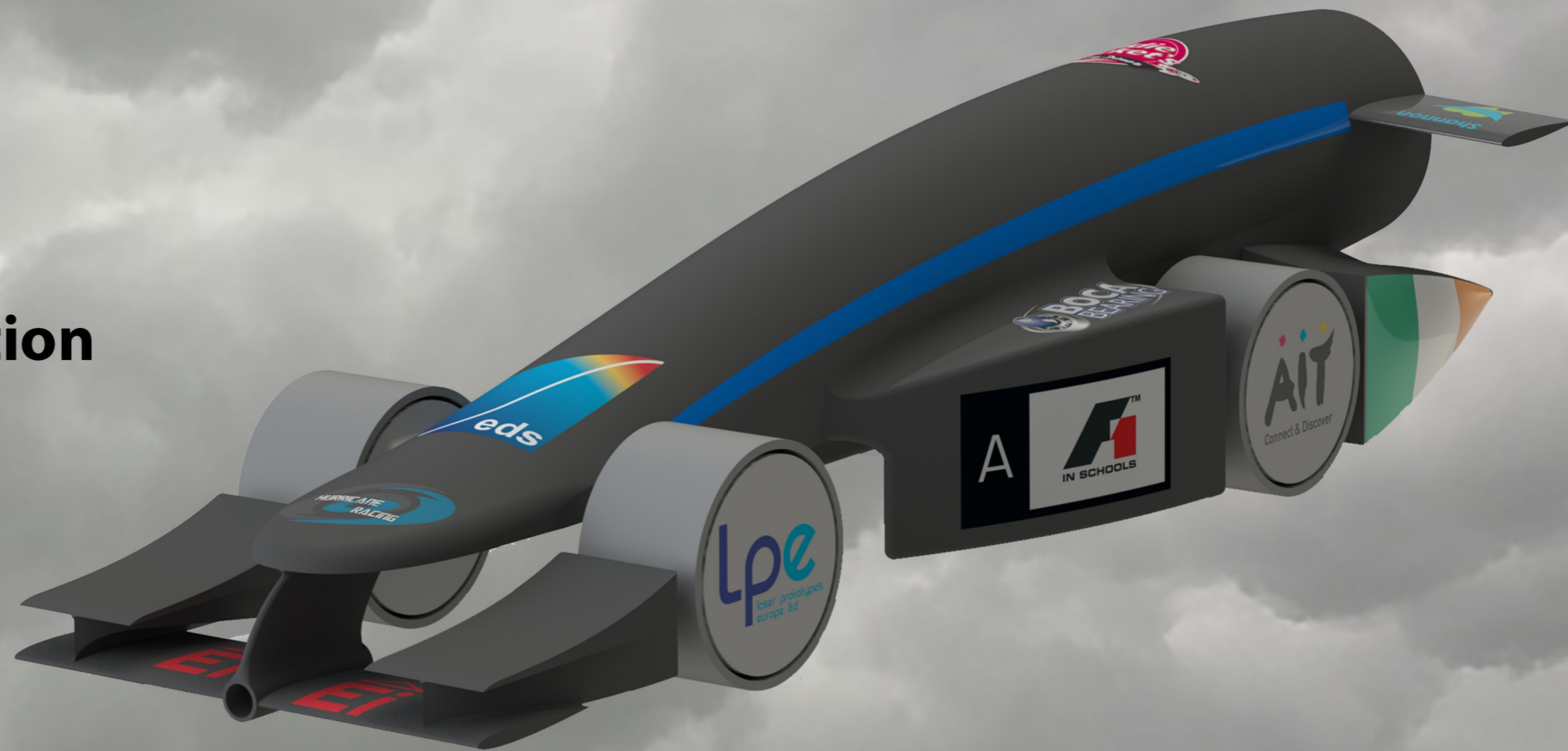# Hurricane Racing

Hurricane Racing

1. Team Profile
2. Project Management
3. Project Management
4. Team Identity
5. Sponsorship and Collaboration
6. Sponsor ROI and Marketing
7. Pit Display Design Process
8. Pit Display Design Process
9. Team Evaluation
10. Project Evaluation

Enterprise Portfolio

Eddie Rocket's City Diner

Building the "Perfect" Team

The success of any team depends on different skillsets provided by the team members. It is how you develop and appropriately structure your team that determines succes. Rather than having one person working on an individual area of the project, each area had a team of people contributing with different roles. This overall team structure is called "scrum". Each scrum has an overall leader called a scrum master (SM) who is responsible for the outcome of the scrum.

Project Management Scrum

Cian (SM)	Project Management
Tom	Financial Management
Darren	Team Management

Design Scrum

Darren (SM)	CAD - Virtual Analysis - Development
Cian	Research
Tom	Testing
Ciaran	Manufacturing Consultation

Manufacturing Scrum

Ciaran (SM)	CAM - Machining - Finishing
Cian	Scrutineering
Darren	Design Consultation
Joe	Car Graphics

Enterprise Scrum

Jamie (SM)	Marketing - Sponsorship
Tom	Fundraising
Joe	Promotional Material

"None of us are as smart as all of us"

Through the implementation of our team's scrum structure, every team member worked as a unit rather than as individuals. However, each team member had an important role in the team with effective and critical contributions that allowed each scrum to excel and produce high quality results. We utilised the large team number to our advantage by distibuting work evenly and working on project areas as a unit.

Darren O'Hara Duggan - Design Engineer

Darren is the lead designer of our car. He developed concepts based off research, tested these concepts using virtual analysis and developed the car from test results.

Critical Contributions
- Innovative "Development System" based off advanced CFD and FEA analysis.
- Coanda Effect and Magnus Effect application to develop air diversion system around front and rear wheels.

Jamie McManus - Marketing Manager

As marketing manager, Jamie was responsible for promoting our team and building our team brand. He worked with media firms in marketing our team. Jamie also was in charge of sponsor acquisition and sponsor relations.

Critical Contributions
- Innovative F1 in Schools - Irish Motorsport link during marketing campaign.
- Sponsor relation and sponsor return on investment management.

Cian McBrearty - Project Manager

Project management is the foundation of any good team. Cian outlined goals, established tasks, and set deadlines which each team member could follow. He ensured that our time was balanced correctly and effectively.

Critical Contributions
- Developed Agile/Waterfall project management system to our team.
- Car quality assurance system established using percision equipment and regulation jigs.

Tom O'Carroll - Resource Manager

Tom managed the team's finances, inventory and team expertise. He worked alongside an accounting firm to draw up financial budgets and reports and allocated resources to each project area.

Critical Contributions
- Development of "Expertise Plan" where areas of the project could be improved via collaborations.
- Organised team fundraising events including bagpacking and community raffle (24% of funding).

Ciaran McDermott - Manufacturing Engineer

Ciaran excels in the preperation and production of our car. Using CNC machinery and 3D printing machinery he manufatcured car components. He also managed the finishing and assembly of our World FInals car.

Critical Contributions
- Forged manufacturing partnerships while outsourcing based upon Tom's "Expertise Plan".
- Deisgned and manufactured CNC jigs to resolve manufacturing issues.

Joe Reidy - Graphic Designer

As Huricane Racing's graphic designer, Joe developed our team's graphics for our team's pit display, portfolio, and verbal presentation. Using Adobe software, he developed our team logo as well as promotional material for the team.

Critical Contributions
- Designed promotional material for innovative marketing activities such as our decaled bus.
- Collaboration work with printing agency and pit display manufacturing company.

Comprehensive Project Management

We learned through the evaluation of our qualifying competition that we needed a project management system that would adapt to our rapidly changing project but also give us a structured process to rely on.

Hybrid Project Management System

Through our research and trial usage of multiple project management systems, we found that no system was suitable to our needs. We set about building our own comprehensive project management system using different aspects from industry and university styled projects. The system was laid out to encourage innovation and collaboration among team members. Our hybrid system uses the following:

Team Organisation	Scrum
Task Completion	Sprint Methodology
Time Management	Kanban Flow and Gantt Chart
Financial Management	Estimate Vs. Actual Budget System
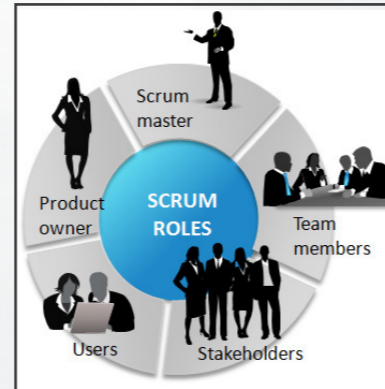
Triple Constraints

We initially considered our scope, time, and finances. These were the areas with the strongest constraints. As they work in tandem with each other, one can't be altered without affecting another. They are the key attributes for successful completion and closure to our project.

Project Scope

From our experiences we learned that a more developed scope would be crucial to our success. Our project's scope sets a clear methodology towards success of our vision. We assessed multiple principles of project management when justifying our scope procurement, goals and deliverables, quality and past experiences. Our scope established each member's responsibilities and set procedures for how completed work will be verified and approved. During the project this allows the project team to remain focused and on task.

Our Vision

To improve our skills personally in our areas of expertise but also to improve them as a team and continuously increase the standard of all workings. To have an understanding of what our roles entail in a fully functional working environment and what it takes to fulfil them.

Overall Team Goal

To represent Ireland to the best of our capabilities and to win the F1 in Schools World Title.

Deliverables

To engineer the fastest car, to perform the most powerful presentation and to boast the most elegant pit display & portfolios. We needed a strategic and rewarding marketing campaign alongside a large sponsor base.

The way we planned to achieve these deliverables was by creating a professional environment and we believe that this will give us the efficacy to overcome our obstacles and exceed expectations as a team.

Project Cost

In determining the cost of our project we estimated the amount of money that would be required to complete it. Cost itself encompasses various things, such as resources, risk estimates, materials. All aspects of the project that have a monetary component are made part of the overall cost structure.

Resource Priority

In order to allocate appropriate resources to all areas of the project, we implemented a priority scale. High, Medium and Low priority areas of the project would be alloacted different amount of resources.

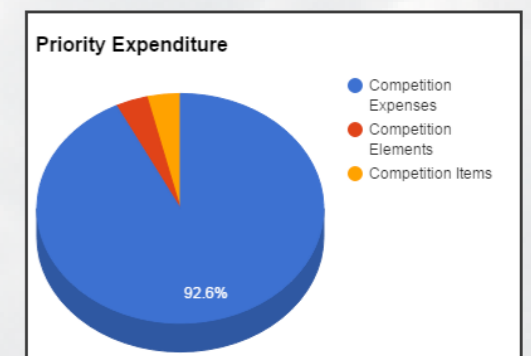| Priority	Project Area	Example
High	Competition Expenses	Flights, Hotel Fees
Medium	Competiton Elements	Car Components, Pit Display
Low	Non Compulsary Project Items	Merchandise, Additional Apparel

Financial Management

Proper financial management is key to a succesful project. We used a comprehensive system to manage our funding in such a manner as to accomplish our goals. The main form of financial management we used was an accurate and effective budget system. We collaborated with a local accounting firm who helped us accurately draw up our estimate versus actual budget as well as income and expenditure accounts.

Item	Estimate	Actual	Difference
Main Sponsorship	€28,900	€20,900	-€8,000 (28%)
Donations	€1,000	€2,250	+€1,250 (125%)
Bagpacking	€4,000	€3,832	-€168 (4%)
Community Raffle	€1,500	€2,250	+€750 (50%)
School Fundraising	€600	€1,100	+€500 (83%)
Total Income	€36,000	€30,332	-€5,668 (16%)
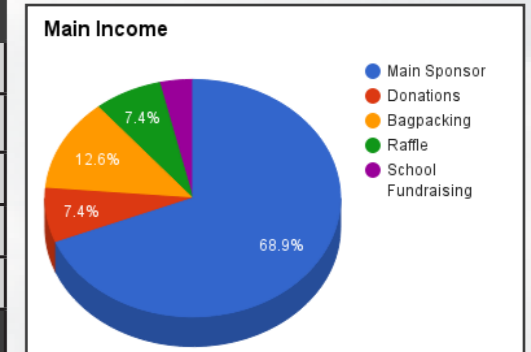
Item	Estimate	Actual	Difference
Competition Expenses	€15,080	€16,454	+€1,374 (9%)
Logistics	€8,500	€5,987	-€2,513 (30%)
Apparel	€840	€793	-€47 (5%)
Pit Display	€2,100	€650	-€1,450 (69%)
Marketing	€1,570	€267	-€1303 (83%)
Car Construction	€3,000	€1,082	-€1,918 (64%)
Development and Testing	€4,750	€157	-€4,593 (96%)
Total Expenditure	€35,840	€25,390	-€10,450 (29%)

Main Income
- Main Sponsor — 68.9%
- Donations — 7.4%
- Bagpacking — 12.6%
- Raffle — 7.4%
- School Fundraising

Priority Expenditure
- Competition Expenses — 92.6%
- Competition Elements
- Competition Items

Funds Allocation

We used the "You Need A Budget" website for managing our income and expenditure. This allowed us to allocate money to areas based on their level of importance to the team. High Priority fees such as flights and accomodation were the main expenditure items with competition elements such as car expenses and pit display taking precedence also.

Project Time

Our project's timeline starts in May and ends in October. However, our project's time is the time we have available to complete tasks and meet deadlines. We established our inital time frame for all elements of our project taking into consideration procedures and constraints.
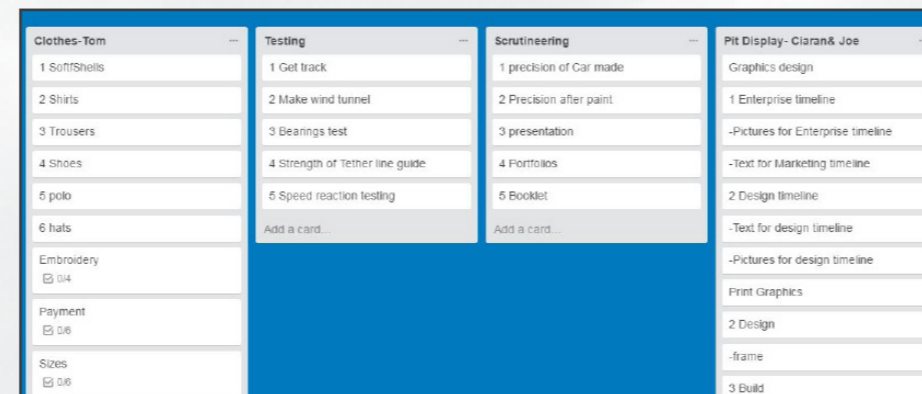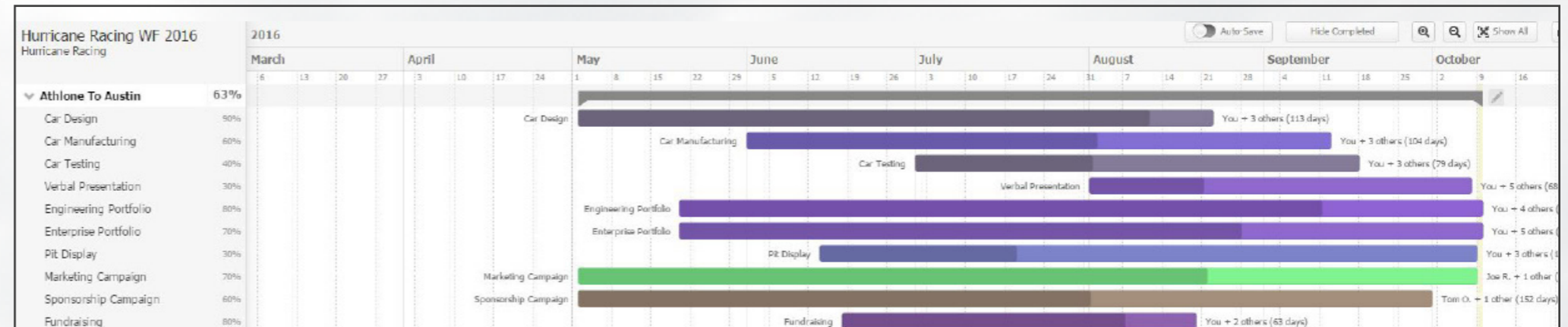
Time Management

Time management is the act or process of planning and exercising conscious control over the amount of time spent on specific activities, especially to increase effectiveness, efficiency or productivity. We developed a project Gantt chart to keep track of our overall project. Our aim was to have a simple visual management system where miscommunication could be eliminated. We also used Kanban Flow diagrams to map out weekly tasks.
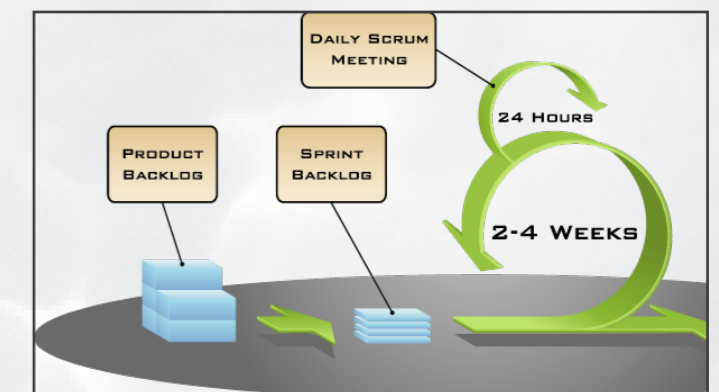
Kanban Flow

Our project management system revolved around task completion. The Kanban Flow diagrams allowed us to visualise our tasks. We adopted a simple and effective "sprint" methodology which categorises tasks for our team's scrums into three main sections.

Sprints	Tasks in the process of being completed
Sprint Backlog	Tasks lined up to be completed next
Release Backlog	All tasks which need to be completed

Gantt Chart

Hurricane Racing WF 2016 — Hurricane Racing — 2016

Athlone To Austin	63%
Car Design	50%
Car Manufacturing	60%
Car Testing	40%
Verbal Presentation	30%
Engineering Portfolio	80%
Enterprise Portfolio	70%
Pit Display	30%
Marketing Campaign	70%
Sponsorship Campaign	60%
Fundraising	80%

Kanban Board

Clothes-Tom
1 SoftiShells
2 Shirts
3 Trousers
4 Shoes
5 polo
6 hats
Embroidery
Payment
Sizes

Testing
1 Get track
2 Make wind tunnel
3 Beanings test
4 Strength of Tether line guide
5 Speed reaction testing
Add a card...

Scrutineering
1 precision of Car made
2 Precision after paint
3 presentation
4 Portfolios
5 Booklet
Add a card...

Pit Display - Ciaran& Joe
Graphics design
1 Enterprise timeline
-Pictures for Enterprise timeline
-Text for Marketing timeline
2 Design timeline
-Text for design timeline
-Pictures for design timeline
Print Graphics
2 Design
-frame
3 Build

Sprints Timeline

DAILY SCRUM MEETING

24 HOURS

PRODUCT BACKLOG

SPRINT BACKLOG

2-4 WEEKS

Risk Identification

We learned when qualifying that if a potential risk was not identified early, there would be a higher possibility that the project would not be within our financial constraints, completed as per schedule and to our targeted standards. When planning our sprints we looked into what tasks needed to be done and we did Strength, Weaknesses, Opportunities and Threats (SWOT) analysis for relevant tasks. This allowed us to identify potential risks.

Risk management

Once our analysis was completed, we classified the risks into different categories. Then we put a process in place to mitigate the effects of the potential risk.
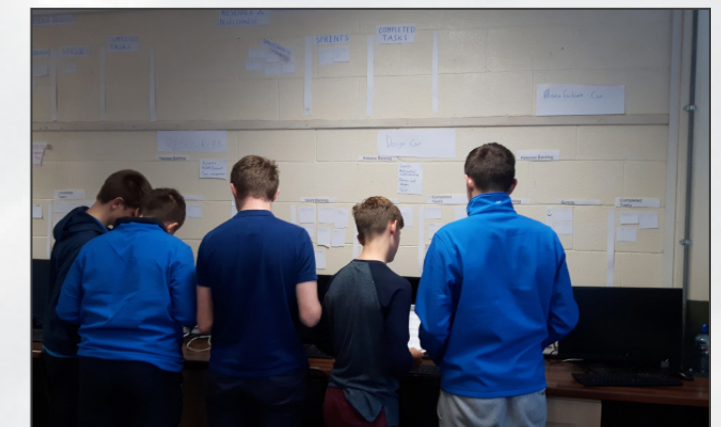
Plan Changes

We realised in week 21 that our pit display was going to be too expensive to manufacture and transport by courier. We engineered the pit display so that it could fit into a flight case which we transported with us. Our sponsorship plan was re-evaluated in July and we dedicated more time to our sponsorship campaign..

Communications

We used Facebook Messenger to contact each other and we used Google Drive to store documents. The most productive way of communication was face-to-face interaction and this method was used to make all the important decisions.

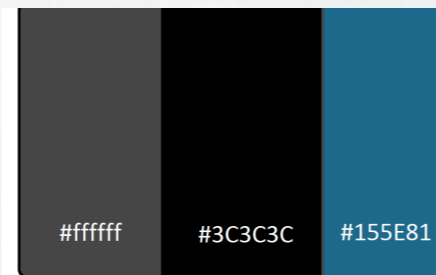| Item	Risk	Solution
Schedule	Delay in Dependable Items	Flexi Time Allocation
Procedure	Unexpected change in a high priority task	Additional resources to the task area
Project Management	Project elements needing resources at the same time	Prioritisation of tasks
Human Resources	Lack in expertise in crucial software or conflict within team	More time alloted to areas where expertise lacked
Partnership Risk	Delay in car component manufacturingr	Implementation of a "Plan B" partner e.g. LIT for manufacturing chasis

What is Team Identity?

The team identity is the image showcased by the team throughout all areas of the competition. We decided that having a consistent and effective team brand would be key to building our team profile. We followed the C.S.I guide to make sure our team identity showed professionalism and that our image was a success.

- Consistent
- Simple
- Innovative

Innovative Slogan

We wanted to come up with a catchy slogan and theme for identity. We came up with the slogan "Athlone to Austin". This slogan was used on our displays and brochures. It left people with something to remember us by and also reminded them of our journey

Branded Colour Scheme

Establishing team colours was a main focus of our team identity campaign. Once established we could design everything from our uniforms to the car itself based on these colours. We wanted to incorporate our school colours as well as the hurricane theme. Therefore we decided on a black, dark blue and stormy grey professional colour scheme. Our colours blended well together and subtly enhanced the viewer's experience.

#ffffff   #3C3C3C   #155E81

Team Website

The Hurricane Racing website acted as the hub for all sources of information about the team. We designed the website ourselves using ".php code" and made it to accurately represent our team.

Six students from the Marist College, Athlone will represent Ireland at the 'F1 in Schools' world finals in only 17 days.

Ireland's Winning F1 Team in 2016

Team Name

We wanted our name to be memorable and also to summarise our car's focus, which is speed and power. We pondered over many names before settling on "Hurricane Racing". The team felt this name encapsulated what we set out to do as a group, which was to create a car that is both fast and powerful.

Team Apparel

Our team apparel's focus was to incorporate the team identity while also advertising our sponsors. We decided to break up our apparel into three categories: Promotional, Competition, and Casual.

Promotional Uniform

- Blue Softshell Jacket
- Grey Trousers
- Black Casual Shoes

Team Logo

We wanted the logo to be professional so that people could associate it with our team brand. The logo contained our team name and hurricane image. We also incorporated an F1 car's rotary engine into our logo. Our logo was updated after the National Finals to add our Irish heritage as well as the chequered flag to symbolise that we are nearly at the finish line!

Competition Uniform

- White Shirt with Sponsors
- Grey Trousers
- Navy Suede Shoes

Car Model

At the heart of this competition is the car. We knew that our car would be a very visible part of our team and would need to be consistent with our brand. The car was given a sleek grey finish with our Hurricane Racing Blue racing stripe. This kept the car in line with our identity and made it easily recognizable as our car.

Casual Uniform

- Long-Sleeve Grey Top
- Navy T-Shirt
- Casual Shorts
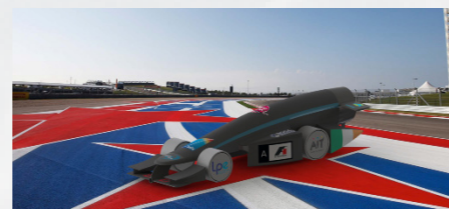
Pit Display

Our Pit Display allowed us to showcase our all our work and needed to be easily associated with our team and our identity. To do this we incorporated our team colours and branding across the pit. We did this in a simplistic yet effective manner which still allowed us to show our work effectively.

Evaluation

We have established a good team identity. We aimed to keep our identity simple, consistent, and innovative, and we are very happy with the team image that we have formed. Throughout the course of the project we consistently applied our identity in a professional manner that greatly boosted the recognition of our team, along with team morale.

Sponsorship

Sponsroship is the lifeblood of our team. Securing worthwhile sponsorship is what enables us to work to a high standard. We began our campaign by devising a sponsor tier/hierarchy where we developed sponsorship packages at different price ranges. Sponsor return on investment corresponded to sponsor investment teirs. These were.

Sponsorship Tiers

Diamond → **Gold** → **Silver** → **Bronze**

Sponsor Acquisition

We employed a simple yet, highly effective, two step sponsor acquisition method. We began by creating initial contact with our sponsor and we learned from experience that being persistant at this step is key, i.e. more than one method of contact. Once we had reached out to our sponsor, we arranged a formal presentation where we could fully explain the project, our proposed partnership and answer any questions. Through this two step method we were able to show professionalism and educate our sponsors fully on our project.

Key Sponsors

EDS.ie

EDS (Environment Design & Simulation) reached out to our team after we appeared in an online Irish engineering blog (Techweek). They took a keen interest in us as a team, and helped us throughout the competition in many aspects of the project. These areas included financial sponsorship, aerodynamic research, CFD analysis, marketing activities and presentation scrutineering. Their CSR focus is promoting engineering to teenagers and they plan to do so through the promotion of F1 in Schools.

Athlone Chambers

Athlone Chambers is a group that aims at promoting business and innovation in our hometown of Athlone. We employed our two step sponsor acquistion when appoaching them and made a lasting impression. Not only did they become a sponsor of the team, but they promoted us through their local business networks. They helped us in our sponsorship campaign by providing expert advice regarding negotiation and presentation alongside sharing their knowledge of the business world with us.

Collaborations

Collaboration with relevant and worthwhile organisations was a key element of all aspects of our project. It allowed us to develop skills and knowledge in many areas from companies with the relevant expertise. This ensured that our project was of a higher quality and furthered our learning in some specific areas of the program.

Athlone Institute of Technology

The Athlone Institute of Technology (AIT) is a higher education college in our local area. We have collaborated with the college from the start and made ood use oftheir state-of-the-art 3D printing Machines. They demonstrated the machines and trained us to use them by ourselves. This partnership enabled us to have very high quality SLA parts printed throughout the competition with little wait time.

The Marketing Department

The marketing department is another local company. that specialises in advertising businesses and making sure they get as much brand exposure as possible. We collaborated with them to allow us to gain information of the marketing world and to learn how a business effectively markets their brand.

Limerick Institute of Technology

The Limerick Institute of Technology (LIT) is a similar establishment to AIT, yet is commonly known for their expertise in CAM and related software. CAM is a big part of the competition and we wanted to know it inside out. This partnership gave us the opportunity to learn CAM, which we took full advantage of.

Takumi Precision Engineering

Takumi Precision Engineering is a leading precision component manufacturing partner. We partnered with Takumi to manufacture our car body using their state of the art CNC Machines. This collaboration allowed us to become knowledgeable in the use of these machines, and after our time with Takumi, the Manufacturing Engineer on our team is fully capable of operating a CNC Machine by himself.

LPE

LPE is an industry leader in rapid prototyping and 3D printing. We worked with them to manufacture our world finals car components using their SLA 3D printing machinery. We collaborated with them when AIT's SLA printer was under maintenenance and we needed parts. Our "Plan B" collaboration strategy proved very rewarding as they manufactured our parts to a very high quality finish.
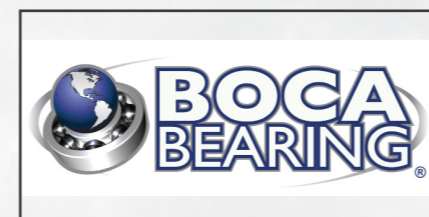
Boca Bearings

Boca Bearings are a longtime supporter of the competition and of our team. We've partnered with them since the Regional Finals and their expertise has been invaluable. Thanks to this partnership we have always had the bearings for our car which allows it to perform at the best level possible.

Innovatove Marketing Activities

Chalk Marketing

Decalled Bus

7 days of Bagpacking

Community Raffle

Marketing Strategy

Our marketing strategy focused on three things, our team, our sponsors and F1 in Schools. We wanted to market our team professionally across all media platforms and provide our sponsors with a unique return on investment. We realised that after winning the National Stage of the comeptition, we became ambassadors of the comeptition and our country and had to represent it accordingly.

Online Presence

In this day and age,an online presence is crucialfor exposure and in our case sponsorship. We set up a strong social media base with facebook, twitter and instagram, a professional yet informative website and featured in online blogs and articles. We associated ourselves with motorsport and celebtrites such as Eddie Jordan and Irish rugby international, Robbie Henshaw.

F1 in Schools Program Marketing

Marketing of the competition became a key focus of our campaign after we won the National Finals. F1 in Schools has provided us with an experience that no competition ever could replicate and we wanted to get this across to our target audience.

Visiting local schools

We presented the car at numerous primary schools. These were students between the ages of 8-13 and we wanted to inspire them to pursue engineering and take part in F1 in Schools. We displayed the car and trophies and we noticed a large interest in the competition and Formula 1 itself.

Presentations in our school

We presented to all classes in our school and also ran race demonstrations in school using our track. One of our key presentations was with the Third Year and Transition Year Students. We talked with these students about the competition and all the great benefits that arise from being involved in such a project.

Motorsport - F1 in Schools

We wanted to establish a link between F1 in Schools and Irish motorsport. We acted as a pit crew at the Irish Karting Championships in Pallas Karting and the Irish F4 Championships at Mondello Park. At these events, we setup a stand and engaged directly with drivers, fans and motorsport enthusiats.

Sponsor Return on Investment (ROI)

The cornerstone of our campaign revolved around displaying our sponsors. We wanted to make sure that sponsorship wasn't seen as a one sided relationship, i.e. they had a substantial return on investment. We provided ROI in three main ways, advertising, physical benefits, and worthwhile experiences.

Advertising

Through our partnership with local radio stations and newsagencies, we were able to advertise our sponsors locally through press releases and interviews. Our signs were an effective way of showcasing our sponsors and their link to our team. As well as this, our main sponsors featured on our decaled bus. These two media of advertsing would normally cost a large amount of resources to obtain, yet through our partnerships, we could provide our sponsors with this unique form of ROI. As well as the above, we used our online presence to advertise our sponsors through our social media platforms, our website, and technology blogs and articles.

Physical Benefits

As an initial goodwill gesture we gifted our sponsors with our personal "Hurricane Hampers". This was a gift basket which contained a variety of team merchandise including pens, notepads, mouse pads, etc. It also contained a handwritten thank you letter signed by the team. We also wanted our sponsors to feel directly involved in the process of building a car. We presented 3D printed parts of our car to our sponsors, including our front wings and rear wings. Our main sponsors also received an aluminium model of our World Finals car. Finally we gave them a signed photo with the team for their business.

Worthwhile Experiences

Finally, we provided worthwhile experiences for our sponsors. As we mentioned above, taking our sponsors to see the Boss F1 championships in Mondello Park. We held an open night where we showcased our team and our sponsors. We made ourselves available to sponsor-organised events such as product launches and promotional activities.

Pit Display Concepts

With the freedom of the space provided, our team imagined numerous pit display design concepts. We saw that the pit could be divided into two main sections, the backdrop and the centrepiece.
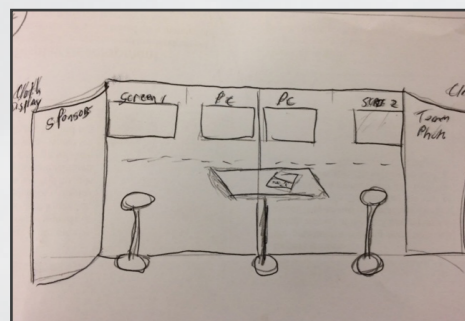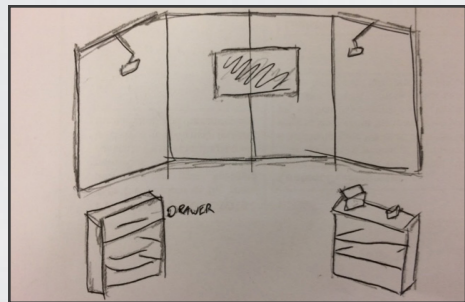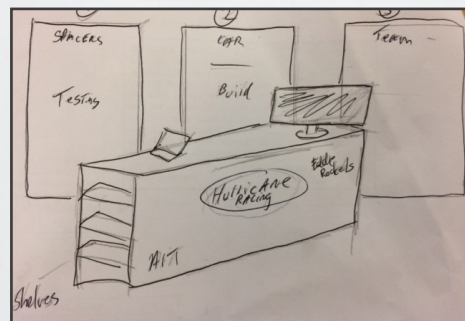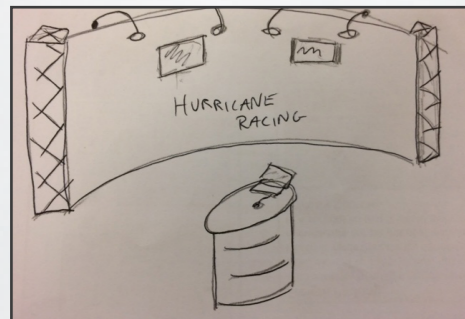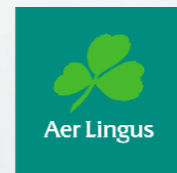
Content Development

At our National Finals, we clustered our pit display with an excessive amount of information that made it hard to navigate. We asked ourselves "What do you want to learn about the team when you view their pit?" and from this question we developed our content plan. Our content consists of our design process, marketing timeline, team profile, and a car

Functionality

Overall functionality of our pit was a key factor in how we designed our pit display. We opted for a monitor, laptop and tablet technology display, to add an interactive feel to our pit display. We also manufactured the centrepiece of our pit to allow for storage space inside where we could store our flight case and put valuable items.
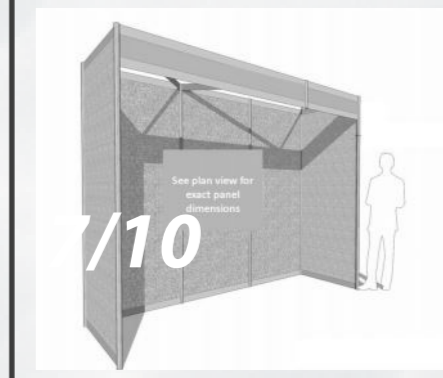
Expert Advice

We organised a meeting with team AIB racing, winners of the 2015 best pit display award. They advised us to purchase a display screen in Austin. This reduced the cost of transporting a monitor, and also took into consideration the 120 voltage in USA as opposed to the 230 voltage in Ireland.

Logistics

Rather than paying thousands to transfer our pit display with a courier, we decided to design our pit so that it could be transported on a commercial flight.

€3000 vs €75

Pit Display Development

With our concepts finalised, we moved forward to a development stage where we shaped our pit based of a number of factors which would shape the apperance of the pit.

Time Constraints

Instead of using a backdrop for our pit, we printed roll up posters accompanied with velcro strips to secure it to the backdrop provided.

Freight Packing

With our innovative flight case transport plan, we had to consider how our pit would fit inside the case. We decided to manufacture our pit out of aluminium in 4 sections so that it would easily fit inside the flight case.

Stability

Through the experience at our National Finals, we realised pit stability is a huge factor when designing our pit. We therefore used multiple aluminum posts to support our pit which easily slotted into the table top. This improved the overall strength of our pit display.

Team Identity

Our team identity sets us apart from other teams. We wanted to keep the "Hurricane" identity and we did so by having a storm cloud backdrop throughout our pit. We also put an overhead banner with our team colours along with our national identity of the Irish flag. The chequered flag was also added to our back three posters.

Pit Display Manufacturing

We partnered with two companies who helped with the manufacturing and printing of the pit display. We worked with Spectrum Signs who printed our pit display posters and Kennedy Commercial who manufactured our pit.

Aluminium Cutting

To fit our centrepiece inside our flight case, we had to manufacture our pit to fit. This would require us to keep all our parts less than 1390mm in length. We therefore had to make the stand from six parts rather than four as we had initially hoped to do. We used a hydraulic guillotine to cut the pieces out of 2mm aluminium plate.

Curve Shaping and Welding

The aluminium plate was then formed into the final shape using a hydraulic press. End plates were welded into each part using a specially adapted MIG welder. The curve on the front of the stand was formed using a Plasma cutter and this was spot welded in place on the front.

Support Legs

All parts on the top of the stand were joined together using 8mm nuts and bolts. A sequence of square sockets were welded to the underside of the platform. The legs were formed to slot into these sockets. The legs at the front of the platform were also used to support the lower display posters.

Pit Assembley Process

When assembling our pit, we needed to establish a set procedure as to how to effectively use our time when setting up the pit. The process involves 3 main steps with each member of the team working on their designated role until they are ready to assemble all components together.

Posters → Centre Piece → Electronics → Finishing

Pit Display Assembly Teams

Having an organised plan when assembling our pit is key to efficiency and accuracy during the two hour assembley period. We began by establishing different roles when setting up the pit display so that each team member could equally contribute and have set tasks when assembling our display.

Supervision
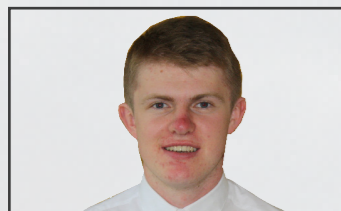
Cian ensured our display was assembled safely and in line with the marking scheme.
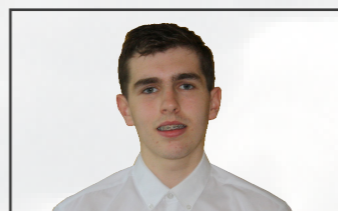
Centrepiece

Ciaran and Tom worked as a team to build our centrepiece with support legs and wing nuts.

Posters

Joe and Jamie were in charge of setting up our posters on the backdrop and on the centrepiece.

Electronics

Darren made sure all electronics were fully operational and wired our pit display correctly.

Hydraulic Guillotine

Hydraulic Press

Support Legs

Pit Design Design Evaluation

Our final pit display design is the product of creative concepts and justified developments. It fully utilises the space allocated to our team and is designed to be innovatively resourceful, multi-functional, and stimulating for the viewer. Through each stage of the competition, our design has been reimagined and developed to improve our pit display.

Regional Finals

National Finals

World Finals

"Begin With The End in Mind" -- Stephen Covey

To evaluate our project we used the logic model of evaluation. This method allowed us to breakdown our entire project into four simple areas that we could easily evaluate and then improve. The four areas of the model are inputs, activities, outputs and results.

Why we Evaluate?

The purpose of evaluation is to guide, to be accountable, to see what works best, and to improve. Evaluation is important as it allows you to identify areas that can be improved at an early stage which then improves the overall quality of the project.

Inputs

The inputs of our project are the resources that we use to complete our project. These resources include funding, project time , expertise, partnerships, technology, and the most important resource, our team.

Funding	Project Time
Expertise	Technology
Partnerships	Team

Activities

The activities of our project include all the tasks and process we undertook and implemented. These activites were divded into two main sections, project tasks and resource management.

Car Design	Car Manufacture
Project Management	Fundraising
Marketing	Graphic Design

Outputs

The project outputs are all project entities that we actually produced. They are the result of all activites we undetook as outlined in our project management software.

4 Cars	€30,332
Business Networks	Portfolios
Pit Display	Sponsors

Results

The results of the project can be summarised as what is the overall end product of the project ie. what we got out of the project. They generally consist of what we learnt from the project and the team.

Well Functioning Team	Career Choices
Increased Skills	Partnership Management
Presentation Confidence	Community Impact

"If You Define The Problem Correctly, You Almost Have The Solution" -- Steve Jobs

We evaluated each area of the project and when we found problems, we were able to find a solution through critical thinking and understanding the problem.

Teamwork

Problem

At the beginning of our season there was conflict between all team members on how we should go about doing the project and roles on the team. This lead to miscommunication and a drop in the standard of work.

Solution

The development of our project management system solved this problem almost immediately. Our hybrid system allowed all team members to work on all areas of the project as a unit rather then as individuals.

Time Management

Problem

During the manufacturing of our car, we quickly realised we had not allowed time for the shipment of parts and our manufacturing partner's wait time on parts. This led to delayed development in our overall car.

Solution

We allocated more time to the manufacturing of our competition car. We also secured a "Plan B" partnership. When one of our partners had complications with manufacturing our parts, we always had a backup.

Sponsorship

Problem

During July, we were underbudget and were finding it difficult to acquire worthwhile sponsorship as they had already decided their sponsor organisations and alloacted their funding to sponsorship for the year.

Solution

In Irish business, networking is extremley important and cold calling a business is not effective. We developed a network board where we listed all of our current contacts and mapped them to businesses that they had connections to.

Financial Management

Problem

We had not anticipated to be under budegt in July due to the lack of funding from worthwhile sponsorship. This lead to a delay in crucial parts and materials being ordered.

Solution

We re-evaluated our entire budget at the beginning of July. The biggest change was in our pit display where we cut expenditure by nearly 90% through simple ideas of outsourcing manufacturing and shipping via a flight case.

€3000	vs	€75

Team Evaluation

As well as continously evaluating each area of the project, we each conducted individual evaluations into what we were getting out of the project. By doing this, we were able to take a step back and reflect and learn from our experiences.

Darren O'Hara Duggan - Design Engineer
F1 in Schools has inspired me to become an engineer. Before this competition began, I had no experience with CAD software and no exposure to engineering careers. Working with my team in an engineering setting and working with EDS.ie and CADFEM exposed me to what a career in engineering entails. Though there were many ups and downs, I thoroughly enjoyed working with the team throughout the project.

Jamie McManus - Marketing Manager
I loved working directly with businesses and gaining experience into how Irish businesses function. When we came together as a team in September 2015, I had no idea what career I wanted to pusue later in life. I now know that I want to study business in college and work where I can use the marketing and negotiation skills gained throughout this competition.

Tom O'Carroll - Resource Manager
I am studying accounting and financial mathematics in school, and this competition has allowed me to apply these skills in a real life setting. Working with Hardiman Accountants was a fantastic experience and I enjoyed working with the team in raising funds and figuring out how we were to complete this seemingly impossible task of raising enough funds.

Cian McBrearty - Project Manager
The most valuable part of this project was the way it gave us the opportunity to work alongside engineering firms and businesses. At the commencement of the project, I had little practical knowledge in engineering and business but I had an interest in running a company. As project manager I worked on all elements alongside the firms we collaborated with and I adopted their ways of working to create a professional environment for us to work in. From working on our project I am certain that F1 is a path that I would be lucky to persue.

Ciaran McDermott - Manufacturing Engineer
Before we set out in this competition, I had little idea of what was involved in manufacturing our car. We began with the goal of becoming experts in the field of precision manufacturing. In our collaboration with Limerick and Athlone Institute of Technology and Takumi Precision it was not long before our goal was met. I am now confident in using manufacturing programs and machinery and look forward to a career in mechanical engineering.

Joe Reidy - Graphic Designer
Until now, I wasn't comfortable with presenting in front of groups of people and I have gained invaluable presenting skills. I also had never used graphic design software before this competition and I am now fully versed in Adobe Photoshop and InDesign. I will explore graphic design and computer programming as a possible career.

Sponsorship and Partnership Evaluation
Throughout our 2015/16 season, we worked with multiple businesses, companies, and industries. Without the support of our sponsors and partners, we would not of been able to achieve what we have. We would like to thank all of our sponsors and partenrs for their continued support throughout the season.