

FIRST Team 2996
Cougars Gone Wired
Business Plan and Annual Report



"...To transform our culture by creating a world where science and technology are celebrated and where young people dream of becoming science and technology leaders."

-Dean Kamen, FIRST Founder



Executive Summary

The Team

- 5 years old
- 60+ students
- Competes at 2 regional events
- Has competed in the World Championships 3 years out of 4
- Is run like a business: the team has a CEO, CFO and multiple VPs

Our Mission

- To build the foundation for a STEM orientated culture and spread STEM through the community
- The team has increased minority participation in STEM related activities
- To maintain a strict student-run, mentors may not touch the robot policy
- To build the community by showing what kids with a STEM education can do
- The team has created 1 FTC team, 4 FLL teams, and 5 Jr. FLL teams
- To build futures by equipping students with lifelong skills in problem-solving and leadership

Strategy and Implementation

- Build two robots and give the team a competitive edge
- Network with other FRC teams
- Reaffirm connections with sponsors

Financial Plan

- The team spends upwards of \$80,000 per year
- \$15,000 of this is paid for by students through team fees
- The remaining \$65,000 is paid by corporate and independent sponsors

Mission Statement

"FIRST team 2996 will strive to build robots while building students, working hard and having fun, and trying our best while helping others. We believe FIRST creates a place to learn and grow and FIRST team 2996 promises to promote student involvement and interest in STEM. By showing the community the value of STEM education, FIRST team 2996 will build a foundation for a new STEM orientated culture."

Foundations

- The team was founded in the fall of 2008 by Bryce McLean, an engineering and mathematics teacher at Coronado High School (the home of FIRST team 2996). By the start of the 2009 build season the team had 50 members on the roster and has maintained that level of members ever since
- The team is sponsored by: the United States Air Force Academy, the Challenger Learning Center, Honeywell, Agilent Technologies, Aeroflex, Lockheed Martin, Northrop Grumman, IEEE, Vertec, MCAD, Volson, Double M Concrete LLC, NAWIC, Fastenal, and EON Studios
- The team has fostered an appreciation of STEM at Coronado High School causing its number of members to grow to an all-time high this year- over 60 student members. The team has also gained invaluable sponsors through personal and corporate connections.

Future

- In the spring of 2013, FIRST team 2996 plans to create more Jr. FLL teams in Southern Colorado and host another Jr. FLL event.
- The team will strengthen current sponsor relationships and foster new sponsor relationships.
- The team will work to improve communication, redefining job descriptions, and encouraging a higher percentage of team members to participate in activities outside of robotics meetings.

The Team

-“If you’re ahead of schedule, work faster!”



2012 Denver Regional Team Picture

This year's objectives

- The Robot(s)- build two robots in order to use the second one for valuable driver practice and programming testing
- The Team- maintain a 40-50 member team by recruiting freshmen for FTC and other students for FRC
- Community Involvement- establish long-lasting partnerships with other organizations; earn more money to fund other school's FIRST organizations and STEM education; maintain the same (if not greater) level of active community involvement
- Competition- raise enough funds to attend both the Greater Kansas City and Colorado Regional events with the goal of attending World Championships in St. Louis by winning either the Chairman's Award, Engineering Inspiration Award, or a regional event
- FRC Team Connections- improve existing relations and establish strong mutual relationships with local FRC teams
- Sustainability- improve sponsor relations and make a **template** for upcoming years
- Gracious Professionalism- improve student-to-student relationships and prepare team members for the future by **improving GP through education via power point and setting a goal for team improvement**
- Encouraging STEM Education in Schools- create and mentor Jr. FLL teams in various elementary schools; mentor FLL teams; inform the community about the benefits of STEM education
- Laying the Foundation for a STEM Orientated Culture- make STEM exciting for everyone **through community events where we let children drive the robot**; engage the younger and older generations in STEM activities; maintain a high level of team participation at school and in the community

Keys to Success

In order to succeed in team objectives this year, a level of commitment must be volunteered by every team member. Through tackling the construction of two robots and attending two regional events, the team faces the challenge of: obtaining more funding, inspiring more motivation, and sustaining support from the community.

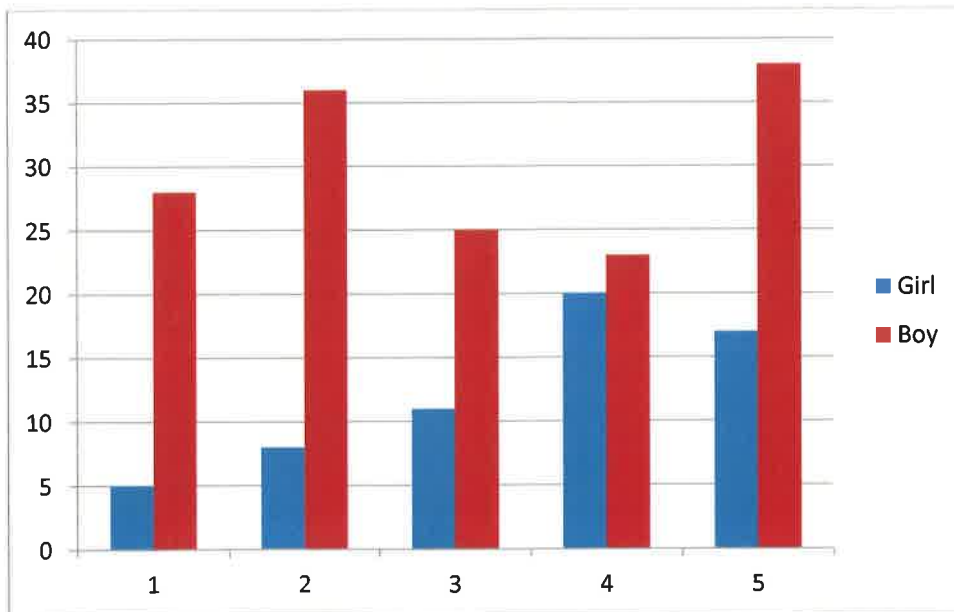
Organization Summary

FIRST team 2996 is a five-year-old student run organization that competes in an annual national and international robotics competition through an organization called FIRST (For the Inspiration and Recognition of Science and Technology). Based out of Coronado High School in Colorado Springs, Colorado, FIRST team 2996 is a District 11 team that welcomes everyone- both from within and outside of the district.

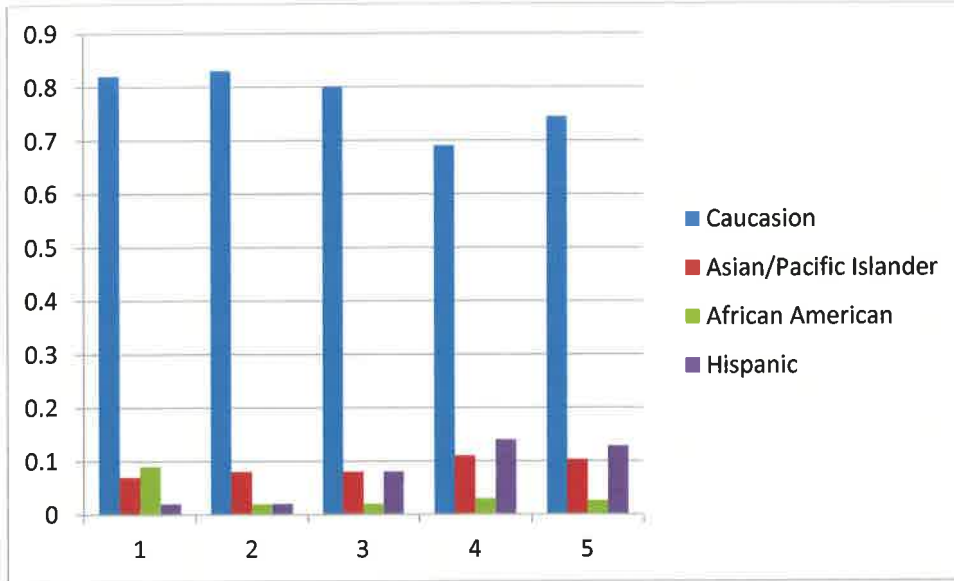
FIRST team 2996 is dedicated to giving students in the Colorado Springs area and beyond a unique hands-on opportunity to experience and discover passions in science and technology while learning from professional engineers. **The team spends the year learning to work as a team, solve problems, and make ideas become feasible; this is reinforced during the build season.** The team focuses on preparing students for future careers in the diverse fields of STEM (science, technology, engineering, and mathematics) and contributing to the growing work force of problem-solvers and engineers.

With the goal of being a competitive FIRST robotics team, FIRST team 2996 strives to be much more than just a student club. The team believes that in order to help FIRST make a large cultural impact on the world, all FIRST teams must promote excitement for STEM within their communities. Likewise, FIRST team 2996 strives to contribute positively to STEM education, the community, FIRST, and its supporters. In the year to come, the team hopes to grow and establish a lasting impact on future generations.

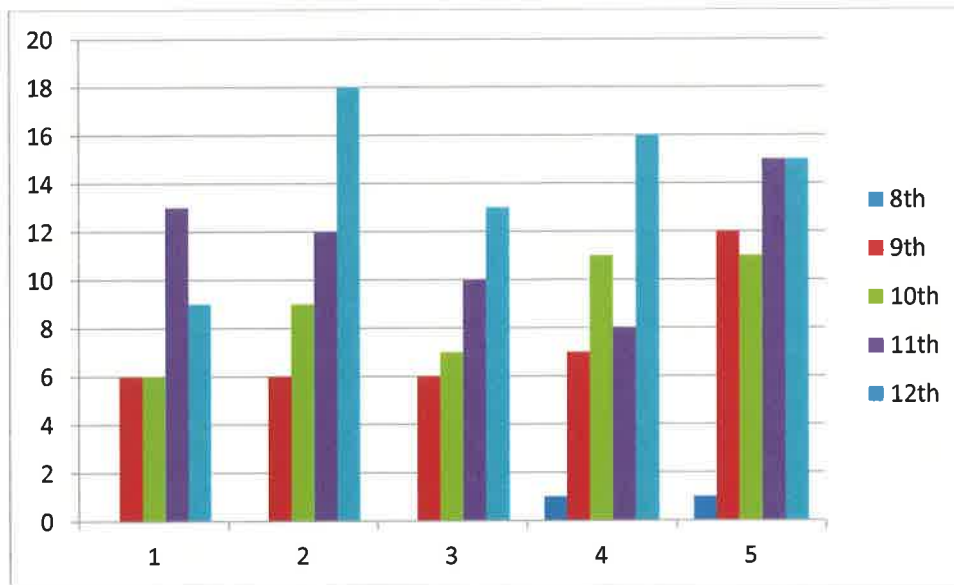
Girl to Boy Ratio



Percent Ethnicity



Age Distribution



Team History

FIRST team 2996 was founded in the fall of 2008 by a few dedicated students and Bryce McLean, an engineering and mathematics teacher at Coronado High School. The team blossomed from there, gaining nearly 50 students by the beginning of the 2009 build season.

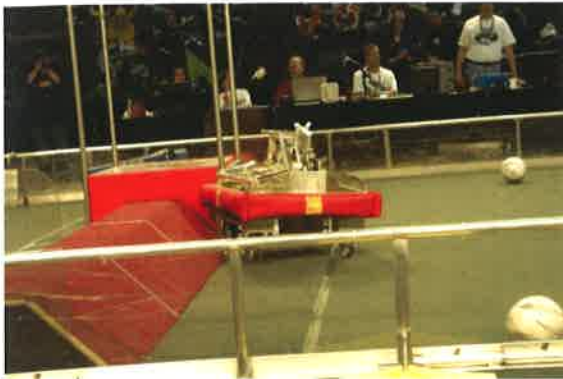
2009

Since that very first season, the team has gained considerable success but not without challenges. Given the complexity of building a robot and the team's inexperience, the robot for 2009's *Lunacy* was built to be what the team jokingly called "Dozer" for its ability to do little but push other robots around the field. Though energized by receiving the Website and Animation Awards, the team had very little competitive success on the first day of competition. Nevertheless, the team returned to competition the next day intent on enjoying the rest of the competition- at this point it was fairly certain that Dozer would not make it into the elimination rounds. Surprisingly, thanks to the kindness of the 1st seeded alliance composed of FIRST teams 399 and 1332, FIRST team 2996 not only made it to the elimination rounds but were part of the winning alliance. Between that victory and winning the Rookie All-Star Award, FIRST team 2996 made it to World Championships in Atlanta, Georgia.



2010

Inspired by the previous year's success, FIRST team 2996 went into the 2010 *Breakaway* season with the aim of creating a robot that would be able to competitively play the game. This met with limited success- at the Greater Kansas City Regional the team did not place highly in the standings or receive any awards. At the Colorado regional the team was awarded the Entrepreneurship, Industrial Safety, and Autodesk Excellence in Design Awards and made it to the semi-finals in competition.



2011

2011's *Logomotion* was one of FIRST team 2996's more successful years (along with 2012's *Rebound Rumble*). Winning the Entrepreneurship Award and making it to the semi-finals at the Greater Kansas City Regional fueled the team's excitement. At the Colorado Regional the team hit the ground running. The first evening saw several personal triumphs with seasoned member Scott Von Thun receiving the FIRST Dean's List Finalist Award. The team went on to win the Chairman's Award and place 7th in the Curie division at World Championships.



2012

FIRST team 2996 went into 2012's *Rebound Rumble* with a new strategy: build two identical robots. The first robot was 'bagged and tagged' at the end of the six week build period as the rules demand and the second one was kept out and operational for programming and driver practice. Having said second robot gave the team a huge advantage at the Colorado Regional and was, quite possibly, the whole reason the team was so successful that year. FIRST team 2996 won the Colorado Regional as the head of the top seeded alliance, along with FIRST teams 399 and 3807, then proceeded to World Championships in St. Louis, Missouri.



Alliance selection at the Colorado Regional



The top seeded alliance competing. (2996 is the front robot)



The top seeded alliance at the Colorado Regional- 2996, 3807, and 399.

Our Mission

Mission Statement

"FIRST team 2996 will strive to build robots while building students, working hard and having fun, and trying our best while helping others. We believe FIRST creates a place to learn and grow and FIRST team 2996 promises to promote student involvement and interest in STEM. By showing the community the value of STEM education, FIRST team 2996 will build a foundation for a new STEM orientated culture."



Building the Team

FIRST team 2996 is an FRC team based out of Coronado High School in D11 and welcomes everyone. By teaming up with Coronado High School's student government for assemblies, festivals, and homecoming parades, the team has increased the popularity of STEM in both the school and community, especially within the female and minority **populations**.

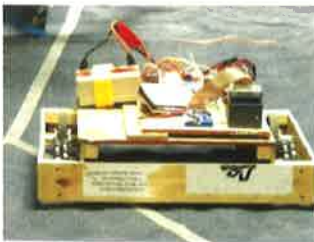
FIRST team 2996 hopes to create an environment that utilizes a diverse group of talents and skills. Anyone can be an engineer, a scientist, a doctor, or an inventor with enthusiasm and dedication; this is the message the team works to exemplify. In order to accomplish such a task, **this year the team** will put a greater emphasis on recruitment and team-building to appeal to a broader audience and form a cohesive team of various strengths.



2012-2013 school registration

Building the Robot(s)

In its five years, FIRST team 2996 has seen nearly exponential growth in many areas due to the team's strict student-run policy. This strict student-run policy has hiked the team's learning curve to a new level. Because the student's learning experience is protected by a "mentors may not touch the robot" policy, students remain motivated to design, build, test, redesign, and retest their creations.



2013's prototype robot

Building the Community

FIRST team 2996 is enthusiastic about showing the community what kids with a STEM education can do. During the 2012-2013 school year, the team created five Jr. FLL teams at a local elementary school (Chipeta Elementary) and personally mentored each of the five teams. At the end of the six week "build" period, the team also hosted a Jr. FLL event- the first Jr. FLL event to take place in Southern Colorado. The team plans to start more Jr. FLL teams at other schools in the 2013 spring. Other community events the team participated in during the 2012-2013 season are: the Cool Science Festival, the What If? Festival, and the Southern Colorado FLL Competition. The team will host the 2013 Colorado Scrimmage on February 9th.



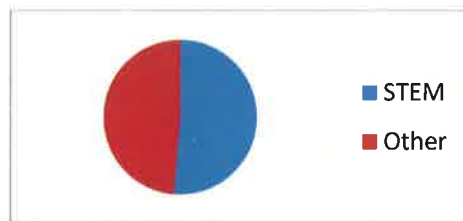
The team handing out sandbags after the
Waldo Canyon Fire



Care and Share Food Drive

Building Futures

FIRST team 2996 strives to equip students with lifelong skills in problem-solving and leadership. This year, the team hopes to promote more successful futures in diverse fields. So far, the team has had success in **this as nearly 1/2 of team members** are English and social-sciences orientated. By maintaining a student-centered learning environment and student-run team, FIRST team 2996 plans to provide everyone the opportunity to succeed.



Strategy and Implementation

During the off-season, FIRST team 2996 meets every Wednesday for two hours in order to prepare for build season and various community events. Outside of build season, the CEO, CFO, and business VPs use email-based calendars to keep up-to-date with sponsor presentations, due dates, meetings, community events etc.... During build season, the CEO keeps a Microsoft Office Project Management calendar that lists every task that each sub-team must complete in order to finish building the robot by ship-date. This calendar helps the CEO prioritize and decide where to put more time and effort.

Building the Robot(s)

This year, FIRST team 2996 hopes to build two robots (a task which was completed last year) in order to improve its outcome in the FRC competitions. The strategy is to make two identical robots during the six week build period, bag-n-tag the first robot, and then use the second robot for much needed driver practice time and programming testing. The construction of both robots is accounted for in the build season schedule. In order to use the second robot **for this purpose**, the team will need to extend its build season hours for one week beyond the end of build season. Having the second robot will provide more programming testing and driver practice.



2013 CAD designs

Sustaining the Team

Strategy

- Recruit more freshmen in order to balance the large number of seniors leaving annually
- Train new students during the off-season by doing team-building exercises and educational seminars on each robotic system
- Save time to have fun in order to motivate the team with events such as Frisbee Friday and pie night on Wednesday
- Pass on more organized documentation, such as the scrapbook, technical notebooks, and business plan, to the next team

Implementation

- 12 freshmen were recruited this year through advertising at school functions such as: eighth grade orientation, open house, and the homecoming parade. In order to recruit students outside of Coronado High School, the team gave several demonstrations at elementary and middle schools and in the community.
- In order to keep team members motivated and excited, the team kept the same build season hours as if only one robot was being built. In order to do this the team had to be very efficient.
- Previous VPs have left binders and packages of information and resources for their successors



Team building exercises and freshmen initiation during first meeting of the year.

Promoting FIRST's Objectives

Gracious Professionalism

- Network with other FRC teams (possibly by helping them make parts on the team's 3D printer)
- Invest in FLL and Jr. FLL teams by mentoring them and volunteering at the Southern Colorado Regional
- Discipline team members who do not display good GP

Increasing Community Involvement

Strategy

Based off helpful criticism received in previous years, the team has decided to focus on gracious professionalism, improving the team as a whole, and increasing promotion of diverse science and technology careers. This year, a portion of team funds will be donated toward school functions and organizations (such as Jr. FLL). The team will use its fifth year to extend relations to more unique organizations not restricted to STEM while forming close bonds with other FRC teams.

Implementation

- The team has created a GP power point to teach new members what GP is
- Five Jr. FLL teams were started and mentored by the team
- A portion of team funds was donated to Cougars Care, an organization at Coronado High School that gives assistance to students in need
- The team hosted an annual strategy conference for Colorado Springs FRC teams

Management Summary

FIRST team 2996 models its team structure like a business by dividing its 61 members into seven technical sub-teams and four business sub-teams. Every technical sub-team is in charge of a different system of the robot: drive, manipulation, electronics, programming, **integration**, 3D modeling, and field construction. The only technical sub-team that does not work on the robot is animation. The business sub-teams are responsible for all elements other than the robot that make FIRST team 2996 successful: finance, awards, web and communications, and community and media. All team members are required to be on both a technical and business sub-team to ensure all tasks get done on time.

Student Leadership

FIRST team 2996 maintains a strict student-run policy to encourage students to take full advantage of the experience that FIRST has to offer. Instigated by Head Mentor Mr. McLean, the team's "mentors can't touch the robot" policy has paved the way for unbreakable mentor-student relationships and has pushed the team to grow rapidly over the past five years. FIRST team 2996 believes that the FIRST experience is first and foremost a chance for students to learn and grow. Protecting student enthusiasm and passion for STEM and leadership remains the team's highest priority.

Team Structure

Every member of the team is required to be a member of both a business and technical sub-team in order to build both the robot and the team. Business sub-teams are responsible for community outreach, publicity, communications, and acquiring the funds needed to build the robot(s), travel, and compete. Technical sub-teams are responsible for building the robot, the field, and creating animations.

Leadership Positions

Each sub-team, business and technical, is led by a VP who must ensure that said sub-team's goals are performed well and on time. VPs are required to attend team meetings 90% of the time and VP meetings outside of whole group meetings. The CEO and CFO make up the top layer of leadership. While the CFO is responsible for managing the team's budget and communicating effectively with sponsors and the community, the CEO guides and manages the actions and responsibilities of the VPs.

Leadership Requirements

In order to obtain leadership positions, each student must go through an interview process and submit a cover letter, résumé, and transcript to a panel of mentors. These mentors, with input from the CEO, decide who the best fit for each VP position annually is. The CEO and CFO must go through a similar process. To keep a leadership position, VPs are required to be present at meetings and events 90% of the time, maintain at least a 2.0gpa, and exemplify good role model characteristics.

Job Descriptions

Chief Executive Officer- the CEO provides direction and leadership toward the achievement of the team's philosophy, mission, and strategy, and oversees the entire project. To do this, the CEO makes decisions based on the time frame and priorities of the project. The CEO must look for ways to optimize team performance and effectiveness while ensuring that deadlines are met and good team work and communication is present.

Chief Financial Officer and Finance VP- the CFO, also the VP of the Finance sub-team, is in charge of managing the team budget by allocating where expenses go and deciding what actions are taken to raise money for the team. Other responsibilities include organizing presentations to potential sponsors and fundraisers. The CFO is also the main contact for companies and organizations and works closely with the CEO.

Awards VP- the Awards VP is in charge of making sure the team is eligible to receive awards, deciding what awards to **apply** for, and overseeing all the work that needs to be done for each award (such as the Chairman's essay).

Community and Media VP- the Community and Media VP is responsible for deciding which service and outreach projects the team should do, organizing participation, motivating the team to attend events, and contacting the media to get event coverage.

Website and Communications VP- the Website and Communications VP is tasked with maintaining and updating the website and maintaining media and social sites- YouTube, Picasa, twitter, and facebook. Other responsibilities include sending out regular correspondence to team members and updating the team calendar.

Animation VP- the Animation VP is in charge of organizing the year's animation through story boarding and design and teaching Autodesk 3Ds to the sub-team members. Because there was no animation competition during the 2012-2013 season, the Animation VP decided to have the Animation sub-team create the Chairman's video.

Electronics VP- the Electronics VP is in charge of designing the electronics board and wiring the robot.

Manipulator VP- the Manipulator VP controls and oversees the design and construction of all sections of the robotic manipulator design including game piece manipulation, hanging, and field access devices needed to complete the strategy decided by the team.

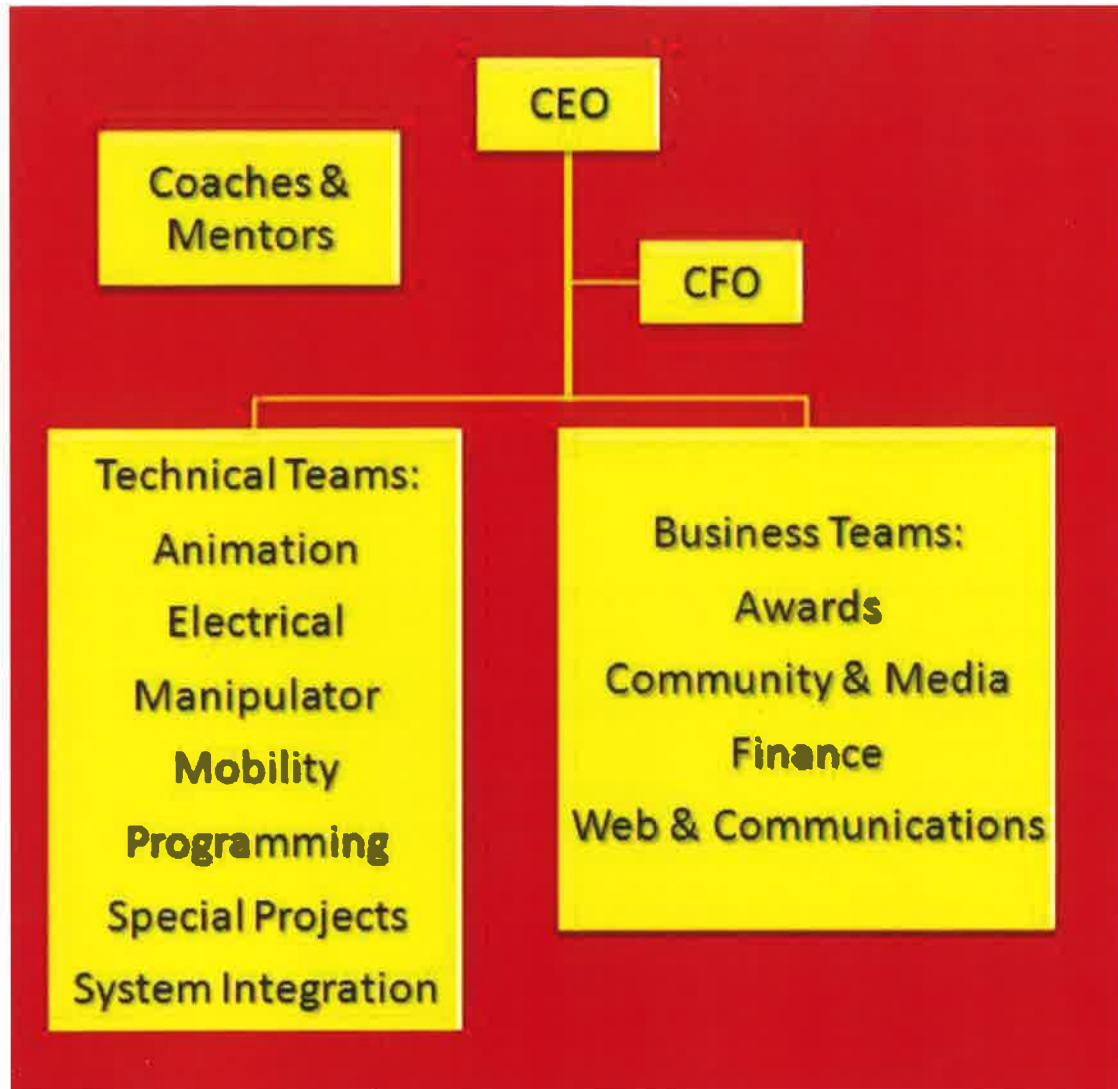
Mobility VP- the Mobility VP is responsible for overseeing the design and fabrication of the drive train for the robot. Other responsibilities include teaching each team member the different drive trains and wheels, communicating with other sub-teams as to what

the space limits are, knowing what the chassis is composed of, and helping with the overall assembly of the robot.

Programming VP- the Programming VP is in charge of teaching new students how to program using LabView and working with them to write working teleop and autonomous programs for the robot. Other responsibilities include working with electronics to determine which inputs and outputs are needed.

Special Projects VP- the Special Projects VP is the head Safety Captain and must oversee the team's safety procedures and proper use of equipment. Other responsibilities include directing the Special Projects team as it builds the practice field and monitors supply use.

Systems Integration VP- the Systems Integration VP is responsible for the communication between teams and ensuring that all of the sub-teams' systems work together. Other responsibilities include CADing the final design in Autodesk Inventor and making sure all systems come together successfully in the CAD design before building starts.



Financial Plan

Especially during the off-season, the CEO and CFO are responsible for obtaining sponsors. Raising funds requires a number of things: gaining new sponsors, maintaining sponsor relations, good organization, prompt communication, and efficient time management. With the knowledge of how difficult this is, the CFO put together a business and finance plan that logs when sponsors and businesses were contacted. The leadership of FIRST team 2996 hopes that this plan will help future CEOs and CFOs manage sponsor relations easily and efficiently.

Analysis

This year the team had a difficult time finding new financial sponsors, even with the expanded range of sponsor criteria. "Fueled by" is a more recent category of sponsorship that was created due to the explosion of food donations from various parents and restaurants during build season. In order to persuade sponsors to donate more and gain new sponsors, the team plans to reinforce the idea of sponsors being team members too. With sponsorships such as the United States Air Force Academy, the team has enjoyed having the opportunity to demonstrate the robots at their annual STEM Boot camp during the summers. By publically advertising a mutually enjoyed bond between the team and its sponsors, the team hopes to attract a stronger commitment. The team also strives to improve marketing- especially through the team website- so that it will be easier for willing people to donate and sponsors to contact the team. A renewed effort toward maintaining strong communication with supporters of the team will be made.

Financial History

FIRST team 2996 has grown exponentially over the past five years both on the technical and business side. During the 2009 season, the majority of team funding stayed in savings. Since, the team has learned the value of a large budget. In the future, the team will strive to accomplish more prep work during the summer. Because the team gives many presentations during the year, a goal is to design the presentation team early in the summer and establish many types of basic presentations with visual elements. Likewise, brief modifications will be easy to make and more time will be spent rehearsing verbal content.

Beyond Today

A strong team is defined by its ability to build upon its foundations. In other words, to have goals and make strides to accomplish them. The quote "You can always do better" (Unknown) is a feeling shared by the team members that takes FIRST team 2996 to the next level. This year (and last) the team adopted the goal of building two identical robots. Having said second robot allowed the team to follow the rules of "bagging and tagging" at the end of build season while keeping the second robot for programming and driver practice. This has allowed the team to be truly competitive and give assistance to alliance partners.

Aware that the team needed to improve, a team survey was taken and the results showed that communication, redefining job descriptions, and encouraging a higher

percentage of team members to participate in activities outside of robotics meetings are things the team needs to work on.

Given that good communication in general is challenging, the goal of good communication encourages the team members to learn new, better ways to accomplish acquiring life-long communication skills. Job descriptions have been clearly outlined this year and likewise cause far less confusion in team members. FIRST team 2996 has reached success on many levels but still believes that through giving more intricate detail to its foundation all confusion will be eliminated.