ISM Administrative Coordinator
- Obtains authorization for team expenditures from the faculty advisor

- Establishes a budget plan. Obtain project manager and faculty advisor approval for expenditures
- Authorizes, tracks, and manages all expenses and ensures project stays within budget
- Reviews accounting reports with faculty advisor monthly to ensure project budget
- Submits Student Reimbursement Form (Appendix 3) on a timely basis

3.3 Client Role

- Provides a prospectus of the proposed work
- Commits to meeting periodically with student team
- Appoints a point of contact during the 15-week semester
- Responds to student inquiries
- Attends the mid-semester and final presentation
- Pays all client expenses

4. ADMINISTRATIVE LOGISTICS

Please adhere to the following guidelines for requesting and using CATERING, FILE STORAGE, SOFTWARE, VIDEO CONFERENCING, and EQUIPEMENT LENDING

4.1 Catering - Unallowable Expense

Catering or any type of food purchase is an unallowable expense. If applicable - Academic coordinator will order catering for final presentations.

4.2 Computing & Software - Requires Pre-Approval

NOTE: While integral to many of the projects, project teams are not permitted to purchase or download software without prior consent of the University. This includes FREE software available on the web.

Please check with ISM office **BEFORE DOWNLOADING FREE OR PURCHASING ANY SOFTWARE SERVIC**E. Send an email with the name(s) of the software to the Academic Coordinator as well as a link to each, a link to the terms and conditions, and a brief explanation of the team use to start approval process.

Project files can be stored on the central file server. The initial quota is 5 GB. Additional space can be requested as needed. All files stored on the central server are backed up overnight. Files deleted for longer than 30 days cannot be restored. Email Heinz- computing@andrew.cmu.edu to request file server space or to request file restores from backup.

4.2.1 Software - PRE-APPROVAL IS REQUIRED
There is no charge for software that is licensed under an unlimited licensing agreement by the University or by Heinz College. Some software packages do have an additional charge — even if that software has a licensing agreement with the University or with Heinz College. Such charges will be assessed to the project budget. If there are questions about charges for project software, please email inquiry to heinz-computing@andrew.cmu.edu.

PRE-APPROVAL IS REQUIRED TO PURCHASE (OR DOWNLOAD FREE) SOFTWARE NOT LICENSED BY THE UNIVERSITY;
Please keep in mind that this includes any software that your client and advisor advise that you use. Pre- approval can be acquired by emailing the ISM Academic Coordinator**. Please include the following information: Software name, direct link to software, direct link to terms and conditions, 1-2 sentence statement explaining why and how you will be using the software.**

4.2.2 Video Conferencing
Zoom is the preferred videoconference software that can be used with project clients. Use your CMU Andrew ID to access Zoom here: https://www.cmu.edu/computing/services/comm-collab/web-conferencing/zoom/index.html
For more information, please reference the **Video Conference Guidelines** (Appendix 5).

4.2.3 Equipment Lending
Project teams can reserve portable projectors and laptops for presentations. Email heinz-computing@andrew.cmu.edu for reservations.

NOTE ABOUT REHEARSALS FOR FINAL PRESENTATIONS: If the presentation involves a technical component, it is advisable to include the component in the final presentation rehearsals. Project teams can borrow a laptop and/or projector for rehearsal purposes.

4.2.4   Heinz Consulting Services

The Heinz Computing Services department is available for consultation on information technology related subjects. Email heinz-computing@andrew.cmu.edu to schedule an appointment.

4.3 Copy Services

Photocopies will be charged directly to the team's budget. Tartan Ink on campus can assist with the order and charge fees directly to the project Oracle Account String. Remember to consult with the Tartan Ink associates about cost estimates and lead times for copying and binding reports.

4.4 Parking and Transportation

Please visit https://www.cmu.edu/coronavirus/visitor-protocol/index.html for the University's strict visitor protocol. If appropriate steps are taken, with permission granted, the below parking guidelines should be followed

Validation tickets are available in any of the lots across campus. Reserve validation tickets at least 3 days in advance using the system found at www.cmu.edu/parking. The validation ticket, once created, should be provided to the visitor during their visit. They must have the validation ticket to leave the garage. Remember, visitors are not guaranteed a spot, so check the parking website for garage and parking lot closings.

Please inform guests they are likely to be ticketed if they park in authorized spots without a parking pass.

Rather than drive cars to campus, offer guests the following alternatives:
• Carnegie Museum parking lot
• PAT bus-28X provides transportation to and from the Pittsburgh airport.

4.5 Zoom Meetings/Room Reservations

In-person gatherings or meetings are permitted in spaces that allow proper adherence to guidelines for reducing health risks. Recognizing that many may still be operating remotely during this transition period, virtual alternatives are required to ensure adequate participation. **Be sure to reserve rooms with video conferencing capabilities.**

Teams are responsible for securing their own rooms for project meetings and presentations. **Please adhere to the times requested!** It is likely that another presentation or meeting is scheduled immediately following, therefore remember to include clean-up and post-presentation discussion time, when estimating duration. Please wait for an email confirmation from the room coordinator before a confirmation is sent to the team. During busy times, reservations may need to be modified. If this is necessary, the room coordinator will contact the team.

For all room reservation questions and policies see **Appendix 4**.

4.5.1 Creating Zoom Meetings for Midterm/Final Presentation

Project manager s are responsible for creating zoom meetings and sharing connection details with the academic coordinator one month in advance using the links found on the "important dates" documents found in the S23 Capstone Resources BOX file.

Please note the following:
• Zoom meetings should be scheduled for 1.5 hours at a time.
• Please list 1-2 teammates as "alternative hosts" for the meeting in case any technical issues arise.
• Please reserve rooms through the 25 LIVE system: https://www.cmu.edu/hub/registrar/25live/index.html .

For questions, please email hzrooms@andrew.cmu.edu.

4.6 Travel

Any travel must be approved by the academic office and project advisor. Please send any requests to the program director and academic coordinator.

4.7 University Telephones

Teams should use telephones located in Hamburg Hall. Instructions on how to use these phones are on the wall in each room in the A001 suite. **Please do not use personal mobile telephones for team projects-personal telephone charges will not be reimbursed.**

University telephones may be used for project-related calls ONLY.

5. FISCAL MANAGEMENT

5.1 Budget

There is a budget of $750 per capstone team. Every purchase that is not through a CMU vendor must be pre-approved by the ISM office before the purchase is made. No purchase will be reimbursed that has not been pre-approved by the ISM office. No catering purchases will be reimbursed unless pre-approved by the ISM office.

5.1.1 Appointment of Financial Manager

Project teams will be held strictly to their budgets. The Faculty Advisor must appoint a Financial Manager for the team within the first week of the project. The role of the Financial Manager is to ensure that the project stays within budget by making sure expenses are approved, tracking expenses, and limiting spending to ensure there are no cost overruns.

5.1.2 Oracle Charge String Account

The Financial Manager is in charge of keeping track of the teams spending. Only those expenses necessary to the project should be charged to the account. Consulting services and/or outsourcing of data analysis may not be purchased.

Remember, purchases made from CMU Vendors, such as parking and transportation, printing and copying, etc. can be made directly using the Oracle Charge String provided. All purchases made outside of CMU must be purchased by a member of the team (preferably the team's financial manager), who must then follow the Out of Pocket Expenses section (see below) for reimbursement from the team's budget.

5.1.3 Creative Video

All teams are required to create a 3–5 minute creative video trailer that highlights and advertises your project. These videos will be shared as invitations for the final presentation and will be submitted as a final deliverable to the client and academic office. These videos are NOT meant to be a recording of a truncated presentation, the focus should be on creativity and engagement to tell the audience the importance and value of the project and entice attendance to your final presentation. More information and resources will be shared during the creative video information session on **Friday, March 17, 2023**.

5.2 Purchases - Requires Pre-Approval
All purchases must be directly related to the success of your project and **must be approved by the Faculty Advisor AND the ISM office**. Reimbursements take 4-6 weeks to be processed through the university systems. GIFTS FOR CLIENTS and/or THE TEAM ARE NOT PERMITTED.

5.2.1 Use of the team ORACLE string
Once approved, purchases should be made by the team's Financial Manager, using one of the University's internal

Vendors such as the University bookstore and University catering. These expenses will be applied directly to the Team oracle charge string and show on team account reports. Do not forget to account for these purchases when balancing the budget.

5.2.2 <u>Out-of-Pocked Expenses</u>

- A completed student reimbursement form (APPENDIX 3) is required to process all out-of-pocket (cash) expenses. The form must be accompanied by original receipts, list a valid Oracle string **(assigned to financial manager)** and be signed by the team's faculty advisor. Completed forms should be submitted directly to the Academic Coordinator. The team financial manager should not personally reimburse individuals for their expenses; each reimbursement must be submitted separately, under each purchaser's name. Questions? Contact Academic Coordinator- Brittanf@andrew.cmu.edu.

- *Original Receipts* If any out-of-pocket (cash) purchases are made be sure to retain the receipt. ORIGINAL receipts must accompany all reimbursement requests. If an original receipt is not submitted, the expense cannot be processed. The receipt should show an itemized list of all purchases, as well as show that the item was paid. Be sure to keep track of team receipts.

- *30-Day Rule*-The University has a 30-Day Rule: All reimbursements must be processed within 30 days of the purchase. Failure to comply with this may result in additional fees, additional taxes or denial of the reimbursement.

- *Tangible purchases*- All purchased items must be returned to the ISM office within two weeks of the completions of the capstone project. Tangible purchases include, but are not limited to, art supplies, USB drives, CD's, etc.

5.2.3 <u>Survey Incentives</u>
Please contact the ISM Academic Coordinator or Program Director for direction <u>BEFORE</u> considering using a survey.

6. FINAL PRESENTATION

Each team will work with their advisor and client to pick a one-hour time slot on one of the days. Time slots will be first come, first serve. Teams must inform the ISM office of their preferred date and time two weeks prior to the dates. The ISM Office will send out a sign-up sheet to schedule presentations. Slots are first come, first serve.

The dates and times for spring 2023 are: **Monday, April 24th – Friday, April 28th <u>and/or</u> Monday, May 1st- Thursday, May 4th**

Timeslots:
7:50am-8:50am
9:00am-10:00am
10:10am-11:10am
11:20am-12:20pm
12:30pm-1:30pm
1:40pm-2:40pm
2:50pm-3:50pm
4:00pm-5:00pm
5:10pm-6:10pm

Appendix 1: Sample Peer Evaluation Form: Found in the S23 Capstone Resources

Please direct any questions regarding the sample peer evaluation form to Professor Riel (djriel@cmu.edu).

Appendix 2: Critical Thinking Exercise

COMPLETE THIS EXERCISE <u>AFTER</u> YOUR KICK-OFF MEETING WITH THE CLIENT

All team members must contribute to this project artifact. This artifact will help guide your work during the semester. The team will want to refer back to this as the project unfolds and use it as a resource to prepare for the midterm presentation, poster day, and the final presentation. Remember, this is a team exercise and requires input, brainstorming, and full participation by all team members.

First, each team member should work alone on this exercise. Team members should then collectively share their thoughts together during the next team meeting. It may be helpful to display everyone's thoughts on a white board or overhead display. Team members should reconcile the answers, decide on which to commit to their Critical Thinking Piece document, and then submit the document to the project advisor and Program Director no later than the 10th day of class. The document itself should be written as an executive summary focused on the 4 elements below.

Critical Thinking Piece

Answer these *Key Questions* as they relate to the following 4 elements:

Objective(s)

What is the objective(s) of this project?

How will you contribute to the objective(s)?

What do you want to learn while working toward the objective(s)?

What objective should the team consider even though it's not stated in the proposal?

Approach

What approach should the team take to achieve the objective(s)?

What challenges do you foresee with choosing an approach?

What are your limitations/weaknesses that may impact the chosen approach?

What skills/strengths do you bring to this project?

Solution

What creative features should the solution contain?

What positive outcomes will your solution provide?

What resources will you need to acquire to develop a solution?

What could go wrong with the solution?

How should you market the solution to secure buy-in from all stakeholders?
Why should your client (or anyone) care about this?

Business Impact

Describe the business impact the solution will provide.

Describe the business impact if the solution fails to meet the objective.

Describe what you believe is the most important business impact (e.g., money, time, resource allocation, institutional knowledge, etc.).

How will you quantify the business impact?

Appendix 3: MISM/MSISPM - STUDENT REIMBURSEMENT FORM

<u>Please print clearly inside the boxes and complete the **entire form in detail**</u>; <u>you may write on the back of the form.</u>
INSTRUCTIONS:
1. All information must be filled out completely before reimbursement can be processed.
2. Please fill out one form per person and then turn form and receipt(s) into Academic Coordinator.

NAME OF PROJECT TEAM: **ORACLE CHARGE STRING:**

NAME & ADDRESS OF STUDENT WHO MADE PURCHASE:

ANDREW ID OF STUDENT WHO MADE PURCHASE: **ANDREW ID of FINANCIAL MANAGER:**

PRODUCT VENDOR NAME: **DATE OF PURCHASE:**

Is this an IT SERVICE or SOFTWARE purchase? NOTE: Pre-approval is required

YES [ ] (GO TO "A" BELOW)   NO [ ] (GO TO "B" BELOW)

A. IF FOR IT/SOFTWARE RELATED SERVICE:

1.	Detailed description of PRODUCT and why it is needed for project:
2.	What are the terms of the purchase (month, year)?
3.	Are you collecting private data with product (personally identifiable information)?
4.	Who on the team will have access to the data/domain?
5.	Will the data be destroyed at project end? If not, who will retain data/domain?

B. IF FOR ANY OTHER SERVICE (SUPPLIES, PARKING, ETC.):

REASON FOR PURCHASE (Need: Who, What, When, Where, How many people attended, and Why):

TOTAL AMOUNT OF REIMBURSEMENT:

$

ADVISOR'S APPROVAL (Required)

_____   _____

Advisor's Printed Name   Advisor's Signature

Appendix 4: Room Reservation Guidelines

PLEASE FOLLOW THE FOLLOWING INSTRUCTIONS OR THE ROOM WILL BE DENIED

Request a Room go to https://25live.collegenet.com/cmu/
Room Requests can only be made on a **monthly basis**. Rooms *CANNOT* be requested for the entire semester by a Capstone and/or Information Systems Project.
Requestor only one student designated to request rooms on your group's behalf.
Event Name use the following format when entering information into 25Live:

> Course Number/Section/Professor's Last Name/Purpose
> **Example:**
> 95-720/A/Lightman/Meeting

Keep in mind 8:00am – 9:00am is an option for meeting with your group prior to the start of classes.

Please allow 24 hours for a room request to be confirmed or denied. This does not include weekend requests.

Please note …you may only book the room for a *maximum of 90 minutes* – **No exceptions**. Only one room per group, per day.

Please use hzrooms@andrew.cmu.edu and not a personal email

Appendix 5- Video Conference Guidelines

1. Schedule the Zoom connection using your Andrew ID - https://www.cmu.edu/computing/services/comm-collab/web-conferencing/zoom/index.html.
2. Select a Room
   - Use 25Live- https://25live.collegenet.com/cmu to schedule a room based on your needs and classroom availability. Include a 30-minute setup time if at all possible.
   - Rooms 1002, 1004, 1007, 1202. 1204, 1206, 1208, 1214, 2003, 2008, A301 are fully equipped with VC equipment, ample space for presenters and audience.
   - Rooms 1107, 2108, and the Dean's Conference Room have limited space. Cameras in these rooms face away from the monitors, so you cannot stand in front of the monitors during a presentation.
   - Interview Rooms (A001) have very limited space. A001F is large enough for a few audience members.
3. Contact Heinz Computing Services
   - Email heinz-computing@andrew.cmu.edu to request help setting up the videoconference. Include your Team Name and Room Number in the subject line. List the date and time of the event, the names of all the people in your group, the approximate number of local audience members in the message body, and the Zoom meeting information in the body of the message.
   - **Please contact Heinz Computing at least one week** (five work days) prior to the conference date, even if you are unsure of the exact details. Accommodations for requests less than one week in advance cannot be guaranteed.
4. At the time of the videoconference
   - Please have someone in the room with the laptop you will be using 10 minutes before the start (if room booking permits.)
   - A member of the Heinz Computing staff will set up the equipment and start the connection approximately 10 minutes before the start. Distant participants often do not connect until right before or even after the start time.

A few things to remember when using the video conference:
5. Content sharing is designed to share PowerPoint slides. If you choose to use the computer for a live demonstration (ex. in Excel or a website), the screen must be in Clone, Duplicate, or Mirror mode the entire time and PowerPoint Presentation View must be off.
6. Use ⊞ + P or ⌘ + F1 to switch to Clone, Duplicate, or Mirror modes.
7. Complete all edits to your presentation ahead of time so the tech can work on connecting your laptop during the setup time.
8. Email the presentation to distant participants and distribute printed copies to audience members so they can follow along in the event there is an issue.