Team Neutrino

FIRST Team #3928

Business Plan

Table of Contents

Executive Summary

Team Neutrino faces the exciting challenge of building a robot to compete in the *FIRST* Robotics Competition and performing community outreach. The team is composed of high school students from the Ames, Ballard, and Gilbert area. Each year a new game is released the first week of January. The students have 6 weeks to design, build, and program a robot. Students work alongside mentors to problem solve, gain technical and design skills, and experience the engineering process firsthand. Students are also responsible for marketing the team, creating a recognizable team brand, designing a website, and fundraising. Team Neutrino students also volunteer their time to community events such as mentoring children through summer camps, providing robot demonstrations, and sharing the *FIRST* message.

Mission Statement

The mission of Team Neutrino is to provide students with hands-on STEM (Science, Technology, Engineering, and Math) experiences at the high school level that would not exist otherwise. The team acts as a real world application to supplement material learned in the classroom. Team Neutrino strives to create a robot that is competitive in the FIRST Robotics Competition and to maintain a positive and recognizable impact in the local community.

Team and Program Summary

The FIRST Robotics Program provides high schoolers with an opportunity to learn skills in fabrication, design, programming, and business, all while inspiring students in a creative environment. After one year at Ames High School, Team Neutrino, formed by FIRST alumni, subsequently moved to the Iowa State College of Engineering campus, providing even more opportunities and resources. Since its start 4 years ago, the team doubled in size and has continued to grow.

Location of Team and Current Diamond Sponsors and Partners

Location: Ames, Iowa, United States of America
Sponsors: John Deere/Danfoss/Monsanto Fund/CIT Signature Transportation/Quality Manufacturing Corporation/3M/City of Ames Electric Services/Iowa 4-H Foundation/Emerson Process Management/Interstate All Battery Center/Jimmy Johns.

Partners: Story County 4-H/Iowa State University College of Engineering/Iowa State University Robotics Club/Boyd Lab.

Team Impact/Outreach

Team Neutrino aims to have a positive impact in the community and to get kids excited about STEM. The team partners with other organizations in various demonstrations, events, and activities to inspire students around the area as well as create and maintain strong relationships with local engineering firms. In performing community outreach, the team prepares students with not only technical skills, but also public speaking, communication, and business skills necessary to be successful in an ever-changing industry.

Summary of Team Growth

The team has expanded in several ways since our rookie year. It moved from Ames High School to the ISU Boyd Lab, where the team works in the shop with mentors from ISU, parents, and some of our sponsors. The number of students quintupled in size since founding, growing from 9 students to 43. Team Neutrino maintains solid relationships with their sponsors through regular newsletters, sponsor visits, demonstrations, and invitations to events.

Summary of Team Sustainability:

Team Neutrino works to build team sustainability by creating visibility, building a strong FIRST foundation for our team members, and maintaining contact with their sponsors and alumni. The team members mentor local FLL teams to provide a progression of FIRST programs starting in elementary school and culminating in being a part of Team Neutrino. The team participates in the Ames High School Club Fest in order to recruit new team members. Older team members work with and mentor younger team members to pass on skills and knowledge. Team Neutrino is working on delegating jobs to other team members, in an effort to make sure everyone gets experience in the areas they are interested in. The team fosters good relationships with sponsors through maintaining contact and updating them on team progress. This continues their interest and partnership with the team. Team Neutrino is continuously improving on organization and documentation. Documentation will help with branding and creating a sustainable team image which is a key factor in being remembered throughout the community.

Team Overview

FIRST Overview

The mission of FIRST is to inspire young people to be science and technology leaders, by engaging them in exciting mentor-based programs that build science, engineering and technology skills, that inspire innovation, and that foster well-rounded life capabilities including self-confidence, communication, and leadership.

The program follows kids from kindergarten all the way through high school, starting with Jr. FIRST Lego League (FLL Jr.) for grades K-3, then FIRST Lego League (FLL) for grades 4-8. FIRST Tech Challenge (FTC) and the FIRST Robotics Challenge (FRC) are for high school students wanting to gain firsthand experience in the engineering world.

Founded by Dean Kamen in 1989, FIRST develops accessible, innovative programs to motivate young people to pursue education and career opportunities in science, technology, engineering, and math, while building self-confidence, knowledge, and life skills. For more information about FIRST, visit http://www.firstinspires.org/.

The varsity Sport for the MindTM, FRC combines the excitement of sport with the rigors of science and technology. Under strict rules, limited resources, and time limits, teams of 25 students or more are challenged to raise funds, design a team "brand," hone teamwork skills, and build and program robots to perform prescribed tasks against a field of competitors. It's as close to "real-world engineering" as a student can get. Volunteer professional mentors lend their time and talents to guide each team by working alongside students in a process where both the student and mentor learn.

Team Neutrino History

Team Neutrino was founded in 2011 by FIRST alumni, mentor support, and parents. It started at Ames High School. In that first year, the team attended the Midwest Regional and seeded 8th which lead to the team winning the "Highest Rookie Seed" award. The team attended Cow Town ThrowDown, an offseason competition in Kansas City, and was selected to compete on an alliance with the 4th seeded team.

In 2013, Team Neutrino competed at the Greater Kansas City Regional and the Minnesota North Star Regional. At the Kansas City Regional, the team was ranked 9th, was chosen to play with the 2nd seeded alliance, and was the recipient of the "Excellence in Engineering" award. At the North Star Regional, the team was undefeated during the qualifying matches and finished as 1st seed. Team Neutrino won the "Innovation in Control" award and was honored to participate in the Indiana Robotics Invitational with 68 of the top ranked teams in the world. At the

end of the 2013 season, Team Neutrino was ranked in the top 3% of teams worldwide.

In 2014, Team Neutrino competed in the Kansas City regional and the North Star regional again, earning quarterfinalist status at both. At the North Star regional, the team was awarded "Engineering Inspiration", which is given to the team with outstanding success in advancing respect and appreciation for engineering within their community. This award earned Team Neutrino a paid trip to the World Championships in St. Louis!

In St. Louis, we had a win-loss record of 6-4 and during alliance selection; we were picked to be the 4th robot on the 4th seed alliance (in the Newton division)! We ended up being semifinalists on the Newton field (similar to the Sweet 16 in March Madness).

In 2015, 3928 competed at Central Illinois and North Star. The team finished 17th and competed with the 7th seeded alliance at Central Illinois & finished 7th at North Star and competed on the 4th seeded alliance. Team member Dagney Paskach won Dean's List Finalist! With the expansion of the ISU engineering program last year, 3928's build space moved to the new Biorenewables Complex. This worked out well when 3928's size reached an all-time high of 43 members, quintuple the size of the original team.

Student Team Members

Students from Team Neutrino come from Story County high schools. The team is comprised of members with an abundance of interests ranging from science, technology, engineering, programming, machining, graphic design, marketing, writing, photography, filmmaking, and so many more. Returning members help to promote team sustainability by passing these skills on to the new members. All of the team members graduate high school and many continue on to pursue careers in a STEM field.

Team Mentors

Team Neutrino mentors consist of parents, ISU students, and representatives from sponsors of the team. All of the Iowa State University mentors are alumni from FIRST teams around the country, and they provide a wide range of skills and background knowledge to help the team. Parent and professional mentors also provide invaluable aid to the team. Our current lead mentor is an employee of John Deere. Mentors have experiences and knowledge from many areas, such as engineering, programming, and business.

2016 Sponsors & Partners

Partners

Diamond

Platinum

Gold

Silver

Honorable Mention

Jimmy John's
Panera

Team Management

Team Membership

Students who would like to join Team Neutrino are required to fill out an application consisting of contact information, interests, and other commitments. If a student is interested in the leadership positions of Captain or Co-Captain, they must submit a further application when the position becomes available in May.

Team Structure

The team structure is the general team organization of both students and mentors. Students are divided into subgroups to make management easier and to keep the team efficient and cohesive.

ALL CAPTAINS AND MANAGERS ARE APPOINTED AFTER AN APPLICATION PROCESS:

After an application process, the Captain and Co-Captain are appointed by the mentors. After a second application process, the managers are appointed by their respective Captain. More than one Manager position can be held by a single student; however, no one can be both Captain and Co-Captain.

Technical Roles

Team Captain – Timothy Steward

The Team Captain is the voice and personality of the team and must act accordingly. It is his/her job to keep the goals of FIRST in everyone's mind until "they get it." The team Captain should be the main speaker at all meetings with potential manufacturing sponsors. The Team Captain should be in charge of the team for all competition and building events.

~Team Spokesperson

~Liaison to FIRST

~Personnel management

~Acts as tiebreaker and has executive decision powers

~Accepts trophies

~Oversees the technical sub teams

~Runs meetings

CADD Manager – Woo Young Joo

The Chassis sub-team finalizes and builds the robot drive base and basic frame. Member of this group are often also part of the manipulator group.

~Designs the frame, drive train, and scoring mechanisms

~Makes CAD renderings of the robot

~Takes charge of making sure all parts can be made either by shop tools or by the machine shop

Mechanical Manager – Benjamin Steward

The Manipulator sub-team finalizes and builds the scoring mechanisms. They should be heavily involved in strategy planning, as the final strategy ultimately dictates their tasks.

~Constructs the frame, drivetrain, and scoring mechanisms

~Oversees prototypes

~In charge of construction, machining, designing, and mechanical aspects of the robot

~Takes charge of testing the individual components which belong to their subsystem

Programming Manager – Logan Peters

The Safety Captain makes sure that all team members and mentors are following FIRST's safety guidelines, as well as safety guidelines outlined by 4-H and Boyd Lab.

~Takes charge of building and programming the controls interface

~Takes charge of writing and testing all robot code

Electrical Manager – Conor Albinger

The Safety Captain makes sure that all team members and mentors are following FIRST's safety guidelines, as well as safety guidelines outlined by 4-H and Boyd Lab.

~Takes charge of wiring all electronics

Safety Captain – Nicole Essner

The Safety Captain makes sure that all team members and mentors are following FIRST's safety guidelines, as well as safety guidelines outlined by 4-H and Boyd Lab.

~Reads and understands the FRC Safety Manual

~Keeps Team Neutrino's Safety Manual updated

~Goes to the safety meeting at official FRC competitions

Non-technical roles

Co-Captain – Dagney Paskach

The Co-Captain oversees all things non-technical. He/she is in charge of making sure awards are submitted on time and that all non-technical projects are making headway. The Co-Captain needs to be organized and is in charge of making sure all non-technical activities are documented to ensure sustainability.

~Runs meetings in Captain's absence

~Coordinates non-engineering team activities

~Oversees the non-technical managers

~Directly oversees the Chairman's award submission

~Exercises final approval on all awards submissions

~Documents all team activity and supervises past team documents

Outreach Manager – Tianxin Xu

The outreach manager organizes and documents all community and volunteering events.

~Plans and organizes the team's outreach and volunteering events year round

~Is the primary contact for outreach event coordinators

Fundraising Manager – Rucha Kelkar

-The fundraising manager is in charge of raising money for the team and maintaining contact with sponsors. He/she also maintains the overall team budget and acts as the primary contact for sponsors.

~Organizes and maintains contact with the team's sponsors year round

~Works closely with a mentor and fills the treasurer position.

~Must keep the team within budget

Scouting Managers – Takeshi Suzuki and Woo Young Joo

The scouting manager develops the team's scouting system and electronic database; at competitions/ he/she oversees the scouting sub-team. He/she also runs the scouting meeting on Friday night of each competition.

~Stays updated with rule changes

~Takes charge of the development of our team's strategy prior to and during the competitions.

~Provides competitive information for the competition team prior to and during competition, and develops scouting database and data collection system.

~Organizes the scouting sub-team at competitions

Graphics Manager – Logan Peters

The graphics manager is in charge of the team's image and making sure that the team image is recognizable and consistent from year to year. All designs must be approved by the Co-Captain before publication.

~Maintains and updates the team's marketing materials (handouts, buttons, pamphlets, flyers, etc.)

~Designs innovative marketing strategies to create a cohesive team image

Website Manager – Benjamin Steward

The website manager ensures that the team's web presence is up-to-date by regularly adding posts on our website, Facebook, and Twitter. His/her primary job is to maintain the website and make it as professional as possible.

~Regularly updates website year-round

~Maintains the Facebook and Twitter pages as needed

Photography/Videography Manager – Lucas McLeod

The primary location for team pictures and videos is the Flickr page. The photography/videography manager ensures that all photos and videos are present and organized on the Flickr. He/she also creates team videos and slideshows.

~Makes sure high-quality pictures are taken at all events

~Collects and compiles all media (pictures, video, etc.) in a place accessible to members on the team Flickr

~Creates a video for each of the following: Robot Reveal, Chairman's submission, Season Wrap-Up, IRI application

Public Relations Manager – Evan Williams

The PR manager remains in the team's pit at all times during competitions so that he/she can talk to the judges and other teams about Team Neutrino. If the team wants to receive media coverage for events, the PR manager is in charge of acquiring this.

~Acts as primary pit representative at all competitions

~Contacts local media to get coverage for important team events

SWOT Analysis

Strengths	Weaknesses
Comprised of multiple schools	Location
Machine shop and workspace	Team organization
Interested and quality students	Team spirit
Positive reputation	
Experienced mentors	
Harmonious Team Structure	
Opportunities	**Threats**
Procuring sponsors	ISU class interference
Outreach	

Strengths

- Team Neutrino is comprised of high schoolers from around the Story County area.
- ISU generously provides Team Neutrino with access to their machine shop and workspace.
- Team Neutrino students are dedicated to succeed at building a highly performing robot and strong outreach program. Team Neutrino students each bring their unique perspectives to face challenges and tasks head on.
- Through their continued success, the team has developed a reputation of having a competitive, helpful, professional team.
- Mentors of Team Neutrino have a variety of interests and skills. Most have had prior experience as part of an FRC or FTC team. They all work together with no major issues.

Weaknesses

- Because Team Neutrino is self-funded, the team has learned how to effectively market themselves. Team Neutrino has learned how to give sponsorship presentations, put together official letters, create an organized budget, and document their funding.
- With the expansion of ISU's mechanical engineering program, Team Neutrino has accommodated by spreading out their workspace.
- Team Neutrino struggles with team spirit at competitions and other events. The team plans to overcome this by developing a team cheer.
- At the start of the 2014-2015 season, Team Neutrino doubled in size. The team solved the problem of organization by creating sub-teams.

Opportunities

- The business community surrounding Team Neutrino has been very supportive since their start in 2011, and this provides Team Neutrino with several opportunities to procure sponsors.
- The size of the team has doubled since the previous year. With more members, Team Neutrino will have the opportunity to do more at once and have a greater impact in our community.
- Since Team Neutrino has emphasized community outreach since their rookie year, this allows them to sustain and expand upon their 24+ annual outreach opportunities.

Threats

- Because Team Neutrino uses Boyd Lab for their shop, they are not able to machine parts for the robot when classes are scheduled there. To overcome this, they schedule their meetings for later times.

Team Outreach

Team Neutrino aims to have a positive impact in the community and get kids excited about STEM. Highlighted below are some of their most influential outreach programs.

Summer Classes: Team members worked with elementary and middle school students to teach them how to build and program the Lego NXT.

Maker Tech Camp: Students worked on 3928's challenges and learned about circuits, coding, robots, and 3D drafting and printing.

FLL: Team members volunteer and host outreach booths at local FLL competitions and help out teams in the Ames area. Team Neutrino has been present at the following events: The Marshalltown FLL regional, The Science Center of Iowa's FLL regional competition and the Iowa State FLL Championship. In 2015, Team Neutrino mentored 8 FLL teams.

Jr. FLL: In 2015, Team Neutrino started 3 all-girls Jr. FLL teams, Club Proton, at Edwards Elementary school. The teams worked through the Think TankTM challenge and utilized a MakerSpace and its resources. By 2016, Team Neutrino was mentoring 11 Jr. FLL teams.

County Fair and State Fair: The team held a robot demonstration and spread knowledge of FIRST to hundreds of thousands of people at both the Story County Fair in Nevada, Iowa, and the Iowa State Fair on the grand concourse during the STEM day.

SCI's *FIRST* Day: Team Neutrino represented the FRC division of FIRST at the Science Center with FRC Team #4646 and FTC Team #5126.

Robotics Day: In July, members of the team traveled to the SCI to present at their Robotics Day along with representative teams from Jr. FLL, FLL, and FTC.

SCI Maker Fair: September 1st, 2014 marked the Science Center of Iowa's FIRST Maker Fair, which Team Neutrino had the honor of being a part of. The team's robot interacted with FRC Team #4646's robot to demonstrate FRC.

Elementary School Events: During the school year, members of the team show the previous season's wrap up video at Edwards Elementary's "Science Night" and tell the kids about FIRST.

Ames 4th of July Parade: Team Neutrino participates in a local 4th of July parade annually. 2014 marked Ames's 150th anniversary, so attendance reached 14,000.

SCI's Girls in Science Event: Team Neutrino participates in this event to help influence girls to pursue a STEM path. They set up a booth to present FRC with Snap Circuits as their interactive exhibit.

Sponsor Presentations: After their competitions, Team Neutrino showcases their robot to their sponsors. This has been a good way to maintain a positive sponsor relationship.

Team Neutrino communicates amongst themselves and with the community via the following methods: Website, Newsletters, Email, Facebook, Twitter, and Flickr.

Future Plans

Team Neutrino holds high expectations for their future success. To achieve these standards, they plan to move towards and complete these goals, listed as follows:

~Provide students with hands-on STEM (Science, Technology, Engineering, and Math) experiences at the high school level that would not exist otherwise.

~Act as a real world application to supplement material learned in the classroom.

~Create a sustainable team.

~Establish and maintain a positive and recognizable team image.

~Compete at the highest level in FIRST.

~Create a robot that is competitive in the FIRST Robotics Competition.

~Be eligible to apply for all awards (except Rookie All-Star) offered at a Regional Competition

~Promote STEM, FIRST programs, and Team Neutrino at community events through volunteering and outreach.

~Act as a role model to other FRC, FTC, FLL, and Jr. FLL teams.

Team Neutrino continues to implement these goals through the strategies outlined in this document.

Action Plans

Strategy	Actions	Group Responsible	Planned Completion
Increase collaboration with the *FIRST* Community	Contact local teams to find out how we can help them.	Fundraising Sub- Team	2016
Inspire more students to join FIRST	Increase awareness of FIRST, start and help sustain FIRST teams.	Outreach Sub-Team	Fall 2016
Increase FRC teams in Iowa	Continue to assist with the new FRC team in Grinnell, see if anyone else wants to start a team.	Captain and Co-Captain	2016
Build a stronger relationship with sponsors	Provide benefits to sponsors directed to what they want. Maintain strong ties through more sponsor related events.	Fundraising Sub-Team	2016
Continue to expand FLL at Ames community elementary schools	Continue the mentoring program for our students to outreach to the AMS and elementary school teams, implement more teams.	Captain and Co-Captain	August 2016
Expand Jr. FLL at Ames & beyond elementary schools	Help sustain newly created elementary school teams.	Captain and Co-Captain	Fall 2016

Team Budget

Our budget is developed through a combination of last year estimates, promised sponsor donations, and estimations of the new season's expenses.

Predicted Income		Predicted Expenses	
Source	**Amount**	**Item**	**Cost**
Endowment Fund Grant Request	$500	Robot	$8,000
Sponsorships/Grants	$18,515	Regional Competitions	$9,000
Out-of-pocket (30-35 members, $110 each)	$1,960.63	Off-season competitions	$1,350
In-kind	$5,600	World Championships	$5,000
		Pit/Field	$1,256.87
		Robot Transportation	$807.89
		Apparel	$200
		Team Supplies (i.e. gas, marketing, etc.)	$961.87
Total	$26,575.63	Total	$26,576.63

Sponsor Benefits

We show our appreciation for our sponsors through levels of sponsorship:

Diamond ($5000+) Large logo on robot, banner, pit, team shirts, and mention in team displays and literature

Platinum ($2500+) Small logo on robot, banner, pit, team shirts, and mention in team displays and literature

Gold ($1000+) Small Logo on banner, pit, team shirts, and mention in team displays and literature

Silver ($500+) Logo in pit, team shirts, and mention in team displays and literature

Bronze ($250+) Mention in team displays and literature

Honorable Mentions ($50+) Mention in team literature

Additional Opportunities for Support:

Team Neutrino relies on having technical and non-technical mentors to provide guidance for the team. Some of the roles that mentors fill are listed in the table below:

Mentor Roles	Description
CAD	Teach students on the team how to CAD.
Marketing	Assist with team marketing and creating a team business plan.
Travel Logistics	Organize the team travel to regional events outside of the local area.
Prototyping	Assist with the design of the robot and teach the students how to create basic prototypes.
Writing	Assist the Fundraising and Award Sub-Teams with team award submissions.
Electrical	Show students how to wire, organize an electrical board, and update and check the robot.

Finance	Help students manage team funds and assist with fundraising.
Fundraising	Help students budget money, organize sponsor events, and maintain strong relationships with sponsors.
Programming	Work with the students to program the robot for competition
Graphic Design	Work with students to create banners, logos, team handouts, and T-shirts for competitions.
Public Speaking	Teach the students how to speak in front of potential Sponsors and Judges.
Engineering Design	Work with the team to pick a strategy, design a robot, and manage robot creation.
Mechanical	Help the students build a robot for competition in March.
Social Media	Work with students to set up and manage social media sites.
Website	Teach students how to build and maintain a website.
Project Management	Work with students to set time and performance goals to meet deadlines, etc.

Team Fundraising

Current Team Fundraisers

Light Bulbs: The team promotes and sells the FIRST E-Watt saver bulbs at the "Eco Fair" in Ames.

Summer Camp/Workshop: Team Neutrino members would work with elementary students to get them interested in STEM. They would also teach them basic construction and programming of the LEGO Mindstorms Kit.

Chipotle Night: This year the team worked with their local Chipotle to set up a team fundraising night. 50% of profits made between 4-8 PM that day were donated to the team.

Future Team Fundraisers

"Neutrino Nights": Students would work at a local restaurant bussing tables and helping and would earn some of the profits made during the event. They would also provide information about FIRST and Team Neutrino to customers.

Robotics Rainbow Run: Similar to current "Color Runs", students of Team Neutrino would host a run where powdered color is thrown at runners. The powder consists of cornstarch and powdered paint. The goal would be to raise enough money to pay for attending a regional competition (about $5000).

Team Neutrino is currently one of seven FIRST Robotics Competition teams in Iowa. The team has a strong and positive partnership with Iowa State University which provides many benefits for the team such as shop space and mentors. The team has been very successful since its start in 2011 and will continue improving each season.

Team Contact Information

Website: www.teamneutrino.org

Team Email: neutrinofrc@gmail.com

Facebook: www.facebook.com/frcneutrino

Twitter: twitter.com/frcneutrino

Main Contact

Mentor Name: Tony Milosch
Title: Software Engineer / Head Mentor
Email: MiloschAnthonyM@JohnDeere.com
Phone: 815.978.9972

Team Meeting Location

Sukup Hall, Ames, Iowa 50014

Sponsorship Information:

Checks should be made payable to: *FIRST* Team Neutrino 4-H

Mailing Address:

Anthony Milosch
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