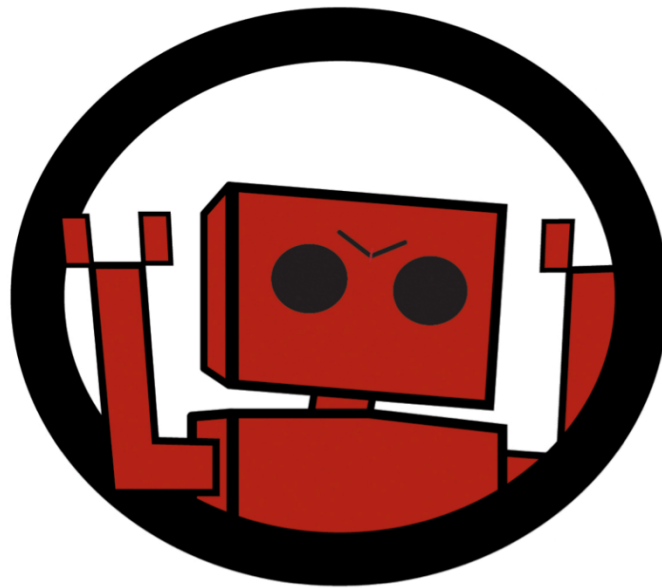


Mountaineer Area Robotics

MARS 2614



2022

Business Plan

1. MARS Mission

The Mountaineer Area RoboticS (MARS) mission is **to inspire youth in rural and underserved areas around the world to pursue their creative and intellectual passions.** MARS does this through a hybrid (both physical and digital) approach to community outreach and the development of technical programs designed to instill superior life skills in students of the program. These skills include Gracious Professionalism[®], Teamwork, Leadership, and Coopertition[®]. MARS members also develop exceptional personal productivity skills such as a strong work ethic, time management techniques, superior dedication, commitment to team and community, and highly refined organizational skills.

2. History & Growth

MARS Team 2614 was founded in 2008 by five student members of a champion FIRST LEGO[®] League team to continue the exploration of Science, Technology, Engineering, and Mathematics (STEM) education. The MARS program consists of youth primarily from North-Central West Virginia who dedicate themselves to expanding STEM statewide. **In 2017, MARS won the Championship Chairman's Award**, which placed MARS in the FIRST Hall of Fame and provided a stronger connection to high-performing FRC teams and the organizational leadership of FIRST. During the COVID-19 pandemic, MARS held weekly online meetings to keep students engaged with the team. MARS resumed in-person meetings once COVID-19 cases declined, prioritizing student and mentor safety. Through the progression of programs and direct community engagement, MARS maintained its traditional average of 40 students per season during the pandemic.

3. Team Structure

MARS prides itself on being a student-led team that is divided into two major subsets: Technical and Non-Technical. The Technical Team comprises the Mechanical, Electrical, and Programming sub-teams, and the Non-Technical Team consists of the Outreach and Public Relations sub-team and the four Outreach Task-Forces. Each sub-team has a student leader who keeps fellow students focused. Many former students volunteer with MARS as mentors, returning as examples for younger members and providing the team with a tremendous range of experience to utilize.

4. Outreach & Marketing

With the challenges brought by the COVID-19 pandemic, MARS reevaluated its strategies to engage with the community. In 2021, MARS introduced the Hybrid Model of Outreach, integrating traditional in-person strategies with new digital approaches used during the pandemic. The hybrid model has been all-encompassing, ranging from adapting WVROX, a MARS-hosted FRC offseason event, into a 22-hour FRC stream, to integrating Tucker Teams digitally by opening an online FRC Help Desk. This inventive approach to outreach works to expand the accessibility of MARS' products and initiatives and to rebuild programs, like First Lego League Challenge and Explore, that were negatively impacted by the pandemic.

4.1 MARS Plan

The MARS Plan is composed of five main areas of focus when growing FIRST and STEM education in the community: **Engage, Inspire, Sustain, Progression of Programs, and Creating Leaders and Innovators.** This is a comprehensive strategy detailing how MARS finds, grows, and sustains students through STEM programs and maintains the programs themselves. MARS continues to use the MARS Plan to spread STEM education and to further the values of MARS and FIRST.

4.2 Branding

MARS maintains a cohesive image throughout the community and within FIRST competitions. Students wear standard team t-shirts at all events and wear black dress shirts with black slacks and red bow-ties for the team's "dress-up" day. These uniforms are fitted with MARS patches bearing the team

logo to maintain uniformity throughout the competition. Additionally, MARS utilizes a standard for all printed documents including colors such as the “MARS Red.” The fonts Orbitron and Ubuntu, used in this document, and the MARS logo or Marvin, are included on every printed marketing tool produced.

4.3 Products and Initiatives

MARS provides both physical and digital goods and services in its mission to spread STEM. Products are all the physical and digital goods MARS provides. These range from STEMcrafts to public CAD drawings and LabView programming. Initiatives are all of the services MARS provides to individuals or organizations. These range from online and in-person Tucker Teams to School STEM activities. To maximize MARS’ impact at outreach events, the team uses both products and initiatives in tandem. An example of this conjoined effort is the team’s use of STEMcrafts at MARS hosted FLL Challenge and Explore competitions to keep students and siblings of students involved with STEM beyond FIRST. The use of products and initiatives is crucial in achieving the first three steps of the MARS plan: Engage, Inspire, and Sustain.

5. SWOT Analysis

MARS performs an annual SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis to aid in team advancement each fiscal year. The MARS SWOT analysis divides traits into two categories: internal and external. The internal environment defines the team’s Strengths and Weaknesses. The external environment consists of Opportunities and Threats that can affect MARS's viability.

Strengths

- **Funding** — One of the team's keys to success, MARS has developed a close working relationship with the 23 sponsoring partners, allowing MARS a level of consistency in its funding from year to year. MARS is able to maintain team continuity in the unlikely event of the loss of a sponsor.
- **Mentors & Team Alumni** — MARS is led by 25 mentors who are all highly experienced in their fields, which include education, business, health care, and engineering. Guidance from these mentors allows students to perform well in both FIRST and their future careers. Also, many student alumni continue volunteering as mentors and return whenever possible to serve as examples for younger members. This provides the team with historical continuity and a deep sense of responsibility for founding principles.
- **Facilities** — MARS has access to extensive facilities to aid with its mission. West Virginia University provides access to classrooms, labs, computers, and machining workshops. MARS also has a 2-story building used for summer camps, FLL Challenge and Explore training, and a regional FRC practice space.
- **Team Leadership** — MARS is led by a student leadership council, an elected five-student group, that facilitates communication between the specific areas of the team and makes team decisions. Under the technical and non-technical directors, each sub-team has a student lead who organizes tasks for the sub-team. Each Outreach Task-Force also has a similar lead.

Weaknesses

- **Internal Communication Breakdown** — As MARS has grown, sub-teams have become more separate and distinct from each other. While this increase in members allows for specialization, communication can weaken between the sub-teams. MARS is combating this by holding weekly team meetings (tri-weekly during build season) where students discuss important progress and announcements of each sub-team and plan for the week ahead. Additionally, the Student Leadership Council provides a channel for communication between the technical and non-technical sides of the team and encourages participation in the MARS cross-training system, developed to educate all team members about the important parts of each sub-team.
- **Distribution of Students’ Age** — 51% of MARS students on the team and the entire Student Leadership Council are from the graduating class of 2023. The loss of knowledge and

leadership after these students graduate the team is concerning. To minimize this loss, MARS has been retaining versions of important historical documents including the reasons for any edits. MARS also plans to create instructional videos detailing FRC-related technical skills for basic robot construction. These videos will preserve knowledge from the team's current students, and provide other teams with that knowledge via the MARS YouTube channel.

Opportunities

- **Increased Community Interest in Hybrid Outreach** — As the world was forced online in 2020 due to lockdowns caused by the COVID-19 pandemic, people became more comfortable with digital platforms. This has allowed MARS to implement new methods of outreach integrating traditional in-person strategies with new digital approaches utilized during the pandemic.
- **Rural Communities Inside West Virginia** — MARS began with a mission to promote STEM education and increase participation in post-secondary schooling among West Virginia high school graduates. As the team became more ambitious, it developed the West Virginia Plan, now The MARS Plan, which led to the rapid expansion of FIRST programs throughout the state. Graduates of these FIRST programs continue to post-secondary educational venues. To reach more students within rural communities, MARS has integrated the hybrid model of outreach within the MARS Plan to expand the accessibility of the team's knowledge, products, and initiatives.

Threats

- **Loss of Key Personnel** — The team's adult mentors provide the ongoing organizational and logistical support that makes the very existence of MARS possible. MARS has identified key personnel vital to the team and its ongoing operation. For instance, lead mentor Dr. Scime's expertise, experience, and contacts in the FIRST and business communities are instrumental to the team. In the event that MARS faces the loss of Dr. Scime, MARS is training mentor and alumni Ryan Utzman, program specialist for the NASA Education Resource Center, to step into the lead mentor position.
- **Loss of Core Partners and/or Sponsors** — MARS has four core partners that sponsor a majority of its activities: West Virginia University (WVU), NASA's Katherine Johnson IV&V Facility, the Monongalia County Board of Education, and the United Way of Monongalia and Preston Counties. While all the team's sponsors are important, the loss of support by any one of these four would severely hamper the team's ability to operate at its current levels. However, since MARS has a variety of sponsors, one loss, while detrimental, would not end the program.

While the above threats and weaknesses are indeed real and must be considered, they are survivable. In the end, there is little MARS can do to mitigate the risks other than to maintain good stewardship of its resources, be attentive, and plan accordingly.

6. Finances

MARS is a 501(c)(3) non-profit organization and continuously operates on a cash basis. MARS has no financing and investing initiatives, or need to use debt as an instrument to fund its activities. Sponsorships, grants, and donations are the primary funding source for MARS. Without the generous support of corporate sponsors and private donors, achieving the MARS mission would be nearly impossible.

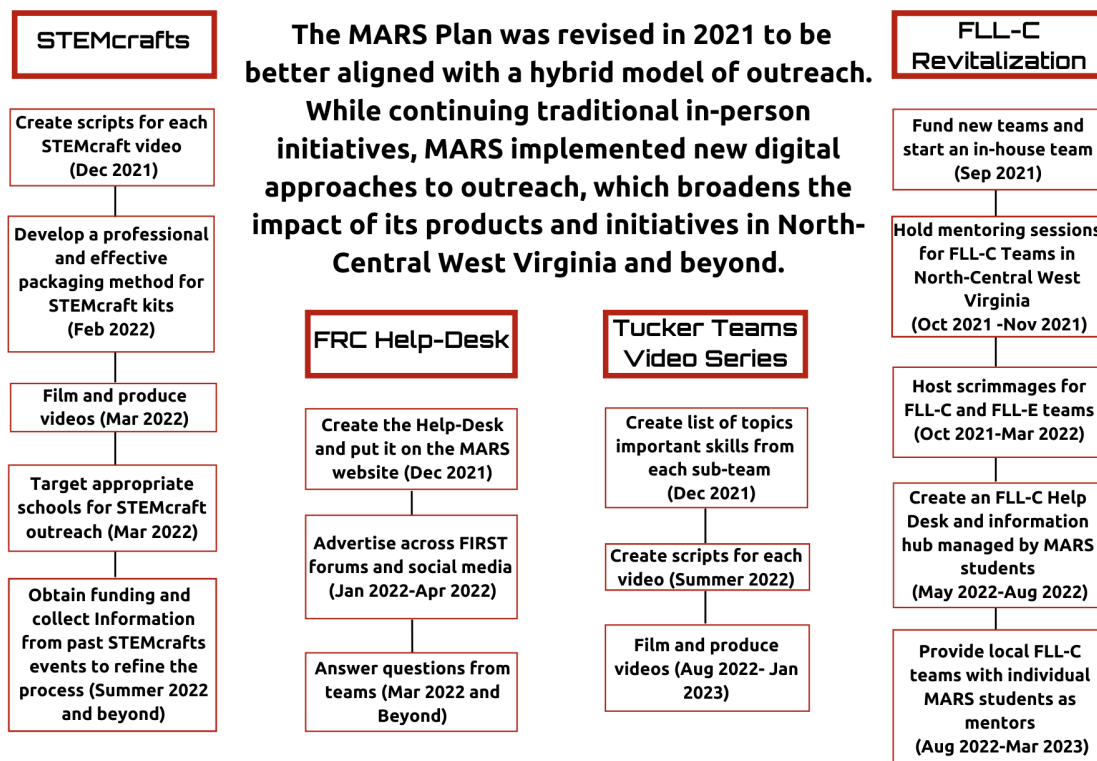
MARS expects a funding growth of 5% per annum to achieve its goals and objectives. This growth is expected to be obtained through the retention and renewal of current grants, the continued support of current sponsors and donors, and the acquisition of new grants and sponsorships. MARS acknowledges its sponsors in several different ways including listing sponsors' logos and names on MARS' competition shirts, robots, and website. MARS believes that by pursuing this strategy and keeping close relations with current sponsors, it can continue to grow its operations without the acquisition of any long-term liabilities.

Appendix:

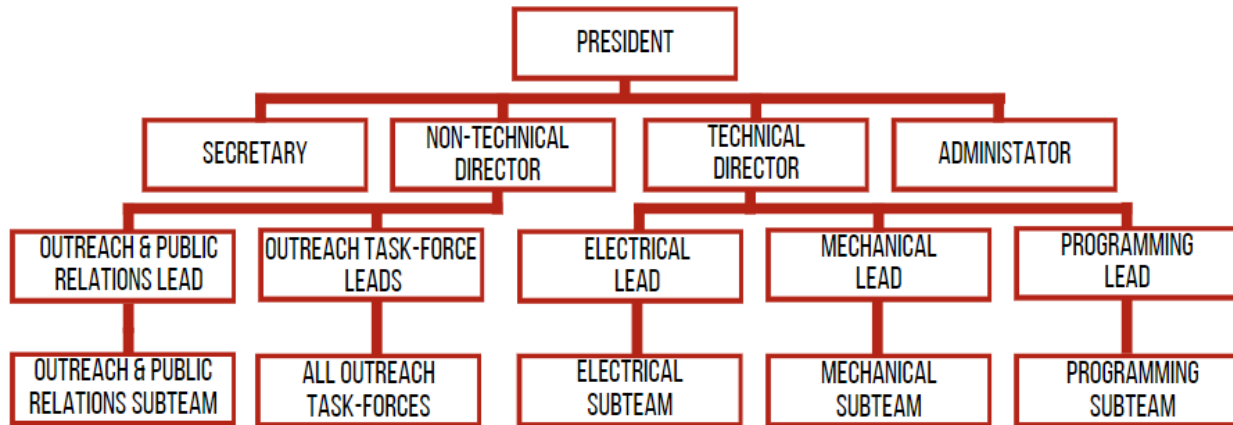
1. Key Partners of MARS

- **Monongalia County Board of Education**
The Monongalia County Board of Education (MCBOE) provides a building for use as a full-sized practice field and mentoring facility. MARS opens the building to nearby teams during its competition seasons, which benefits FIRST teams from the surrounding area. MARS prides itself on continuing education, and are thankful that MCBOE provides MARS students with exempt absences from school for competitions.
- **NASA Katherine Johnson IV&V Facility**
As a NASA house team, MARS significantly benefits from consistent monetary donations along with aid for various STEM activities, including robotics kits and fields to assist in spreading FIRST and VEX. NASA's efforts facilitate the expansion of MARS' image and mission to the community and other teams.
- **United Way of Monongalia and Preston Counties**
One of its largest donors, United Way, allows MARS to engage with the local community by connecting MARS to similar organizations and prominent members of the community, in addition to the financial support.
- **West Virginia University**
WVU graciously provides MARS' main basement workspace and access to machine workshops. MARS also partners with them to hold an off-season event, WVROX, which is held in WVU's Student Recreation Center. Additionally, WVU provides three scholarships to FRC students attending WVROX, as well as aiding with logistics and registration.

2. Hybrid Outreach Implementation Strategy



3. Student Organizational Chart



MARS is a student-led team, and as such, it prides itself on having an organized, responsible team model. All the above team roles are filled by students who have been elected by their peers. Students in these positions have the ability to exercise and improve their leadership, productivity, and management skills.

4. SWOT Analysis Chart

	Helpful	Hurtful
Internal	Strengths	Weaknesses
	<ul style="list-style-type: none"> • Funding • Mentors & Alumni • Facilities • Team Leadership • Team Character & Image 	<ul style="list-style-type: none"> • Lack of Enthusiasm • Internal Communication Breakdown • Distribution of Students' Ages • Distribution of Students' Residency • Weak Digital Security
External	Opportunities	Threats
	<ul style="list-style-type: none"> • Rural Communities inside West Virginia • National & International Underserved Area • STEM Programs in Schools • FIRST Hall of Fame Status • Increased Community Interest in Hybrid Outreach 	<ul style="list-style-type: none"> • Macroeconomic Fluctuations • Loss of Core Partners and/or Sponsors • Loss of Key Personnel • Inability to actively access facilities

5. Statement of Cash Flows

STATEMENT OF CASH FLOWS - 2021	
BEGINNING CASH BALANCE	\$49,710.76
CASH INFLOW	
OPERATIONS FUNDING	
<i>Contributions/Sponsorships</i>	\$47,305.18
<i>Grants</i>	\$11,000.02
TOTAL CASH IN	\$58,305.20
CASH OUTFLOW	
OPERATING EXPENSES	
<i>Promotions</i>	\$32.00
<i>Operations</i>	-\$2,524.85
<i>Equipment</i>	-\$4,180.59
<i>Event Registration</i>	-\$200.00
<i>STEM Support</i>	-\$5,009.38
<i>Robot Construction</i>	-\$14,563.58
<i>Travel</i>	-\$731.05
TOTAL CASH OUT	-\$27,177.45
NET CASH FLOW	\$31,127.75
CASH BALANCE	\$80,838.51