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1.0 Executive Summary

Our Mission

Our mission is to develop well-rounded life skills for the future through embodying the core values of FIRST while promoting Science, Technology, Engineering, and Mathematics in both our local and global communities, as well as to design and implement a robot that effectively and efficiently completes the given tasks of the FIRST Tech Challenge through the cooperation of our team members.

Our Team

Rookie Year	2014
Location	Austin, TX
School Affiliation	Vandegrift High School (ViperBots)
Team Demographic	8 high school students: · 4 seniors, 2 juniors, 0 sophomores, 2 freshman · 3 rookies, 5 veterans
Mentors	Our mentors consist of current teachers and team parents: · 3 coaches: Mr. Allen, Mrs. Wendel, Mr. Adrian · 2 parent mentors: Mr. Kim, Mr. Bagad
Sponsors	Viper Nation Education Foundation, Leander ISD Educational Excellence Foundation, FIRST in Texas, Leander ISD, Arconic

Our Members

Avi Gupta
(Project Manager, Software, Senior)
Alfonso Velasco
(Hardware Lead, Senior)
Sam Kim
(Hardware, Junior)
Hoyoung Song
(Hardware, Senior)

Mia Thompson
(Assistant PM, Marketing, Senior)
Avery Galligher
(Marketing Lead, Freshman)
Arnav Bagad
(Software Lead, Freshman)
Abby Pomerantz
(Marketing, Junior)

Community

One of the aspects of FIRST that we emphasize is **community outreach**. As a team, we actively seek and coordinate a plethora of outreach events in order to spread awareness and enthusiasm for FIRST and STEM-oriented careers. We will be implementing these outreach goals through our **E3 approach,** a three-part approach to spreading FIRST via reaching out to youth, searching for opportunities for mentoring STEAM-oriented students, and collaborating with STEM professionals in our community

Vision

Our team strives to build a **legacy** that will continue with the **future generations** of Team 7161 members. We strive for team cohesion, and work to ensure the **continuity of the team's success** through the mentoring of and communication between incoming recruits and graduating team members. We actively work towards leaving a lasting impact on our community and organization, while building a strong network for the future.

Rationale

The purpose of creating this business plan was to have a comprehensive plan for **long-term sustainability,** business connections, and continuity of the team as a whole. It serves to document our approach to achieving our mission, while simultaneously acting as a guideline for success in the current season, as well as an inspiration for members of Team 7161 in the future.

2.0 Introduction

2.1 FIRST

FIRST® (For Inspiration and Recognition of Science and Technology), based in Manchester, NH, was founded by American inventor Dean Kamen in 1989. FIRST is a 501 © (3) nonprofit public charity that designs accessible, innovative programs to motivate young people to pursue an education and career opportunities in science, technology, engineering, and math, while building self-confidence, knowledge, and life skills.

The mission of FIRST is to inspire young people to be science and technology leaders and innovators 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 such as communication, leadership, and the concept of "Gracious Professionalism", a core value of FIRST that blends knowledge, competition, and empathy.

2.2 FIRST Tech Challenge

The FIRST Tech Challenge is the third level of competition in the four tiers of FIRST Robotics. FTC is designed for students in grades 7-12. Small teams consisting of 6-12 members design a robot using various design components from TETRIX, REV, and/or other companies, in addition to being able to create and use custom parts comprised of almost any raw materials in their design. The goal: To score as many points as possible in an annual challenge. The purpose of FTC is to introduce students to engineering and technology in a fun and competitive environment that gives participants real world

experience in STEM fields such as mechanical design, computer science, electrical engineering, public relations, and marketing.

3.0 Team Information

3.1 Summary

FTC Team 7161 originates from Vandegrift High School in Austin, Texas. In 2014, Team 7161, originally named Big Fang Fury, became the 6th addition to the ViperBots Organization, which now encompasses a total of ten teams. Team 7161 has been participating in FIRST for a total of six years, but adopted a new name in 2015. Since then, Team 7161 has become known as Hydra.

This year, the team is comprised of ten high school students (four seniors, two juniors, and two freshmen), with a rookie to veteran ratio of 3:5. Each member specializes in one of three subcategories (three marketing, two software, and three hardware), but all members are highly encouraged to contribute to every aspect of the team.

This helps foster a healthy learning environment and enables us to approach problems from multi-faceted viewpoints. Team members are committed to inspiring excellence in our peers and spreading the core values of FIRST within the community.

3.2 Values

Team Hydra places Gracious Professionalism and cooperation above all in our organization. We strive to always help others by offering any support we can through our knowledge, our actions, and our words. Our team is a young, diverse group that understands that help can come in many forms and shows willingness to be supported and supportive to teams in and out of competition. This mentality has allowed our team to be successful in the past and will continue to serve us into the future. It also allows us to build deep relationships with other FTC organizations worldwide.

In addition to the core values of FIRST (Gracious Professionalism and Cooperation), our team has developed three values of our own that adequately embodies our team dynamic, and brings us together as a single entity despite our differences. These values act as a reminder of who we are as a team, and motivates us to put forth our best foot throughout the season.

| Dedication	Flexibility	Accountability
We treat robotics as a priority. In order to do so, we are willing to go	We make compromises and adapt to any challenges that may arise.	Members are held accountable for the tasks assigned to them. This

the extra mile to excel in both robotics and academics.	Additionally, members take on more responsibilities as we are able to perform a variety of tasks due to our diverse skill set.	way, members learn to value their contributions and ultimately increase their skills, self-confidence, and productivity.

3.3 Demographic

ROLES	GRADES	EXPERIENCE

Seniors
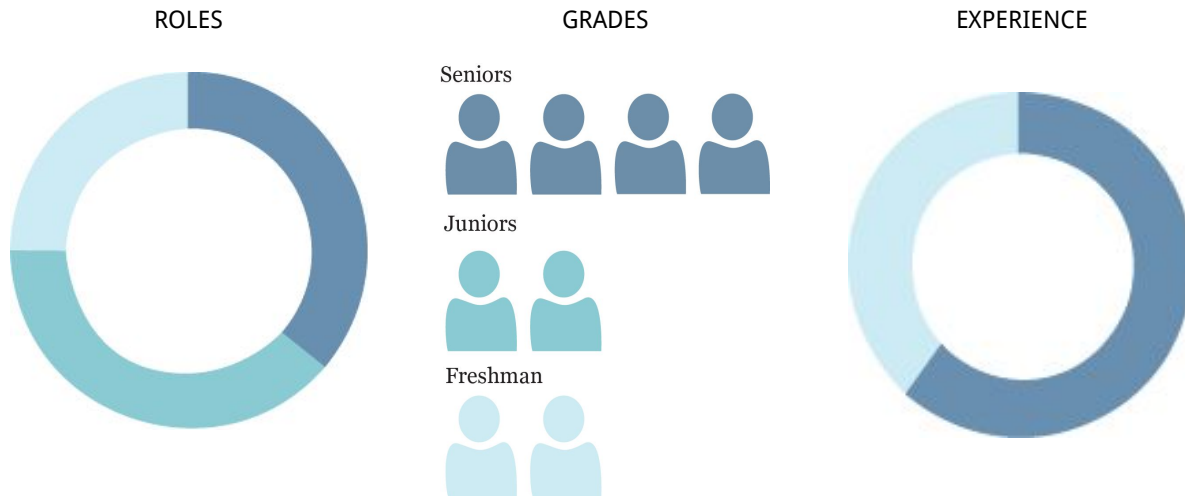
Juniors

Freshman

We have a 3:3:2 ratio of hardware: marketing: software members. Each subcategory should receive the same amount of attention, as they are all vitally important to competition success.	This year, our team consists of 2 freshmen, 2 juniors, and 4 seniors. Having a large number of seniors ensures that each rookie is given an opportunity to be taught new skills individually with the help of one of our many seniors	This season, our team has a 3:5 ratio of rookies: veterans. The rookies are new to robotics and anything regarding FIRST, while our veterans make it their duty to ensure that our rookies gain valuable knowledge and experience throughout the year in order to ensure the continued success of our team in the future.

3.4 ViperBots

The primary focus of Vandegrift High School's Robotics Organization (ViperBots) is to develop and educate the rising generation of entrepreneurs and leaders in science, technology, engineering, and mathematics (STEM). Here, we promote leadership, teamwork, and mentoring others. Additionally, we aim to encourage students of all ages to pursue STEM initiatives and adhere to FIRST values in order to promote future success.

ViperBots was originally founded in 2010 in Austin, Texas with a group of only four students. In its second FTC season (2011-2012), a group of 13 students placed 18th at the FIRST Tech Challenge World Championship. Since then, this award-winning robotics program has expanded to nine FTC teams and one FRC team comprised of a total of 109 members.

Although the teams work independently on building and programming the robot and constructing the associated marketing materials, they do collaborate and demonstrate "gracious professionalism" by sharing resources, ideas, and coming up with game strategies. This sort of environment mimics the real-world STEM industry, and enriches everyone's experience as a result.

4.0 SWOT Analysis

A SWOT chart is used to analyze the strengths, weaknesses, opportunities, and threats of a product prior to its entrance in a market. Similarly, we created a SWOT Chart to assess different aspects of our team before the FTC Season. This allows us to negate our threats, manage our weaknesses, and turn our opportunities into realities. Additionally, having a SWOT analysis allows us to plan for the upcoming season and utilize our strengths to their fullest potential.

Strengths	**Ambition:** Due to our success in the 2018-2019 season, our team is now more motivated than ever to succeed in this year's Skystone challenge. Whether it be excelling in competition or having the opportunity to spread our passion for STEM within our community, we have set goals for our team that we are excited to work to meet. **Experience:** Last season, our rookies learned valuable life-skills and worked all year to strengthen them. At the same time, our veterans developed more self-confidence, along with skill. With many of our members on their second, third, and even fourth year of ViperBots, our veterans are eager to employ their newfound skills and productive energy into this season. **Diversity:** Our team consists of members participating in various extracurricular activities: tennis, cross country, track, hockey, etc. Because we all come from different groups, each member is able to offer a new perspective when it comes to team contribution or creative thinking. Additionally, new Hydra members are able to bring new expertise and skills that they may have learned through prior experience with FIRST or just general knowledge they own that would be beneficial to the success of the team. **Attitude:** As a team that values dedication and cooperation, we all share a common passion for robotics. This allows us to motivate one another and strengthen our team dynamic. Additionally, we are all adaptable and open-minded. Our family-like dynamic fosters a safe, judgement-free zone and promotes growth of skills, knowledge, and confidence. This is extremely important when working in a team as it facilitates the creative process and ultimately leads to success in the season.
Weaknesses	After reflecting on our previous season, we pinpointed the different counter-productive habits that we will be correcting this season. **Task Distribution:** Last season, when a potential task arose, it was never assigned to a specific member. Instead, our team took a more casual

	approach and let members bounce between different tasks. This slowed down our progress because team members were given a specific task and ended up floating between tasks. **We will counter this by** assigning tasks to groups of members and having a more concrete structure of task assignment. **Communication:** Outreach attendance last year was better than the previous year, but it could still be improved. Team members were not able to attend many outreach events due to not being available. Team members were often not aware of outreach dates, and thus were unable to attend as many outreach events. **We will counter this by** developing a concrete outreach calendar for our team that will contain all of the planned outreach events, ensuring that team members are well aware of outreach events long before the event occurs. **Prioritization:** While diversity is something we consider a strength, it can also be one of our greatest weaknesses as it hinders our ability to prioritize robotics over everything else, whether it be other competitions, sports, or rigorous academics. Additionally, tying into the previous point about "unwillingness," some members have a tendency to put off things that they do not deem as important to themselves, but are vital to our success as a team. **We will counter this by** creating a schedule that everybody can adhere to. By keeping a calendar with deadlines and reminders for outreach events, we will be able to ensure everybody is doing what they need to do when they need to be doing it.
Opportunities	**Resources:** We are lucky to be part of the Viperbots organization as it provides a suitable budget for our endeavors, as well as endless resources for help and expertise in each subcategory in robotics. Every member of the organization is more than willing to help one another learn about what it takes to be a Viperbot, whether it be teaching someone how to use certain software or just lending materials to one another-- there will never be a shortage of assistance while you're in Viperbots. **Community:** There are plenty of small companies within our community that would be willing to work with us when we reach out to them. Additionally, there are multiple camps, festivals, and events that would make it easier for us to reach our outreach goals. Our community is one that is open to student-run events, and we plan to use this family-friendly, trusting, school-supporting mindset to help us execute our outreach plan.
Threats	**Time Restriction:** The UIL time restrictions hinder our ability to work on the robot for more than 8 hours each week. This will not be a problem, however, because we will make sure to make the most of our time in the lab. **Grades:** In the ViperBots program, there is an expectation to keep our academic studies as a priority, as it can be easy to dismiss schoolwork when focused on our robots. As a rule, if a student's class average in any class falls below an 80%, that student is placed on probation. During this time, many ViperBots will often step up to tutor this student and help them raise their grade. Once elevated, the student is taken off of probation. However, if a student is on probation and does not improve their grade,

	they risk dismissal from the program. **Schedule Conflicts:** As we have mentioned earlier, our members have plenty of other commitments. This can bring forth problems when trying to schedule outreach events. We will counter this problem by keeping a team calendar. This way, we can plan around days on which members are busy to ensure that more members can participate in these outreach events.

5.0 Goals

5.1 Organizational Goals

Our mission is to **develop well-rounded life skills** for the future and **promote STEM** and the core values of FIRST in both our local and global **communities,** as well as design and implement a robot that **effectively and efficiently** completes the given tasks of the FIRST Tech Challenge through **cooperation** with our team while.

Cooperation	Documentation	Prioritizing
We will create a cohesive final product that is a result of hard work and teamwork. Every member is expected to contribute to the team and listen to others' ideas. By the end of the year, we want each member to know that the team's overall success wouldn't have been possible without their contributions.	It is very important that we keep a log of everything we do with the robot in order to track its progress, design process, and arising issues so that future members will be able to learn from our successes and failures and build from our old design principles. Additionally, it is beneficial for backtracking and finding the moment where we may have messed something up. We will ensure that our success is repeatable through heavy documentation.	It is our responsibility to prioritize certain tasks and deadlines throughout the year in order to make sure everything is done in a timely manner. Prioritizing with schedules and deadlines is a foolproof way to boost team efficiency.

5.2 Operational Goals

1. **Plan & Predict:** We will use our past knowledge and experience to avoid future problems. We will also CAD everything before we implement the design.

2. **Efficiency:** Create a fully modular design, allowing for easy access to fix the robot and switch out and improve upon modules in the future.
   - Build a good drivetrain; emphasize speed with high torque and grip and perfect chain tensioning

3. **Growth & Improvements:** We will innovate and expand on previous designs. We will also transition to CNC from traditional styles like Tetrix and REV, those that we have used in the past.

5.3 Competition Goals

This year, we have four league meets, and a Regional Championships. Our goal is to compete with the intent to win, and improve and refine ourselves after each competition.
- ❖ Be as competitive as last year and win Worlds
- ❖ Utilize and implement the process of <u>iterative design</u> in which we design in a cyclic process of prototyping, testing, analyzing, and refining a product.
- ❖ As the season progresses, we will be documenting and reflecting after every competition in order to come up with new goals that build upon the previous one
- ❖ **<u>Inspire:</u>** We want to be able to inspire those that watch us through our remarkable performance and unique design during competitions
- ❖ **<u>Grow:</u>** We want to spread recognition of both Viperbots and Hydra at every competition through peak performance, networking, team spirit, and gracious professionalism.

5.4 Outreach Goals

Establish	Connect	Spread	Influence
We will establish connections with companies and programs within our community. Goal: work with at least **five** STEM professionals	We will get involved in our STEM community. Goal: Be active mentors for at least one FLL team and one FTC team	We will spread knowledge of FIRST programs among the youth in our community, along with the professionals that surround them. Goal: Reach out to at least 500 people	We will influence children to take part in more STEM-related programs and education. Goal: Implement at least four major outreach events

5.5 Future Goals

This season, we would like to establish ourselves as a team of influencers and advocates for STEM within our community, amongst our competitors, and within our organization.

We would also like to spread our legacy and ensure future success through the passing of knowledge from veterans to new members of Hydra.

6.0 Operational Plans

6.1 Organizational Plan

6.1.1 Team Structure

This year, we are striving to give every member an active role in the design, coding, and implementation of the robot, regardless of sub category. Every member will also be involved in community outreach events throughout the year. Although each member specializes in their area of interest and expertise (hardware, software, marketing, etc.), the final product is a coalition of everyone's ideas.
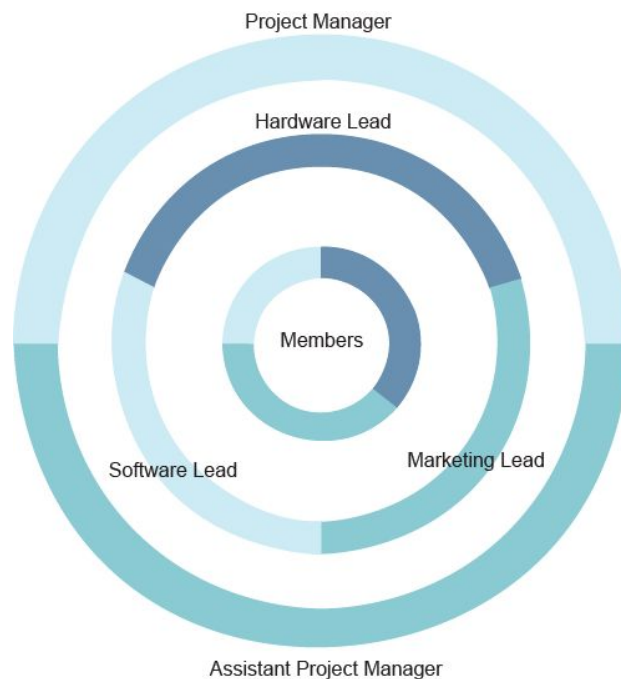
6.1.2 Organization

Our team utilizes 4 different methods in order to effectively stay organized throughout the course of the season.

1. **GroupMe**

    This messaging application allows us to plan, communicate, bond, and make decisions that require input from the entire team. In addition to a shared group chat consisting of the entire team, we have separate group chats for each subgroup in order to organize and prioritize conversations.

    This app has proved to be extremely efficient for our team as the calendar function facilitates the planning for outreach events. Additionally, GroupMe makes it easy to document any important discussions regarding crucial changes to the robot. The platform allows everybody to have a voice when it comes to making pivotal decisions, and we use this software daily.

2. **Google Drive**

    We keep all of our documents and files on a shared folder in Google Drive. It is organized by subgroup, and allows easy access of information for every team member. Furthermore, we keep the online copy of our Engineering Notebook on our Google Drive. This makes it easy for members to just fill in what they have done during the day, and document their goals, accomplishments, issues encountered.

3. **Self-Discipline**

    It is each member's responsibility to account for whatever task they have been assigned to complete. Out of respect for the team and for themselves, it is in every member's best interest to recognize what they are required to do for the betterment of the team, and accomplish it at a high grade. Robotics is one of the few high school extracurricular activities that offer an accurate insight into the "real world," and our members must possess a lot of self-discipline if they want to succeed in the season.

4. **Checks & Balances**

    Although our members are self-disciplined, it always helps to have the help of other team members to keep you in step. The project manager and assistant project manager are in charge of making sure that the team knows what needs to be completed by the end of each week, while subgroup leads are in charge of delegating the tasks to each team member. Every day, we compile a list of goals we would like to accomplish, and documenting these allows us to ensure that we are using our time efficiently. Members are expected to report to their perspective leads, and leads are expected to keep track of the progress of their members' given projects.

Each school year in April, after the competition season has ended, the ViperBots Organization sends out emails to middle school robotics teams and posts flyers around the school to advertise robotics. Students apply by filling out an application that will be reviewed by teachers and mentors at our school. Appropriate members are identified using the following guidelines:

Commitment	While it is not necessary for prospective members to know everything coming in, it is important that every member has the **time to dedicate** to the robotics season. We encourage a hands-on experience that can only be accomplished if everyone is **sufficiently committed**. With that being said, we want every member on our team to have the option to explore other options, and we work as a team to manage conflicts and work around everyone's schedule. To work around this, we work within UIL constraints to **coordinate meetings** within subgroups.
Process	Our organization has a **selection process** designed to ensure that everyone in our program is **committed** to robotics and will **benefit** from being there. After members are admitted, project managers are in charge of putting together a team, with a focus on **diversity** and varying range of experience and interests. The goal is to give every member of the team a **clear role** they enjoy, but also the chance to **grow and learn** from others.
Academic Success	While robotics is important and a passion for many of us, it is important to **place academics first**. To participate in robotics, members are required to maintain a 3.0 (out of 4.0) unweighted average and keep all grades above an 80 to participate. Our robotics program also has a system in place to help people who are struggling in a class. We have a lot of smart people across all grades who take the most challenging classes at our school, and, as a result, peer tutoring is made available for anyone who needs it.

6.2 Technical Plan

Our primary approach to ensuring success in this season is by implementing the methodical approach successful engineers use for problem solving: the **iterative design process**. This technique

allows us to focus on and prioritize the smaller tasks we must perform, and recognize and eliminate any factors that may obstruct us from achieving our main goals in our final product. Below are the steps we will execute in order to reach our Technical Goals aforementioned.
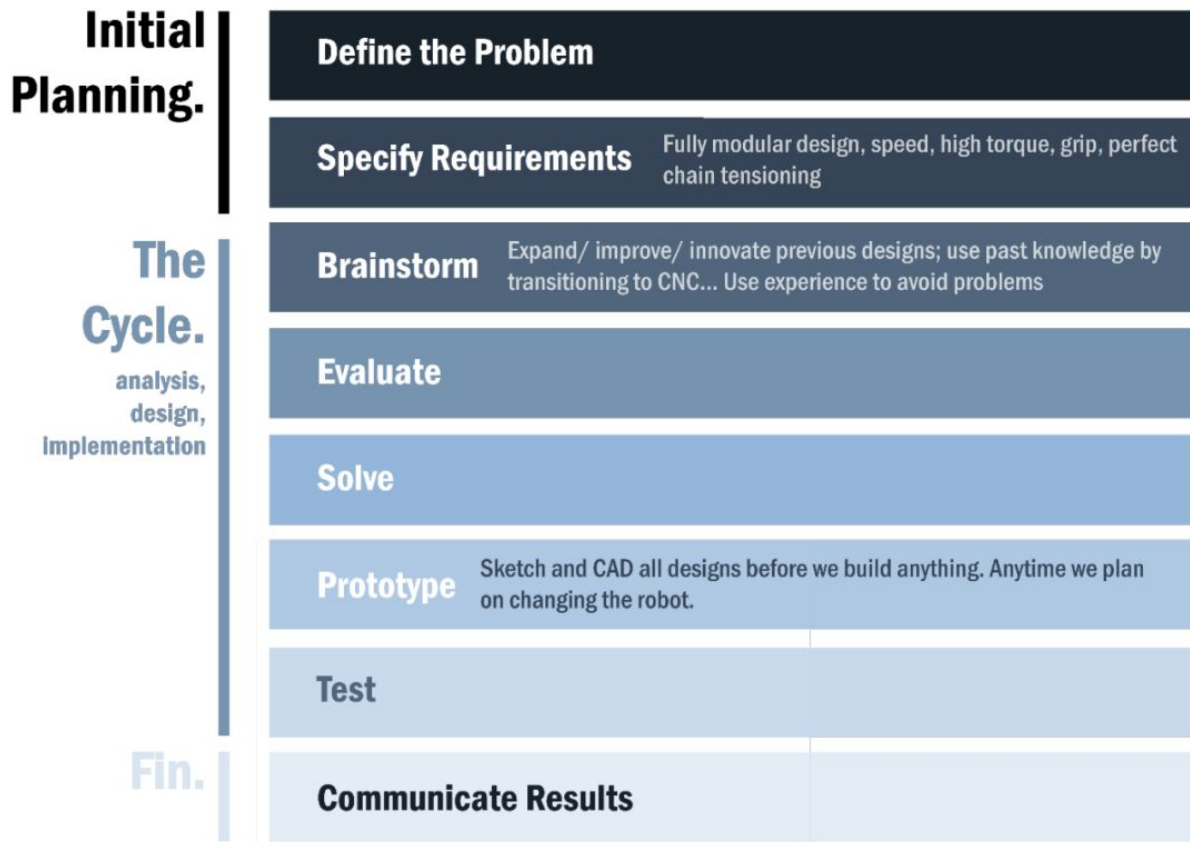
Through the implementation of the engineering process, we hope to meet our competitive goals as well. Each competition offers a chance for improvement, and the more we observe and analyze our own and others' performances, the more likely we are to succeed. By constantly going through the cycle of prototyping, testing our robot, making improvements in the lab, and experimenting with different game strategies until we find the one that suits us best at competitions, we always adhere to the iterative design process as it is the most efficient method of design, and nearly invariably leads to success.

6.3 Outreach Plan

6.3.1 HYDRAE Outreach

HYDRAE stands for Helping Youth Develop Robotic and Academic Excellence. The purpose is to keep students interested in STEM and give them access to STEM-related programs and education. HYDRAE focuses its outreach into three different categories that correspond to each of the heads of our logo:

youth, mentoring, and professionals. These categories explain the importance of engaging the students and the programs they are involved in.

YOUTH	**(1)** Determine what connections we already have in our community and branch off from there. **(2)** Visit pre-existing camps and eventually set up camps of our own (We would like to set up our own STEM camp) **(3)** Engage the kids with our presentations and camp activities in order to help inspire the next generation of engineers + help the community understand FIRST
MENTORING	**(1)** Determine our pre-existing connections with companies/ teams/ programs. **(2)** Exert Gracious Professionalism by offering help to anybody who needs it **(3)** Actively reach out to FLL and other FTC teams in our community in order to set up mentoring opportunities
PROFESSIONALS	**(1)** Determine what connections we already have: parents, family friends, people we've worked with before, etc. **(2)** Research companies, organizations, and events around us that we can reach out to and work with **(3)** Send out emails with a clear purpose by training people how to comprise professional emails **(4)** Set up dates for outreach with the companies **(5)** Spread knowledge of our team and FTC while getting mentoring and life-long advice for success in the real world + exploring opportunities available to us in our local community

6.4 Sustainability Plan

6.4.1 Schedule

Diversity is one of our team's greatest attributes. We value the fact that each of our members are involved in an extracurricular activity outside of robotics as it allows a variety of different perspectives to be brought to the drawing board, however, it makes it difficult to work with everybody's

busy schedules. To combat this, the team has created a schedule to standardize meeting times. Each team member will meet between a minimum of three hours, and a maximum of eight (per Texas UIL rules) per week. This will ensure that our team is able to meet deadlines and achieve success over the course of the season.

1. <u>Min</u>: 3 hours
2. <u>Max</u>: 8 hours
3. <u>Average</u>: Approximately 5 hours

KEY: Software **(S) ;** Marketing **(M) ;** Hardware **(H)**

	M	T	W	T	F	S
AM						BUILD DAYS
PIT	SMH					BUILD DAYS
PM	SMH	SMH	M	SH	SMH	BUILD DAYS

Monday Meetings
   Every Monday, we have mandatory Robotics meetings during our Personalized Instruction Time, also known as PIT. During these meetings, we will be discussing our main goals for the week and how we will accomplish them. Challenges and obstacles we encountered from the previous week will be addressed and we will determine how to fix them or prevent them from occurring again in the future.

Saturday Build Days
   Saturdays will be dedicated to Build Days. Our faculty sponsors and parent mentors have graciously dedicated their time to the ViperBots program to allow us to work on what we couldn't get done during the week. In order to make the most of the time they took out of their day and make sure it doesn't go to waste, we will devote this time to further bettering our team and our robot. baytajiiiii

6.4.2 Deadlines

One of the most important things for any team is to set meaningful deadlines before the season even begins. By setting "due dates" for different aspects of the robot, we hope to promote modular design and take a disciplined approach to the build season. While this framework is tentative and can be flexible, these dates should give structure to our team.

Task name	PRE-SZN	SEP pt. 1	SEP pt. 2	OCT pt. 1	OCT pt. 2	NOV pt. 1	NOV pt. 2	DEC pt. 1	DEC pt. 2	JAN pt. 1	JAN pt. 2
Business Plan	█										
Game Strat		█									
Parts Ordered		█									
Initial CAD		█	█								
Build Drv.Trn			█								
SW Tele-OP			█								
Score Mtd.				█	█						
Auto-Testing						█	█				
End Game						█	█				
Drv. Prac.							█	█	█	█	█
Full CAD											█
Judging						█	█	█	█	█	█

The ViperBots Friends and Family Booster Club supplies us with a certain amount of money at the beginning of the year that we must distribute effectively throughout the season. Team members have agreed to paying out-of-pocket for any expenses that are not covered by the VFF Booster Club.

2019-2020 FTC Robotics Team Budget	Qty.	Price	Combined	Total
Variables				
# Teams	1			
# Students	10			
Operating Expenses				
ViperBot Apparel				
Faculty Mentor Team Shirt	3	$ 15.00	$ 45.00	
Mentor Polos	3	$ 30.00	$ 90.00	
Team Shirt	8	$ 15.00	$ 120.00	
Organization Shirt	11	$ 15.00	$ 165.00	$ 420.00
Arena				
Game Element & Foam Tiles	1	$ 100.00	$ 100.00	$ 100.00
Entry Fees				
Team Registration	1	$ 275.00	$ 275.00	
League Play Fee	1	$ 250.00	$ 250.00	
Regional Event Registration	1	$ 250.00	$ 250.00	$ 775.00
Transportation - League Championships				
League Championships - Bus	1	$ 45.00	$ 45.00	
Truck Rental to Pull Trailer	1	$ 75.00	$ 75.00	$ 120.00
Tools and Equipment	1	$ 625.00	$ 625.00	$ 625.00
Individual Team Budget				
Miscellaneous Parts and Supplies	1	$ 3,000.00	$ 3,000.00	$ 3,000.00
Marketing Supplies	1	$ 300.00	$ 300.00	$ 300.00
Hospitality	10	$ 70.00	$ 700.00	$ 700.00
Banquet	78	$ 30.00	$ 2,340.00	$ 2,340.00
Scholarships	1	$ 400.00	$ 400.00	$ 400.00
Total Estimated 2019-2020 Operating Expenses				**$ 8,780.00**

As planning ahead is something we value in all aspects of our team, we thought it would most beneficial to predict and expect to encounter issues, but also have a definite solution in mind when said issues arise. Based on an analysis of our team's history of success and complications, we have compiled a list of challenges and solutions we can expect to encounter as the season progresses, as well as those we have already encountered and overcome.

Over Commitment	As aforementioned, each of our members are involved in other extracurricular activities that may interfere with our robotics schedule. We plan on countering this issue through planning ahead and maintaining a shared calendar for members to input what days they will be unavailable for robotics. We will also be using this calendar to communicate the dates for outreach to our team members. One of the requirements for joining robotics is to treat the organization as a priority of equal or higher importance of other varsity sports or clubs. Knowing this, members will be expected to make time for robotics whenever it is completely necessary for them to do so.
Under Documentation	Daily documentation can be tedious, especially as most of our members would rather **do** things and be done with it as opposed to reflecting and documenting their decision-making processes. However, it is crucial that we record our design process, problem solving, and successes and failures throughout the year so that future members of Hydra would be able to build upon our designs from this season, and know exactly how to do it. Members will be constantly reminded of the necessity of documentation, and this will urge them to fill in the Engineering Notebook at the end of each day of noteworthy progress. Furthermore, we will be keeping a digital copy of the EN on our Google Drive for easy access and documentation for *all* members of the team. This way, every member will be able to record what challenges they encountered and how the solved it.

Communication	Although we appreciate the independence of our members, our tendency to go off and do something ourselves without letting other members of the team know is detrimental to the team dynamic and success. In order to counter this, we have made it the responsibility of the leads to check in with their sub members and make sure they are reporting everything they do to them. Additionally, keeping an engineering notebook allows members to track the progress of others. Lastly, the presence of a Group Chat and the approachable nature of each of our members make facilitates an open communication within the team.

7.0 Resources

7.1 Mentors

This year our team has three dedicated coaches and two adult mentors. Although they are not with us every single second, they help us stay on track with our goals and priorities. Having their help and feedback really helps us learn and improve our team. Our teacher mentors give us deadlines to meet and help us improve our judging significantly.

7.2 Facilities

Team 7161 is located at Vandegrift High School (VHS), as part of the ViperBots Organization. Vandegrift High School has a "robot room" that is dedicated to its ten robotics teams. The robot room has a meticulously organized parts room, along with cabinets for each team, which allow team members to effectively use their time. Additionally, the robot room contains a game field, so teams can test their robots.

Vandegrift High School also has a marketing room, where marketing members can design, organize outreach, and communicate. Along with the marketing room, VHS has a hardware workshop equipped with various machines, such as a CNC mill, CNC router, chop saw, and sand belt. VHS also has 3D printers that allow members to print custom parts.

7.3 Faculty Sponsors

We currently have three faculty sponsors aiding us. Mr. Allen, Mr. Adrian, and Mrs. Wendel are teachers that have been involved in FTC in the past. Fortunately we have their expertise to aid us and help us when we run into barriers. Currently our Faculty Sponsors have adopted a hands-off policy where they are not allowed to touch or intervene with the robot. This policy allows us to learn and improve from our mistakes. These teachers have also given their classrooms away during homeroom so we could have meetings and design sessions. These Faculty Sponsors are such a valuable aspect to our team and are eternally grateful for their help.

7.4 Achievements

Res-Q (2015-2016)
- Four Points Middle School Qualifier *(Winning Alliance Captain, Think Award Finalist 3)*
- Vandegrift High School Double Qualifier *(K2 Qualifier Winning Alliance Captain, K2 Qualifier Inspire Award Finalist 3, K2 Qualifier Think Award Winner)*
- Alamo FTC Regional Championship *(Think Award Finalist 3)*

Velocity Vortex (2016-2017)
- Austin Metro League Championship - (*Division Winning Alliance First Pick, Think Award Winner)*
- Alamo FIRST Tech Challenge Regional Championship (*Division Finalist Alliance Captain, Think Award Finalist 2, Innovate Award Winner)*
- FIRST Tech Challenge South Super-Regional Championship Tournament (*Division Winning Alliance First Pick)*
- FIRST Tech Challenge Houston World Championship (*17th Place)*

Relic Recovery (2017-2018)
- Austin Metro League Championship – *(Keller Division Winning Alliance First Pick, Event Winning Alliance First Pick, Control Award Finalist 3, Design Award Winner, Rockwell Collins Innovate Award Finalist 2, Advanced to Alamo FTC Regional Championship)*
- Alamo FIRST Tech Challenge Regional Championship – *(Kane Division Winning Alliance, 2nd Control Award, 2nd Motivate Award, 3rd Design Award, Event Finalist Alliance, Winner Inspire Award, Advanced to South Super-Regional Championship Tournament)*
- FIRST Tech Challenge South Super-Regional Championship Tournament – *(Event Winning Alliance, Pemberton Division Winning Alliance, Advanced to FIRST Tech Challenge World Championship Houston)*
- FIRST Tech Challenge Houston World Championship – *(Event Finalist Alliance, Jemison Division Winning Alliance)*

Rover Ruckus (2018-2019)
- Austin Metro League Championship – *(Williams Division Finalist Alliance First Pick, 2nd Place Williams Division, 2nd Connect Award, Winner Inspire Award, Advanced to Alamo FTC Regional Championship)*
- Alamo FIRST Tech Challenge Regional Championship – *(2nd Design Award, 2nd Motivate Award, Winner Connect Award, 2nd Inspire Award, Advanced to FTC World Championship Houston)*

- FIRST Tech Challenge Houston World Championship – *(Connect Award Finalist, 4th Place Overall)*

7.5 Sponsors

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7.6 Contact

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