MICHIGAN STATE UNIVERSITY

01/29: Schedule and Teamwork

The Capstone Experience

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Spring 2026



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



Schedules

- Schedules > Weekly Schedule
- Schedules > Major Milestones
  - 01/27: Status Report Presentations
  - 02/03: Project Plan Presentations
  - 02/19: Alpha Presentations
  - 04/02: Beta Presentations
  - 04/21: Project Videos
  - 04/22: All Deliverables
  - 04/24: Design Day
  - 04/30: Capstone Wrap Up
    (5:45 p.m. – 7:45 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
- Every team must use MSU’s GitLab.
  - Manage All Project Code
  - Instructors must have access.
  - Project sponsors may be granted access.

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
  - Sponsor/Client Contact
  - Program Manager
  - Developer Roles
    - Web
    - Mobile
    - Back End
    - Front End
    - Etc.
  - Tester
  - Systems Administrator
  - Etc…
- Everyone must make significant technical contributions, including significant software contributions. ← **Fair Warning**



Team Dynamics

- Key to Success
- Significant Component of Course Grade
- Potential Teammate Problems
  - Not Attending Team Meetings
  - Not Being Involved
  - Not Responding
  - Not Completing Tasks On Time
  - Submitting Poor Work
  - Leaving Work for Others
  - Working Job Too Many Hours
  - Etc…
- Address Problems Immediately
  - Within Team
  - In Weekly Triage Reports
  - With Dr. D., Dr. J., Luke, Griffin, Jared
- Be Ready to Discuss During Interviews

Grading

[1 of 5]

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

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

[3 of 5]

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

[4 of 5]

- 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 15.0 / 30.0
- 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

Absence does not make your teammates' hearts grow fonder.

- Nonresponsive
  - Email
  - Slack
  - Discord
  - Microsoft Teams Messages
  - Phone
- Miss Meetings
  - All-Hands & Split-Hands
  - Triage
  - Sponsors
  - Team
- Miss Work ← **Key**
  - In Lab and/or Online with Teammates
  - During Sprints
  - Before Major Milestones
- Miss Deadlines
  - Other team members may be forced to do your work.
  - We will tell other team members they… ← **Fair Warning**
    - …can take over the tasks assigned to you.
    - …no longer need to assign you any tasks.

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

GitLab

- Every team must use MSU's GitLab.
  - Manage All Project Code
  - Instructors must have access.
- Access by External Project Sponsors
  - Can Accommodate
  - Contact Dr. J.
- To Receive Credit for Code, Student Must
  - Commit Code
  - Using Student's GitLab Account
- Read the syllabus.



Team Contribution

- Based on Variety of Factors Including But Not Limited to…
  - Attendance and Participation
    - Team Meetings
    - Project Sponsor Meetings
    - All-Hands/Split-Hands Meetings
  - Completion of Tasks
    - Correctly
    - On Time
  - Willingness to Take on New Tasks
  - Making Significant Technical Contribution
- Read the syllabus.

Technical Contribution [1 of 3]

- Required of Everyone
- Significant Work and Code
- Does Not Include Code…
  - Committed to GitLab by Someone Else
  - That Does Not Work
  - That Was Copied from the Internet
  - Not Included In The Project
  - For CheckInCount = 1 to 100 {Modify Code Slightly; Checked Code In Again}
  - Etc…
- Necessary, but Not Sufficient
  - Doing Research
  - Creating UI/UX Designs
  - Creating Documents
  - Giving Presentations
- Read the syllabus.

Technical Contribution [2 of 3]

- Pair Programming
  - Writing Code Together
  - Not Watching Someone Else Write Code
  - Must Decide When Committing Who Gets Credit for What
  - Receive Credit Only for Code Checked Under Your Account
- Demonstrating and Explaining Software
  - By Author
  - Any Time
  - In-Person
    - Lab iMacs
    - Person Laptop
  - If Not Able, Assume Not Working

Technical Contribution [3 of 3]

- Significant Effect on Team Contribution
- Project Software == 43% Team Grade
- No Significant Technical Contribution
  - No Credit for Project Software
  - Maximum of 57% of Team Grade
  - Maximum Team Contribution of 5.7/10.0
  - Most Likely Will Not Pass CSE498
- Read the syllabus.



Meeting and Work Expectations

- Meetings
  - In Person
  - Possibly Excused but Very Limited
  - If Miss Team Presentation, Must Give Presentation to Instructors
- Work
  - Entire Semester
  - Cannot Excuse Work Even if…
    - …Meeting Attendance Excused
    - …Attending Meetings
  - Missing work…
    - …may affect Technical Contribution.
    - …will affect Team Contribution.
    - …will affect Final Grade.
- Example
  - Miss Entire Week
    - Attendance
      - Excused: -0
      - Unexcused:
        - -3+ MAPP Points == 3+% of Final Grade
        - -10 MAPP Points == 10% of Final Grade
    - Work
      - Attendance Excused or Unexcused
      - 1/15th Semester = 7% Semester ⇒ Earned Team Points ≤ 93% of 70 Points
      - At Least -7% of Team Contribution Grade == At Least -4.9% of Final Grade
- **Read the Syllabus.**

Team Problems

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



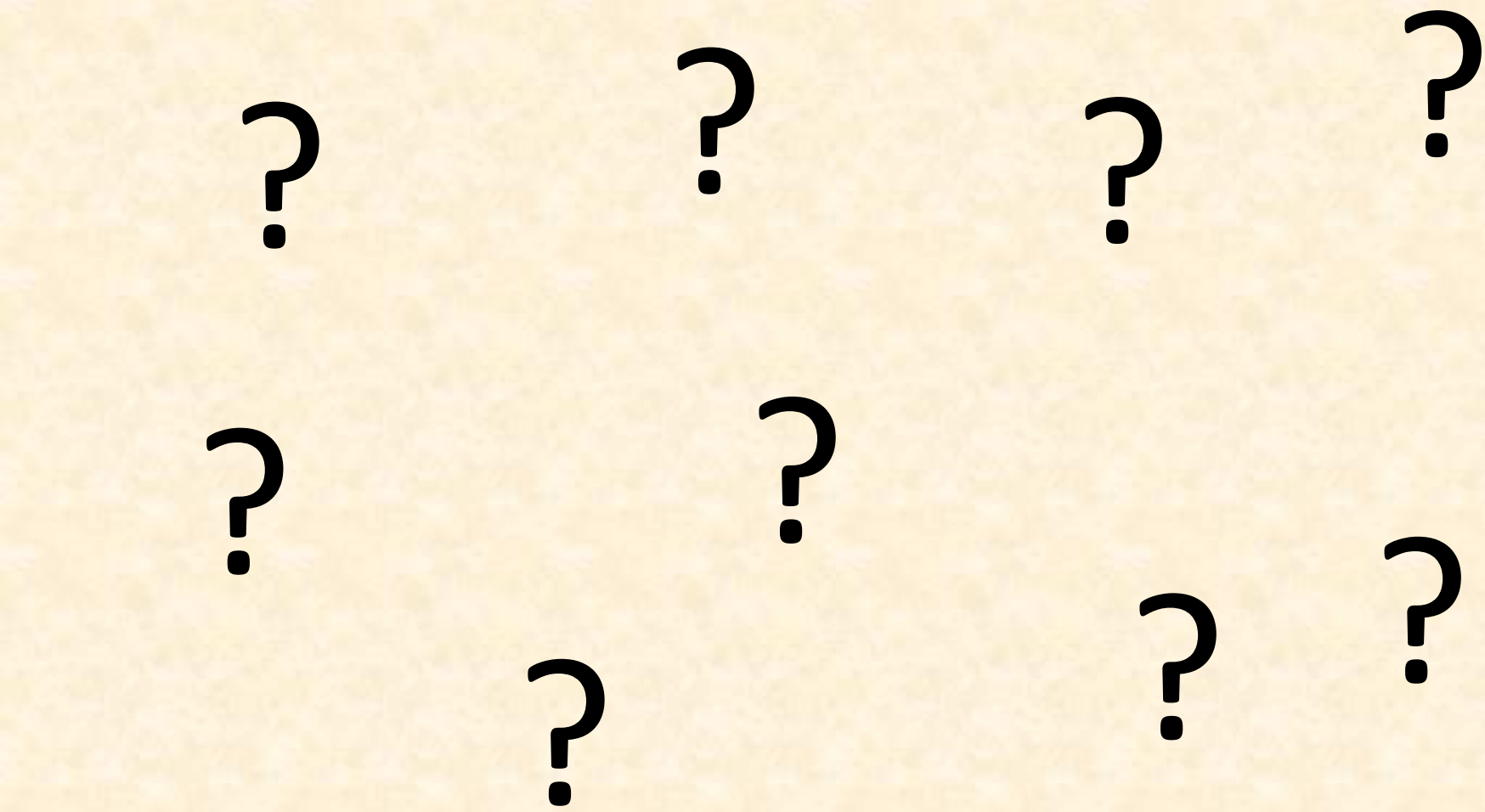
We don’t have one of these.

Schedule and Teamwork

✓Schedule

✓Teamwork

Questions?



What's ahead?

[1 of 6]

- Upcoming Meetings
  - ~~01/20, Tu: Risks and Prototypes~~
  - ~~01/22, Th: Project Plan~~
  - ~~01/27, Tu: Team Status Report Presentations~~
  - ~~01/29, Th: Schedule and Teamwork (All-Hands)~~
  - 01/30, Fr: Team Photos (9:00 a.m. – 5:00 p.m.)
  - 02/03, Tu: Team Project Plan Presentations **←1 Week**
  - 02/04, W: Start Work Towards Alphas **←Note**
  - 02/05, Th: Team Project Plan Presentations



What's ahead?

[2 of 6]

- Upcoming Meetings
  - 02/13, Fr: Design Day Booklet Content **←Lots of Work**
  - 02/19, Th: Alpha Presentations **← 3 Weeks**
  - 02/24, Tu: Alpha Presentations **← Risks Mitigated**
  - 02/26, Th: Alpha Presentations
  - 03/03: Tu: Spring Break
  - 04/02, Th: Beta Presentations
  - 04/07, Tu: Beta Presentations
  - 04/09, Th: Beta Presentations

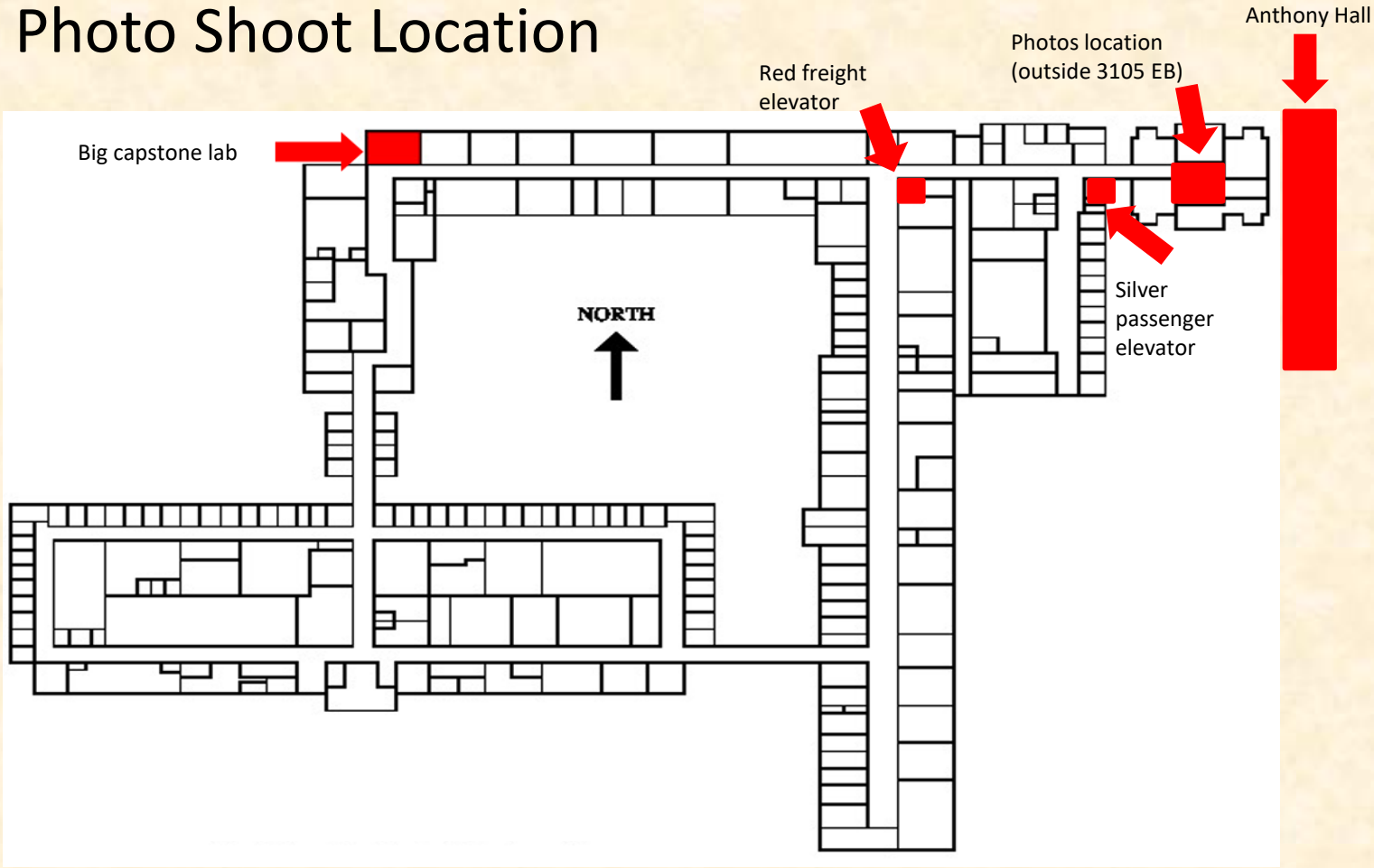
What's ahead?

Photo Shoot Schedule, Friday, January 30

10:00	Ally
10:10	Auto-Owners
10:20	RPM
10:30	Urban Science
10:40	Anthropocene Institute
10:50	Stripe
11:00	Lockheed Martin Space
11:10	Magna CADAIA
11:20	Ludus
11:30	MSUFCU
11:40	BREAK
11:50	BREAK
12:00	BREAK
12:10	BREAK
12:20	BREAK
12:30	BREAK
12:40	Amazon
12:50	TechSmith
13:00	Apple
13:10	Magna 4AICBM
13:20	Corewell Health
13:30	PACE
13:40	PS Technology
13:50	BREAK
14:00	Stryker IST
14:10	Kohler Co
14:20	Meijer
14:30	AkzoNobel
14:40	WK Kellogg Co
14:50	NetJets
15:00	Launch
15:10	Delta Dental 3DMM
15:20	Henry Ford Innovations
15:30	Whirlpool
15:40	GM
15:50	Delta Dental CDUIF
16:00	HAP

What's ahead?

Photo Shoot Location



What's ahead?

[5 of 6]

- 02/03, 02/05: Project Plan Presentations
  - 5 Days From Today **←Note**
  - Split-Hands Meeting
  - Slide Deck Template Posted on Downloads Page
    - 21 Slides
    - Presentation 14 Minutes Max
  - Must Use Windows Version of Office 365 **←Note**
    (See Other Links > Syllabus 30. Editing Documents and Presentations Using Office 365)
  - Read Submission Instructions Carefully
  - Due by 11:59 p.m. ET, Monday, 02/02 **←4 Days**
  - Upload Two Times to Microsoft Teams
    - To General Channel File Space
      Folder "Project Plan Presentation Slide Decks"
    - To Capstone Team's Private Channel
  - Present Using Team Laptop
    - Involve every team member.
    - Ask TM for adapter (Laptop -> HDMI) now.
    - Test projection in advance in split-hands room.

What's ahead? [6 of 6]

- Slide Deck File Names
- Convention
  - Use all lowercase.
  - Delete non-numeric and non-alphabetic characters except dashes.
  - Replace blanks by dashes.
- Examples
  - Team Amazon
    team-amazon-project-plan-presentation.pptx
  - Team Auto-Owners
    team-auto-owners-project-plan-presentation.pptx
- Check
  - Official Team Name (on Website)
  - Spelling
  - File suffix: Avoid team-[team name]-project-plan-presentation.pptx.pptx
  - Everything
- File misnamed == Not Submitted == No Credit

Delete this slide.

Read Me

[1 of 2]

- 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, April 22) and on budget ($0).
  - The time limit for your presentation is 14 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 that your team will be using.
  - We will meet in "split-hands" meetings. Luke's teams will meet in 158 Natural Resources, Griffin's teams will meet in 2400 Engineering, and Jared's teams will meet in 2250 Engineering.
  - All team members of the presenting teams are required to dress business casual on the day of their presentation. Business casual does not include jeans, 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 two meetings, all teams must be prepared to present on the first day scheduled, Tuesday, February 3.
  - The presentation schedule will be posted on our Weekly Schedule page in the evening of Monday, February 2.



Delete this slide.

READ ME

[2 of 2]

- Creating and Editing
  - Read and follow the instructions in “Editing Documents and Presentations Using Office 365” of our course syllabus.
  - 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., Monday, February 2.
  - 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-auto-owners-project-plan-presentation.pptx” and “team-delta-dental-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., Monday, February 2. 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., Monday, February 2. 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.



MICHIGAN STATE UNIVERSITY

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

Spring 2026



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 at least four 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 not include screen mockups of trivial things such as splash screens or login screens.

Do not 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 at least four 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 not include screen mockups of trivial things such as splash screens or login screens.

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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 at least four examples.

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

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Do not 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 at least four 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 not include screen mockups of trivial things such as splash screens or login screens.

Do not include screen grabs of other software.

Give each screen mockup slide a title.

See below for examples and instructions.

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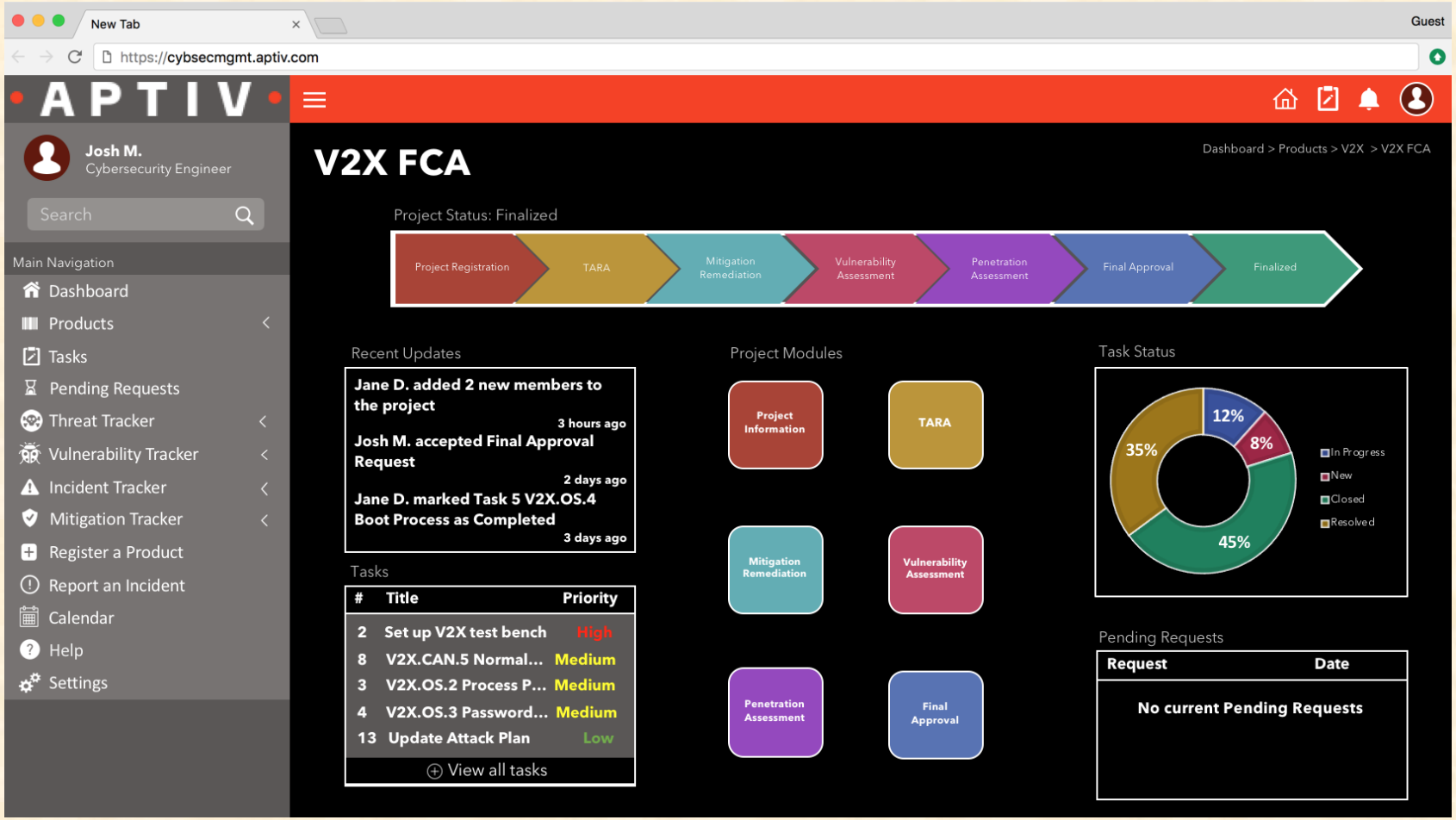
Delete this slide.

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.
- Do not submit screen mockups with platform frames that have shadows. If you start with a platform frame with a shadow, remove the shadow with software like paint.net or Adobe photoshop.

Delete this slide.

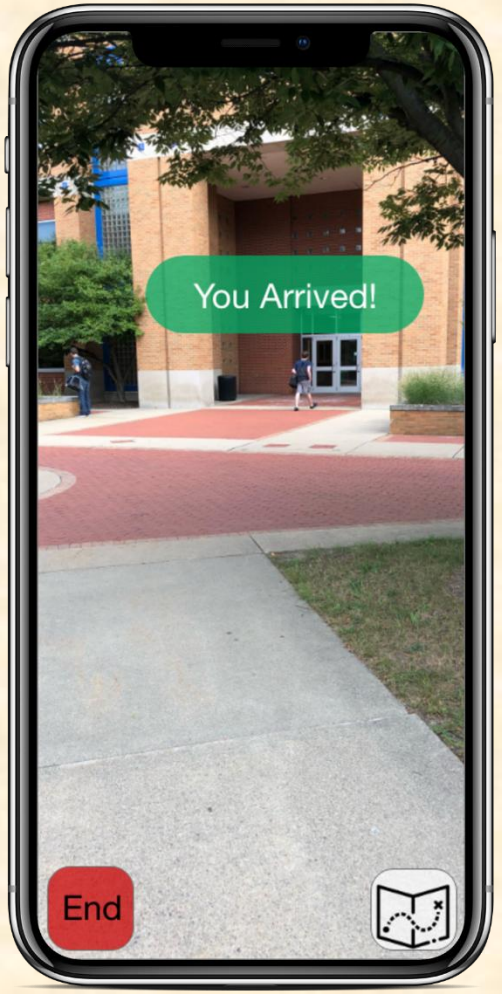
Screen Mockups: Web Interface



Delete this slide.

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.

Delete this slide.

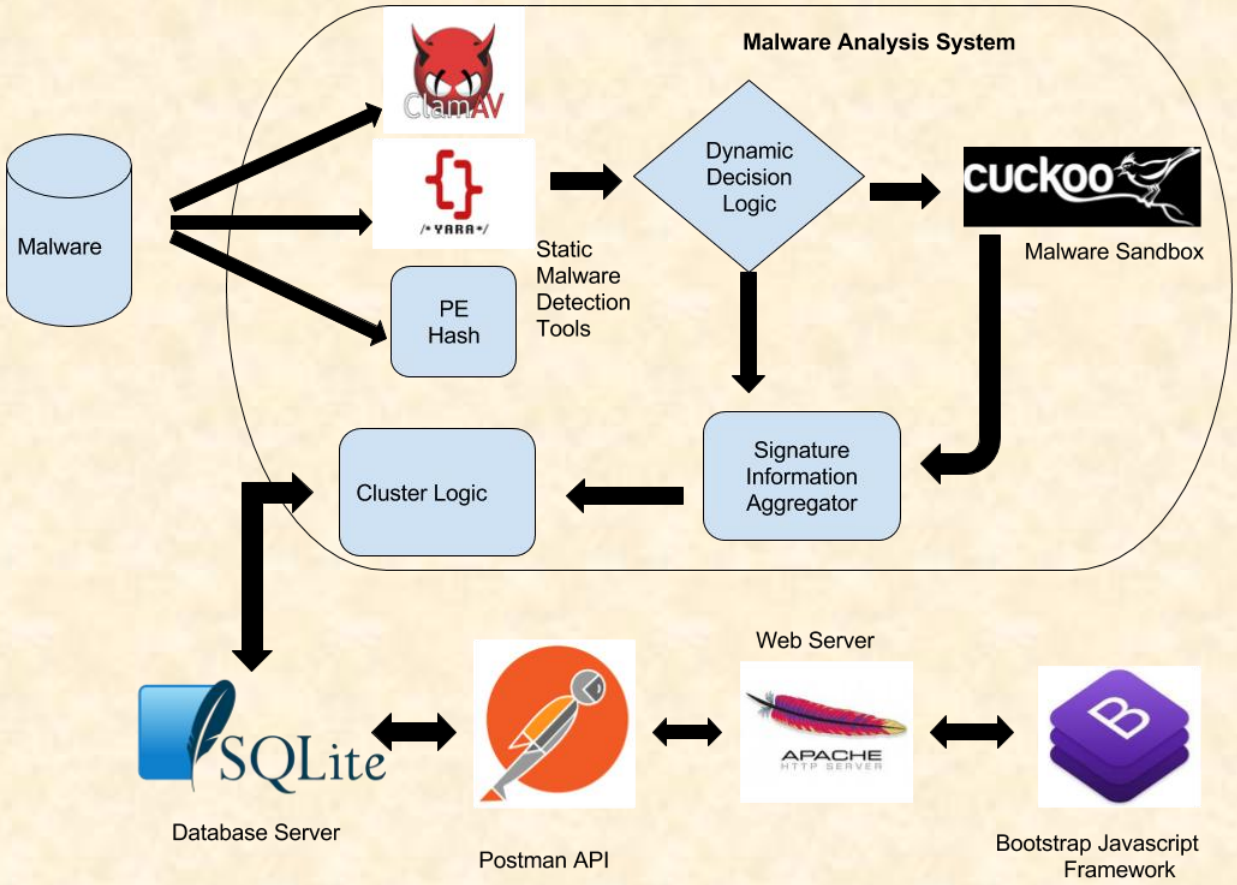
System Architecture Slide Notes

- 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 separate 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.

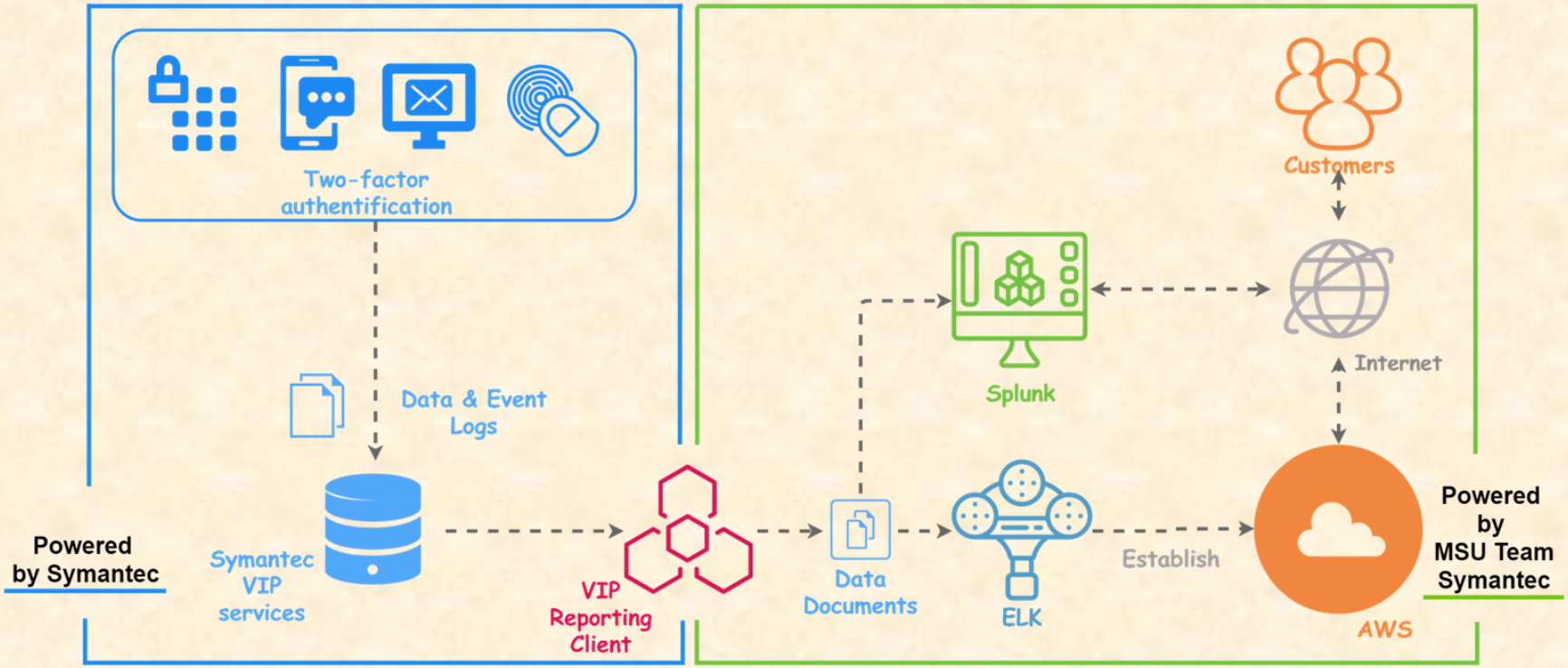
Delete this slide.

System Architecture Slide Notes



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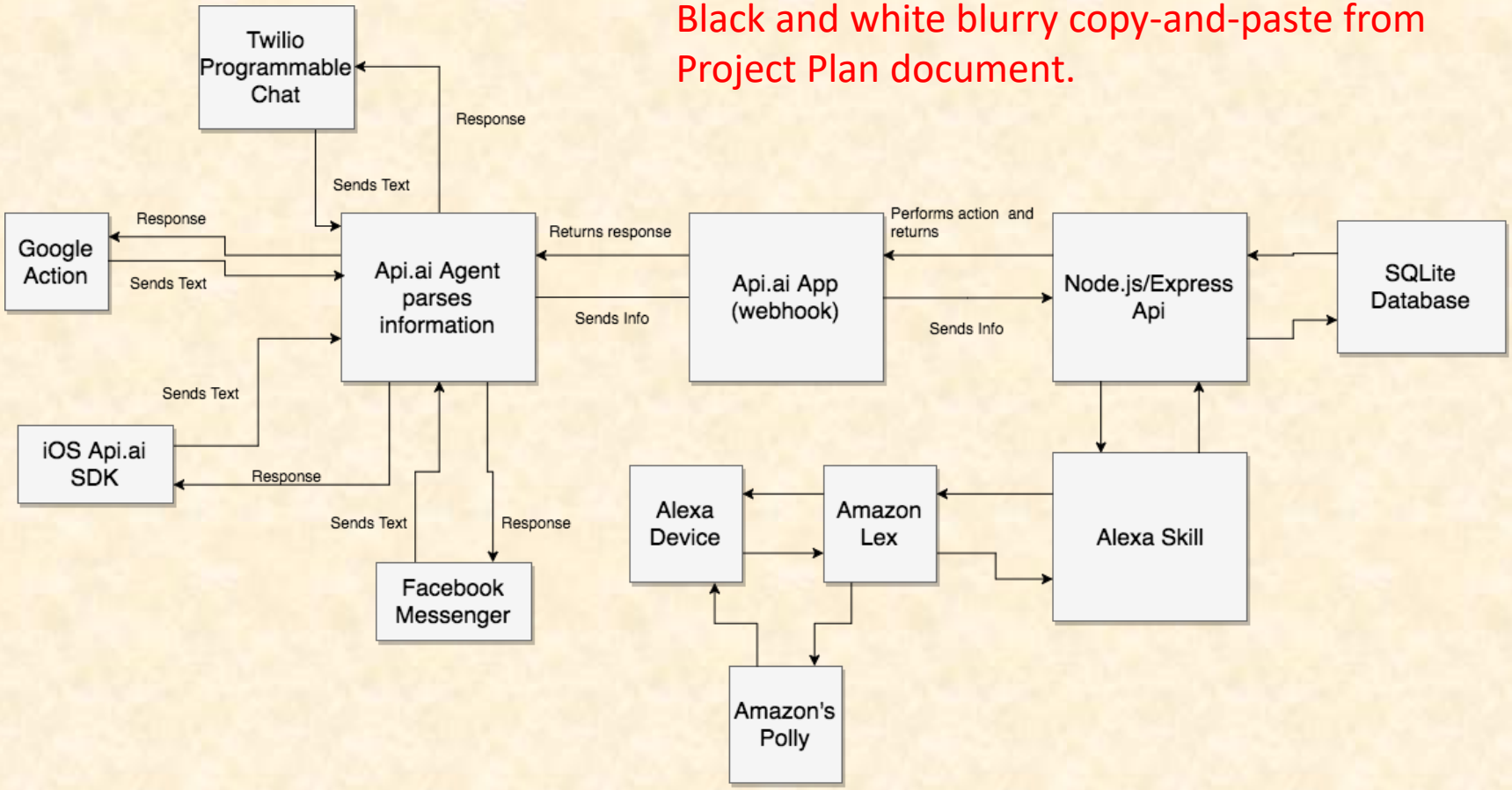
System Architecture Slide Notes



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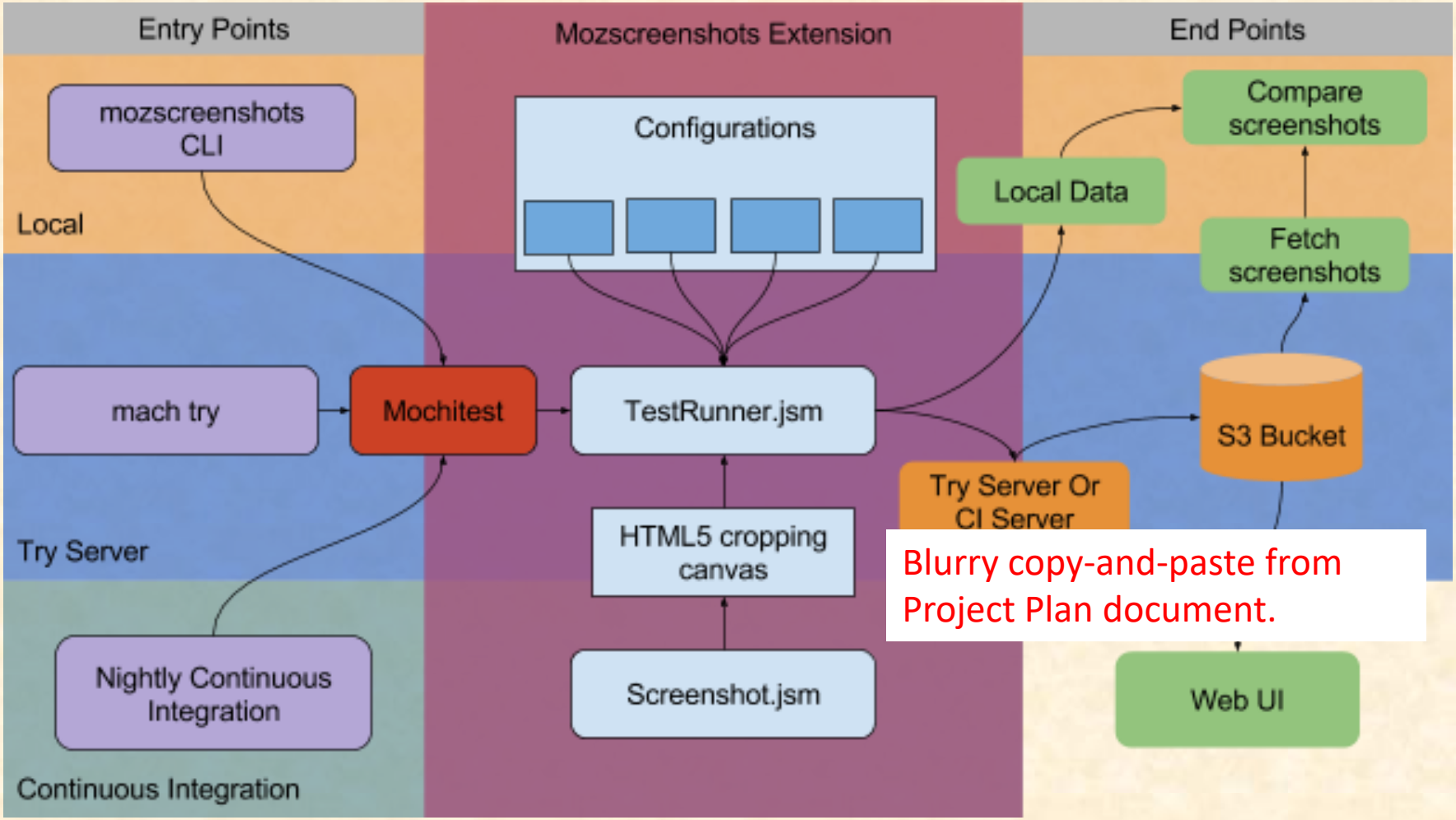
System Architecture Slide Notes

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



Delete this slide.

System Architecture Slide Notes



Project System Components

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

Project Risks

Do NOT modify the title of this slide in any way. List your project risks on this one slide in bullet points.
Delete this textbox.

- Risk 1: Risk 1 Title
  - Description
  - Mitigation
- Risk 2: Risk 2 Title
  - Description
  - Mitigation
- Risk 3: Risk 3 Title
  - Description
  - Mitigation
- Risk 4: Risk 4 Title
  - 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?

