MICHIGAN STATE
UNIVERSITY

09/20: Schedule and Teamwork

The Capstone Experience

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Fall 2022

From Students…
…to Professionals

Schedule and Teamwork

➢Schedule

➢Teamwork

Capstone Work Requirements

- Every team member should be working all the time.
- Work on all parts in parallel.
  - Hardware / Software
  - Front End / Back End
  - Web / iOS / Android
- Work in advance.
  - Mitigate risks.
  - Get systems working.
    - Hardware
    - Software
  - Write Hello World tests.

Schedules

- <u>Schedules > Weekly Schedule</u>

- <u>Schedules > Major Milestones</u>
  - 09/13: <u>Status Report Presentations</u>
  - 09/22: <u>Project Plan Presentations</u>
  - 10/11: <u>Alpha Presentations</u>
  - 11/15: <u>Beta Presentations</u>
  - 12/06: <u>Project Videos</u>
  - 12/07: <u>All Deliverables</u>
  - 12/09: <u>Design Day</u>
  - 12/14: Capstone Wrap Up
    (10:00 a.m. – 12:00 p.m.)

Are there fixed milestones in the "real" world?

Project Parts

- Break Down Project
  - Main Parts
  - Sub-Parts
  - Sub-Sub-Parts
  - Etc…
- Categorize
  - Risks
  - Dependencies
    - Particularly Risk Dependencies
    - Determines Schedule Order
  - Priorities
- Worry About
  - Interfaces Between Parts
  - Integration of Parts

Building A Project Schedule

- Start With Fixed Course Milestones
  - See Schedules > Major Milestones
  - Read About Each
- Estimate Times for Tasks for Parts
  - Building
  - Integrating
  - Testing
- Assign Tasks to Team Members
- Must Keep Everyone Busy All the Time
- Use "Short" Deadlines (E.g., 2-3 Days) Why?
- Document and Track
  - Microsoft Project?
  - Collaboration Tool?

Estimating Time for Tasks

- Rough Estimate
  - Intuition
  - Experience
- Refined Estimate
  - Prototype or Partial Build
  - Extrapolation
  - E.g., 2 Days to Build 1 → 6 Days to Build 3
- Keys
  - Be Realistic
  - Include Buffer Time if Unsure
- Adjust Schedule Accordingly

Typical Build Cycle

Until Project Done Do

1. Divide Next Big Task Into Little Tasks
2. Assign Little Tasks to Team Members
3. Complete Little Tasks
   a. Implement
   b. Test
4. Integrate Little Tasks Into Big Task
5. Test Big Task

Very Important

High Priority Risks Get High Priority Scheduling

Version Control

- Versioning
  - Discrete "Internal" Versions (States)
  - May Correspond to Builds
- Version Control Systems
  - Check Code In and Out
  - Mark Specific States as Versions
- Motivation
  - Build Breaks System
  - Revert to Earlier Build
  - Avoid Bridge Burning
- Examples
  - Git
  - Mercurial
  - GNU Bazaar
  - Apache Subversion

Can Be Serious Problem

Living Schedule

- Schedule Is Dynamic
  - Unforeseen Problems
  - Added Features (Avoid Feature Creep)
  - Etc..
- Track Your Progress
  - Microsoft Project?
  - Collaboration Tool?
- Revisit Schedule Often
  - Weekly Team Meetings
  - Weekly Triage Meetings with TMs
  - Identify Slippage
  - Hold Each Other Accountable (or Contact TMs)
  - Set Corrective Action
  - Adjust Schedule

Schedule and Teamwork

✓Schedule

➢Teamwork

Team Organization

- Up to Each Team
- Organize into Roles
  - Client Contact
  - Program Manager
  - Developer
    - Front End / Back End
    - Web / iOS / Android
  - Tester
  - Systems Administrator
  - Etc…
- Everyone must make significant technical contributions to their team's project, including significant software contributions.

Team Dynamics

- Key to Success

- Significant Component of Course Grade

- Address Problems Immediately

  - Within Team

  - With Managers

- Be Ready to Discuss During Interviews

Grading

- Team (70%)
  - Project Plan Document & Presentation   10
  - Alpha Presentation   10
  - Beta Presentation   10
  - Project Video   10
  - Project Software & Documentation   25
  - Design Day   <u>05</u>
  - Total   70
- Individual (30%)
  - Technical Contribution   10
  - Team Contribution   10
  - Team Evaluation   05
  - Meeting Attendance, Preparation & Participation   <u>05</u> ← Can Be Negative
  - Total   30

Grading

Weekly Triage Forms and Slides
- Last Week Accomplishments
- Describe and Rate Each Team Member's Contributions
- Next Week Goals

Team Evaluation Form
- 5% of Final Grade
- Rate Each Team Member
  - Describe the technical contributions (or lack thereof) of each team member. That is, describe what each team member contributed as a software developer to your project. Be specific. Contributions may include things like architecture, design, algorithms and code. Include comments about the quality of their work.
  - Describe the team contributions (or lack thereof) of each team member. That is, describe what each team member contributed as a team member to your team. Be specific. Include comments about attendance at meetings, timeliness of completing work, commitment to the project, reliability and effort put forth.
  - In the table above, you rated one of your team members as the **worst** team member. Why? Be specific.
  - In the table above, you rated one of your team members as the **best** team member. Why? Be specific.

Grading

- Final Grade Sum Of...
  - Individual Total
  - % of Team Total Based on Team Contribution
- Grand Total =

  (Individual Total)

  +

  (Team Total) * (Team Contribution) / 10.0

- *Nota Bene*: Your Team Contribution will have a very significant effect on your final grade.

Grading

Effect of Team Contribution					
Technical Contribution	Team Contribution	Team Evaluation	Meeting Attendance	Team Total	Grand Total
10	10	5	5	70	100
10	9	5	5	70	92
10	8	5	5	70	84
10	7	5	5	70	76
10	6	5	5	70	68
10	5	5	5	70	60
10	4	5	5	70	52
10	3	5	5	70	44
10	2	5	5	70	36
10	1	5	5	70	28
10	0	5	5	70	20
Nota Bene: Assumes Perfect Score In Every Other Category					

Grading

- Every student must earn the following required minimal grades in each grading category.
- Failure to earn the required minimal grades in any of the grading categories is grounds for receiving a final grade of 0.0 for the course.
- Minimal Team Grade Requirements
  - Project Plan Document & Presentation   5.0 / 10.0
  - Alpha Presentation   5.0 / 10.0
  - Beta Presentation   5.0 / 10.0
  - Project Video   5.0 / 10.0
  - Project Software & Documentation   12.5 / 25.0
  - Design Day   2.5 / 05.0
- Minimal Individual Grade Requirements
  - Technical Contribution   5.0 / 10.0
  - Team Contribution   5.0 / 10.0
  - Team Evaluation   2.5 / 05.0
  - Meeting Attendance, Preparation & Participation   0.0 / 05.0

Grading

- In the capstone course, absence does <u>not</u> make your teammates' hearts grow fonder.
  - Nonresponsive
    - Email
    - Slack
    - Microsoft Teams Messages
  - Miss Meetings
    - All-Hands
    - Triage
    - Client
    - Team
  - Miss Work ← **Key**
    - In Lab and/or Online with Teammates
    - During Sprints
    - Before Major Milestones
  - Miss Deadlines or Deliver Unusable Software
    - Other team members may be forced to do your work.
    - We may tell other team members they no longer need to assign you work.

NB: Your teammates will be evaluating you weekly and at the end of the semester.

Grading

Unacceptable Excuses for Not Contributing

- They never asked me to do anything.
- They never let me do anything.
- I wrote 1000's of lines of code, but they weren't included in the project.
- My features were not included in the project.
- I work 40 hours per week at my job.
- I live 60 minutes from MSU.
- I didn't want to work on this project team.
- I ranked this project last.
- I did a lot of research about stuff that we never used.
- I was busy interviewing.
- Etc…

Grading

- We reserve the right to make changes with sufficient notice.
- No special consideration will be given for final grades, including but not limited to
  - status in any academic program at MSU including CSE,
  - the need to be graduated this semester,
  - the ability to enroll in CSE498 next semester,
  - financial aid,
  - hours worked in a job while a student at MSU,
  - distance commuting to MSU,
  - anticipated graduation from MSU,
  - acceptance of a job in anticipation of graduation,
  - rank in the armed forces,
  - mortgage on a property,
  - lease on a property,
  - upcoming wedding, or
  - visa status,
  - or anything else.

Team of Peers

Effective Team Members

- Relate as equals.
- Have specific roles and responsibilities.
- Respect specific roles and responsibilities.
- Empowers individuals in their roles.
- Hold each other accountable.
- Drive consensus-based decision making.
- Give all members a stake in the project.
- Get their work done well and on time.

Potential Problems

Over and/or Under

- Bearing

- Qualified

- Achiever

- Etc…

Team Problems

- Can Be
  - Really Hard
  - Awkward
  - Frustrating
- Addressing Problems
  - ASAP
  - Directly
  - Respectfully
  - Maturely
- Resolving Problems
  - Internally First
  - TMs
  - Dr. D. and James
- "Bad" Team Not an Acceptable Excuse
- Managers
  - Can Help
  - Have Limited Experience with Time Travel

We don't have one of these.

Schedule and Teamwork

- ✓ Schedule

- ✓ Teamwork

What's ahead?

- Upcoming Meetings
  - ~~09/08, Th: Risks and Prototypes~~
  - ~~09/13, Tu: Team Status Report Presentations~~
  - ~~09/15, Th: Project Plan~~
  - ~~09/20, Tu: Schedule and Teamwork~~
  - 09/22, Th: Team Project Plan Presentations
  - 09/27, Tu: Team Project Plan Presentations
  - 09/29, Th: Team Project Plan Presentations

10% of Team Grade

What's ahead?

- Split-Hands Meetings
  - Used On Presentation Days
    - ~~09/13: Team Status Report Presentations~~
    - 09/22-09/29: Team Project Plan Presentations
  - Three Locations
    - Luke's Teams   STEM 1130
    - Griffin's Teams   Anthony 1279
    - Tommy's Teams   Engineering 1345 **← Nota Bene**
  - Find the rooms in advance.
  - Attendance Taken As Usual Including Lateness

What's ahead?

- Project Plan <u>Document</u> and Slide Deck
  - Due Wednesday, September 21
  - Read Submission Instructions Carefully
    - Slide Deck in Template
    - Document in James' Email
- Project Plan Presentation Schedule
  - Every Team Must Be Prepared to Present on First Day
  - Schedule Posted Evening Before First Presentation
- ~~Project Plan Presentation Conflicts~~
  - ~~Request from Dr. D. via Email~~
  - ~~For Interview that Can Be Verified and Cannot be Scheduled Another Time~~
  - ~~Due by COB Today~~
- Split All-Hands Meetings
  - Split by TMs
  - Three Locations
- Each Team Presents
  - Use Team Member's Laptop
  - At Most 15 Minutes <u>Including "Setup" Time</u> (Rehearse Timing)
  - Multiple Team Speakers
  - Test Audio/Visual Equipment in Advance
  - Rehearse

What's ahead?

- Team Photos
  - Monday, September 26
  - 12:00 p.m. – 6:00pm
  - Engineering 3405, AKA Dean's Conference Room (Around the Corner from the Capstone Labs)
  - Photo Schedule Sent out on Sunday
    - Each team has a 10-minute time slot.
    - Arrive 10 minutes before your scheduled time.
  - Dress
    - Business Preferred
    - At Least Business Casual
    - Team Coordinated

What's ahead?

Time	Team
12:00	Targets' Tips
12:10	Anthropocene Institute
12:20	Vectorform
12:30	Whirlpool
12:40	Roosevelt Innovations Data Science
12:50	TechSmith
13:00	MSU Linguistics
13:10	Ally
13:20	Union Pacific
13:30	Break
13:40	RPM
13:50	Lockheed Martin Space
14:00	Kohl's
14:10	CSAA Insurance
14:20	United Airlines Quality Assurance
14:30	Google
14:40	Kellogg's
14:50	Stryker

Time	Team
15:00	Microsoft
15:10	Break
15:20	
15:30	
15:40	
15:50	
16:00	Atomic Object
16:10	United Airlines Airport Operations
16:20	MSUFCU
16:30	Volkswagen
16:40	Auto-Owners
16:50	Amazon
17:00	United Airlines Training
17:10	GM
17:20	Urban Science
17:30	Roosevelt Innovations Knowledge Science
17:40	Magna
17:50	Meijer

What's ahead?

- Major Milestones
  - 09/22: Team Project Plan Presentations

  - 10/11: Team Alpha Presentations

  - 11/15: Team Beta Presentations

  - 12/05: Project Videos

  - 12/07: All Deliverables

Read Me

- Presenting
  - The purpose of the Project Plan Presentation is to convince everyone that your team has scoped your project, understands the functional, design and technical specifications, and that your team has a crafted plan to develop, debug and deliver your project to your client on time (Wednesday, December 7) and on budget ($0).
  - The time limit for your presentation is 15 minutes, which will be strictly enforced. Practice your presentation to ensure that you will finish within the allotted time.
  - Each team will present using their own laptop. You will be provided with a wireless presenter. Ask your TM for adapters to connect the laptop that you will be using to the audio/visual equipment in your presentation room. Test in advance in the room in which you will presenting with the laptop you will be using.
  - We will meet in "split-hands" meetings. Luke's teams will meet in STEM 1130, Griffin's teams will meet in Anthony 1279, and Tommy's teams will meet in Engineering 1345.
  - All team members of the presenting teams are required to dress business casual on the day of their presentation. Business casual does not include sneakers, tennis shoes, hats, coats, hoodies, t-shirts or shirts that are not tucked into pants. Google "what is business casual."
  - Although the presentations will be scheduled over the course of three meetings, all teams must be prepared to present on the first day scheduled, Thursday, September 22.
  - The presentation schedule will be posted on our Weekly Schedule page in the evening of Wednesday, September 21.

READ ME

- Creating and Editing
  - Use only the Windows version of Office 365.
  - You must use this PowerPoint slide deck template as is. Do not change the number of slides unless the instructions explicitly allow you to duplicate slides. Do not change the order of the slides. Do not change the styles. Do not edit the master slides.
  - Throughout the template, replace placeholders [...] with the appropriate information.
  - Edit the center footer by clicking the Header & Footer button on the Insert ribbon. Change [Team Name] in the footer to your company name as in "Team TechSmith Project Plan Presentation". If necessary, extend the width of the center footer textbox on the master slide, making sure that you re-center the enlarged textbox.
  - Do not include any company confidential information in your presentation.
  - Delete every textbox that includes "Delete this textbox" and every slide that includes "Delete this slide."
- Submitting
  - All presentations are due to us and to your client by 11:59 p.m., Wednesday, September 21.
  - Name your PowerPoint slide deck file as "team-[team-name]-project-plan-presentation.pptx" replacing "[team-name]" with your team's name normalized by using all lower case, deleting non-numeric and non-alphabetic characters, and replacing blanks by dashes. Examples include "team-kelloggs-project-plan-presentation.pptx" and "team-urban-science-project-plan-presentation.pptx". Set File Explorer or Finder to show all file extensions to ensure that there are no blanks before the ".pptx" extension as in "team-amazon .pptx".
  - Upload your PowerPoint slide deck to the folder "Project Plan Presentation Slide Decks" in our Microsoft Teams General Channel file space by 11:59 p.m., Wednesday, September 21. In addition, upload your slide deck to your team's private channel file space in case your slide deck is deleted by accident from the General Channel file space, and you need to prove that you did indeed upload your slide deck by the due date and time.
  - Email a copy of your slide deck to your client as well by 11:59 p.m., Wednesday, September 21. Do not cc us on that email. Include some professional text in the body of your email to practice being a professional and to avoid having your email sent to your project sponsor's junk folder.

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Project Plan Presentation
[Project Title 36pt]

The Capstone Experience

Team [Team Name 24pt]

[Team Member 1 16pt]
[Team Member 2 16pt]
[Team Member 3 16pt]
[Team Member 4 16pt]
[Team Member 5 16pt]
[Team Member 6 16pt]

Department of Computer Science and Engineering
Michigan State University
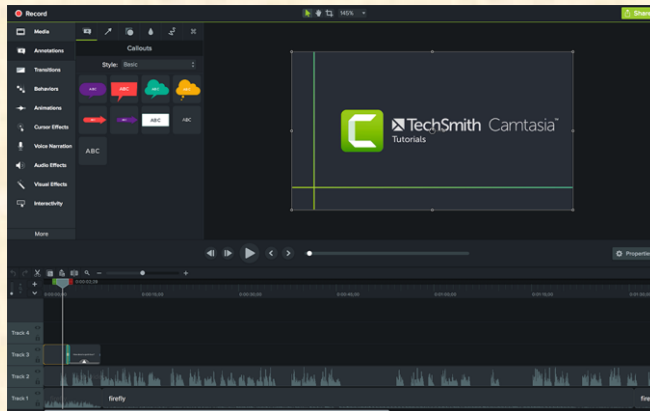
Fall 2022

From Students…
…to Professionals

Project Sponsor Overview

- Point 1

- Point 2

- Point 3

- Etc...

Describe your project sponsor in 60 seconds or less

Add some interesting artwork about your sponsor. Look on your sponsor's website.

Delete this textbox.

Project Functional Specifications

- Point 1

- Point 2

- Point 3

- Etc…

This is your project overview.

Describe what problem your project solves.

Answer the question "What does your project do?"

This is your "elevator pitch".

Delete this textbox.

Project Design Specifications

- Point 1

- Point 2

- Point 3

- Etc...

Articulate a summary of your project's major features as well as its overall design.

Delete this textbox.

Screen Mockup: [Title 1]

You may include as many screen mockups as you have like, but you must include <u>at least four</u> examples.

To include more than four, you can duplicate this slide as many times as necessary.

Good screen mockups should help you elicit project specifications from your client.

Do <u>not</u> include screen mockups of trivial things such as splash screens or login screens.

Do <u>not</u> include screen grabs of other software.

Give each screen mockup slide a title.

See below for examples and instructions.

Delete this textbox.

Screen Mockup: [Title 2]

You may include as many screen mockups as you have like, but you must include <u>at least four</u> examples.

To include more than four, you can duplicate this slide as many times as necessary.

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Give each screen mockup slide a title.

See below for examples and instructions.

Delete this textbox.

Screen Mockup: [Title 3]

You may include as many screen mockups as you have like, but you must include <u>at least four</u> examples.

To include more than four, you can duplicate this slide as many times as necessary.

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Do <u>not</u> include screen grabs of other software.

Give each screen mockup slide a title.

See below for examples and instructions.
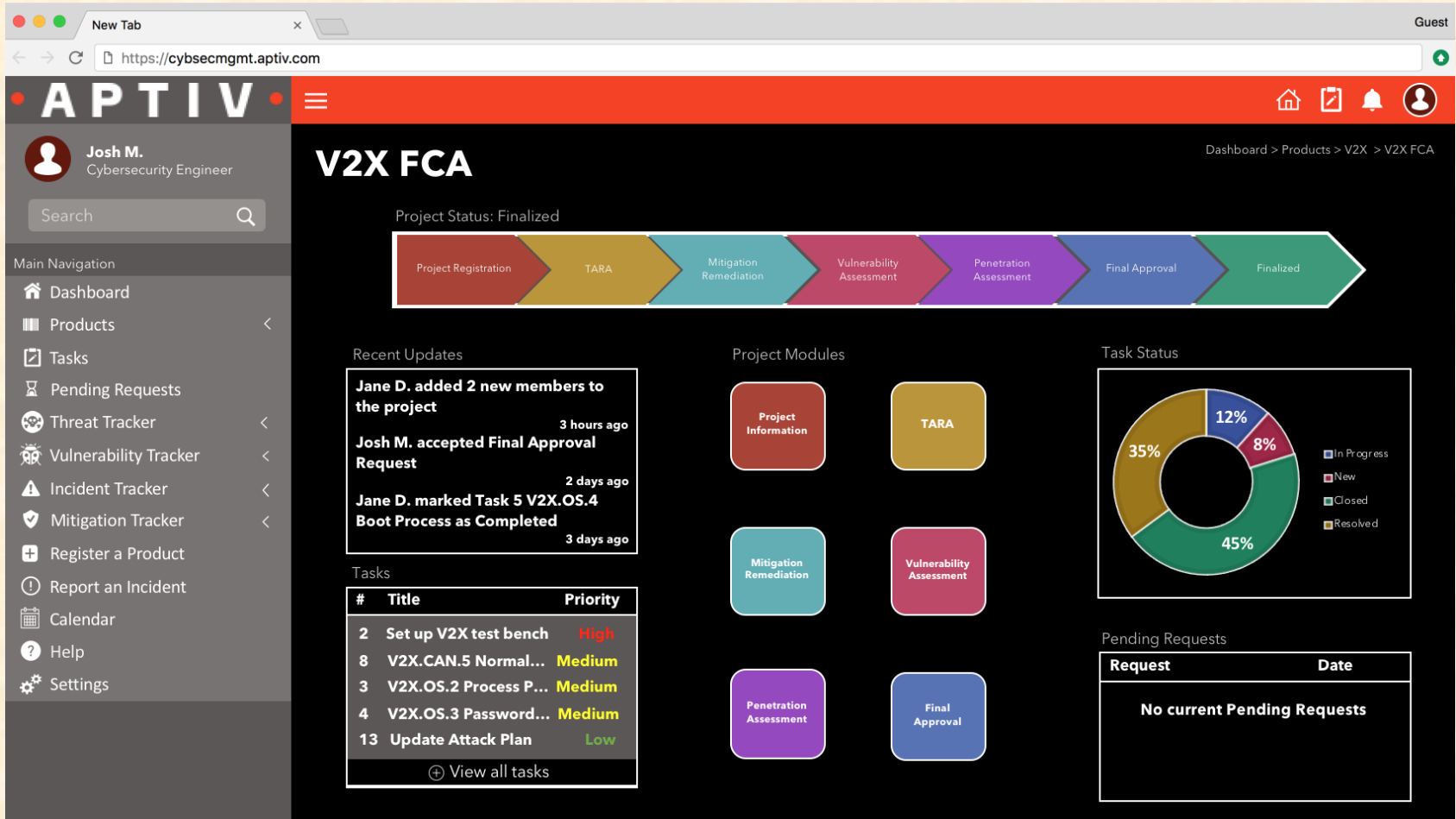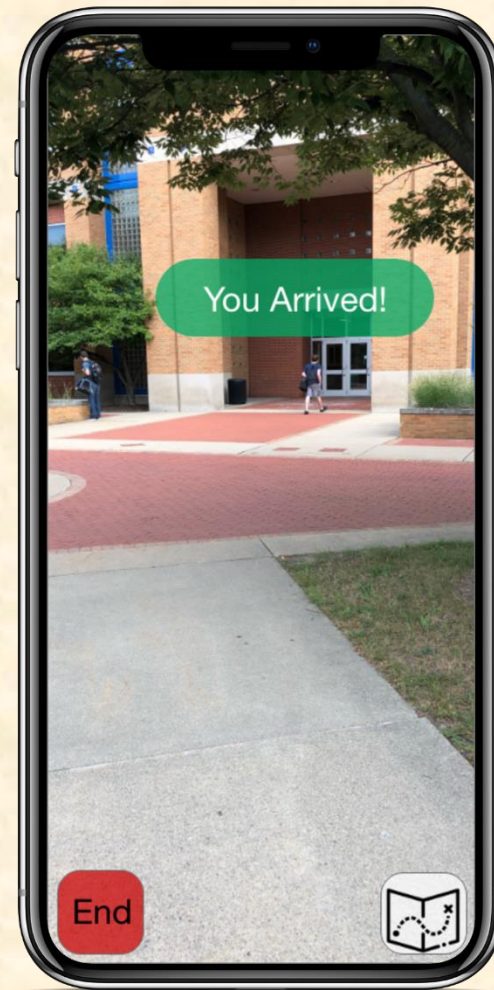
Delete this textbox.

Screen Mockup: [Title 4]

You may include as many screen mockups as you have like, but you must include <u>at least four</u> examples.

To include more than four, you can duplicate this slide as many times as necessary.

Good screen mockups should help you elicit project specifications from your client.

Do <u>not</u> include screen mockups of trivial things such as splash screens or login screens.

Do <u>not</u> include screen grabs of other software.

Give each screen mockup slide a title.

See below for examples and instructions.

Delete this textbox.

Screen Mockup Instructions

- Ensure that your mockups…
  - are readable (size-wise),
  - have the correct aspect ratio,
  - are scalable, and
  - are centered vertically (between the green bar in the title and the footer) and horizontally (Use Home > Arrange > Align).
- The screen mockups should not contain any bordering transparent or whitespace. Use paint.net to crop them appropriately and change any bordering whitespace to transparent.
- In PowerPoint use Home > Arrange > Group to group the objects in your mockup into a single object that can be copied-and-pasted (and scaled).
- Embed your screen mockups into platform frames, like a mobile phone or a tablet or a web browser. See https://mockuphone.com.

Screen Mockups: Web Interface

Screen Mockup: iOS Application

Project Technical Specifications

- Point 1

- Point 2

- Point 3

- Etc…

List the technical components of your project.

Delete this textbox.

Project System Architecture

Show a diagram that illustrates the overall architecture of your project including how all of the parts and pieces are connected and interact.

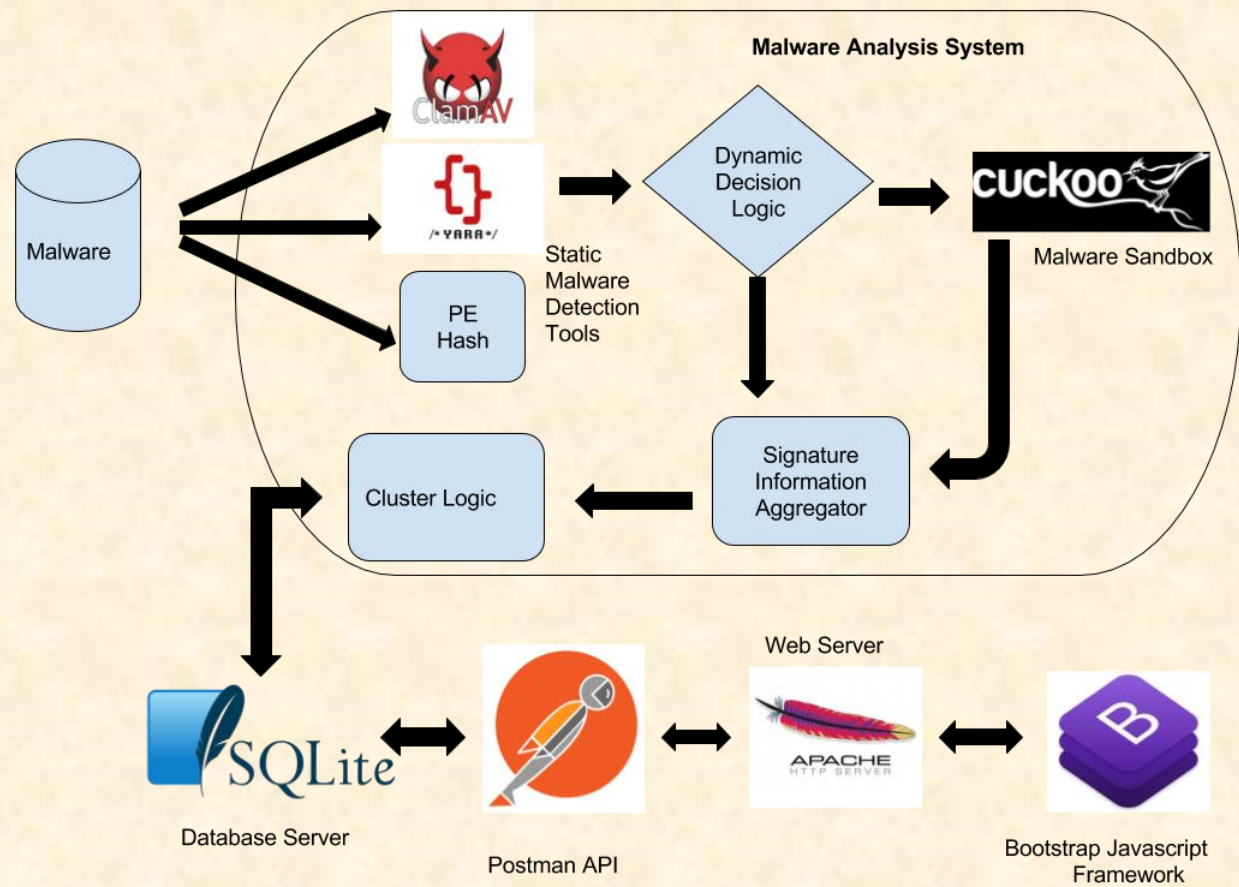See below for examples and instructions.

Delete this textbox.

System Architecture Slide Notes

- Draw your system architecture diagram natively in PowerPoint; do not cut-and-paste a diagram from your Project Plan document.
- Create your system architecture diagram in a <u>separate</u> PowerPoint file.
  - Use a white background with a blank slide layout.
  - Use Home > Arrange > Group to group all of the objects in your diagram into one single PowerPoint object that can be copied-and-pasted.
  - Once grouped, save the diagram as a PNG image so that the entire image will scale including text.
- Use Paint.NET to make the background of your diagram transparent.
  - Download and install it from www.getpaint.net.
  - Copy your diagram into Paint.NET.
  - Select Tool > Magic Wand.
  - Click on a background area.
  - Push the Delete button (on your keyboard).
  - The background area should be a checkerboard pattern.
  - (N.B.: Paint.NET was a capstone project at the University of Washington.)
- Copy-and-paste your PNG image into the slide deck System Architecture slide.
- Ensure that your diagram…
  - is readable (size-wise) when projected,
  - has the correct aspect ratio,
  - is scalable, and
  - is centered vertically (between the green bar in the title and the footer) and horizontally (Use Home > Arrange > Align).
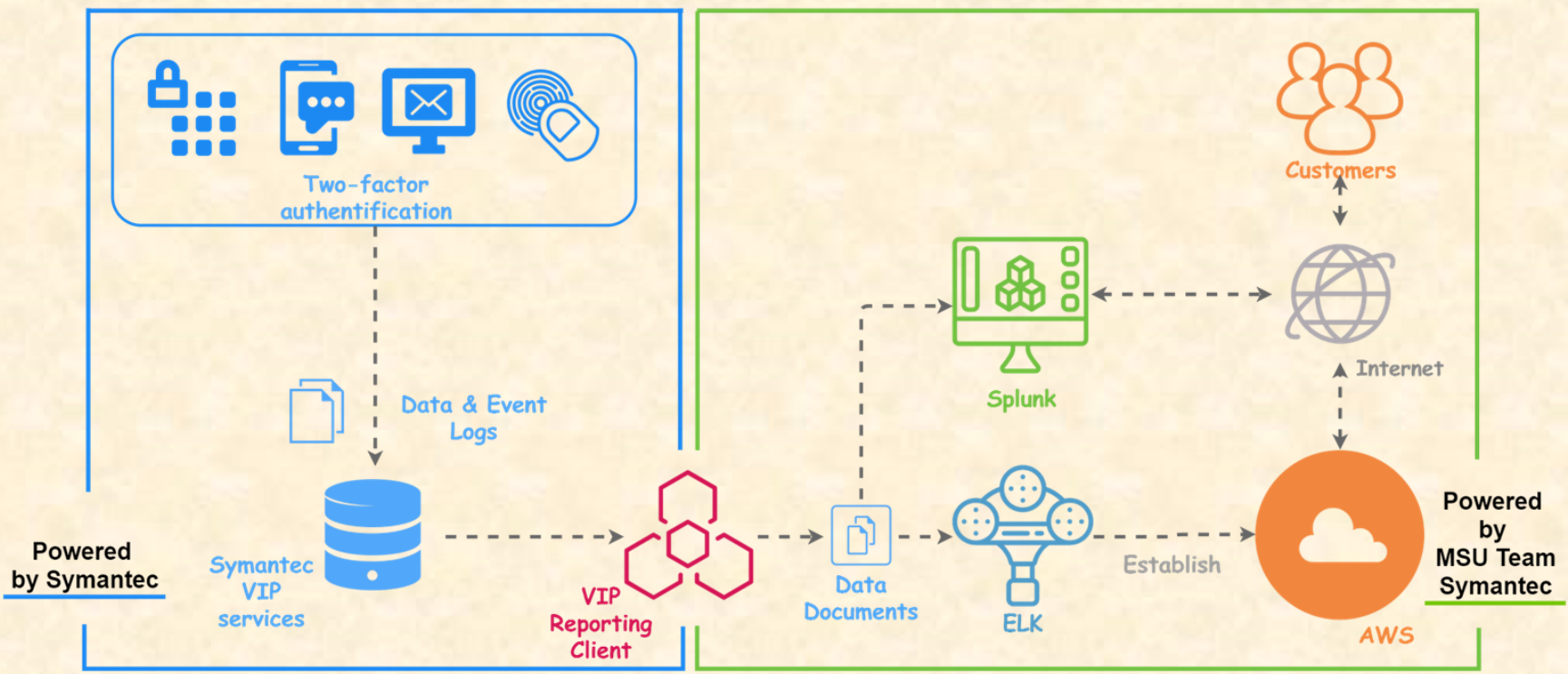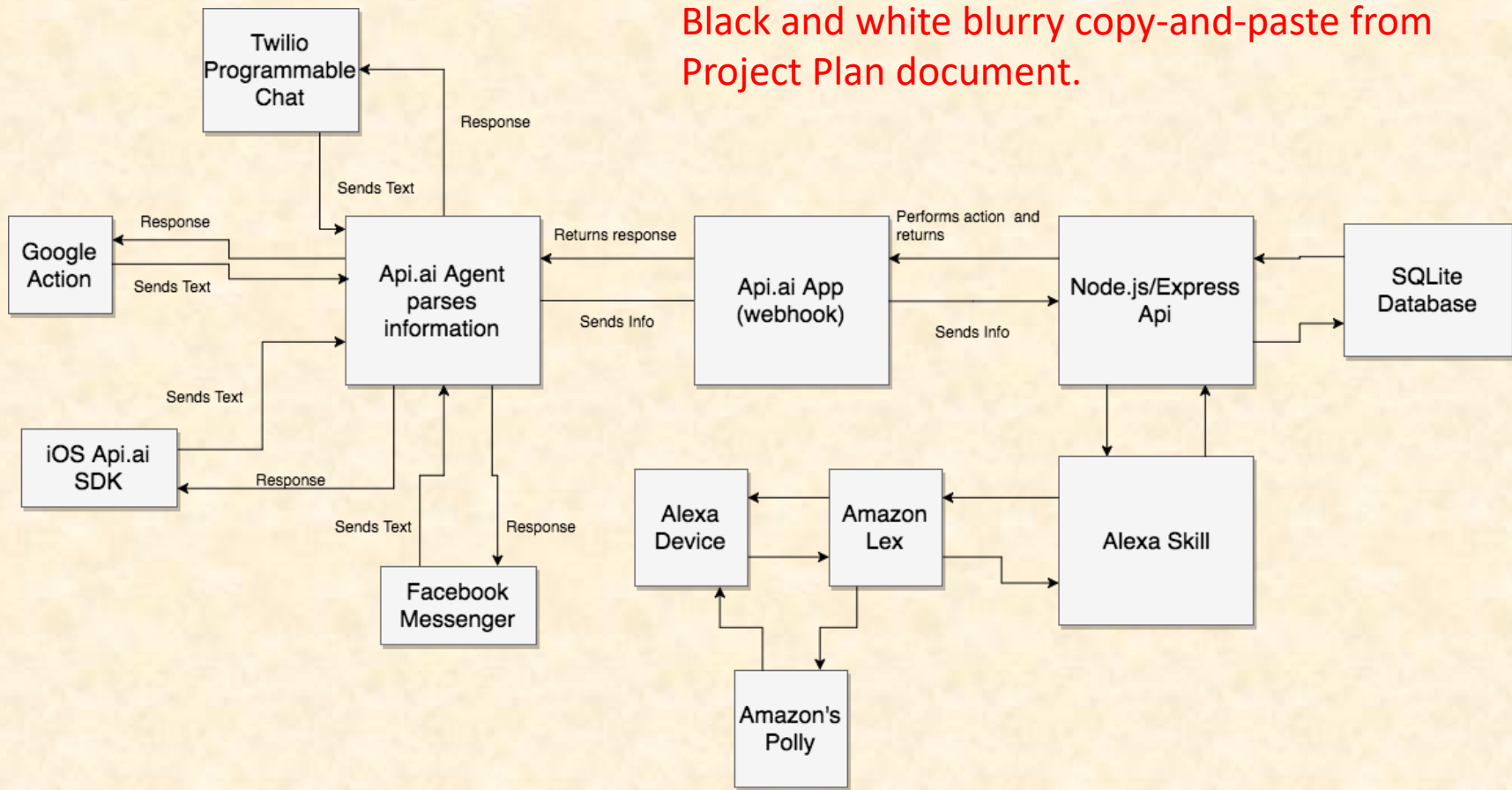
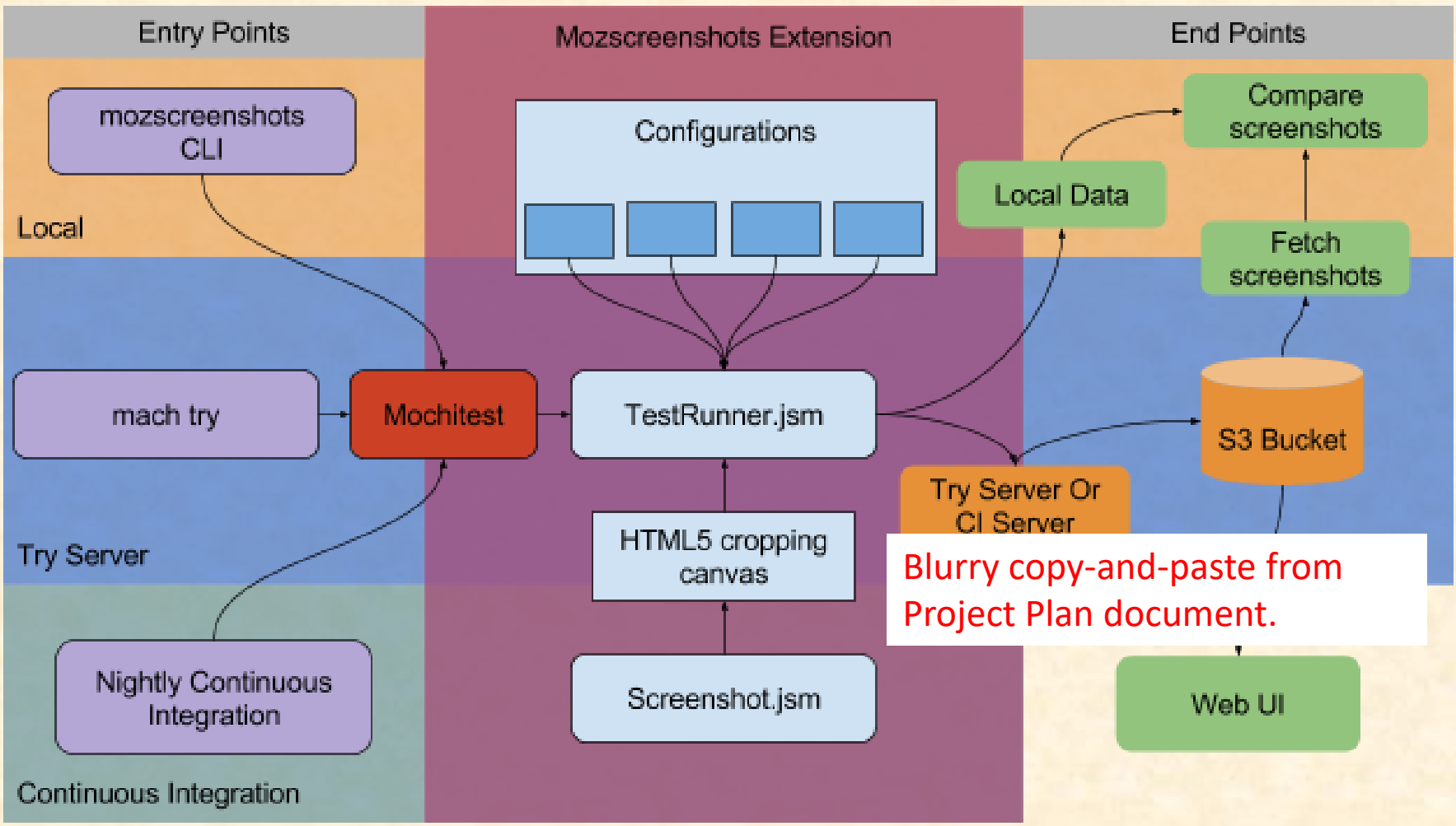**Read this carefully.**

System Architecture Slide Notes

Team [Team Name] Project Plan Presentation

System Architecture Slide Notes

System Architecture Slide Notes

Black and white blurry copy-and-paste from Project Plan document.

System Architecture Slide Notes

Project System Components

- Hardware Platforms
  - Point 1
  - Point 2
  - Point 3
  - Etc...

List your hardware and software platforms including all of the technologies that your project will use.

Delete this textbox.

- Software Platforms / Technologies
  - Point 1
  - Point 2
  - Point 3
  - Etc...

Project Risks

- Risk 1
  - Description
  - Mitigation
- Risk 2
  - Description
  - Mitigation
- Risk 3
  - Description
  - Mitigation
- Risk 4
  - Description
  - Mitigation

Articulate your major risks.

For each risk, describe what the risk is and how you plan on mitigating it.

DO NOT duplicate this slide. All of your risks must fit on this one slide.

Delete this textbox.

Questions?