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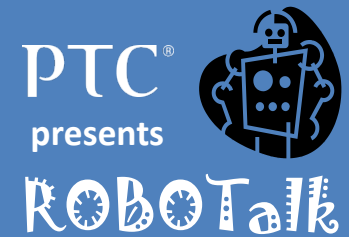
ROBOTalk

Hosted by David Price, the voice of FTC

How to build a  
robot from  
concept to  
competition

September 24<sup>th</sup>, 2014

# WELCOME



- Thank You for joining us!
- PTC Experts on this webinar



**Jordan Cox**  
Director, PTC K12  
Programs



**Scott Morris**  
Windchill & Creo  
Expert



**Mark Cheli**  
Creo Expert &  
Webex Technical  
Assistance



**Todd Kraft**  
Creo & Mathcad  
Expert



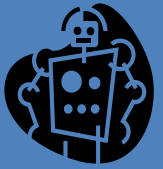
**Kari  
Karwedsky**  
PTC FIRST  
Program Manager

- Our new host,

**David Price**



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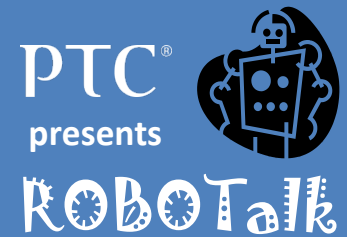
ROBOTalk

**WHAT CITY ARE YOU  
LISTENING TO  
ROBOTALK FROM?**

**Text 643132 and your message  
to 22333**

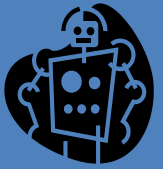
Poll  
Everywhere

# AGENDA



- Poll Everywhere
  - What one word describes your team this week?
- How Do You Organize for Success? – David Price & Scott Morris
- Basics of Project Planning & an Introduction to PTC Windchill
  - Scott Morris & Kari Karwedsky
- Poll Everywhere
  - What was the coolest robot in history?
- From Game Challenge to Robot Requirements – Jordan Cox
- Basic Volume Allocation in PTC Creo – Jordan Cox
- Riddle Challenge– David Price
- Questions & Answers

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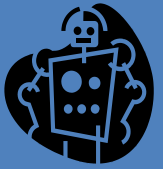
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# WHAT ONE WORD DESCRIBES YOUR TEAM THIS WEEK?

**Text 227922 and your message  
to 22333**

Poll  
Everywhere

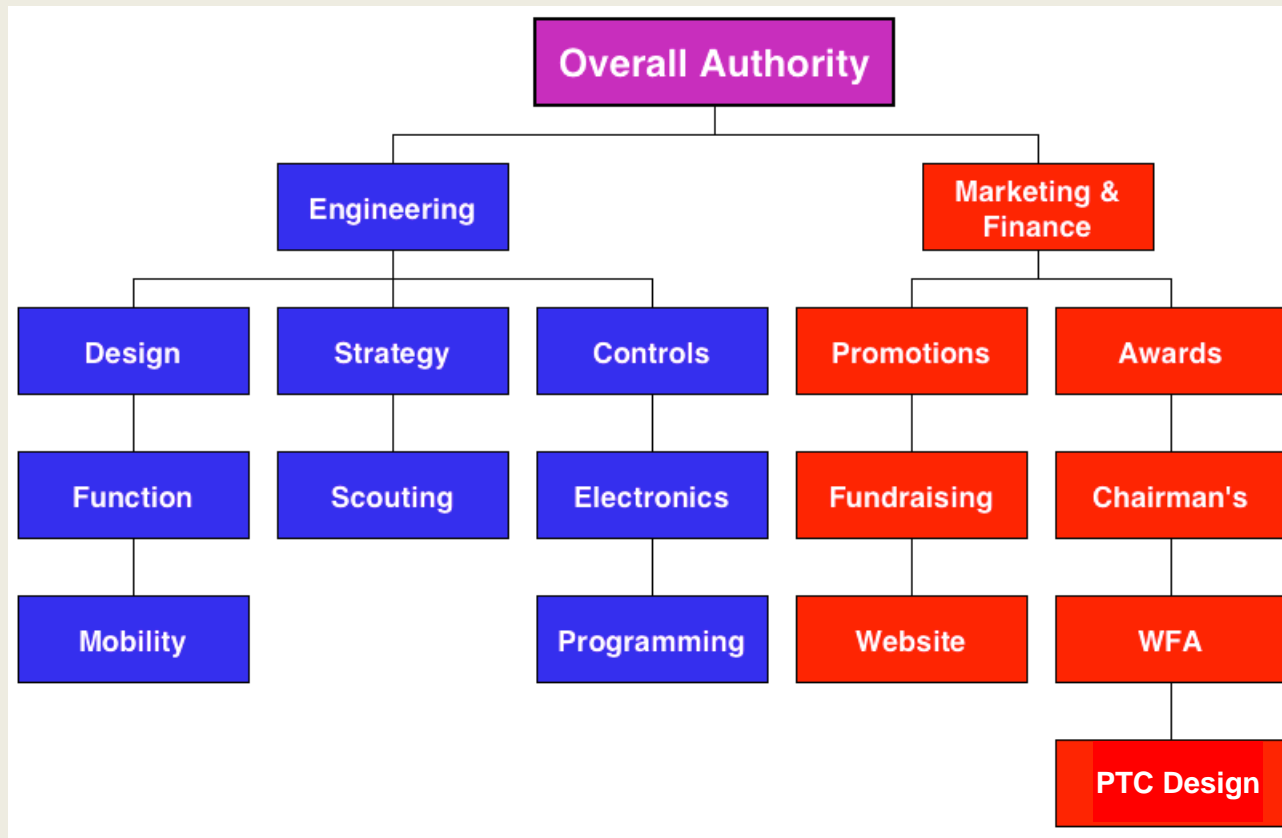
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# ORGANIZING YOUR TEAM FOR SUCCESS

David  
Price &  
Scott  
Morris



# TOP OF THE PYRAMID

## ■ Engineering

- “The Robot Team”
- The engineering leader is the overall authority when it comes to all robot related decisions
- Co-ordinates between the three engineering subteams, and ensures areas of overlap are taken care of (crucial)

## ■ Marketing and Finance

- “The Business Side”
- Often overlooked and neglected
- This section of the team, allows the engineering side to function
- Brings funding, recognition and distinctions to the team
- A great opportunity to expose students to science and technology
- Manages the teams books



# ENGINEERING “SIDE OF THE HOUSE”

## ■ Design

- Responsible for the mechanical design and build of the robot
- “Makes the robot do what it’s supposed to do”
- Usually broken down into two areas
- Mobility – the drive base
- Function – the mechanisms
- Takes design directives from the strategy team
- At competition, responsible for maintenance and upkeep of the robot

## ■ Strategy

- Responsible for the strategic design
- “What should the robot do”
- Analyzes the game and determines the game strategy
- At competition, they are responsible for match planning and execution
- The drivers & coach should be a part of this team
- Scouting
- Gathering information about opponents to help decide on match plans and alliance selection

## ■ Controls

- Responsible for making a mechanically sound robot work
- Electronics
- Wiring the robot and installation and design of all sensors
- Programming
- Writing the code that allows the drivers to interface with the robot.
  - (or in the case of autonomous mode, the code that allows the driver not to interface..)

# BUSINESS “SIDE OF THE HOUSE”

## ■ Promotions

- Responsible for getting the team publicity in the community and at competitions
- Designs team logos, literature, and anything else to help the team establish a brand
- Fundraising
- Raise money to finances the operation of the team
- Much more on this later
- Website
- Essential for publishing team information, for both members and the public
  - FIRST awards the best website at each regional

# BUSINESS “SIDE OF THE HOUSE”

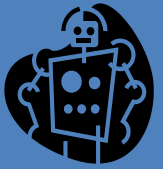
## ■ Awards

- Responsible for the preparations of submissions and accompanying documentation for awards
- Most FIRST awards do not require a submission
- Having a handout or display for the judges never hurts!
- The Chairman’s Award
- The highest honour in FIRST
- Requires a written submission and a presentation
  - Rookie teams are not eligible, but a written submission directed towards the CA will be considered for the Rookie All-Star award
- The Woodie Flowers Award
- Awarded to a mentor for distinguished service in communication and inspiration of his/her students
- Teams select one mentor to nominate
- Requires a 600 word essay
- One winner at each regional event, and an overall winner at the Championships in Atlanta

# TEAM ORGANIZATION TIPS

- You don't need to have subteams for each area
- There's lots of duplication.
- The same goes for the award submissions
- Don't bite off more than you can chew
- Try to have a mentor for each subteam
- Recruit parents, industry professionals, anyone who might be interested.
- Don't restrict your team to "techies"
- Lots of different skill sets are required for a successful team

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# BASICS OF PROJECT PLANNING

## INTRO TO PTC WINDCHILL

Scott  
Morris &  
Kari  
Karwedsky

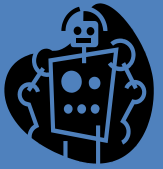
# WHY CREATE A PROJECT PLAN?

- Understand your team's goals
  - Build a robot that can be successful at competitions!
- Understand your team's time constraints.
  - What are your team's major events? Design reviews, competitions?
  - When do you plan to meet?
  - Are you designing any custom parts? How long does it take to order/make them?
- Understand your resources.
  - What is your budget? How do you plan to divide it?
  - Where are you going to meet? Build? Practice?
  - Who is available to help?
- **Keep everyone on the team on the same page for the season!**

# HOW TO CREATE A PROJECT PLAN

- **ANSWER the Question WHO?** – Who is on the team? Who will do the work?
- **ANSWER the Question WHAT?** – What are your goals or objectives? What are your deliverables?
- **ANSWER the Question WHEN?** – When are your project events? When are your deliverables due?
  - **FTC:** When is your first tournament?
  - **FRC:** Six weeks to build, yikes! What are you doing to be prepared now?
- **ANSWER the Question WHERE?** – Where will your team meet? Where are you planning to compete?
- **ANSWER the Question WHY?** – Why are you working on this project?
- **ANSWER the Question HOW?** – What are your resources? What is your budget?

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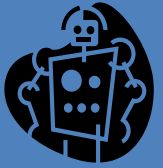
# WHAT IS THE COOLEST ROBOT IN HISTORY?

**Text 239239 and your message  
to 22333**

Poll  
Everywhere



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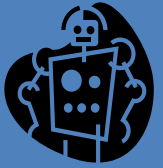
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# FROM GAME CHALLENGE TO ROBOT REQUIREMENTS

## BASIC VOLUME ALLOCATION IN PTC CREO

Jordan Cox

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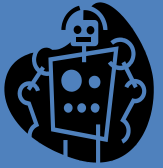


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# ROBOT RIDDLE

David  
Price

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**ASK THE EXPERTS...  
QUESTIONS?**