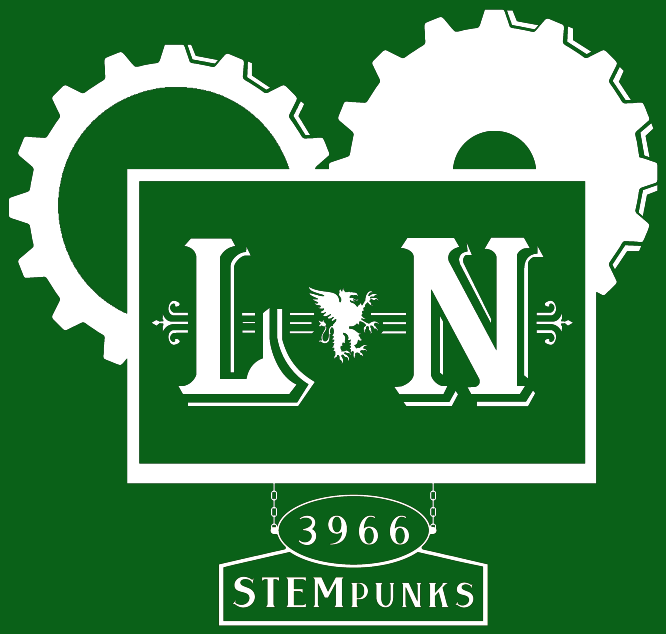

L&N STEMpunks
FIRST Team 3966
Business Plan
2014

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Executive Summary

Mission Statement

Our mission is to provide all members with experience in the STEM fields, and to inspire students to become leaders in technological, engineering, and business pursuits.

Team Origin

Our School

Our school, the L&N STEM Academy, started in 2011 as the first STEM magnet school in Knoxville, Tennessee. Our school is designed to focus on STEM (Science, Technology, Engineering and Math) education. We have a “STEM” class that all students take from Freshman to Senior year (STEM 1-4) and end with an actual internship in a student's desired field. In addition, we also have many CTE classes that are very enthusiastic to get involved with robotics. Our school is also filled to the brim with technology, including a 1:1 iPad to student ratio, five computer labs, and a SmartBoard for every classroom.

Our Team

Founded in 2011, the same year as the L&N STEM Academy, our team began work towards achieving the FIRST mission and goals. With our school being brand new, there were only freshmen and sophomores. We spent the first offseason building a robot for Knoxville’s annual Veterans’ Day Parade. Since then, we have partaken in every annual Veteran's Day Parade. Sadly, our competition robot was not complete come the bag-n-tag day during our first season. But we spent the majority of our competition finishing/fixing our robot.

In our second year, the team doubled in size. In order to manage the extra members, our team began student leadership. The year 2013 was the first season we had a real engineering schedule. We formed a Gantt chart and followed the schedule as closely as possible. Once again we were busy because we were working constantly to finish the robot, but we were able to practice with it on the field.

Organizational Structure

The L&N STEMpunks is organized into three main groups: build, business, and programming.

Build Team

Our Build Team has two subgroups within it; the Electrical and Mechanical Teams. From an electrical standpoint, our robot has become smarter, more reliable, and smaller. The Electrical Team is working with the Mechanical Team much more closely, and working out compromises while helping them with any problem that comes up. Even before the season had started, we had already put in place a rigorous schedule telling us what we needed to do and when it needed to be done.

Business Team

Last year, our business team was one person. This year, we've grown into a group with many more people and much more responsibility. We have diversified into many subgroups that keep the work manageable including finance, media, and design teams. FIRST is more than just building robots -- someone needs to write this, after all. The Business Team has designed costumes, contacted sponsors, and made videos for the Safety Animation and Chairman's Award.

Programming Team

This new season has brought change like mad, in plenty of amazing and new ways. Our switch from LabVIEW to Java and Python has introduced a whole new world of code for the programming team. This also introduces a new competition between Python and Java, forcing us to learn more and work more diligently. Now that we are using a widely used coding language, we are better prepared to move into real world applications.

Relationships

Team Members, Mentors, and Faculty

Our early meetings were focused on identifying talents and passions of team members, along with better organizing our team so that we could better adapt to varying levels of experience, especially with a large influx of freshman team members.

We have four committed mentors from local business and industry, which has provided the team great continuity in the face of school staff turnover this year. Previous faculty had been heavy-handed in their role, and so this year we had much greater independence over our projects.

Even school faculty not involved in robotics has started to use the phrases “coopertition” and “gracious professionalism” in their staff emails.

Sponsorship Strategies

In stark contrast to previous years, we set out to help our sponsors as much as they help us. When Bechtel Corporation invited us to participate in their activities for National Stewardship Month, we had the opportunity to share the mission and vision of FIRST with Powell Middle School Junior Achievement students.

Community Outreach

We knew that growing the reputation of FIRST and promoting STEM education would go hand in hand. When we realized that the historic L&N sign on our school had fallen into serious disrepair, we saw an opportunity to launch a community-based initiative that accomplished both goals.

Deployment of Resources

Building a Better Team

Building a better team all relies on three factors: keeping constant communication, maintaining a positive attitude, and learning from your mistakes. If these three points are kept in high standards by the whole team, then there will be only room for improvement.

Communication is essential for any team. Reporting success will not only keep progress flowing, but make the area more lively and everyone will feel that they are contributing. This leads to our second factor.

Having a positive attitude while doing anything within a team is crucial. Bouncing positive ideas off other teammates and mentors is key to creating a strong foundation to better the team. This can be achieved by establishing processes to reward individual accomplishments by team members.

Finally, we've been learning from our mistakes. Inefficient processes from previous years have been updated to improve communication and efficiency this year.

Building a Better Robot

We've taken steps to improve the process of our robot construction. We've taken more time to prototype new ideas, to create drawings and blueprints, and to ideate as a group. Through our experience, we have really grown as engineers, and become much more mature in our approach.

We are migrating to a better and smarter system. Plus, we realized that we weren't alone in this competition. The fact that other FRC teams in the area are willing to help with any problems we have is incredibly helpful as well.

Future Plans

This year, our team went through the process of completely rebranding and reorganizing itself due to changes in faculty. Unfortunately this long process, lasting from August to October, led to a slow start for the L&N STEMpunks. Next year, we hope to hit the ground running from the very first week of school in August. We plan to hold a summer workshop for new members and upcoming freshmen, giving them the experience they will need for the rest of the season, without the extra stress of school or homework. We hope to make FIRST Robotics not just a seasonal activity, but a truly year-round endeavor.

We discovered that we would greatly benefit from an orientation of new members. We plan on teaching freshmen the basics in every group by giving out rotational assignments. Each new member will spend a few weeks in each group before deciding their final path.

We will focus more on community outreach next year. We will approach other robotics teams more frequently, work to build relationships with the other teams in the Knoxville area, and work to support and mentor younger FRC and FLL teams. For instance, we will have a dedicated commitment to building a relationship with the new Vine Middle School FLL team that we established this year, and we will be more active in meeting with other teams at the MDF, our local FRC robotics forum. We seek to establish a relationship with the University of Tennessee chapter of the Society of Women Engineers to assist the female members of our team and perhaps entice female membership.

Financial Statement

Our major and most predictable annual expense, the Smoky Mountains Regional FIRST Robotics competition, requires a robot built with a budget that does not exceed $4000. Our expenditures for the FIRST Robotics competition will remain constant.

However, because we are a new team, our expenditures for tools and spare parts are high. In the future, after we have amassed a decorated tool bench and a vast parts warehouse, our expenditures for tools and parts will decrease, due to low demand.

We are still a growing team. Due to this fact, expenditures that rely on the number of active members, e.g. food and apparel, are expected to go up as our membership rises in the coming years. However, since these expenditures are typically less than robot-related purchases, this number will impact our budget minimally.

Furthermore, we plan to expand the number of projects we complete as our team grows. Since new projects are the costliest of all expenditures, we can expect our net expenditure, considering all factors, to rise in the coming years. For this reason, fundraising is even more important, and we are currently planning fundraisers for the future.

We thank our gracious sponsors for their financial support. This year, we raised around $15,000 through sponsorship and fundraisers. Next year, our fundraising target will be $20,000. We hope this will open up more opportunities, especially through 3D printing, which is one of our larger future goals.

Risk Analysis

Weaknesses and Threats

Having a large team has its shortcomings. Inter-group communication is one of our weakest areas. STEM class prepares us greatly to work with small groups of four to six, and in that setting we work very well. Unfortunately, however, robotics is the only place where we can practice inter-group communication on such a large scale.

One imminent threat is the total disorganization that can be brought on by a group too large without effective leadership. To protect against this, we have been training future leaders to be better equipped to manage larger and more diverse teams through process improvement. We hope the next generation of STEMpunks will be able to adapt to a great variety of situations, as long as we teach them the tools to be adaptive.

Strengths and Opportunities

One of our greatest and most obvious strengths is that we benefit from the STEM education of our school. We learn leadership skills through our STEM class, which helps tremendously in our robotics program. It is a class of nothing but group work, where we have to learn project management and conflict resolution.

Knoxville is home to many good, established FIRST robotics teams in the Knoxville area. We are home to a bastion of FIRST, in the middle of Appalachia. The numerous science and engineering firms spawned from Oak Ridge provides a huge pool of helpful mentors knowledgeable in areas necessary for robotics.