



# EXPERIENTIAL PROJECT MANAGEMENT FOR STUDENT RESEARCH TEAMS

PRESENTED TO THE NATIONAL COUNCIL OF SPACE GRANT DIRECTORS  
AT THE 2015 SPRING MEETING, CRYSTAL CITY, ARLINGTON, VA  
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PRESENTED BY:

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ON BEHALF OF THE LOUISIANA SPACE GRANT CONSORTIUM (LaSPACE)

# ABOUT THE PROJECT

## Ionization Nexus for Discharge Research in the Atmosphere (INDRA)

- Measured the breakdown voltage of the atmosphere as a function of altitude
- Team of seven students:
  - Young Group: six sophomores, one senior
  - Diverse Backgrounds: three EEs, two MEs, one CE, and one PetE
- Successfully launched from NASA's Columbia Scientific Balloon Facility in May 2014



# TEAM STRUCTURE

LaSPACE Staff

Project  
Manager

Electrical Lead

Software Lead

Mechanical  
Lead

Experience  
d

Electrical  
Assistant

Software  
Assistant

Mechanical  
Assistant

Inexperience  
d

# PROJECT MANAGEMENT

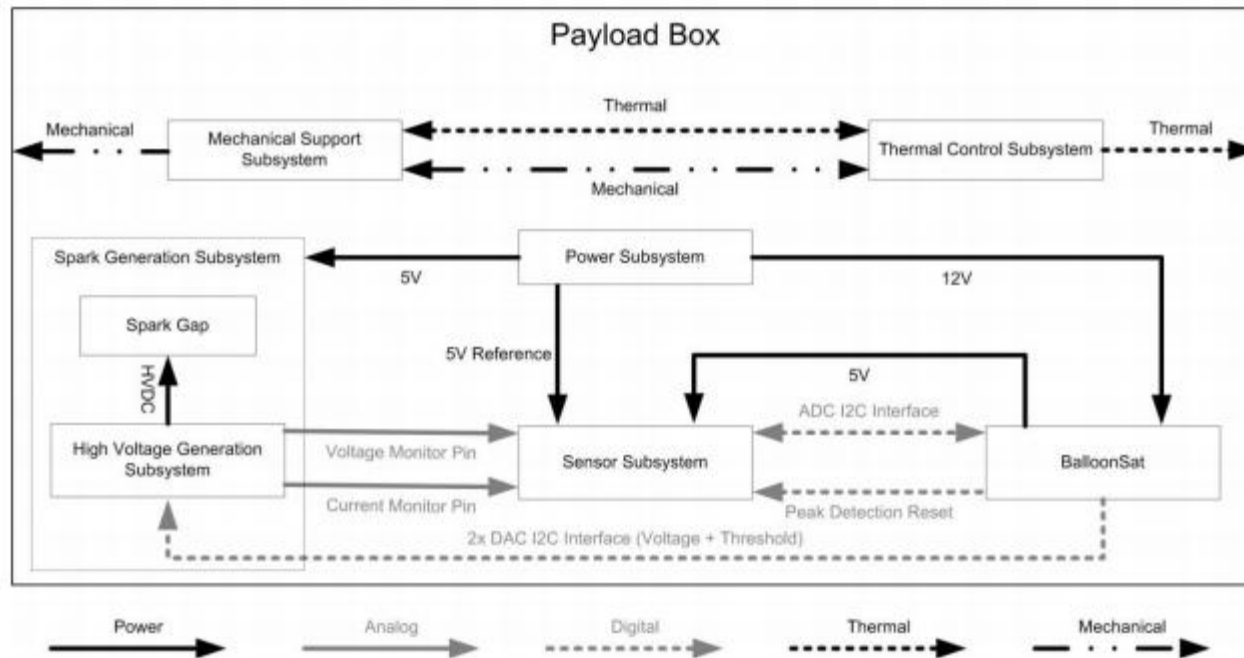
- Project Manager is a full time position
- Project Planning consumes most of a Project Manager's time
  - Must oversee the development of the entire project, consider long lead time need, and critical path items
  - Need to know the system inside and out, and what systems need to be built and tested
  - Must be able to see how the project breaks down into tasks
  - Should know the strengths and weaknesses of each team member for task assignments

# CREATING WORK BREAKDOWN STRUCTURES

- How do you create a long-term project development plan?
  1. Identify the critical path – i.e. the set of components that take the longest time to research and develop, then plan critical path development early
  2. Identify dependencies between tasks, and make sure that pre-requisite activities are completed before attempting post-requisite tasks
  3. Budget significant extra time to complete tasks
  4. Budget extra time to complete documents
  5. Consider school schedule: don't count on midterm week, finals week, or holidays

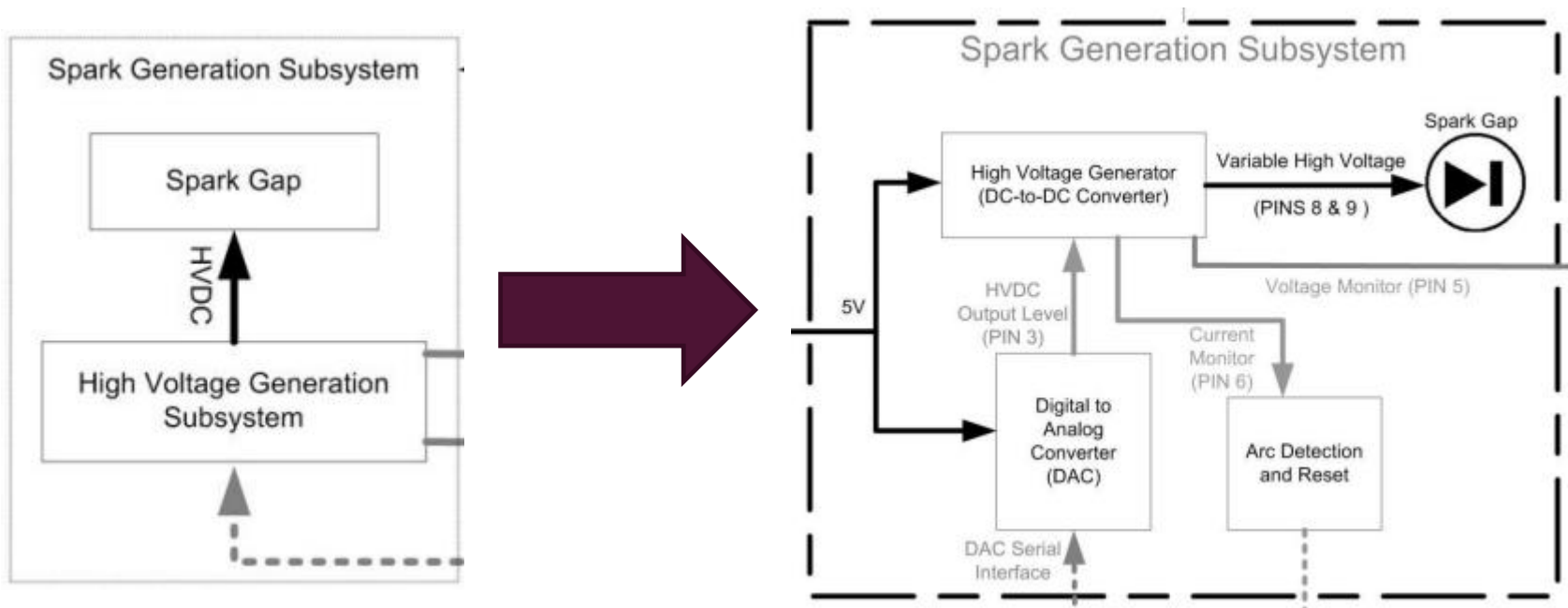
# DEFINING TASKS

- A task is anything required to develop or support development of a project subsystem that can be assigned directly to a team member.
- Most tasks can be derived from a high level system design



# DEFINING TASKS (CONTINUED)

- Expand diagram blocks until physical hardware implementations have been defined



# ASSIGNING TASKS

- Task assignment should be based on a few different things:
  - Skills and expertise
  - Upcoming personal schedules
  - Previous task-completion track record
- Always know what the team is working on, and which tasks are coming up for each team member.

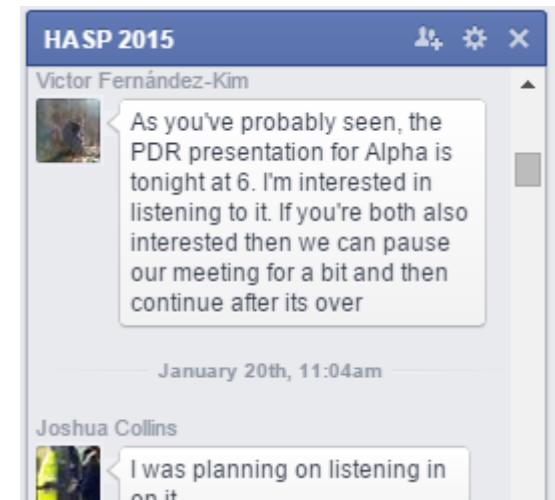


# BUILDING A COHESIVE TEAM

- While good organization and task definitions are important, building a cohesive team was key to the success of our project.
- Project managers should build a strong team by actively:
  - Ensuring team communication
  - Promoting team building

# TEAM COMMUNICATION

- Project Managers should keep in contact with their team
  - Email is useful for long messages and task assignment lists
  - IM clients (Facebook/GroupMe/Texts/etc) great for short reminders and real-time discussions
  - Group Calls should facilitate long-distance meetings (i.e. over school holidays)
- Friendly reminders about upcoming meetings and deadlines are incredibly useful



# TEAM BUILDING

- Team building makes people excited to work on the project instead of just earning money
- Do non-work things outside of the lab
  - We ate dinner at local restaurants to celebrate project milestones
  - We helped each other with classes
  - We played co-op video games
- Should be optional



# LEAD BY EXAMPLE

- Be a good team member
- Keep private conversations private
- Avoid gossip about other team members
- Compliment and support your team (positive feedback)

# A COHESIVE TEAM STAYS TOGETHER

- We began a new project for the High Altitude Student Platform
- In addition to the work on this payload, we mentor two student groups:
  - LSU: Six new ballooning program students
  - Baton Rouge Community College: Working to start a new balloon program

Q&A

Questions?