

Engineering Excellence through Strategic Team Management

Mr. Imran Parvez, Texas A&M University at Qatar

I am a final-year mechanical engineering student at Texas A&M University in Qatar, and currently the Team Manager for the Shell Eco-marathon (SEM) 2025 team. While I have successfully led other organizations, this is my first time leading the SEM team. I bring two years of experience to this team, where I have focused on body design for the competition. My background in leadership, combined with hands-on experience in vehicle aerodynamics and lightweight construction, has equipped me to guide this multidisciplinary team.

Osama Desouky, Texas A&M University at Qatar

Osama Desouky is a Technical Laboratory coordinator at Texas A&M University in Qatar. Osama is currently pursuing his Ph.D. in interdisciplinary engineering from Texas A&M University at College Station. He is responsible for assisting with experimental method courses, 3D printing, mechanics of materials, material science, senior design projects, and advanced materials classes. Osama's professional interests include manufacturing technology, materials science, 3D printing, experiments, and product design.

Dr. Marwa AbdelGawad, Hamad Bin Khalifa University

Dr. Marwa AbdelGawad joined Hamad Bin Khalifa University (HBKU) as an Assistant Professor of Practice. She earned her Ph.D. in Mechanical Engineering from Texas A&M University, College Station, TX where her research was focused on examining the impact of microstructure on the corrosion response and mechanical integrity of magnesium alloys used in biomedical applications, specifically orthopedic implants.

Dr. AbdelGawad's interests are centered around materials and manufacturing, with a strong focus on corrosion of light metal alloys. With an extensive teaching background spanning over 10 years, she has developed a keen interest in advancing innovation in engineering education. At present, she actively explores various methods to enhance student engagement and optimize their learning experiences through curriculum and course design.

Her primary teaching objective is to foster a lifelong learning mindset in her students by promoting critical thinking and problem-based learning. Dr. AbdelGawad's teaching philosophy integrates real-life ethical dilemmas to encourage students to think deeply, challenge their opinions, and integrate ethics into their coursework to help shape them into successful, professional and socially responsible engineers.

Shell Eco-Marathon

The Shell Eco-Marathon (SEM) is an international competition that challenges student teams to design, build, and drive energy-efficient vehicles. This case study focuses on the SEM team at Texas A&M University in Qatar, chosen for its unique context of overcoming significant budget constraints and time limitations. The team's systematic and innovative management strategies offer valuable insights for other student-led engineering teams aiming to achieve excellence under challenging circumstances.

INTRODUCTION

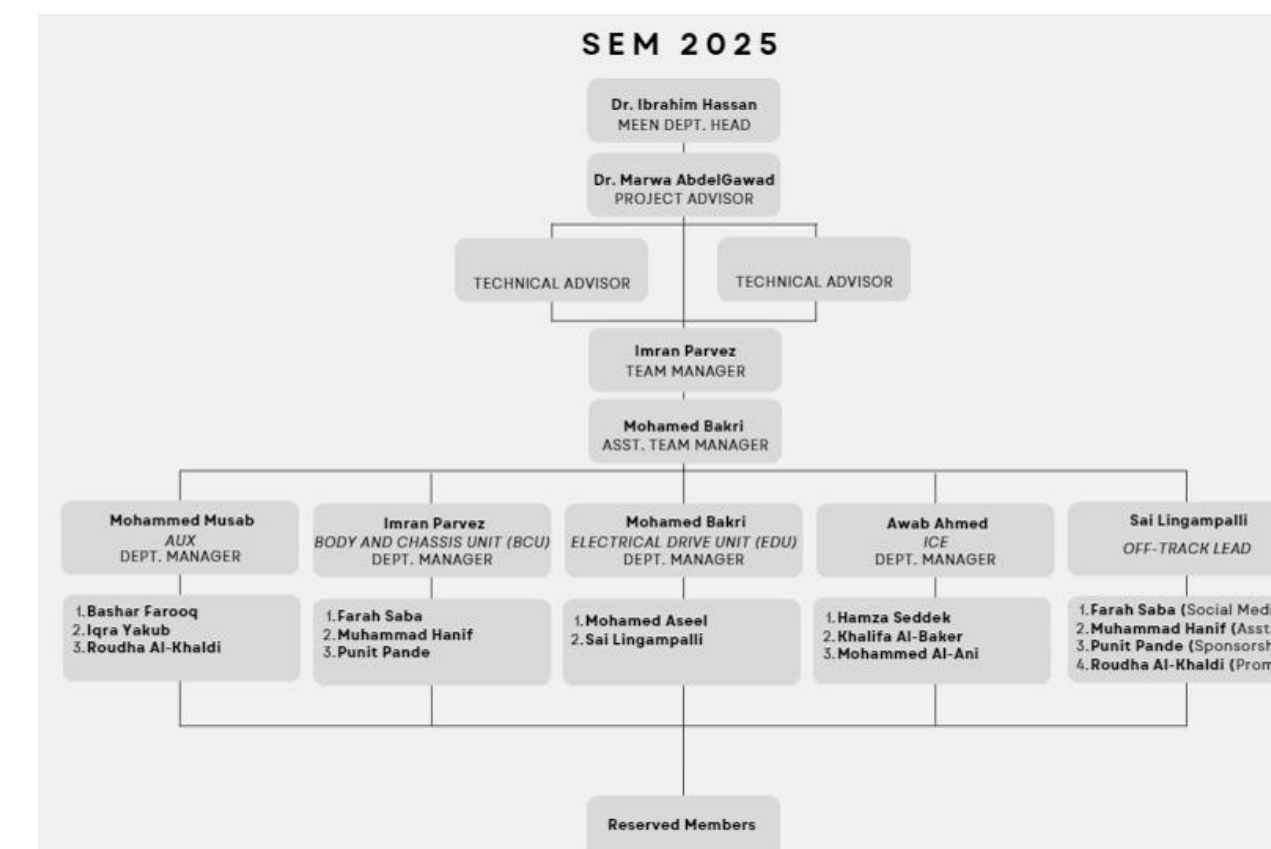
The Shell Eco-Marathon (SEM) team at Texas A&M University in Qatar faced a dual challenge: budget constraints and a significantly reduced preparation period of six months. Following setbacks and an unsuccessful competition in the previous year, the team embarked on a systematic approach to address these issues by identifying previous errors and improving team dynamics and project management. Unlike standard approaches, the team's strategy uniquely combined lessons learned from past failures with insights from other disciplines, such as sports management and tailored consultation. This approach not only prioritized efficiency but also introduced innovative structures and accountability systems, which distinguish it from other engineering team management practice

OBJECTIVES

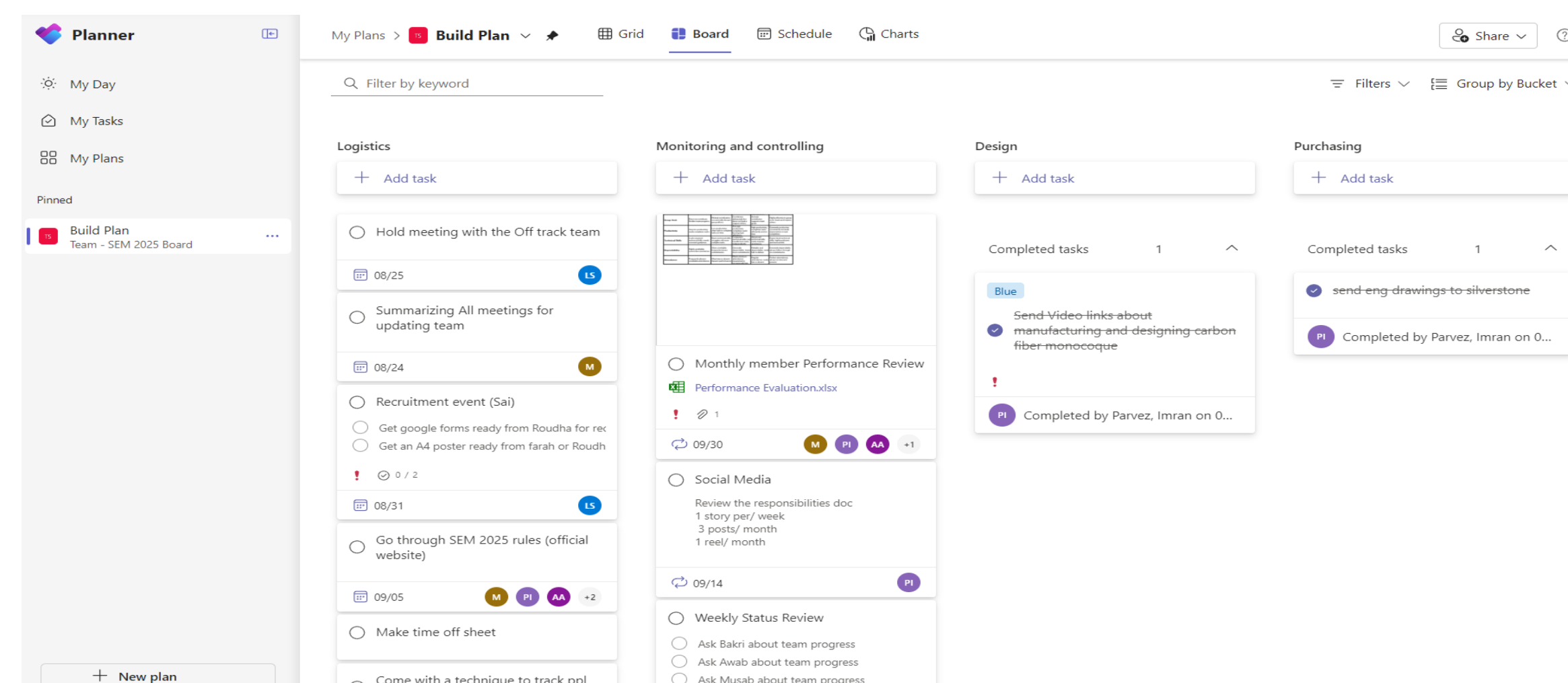
- Clarify the goals and purpose of the SEM competition and its educational value.
- Showcase the unique challenges faced by the Texas A&M Qatar SEM team.
- Highlight the innovative management strategies developed to overcome these challenges.
- Provide actionable insights for other student-led engineering teams.
- Demonstrate the measurable impact of structured planning and adaptive leadership on team performance.

STRATEGIES

1. Clear Team Structure



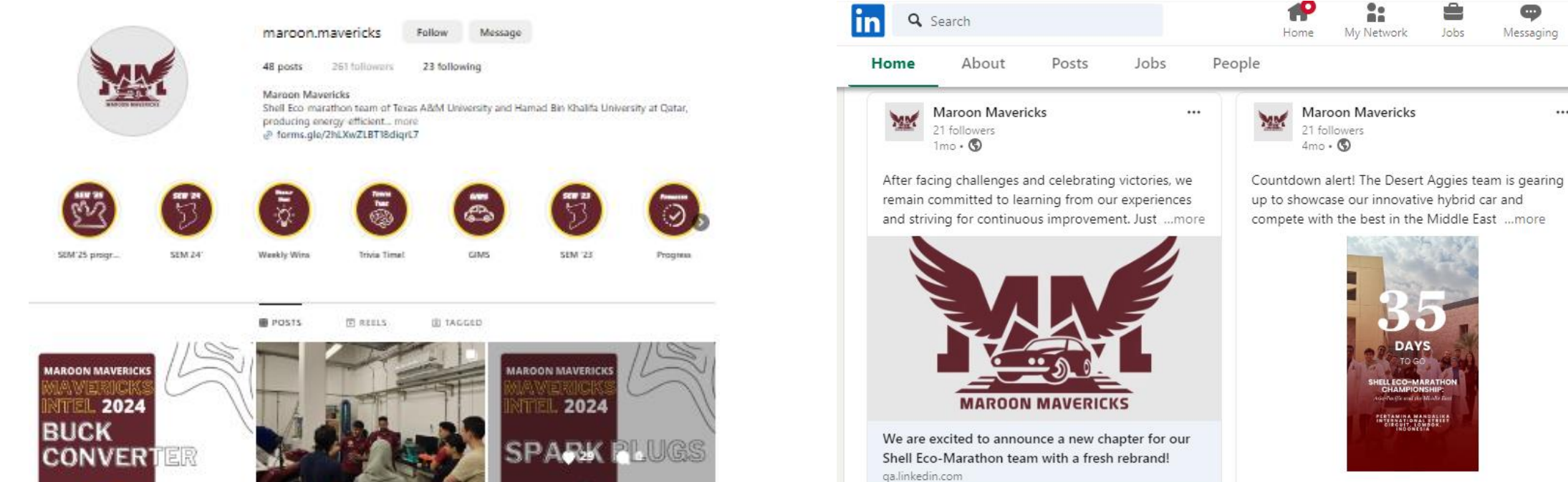
2. Layout Of Tasks



3. Tracking Progress

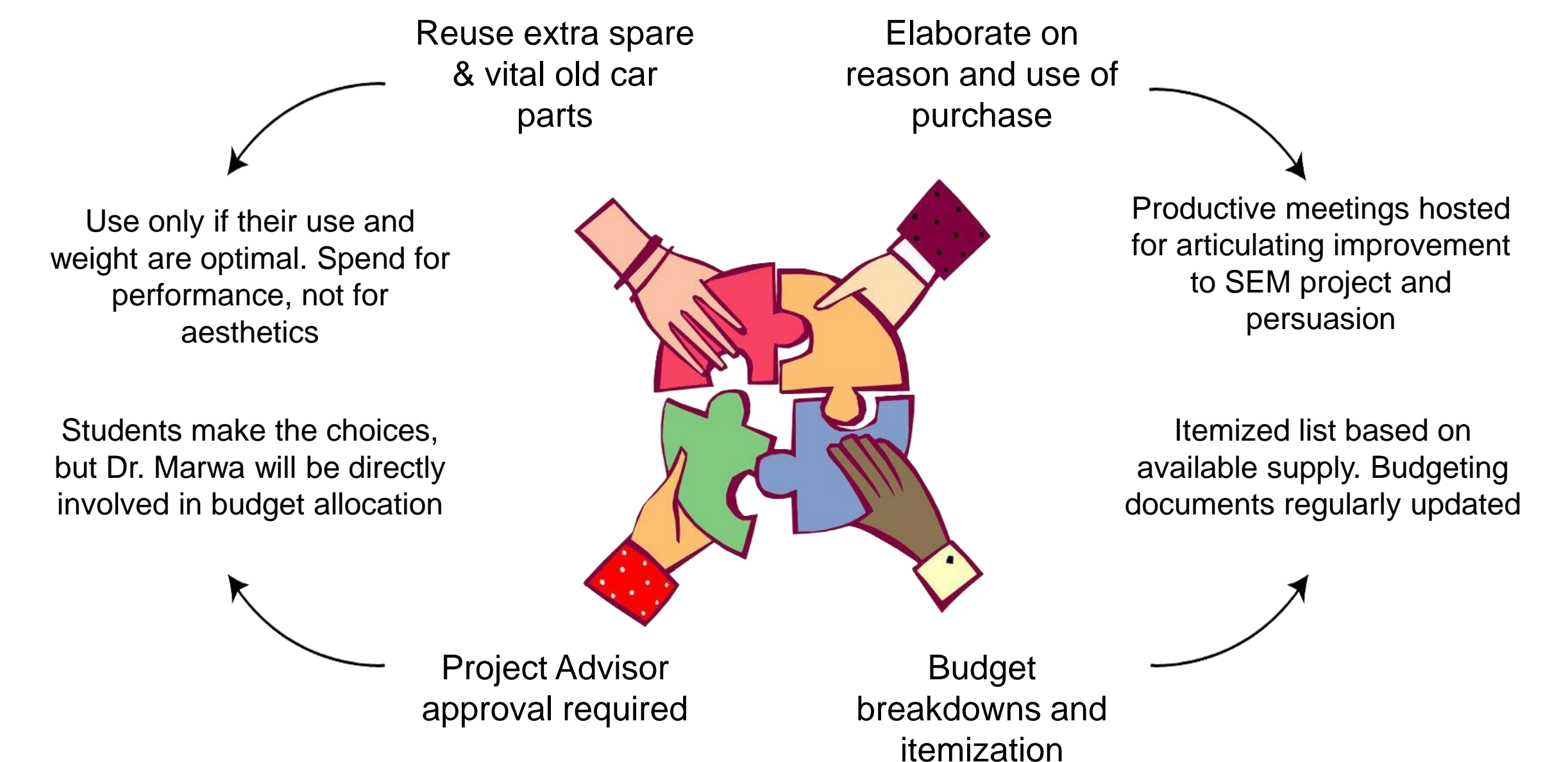
MONTH OF SEPTEMBER													Category						
GROUP EVALUATION FORM													1	2	3	4	5		
CORE COMPETENCIES ANALYSIS																			
DEPARTMENT		DEPARTMENT MANAGER		EMPLOYEE NAME									Wrote to Full Potential	Revised meet expectations but underperforms	Occasionally meets expectations but shows little initiative	Meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative
													Quality of Work	Frequently meets or goes poorly	Occasionally meets expectations but shows little initiative	Meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative
DEPARTMENT		DEPARTMENT MANAGER		EMPLOYEE NAME									Work Consistency	Highly inconsistent, cannot be relied upon	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative
													Communication	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative
DEPARTMENT		DEPARTMENT MANAGER		EMPLOYEE NAME									Takes Initiative	Wants to do more, but lacks initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative
													Group Work	Does not contribute, makes no effort	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative
DEPARTMENT		DEPARTMENT MANAGER		EMPLOYEE NAME									Productivity	Very low productivity, cannot complete tasks on time	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative
													Technical Skills	Lacks required technical skills, cannot complete tasks	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative
DEPARTMENT		DEPARTMENT MANAGER		EMPLOYEE NAME									Dependability	Highly unreliable, cannot be counted on	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative
													Attendance	Frequently absent, unreliable attendance	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative	Consistently meets expectations but shows little initiative
MEMBER TOTAL													0	0	0	0	0		
MEMBER AVERAGE													0	0	0	0	0		

4. Social Media Presence



RESOURCE MANAGEMENT

How did we ensure money and time are not wasted?



OUTCOME



- Students applied engineering principles in a practical, real-world context.
- Participated in a showcase event, improving their presentation skills.
- Enhanced teamwork and leadership capabilities through structured roles.
- Successfully adapted to time and budget constraints while meeting high standards.
- Achieved measurable progress in two months that previously took eight, monitored using Microsoft Planner and statistical tracking