

THIES GÜNTHER
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DESIGN DEVELOPMENT OF A RIGID WING SAIL

MEMBERS



TEAM 5



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PROBLEM - OBJECTIVE



The difficulty for sailboats to navigate without human presence on board



Design a wing sail that allows a sailboat to navigate autonomously



Develop a low cost rigid wing sail

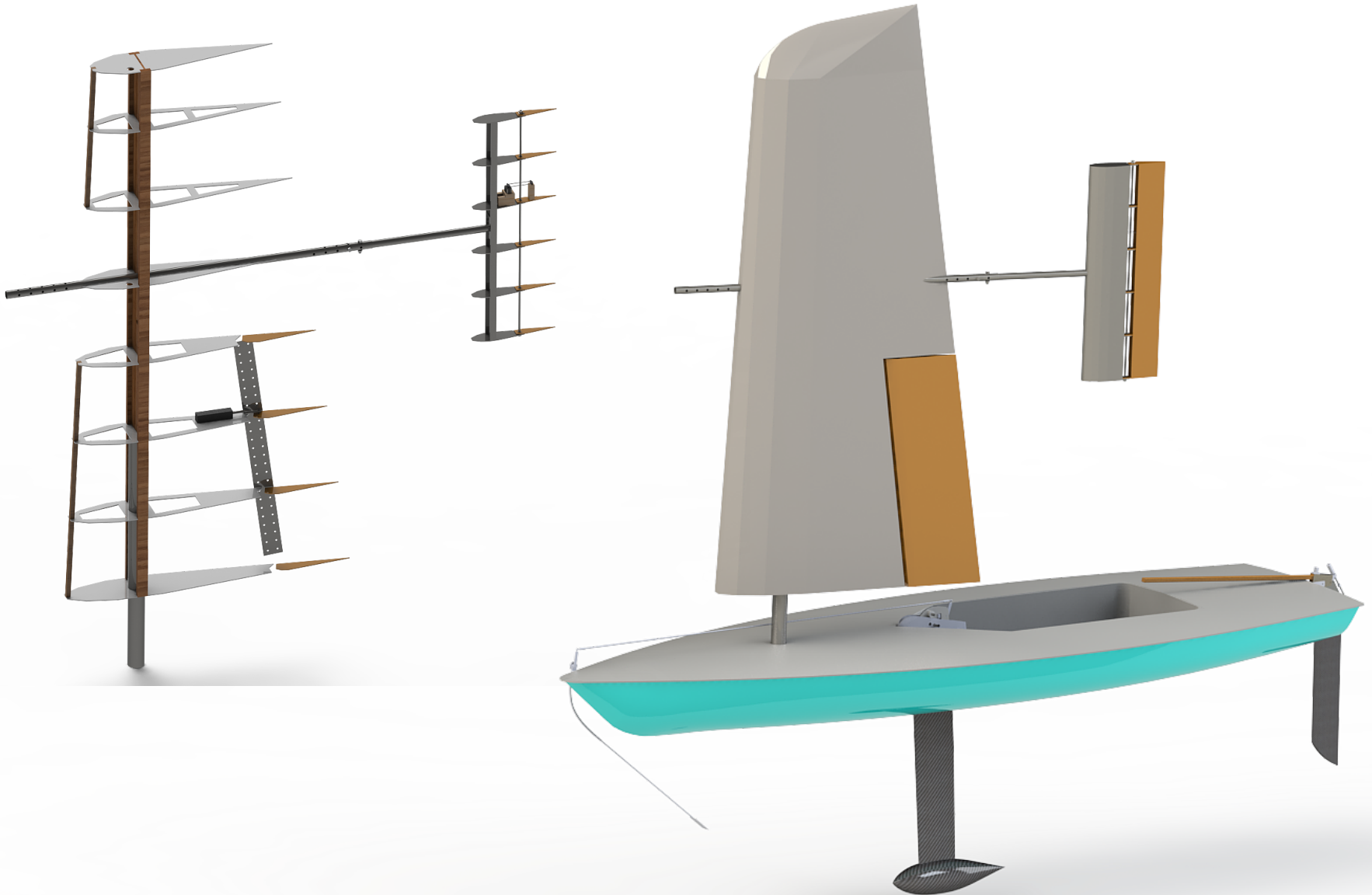


Obtain an environmentally friendly design

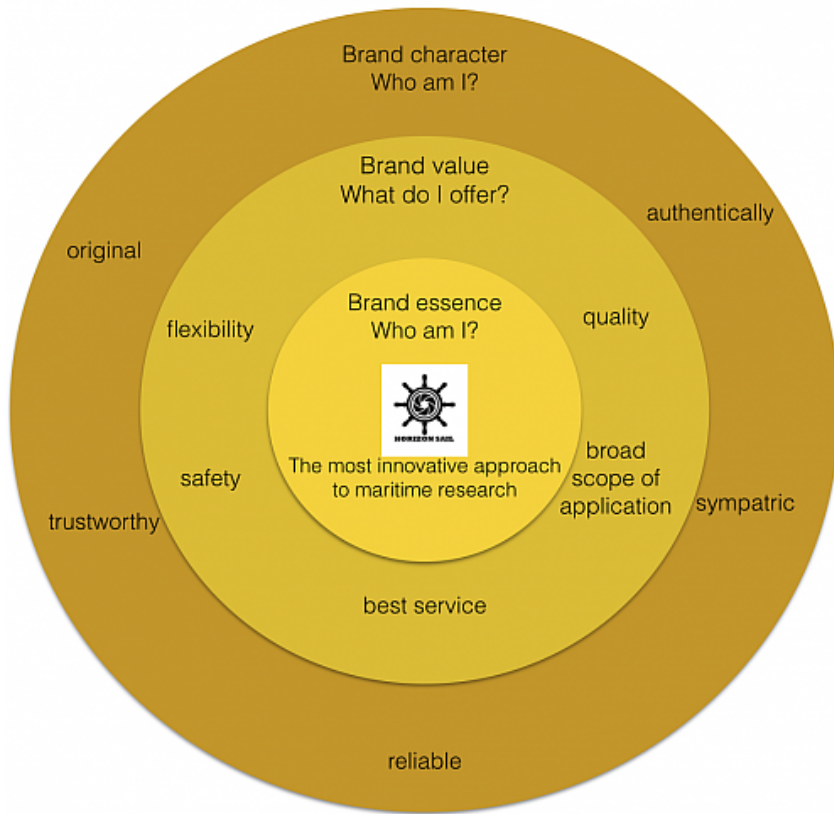


Find a solution for the power supply

PRODUCT



MARKETING



PRODUCT DIFFERENTIATION

NAVIGABLE

AUTONOMOUS

MODULAR ADJUSTABLE

SERVICE DIFFERENTIATION

MAINTENANCE

RECYCLING

TRAINING / SEMINARS

IMAGE DIFFERENTIATION

SUSTAINABILITY

LOGO AND SLOGAN

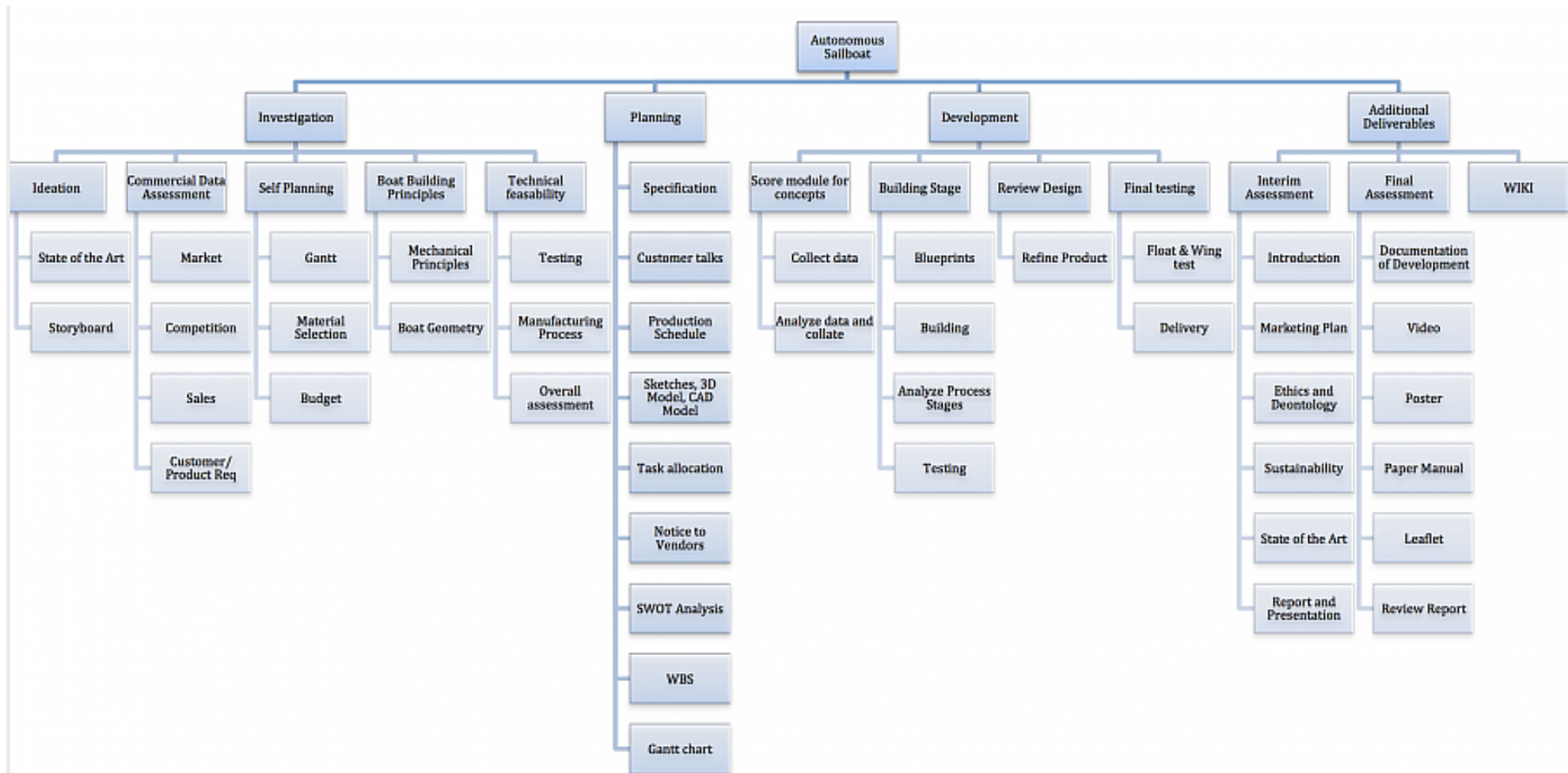
PEOPLE DIFFERENTIATION

TRAINING / SEMINARS

LOCAL COMMITMENT

FAMILY FRIENDLY
COMPANY

PROJECT MANAGEMENT



PROJECT MANAGEMENT



HORIZON SAIL

Ressource Name	Work	Details	March	April	May	June
Roberto	300hrs	Work	80h	100h	80h	40h
		Cost	€400,00	€500,00	€400,00	€200,00
Marc	300hrs	Work	80h	100h	80h	40h
		Cost	€400,00	€500,00	€400,00	€200,00
Jonny	300hrs	Work	80h	100h	80h	40h
		Cost	€400,00	€500,00	€400,00	€200,00
Imre	300hrs	Work	80h	100h	80h	40h
		Cost	€400,00	€500,00	€400,00	€200,00
Thies	300hrs	Work	80h	100h	80h	40h
		Cost	€400,00	€500,00	€400,00	€200,00

Part	Material	Quantity	Weight /unit (kg)	Total weight (kg)	Total weight utilized (kg)	Price/unit (€)	Total Price (€)	Supplier
Mast	Stainless Steel (316L) (Tubo Inox Milimétrico)	1 Cylinder (1000x70x3)	5.033	5.033	5.033	5.00	5.00	Tubinox
1 Beam Spars / Lateral Union	Wood (Pinho)	6 Strips (2400x18x18)	0.13	0.78	0.65	3.39	20.34	AKI
Stabiliser 1 Beam Spars	Ripa Aplainada	1 Strips (2400x12x12)	0.13	0.13	0.1	1.79	1.79	Leroy Merlin
Ribs (Main Wing 8 & Stabilizer 4)	Maritime Plywood B/ BB C3 (4mm)	1 Plate (12 ribs) (3100x1530 x4)	11.19	11.19	2	66.67	66.67	Madeivouga
Wing Jib, skin & stabilizer cover	Maritime Plywood B/ BB C3 (4mm)	2 Plates (3100x1530 x4)	11.19	22.38	6	66.67	133.33	Madeivouga
Extra Wing Coverage	Balsa 2mm	50 Plates (1000x100x2)	32	1.6	1.6	1.69	84.50	Leroy Merlin
Hinge	Stainless Steel	Dobradica Piana Inox (1000mm) x2	-	-	-	6.92	13.84	Leroy Merlin
Stabilizer bar (1)	Stainless Steel (316L)	1 Cylinder (1500x30x1.5)	1.070	1.605	1.2	7.50	15.00	Tubinox
Stabilizer bar (2)	Stainless Steel (316L)	1 Cylinder (1500x33x1.5)	1.183	1.775	0.8	7.50	15.00	Tubinox
Stabilizer Flange	iglide® G – Flange Bearing	12 (No: GFM-0810-050)	-	-	-	2.69	32.28	IGUS

Part	Material	Quantity	Weight /unit (kg)	Total weight (kg)	Total weight utilized (kg)	Price/unit (€)	Total Price (€)	Supplier
Mast Flange	iglide® H370 – Flange Bearing	2 (No: H370FM-70 75-50)	-	-	-	20.74	41.48	IGUS
Mould	MDF	2 Pieces (2440x1220 x19)	-	-	-	30.99	61.98	Leroy Merlin
Glue	Sikaflex 292(Polyurethane)	3 Packs	-	-	-	23.00	69.00	Vitorinox
Electric Linear Actuator EPCO [122]	w/ Stroke ?? & Force ??	1	?	?	??	??	??	Festo
Battery	Ultracell UL 5AH – 12V	1 (90x70x107)	1.62	1.62	1.62	15.00	15.00	Castro Electronica
Wind Sensor	Airmar PB200 Station Raymarine	1	-	-	-	1409.00	1409.00	Loja Top Barcos
Servomotor	HS-5646WP Waterproof Servo (12.9 kg Torque)	1 (41.8 x 21x 40)	61	61	61	70.00	70.00	Hitec Multiplex
Navigation Light	Tricolour Light (M: 1LAZ30429)	1 (125x170x44)	-	-	-	34.98	34.98	Mundo da Nautica
Cable	Copper Wire	1 (8000x5)	-	-	-	9.99	9.99	Leroy Merlin
Cable Duct	PVC Cylinder	1 (3000x32x1)	-	-	-	1.99	5.97	Leroy Merlin
Epoxy Paint	Titan Epoxy Paint	Primario Epoxy x1	-	-	-	23.29	23.29	Leroy Merlin
Polyurethane Paint	Titan Polyurethane Paint	Verniz Marinho Tinta Yate x1	-	-	-	32.99	32.99	Leroy Merlin
Table Support for Manufacture	Cavalete Madeira 73	Supports x3	-	-	-	3.49	10.47	Leroy Merlin
Glue Protection Layer	Rolo Filme Protetor	1 Roll	-	-	-	6.99	6.99	Leroy Merlin
Total	-	-	-	-	≈ 18.1 kg	-	€ ???	

ETHICS



GENERAL CODE OF CONDUCT

SALES AND MARKETING

ENVIRONMENTAL

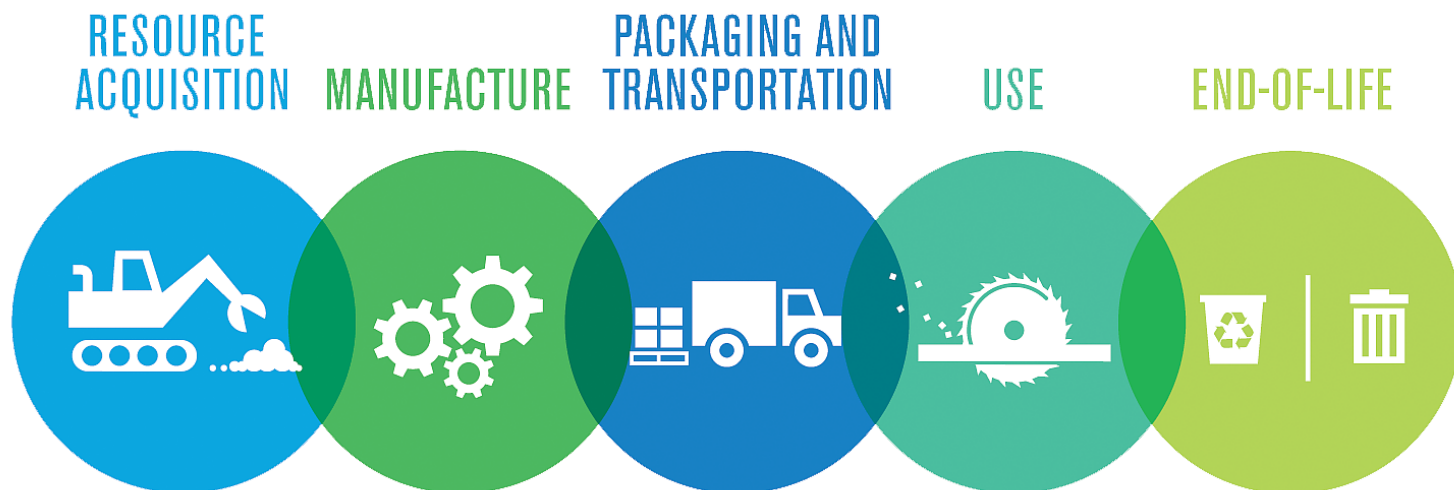
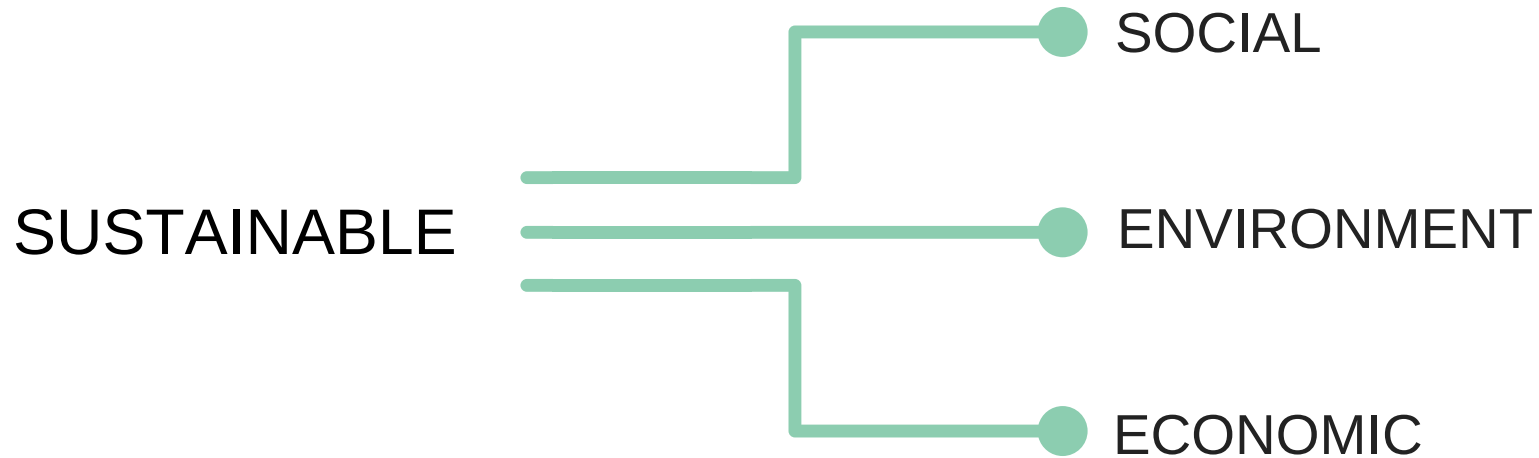
ACADEMIC

ENGINEERING

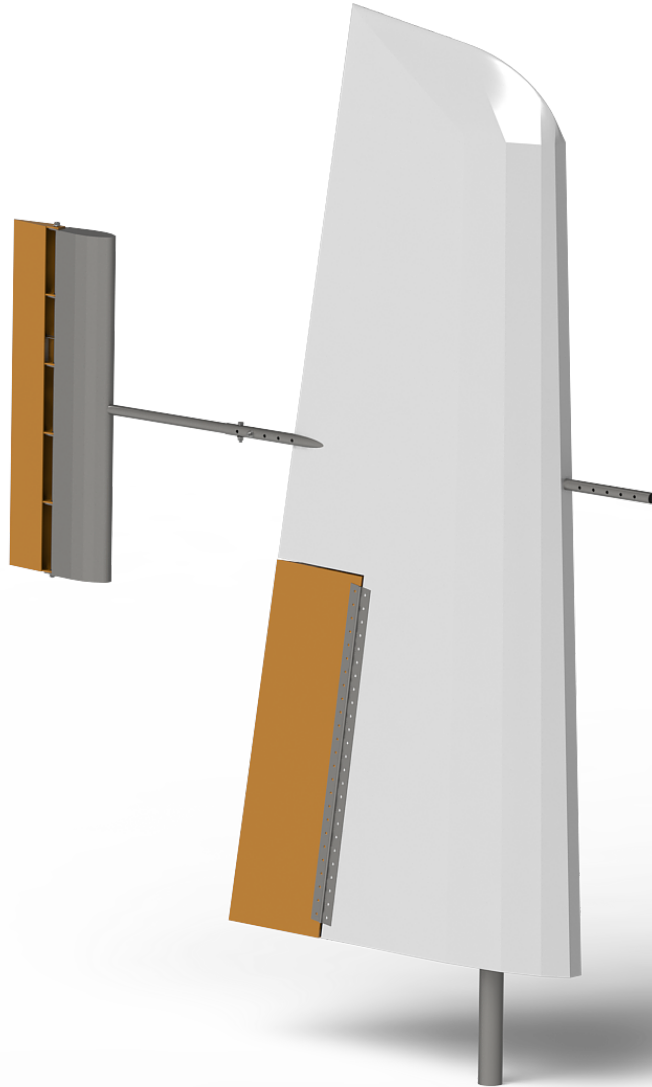
LIABILITY



SUSTAINABILITY



DESIGN



CONTROLLED FLAPS



EFFICIENT ENERGY SOURCE
OF LOCOMOTION



WATERPROOF MATERIALS



ADAPTABLE CONTROL UNIT

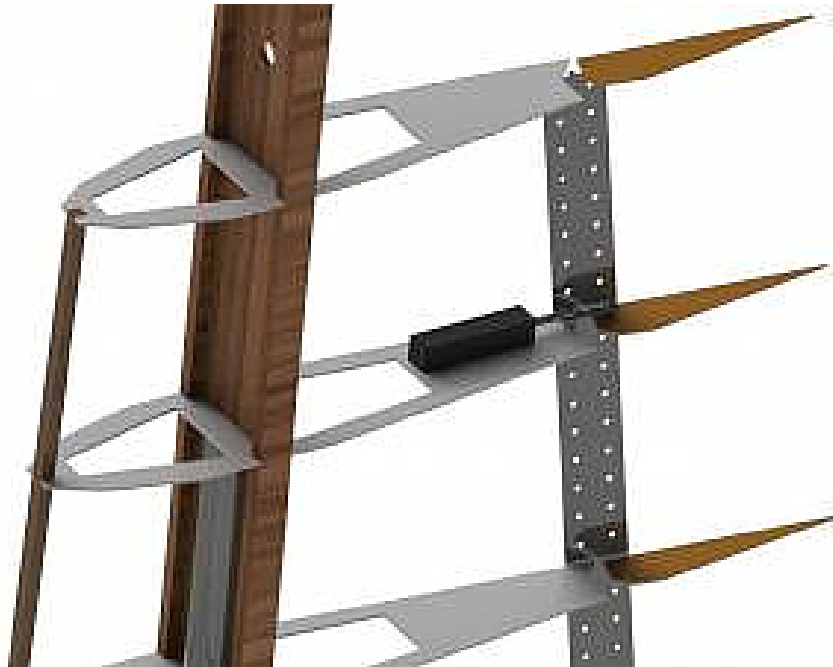
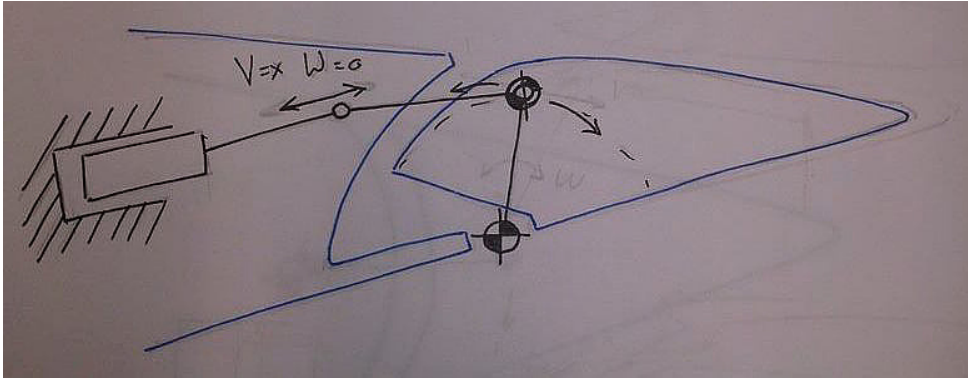


UNATTENDED CONTROL

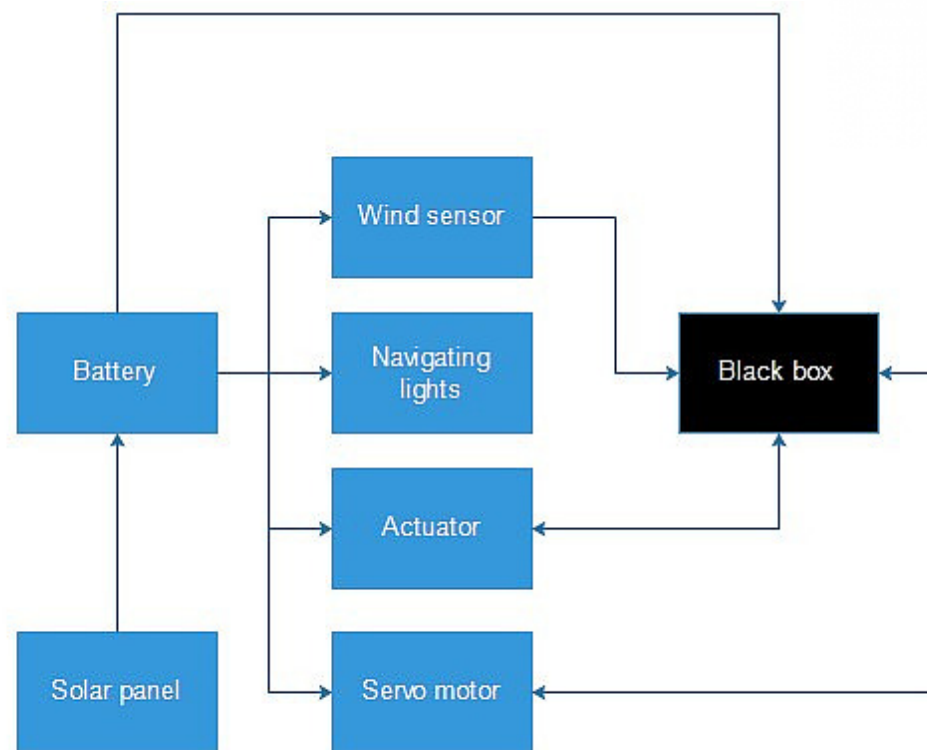


EASY MAINTENANCE

CONTROLS



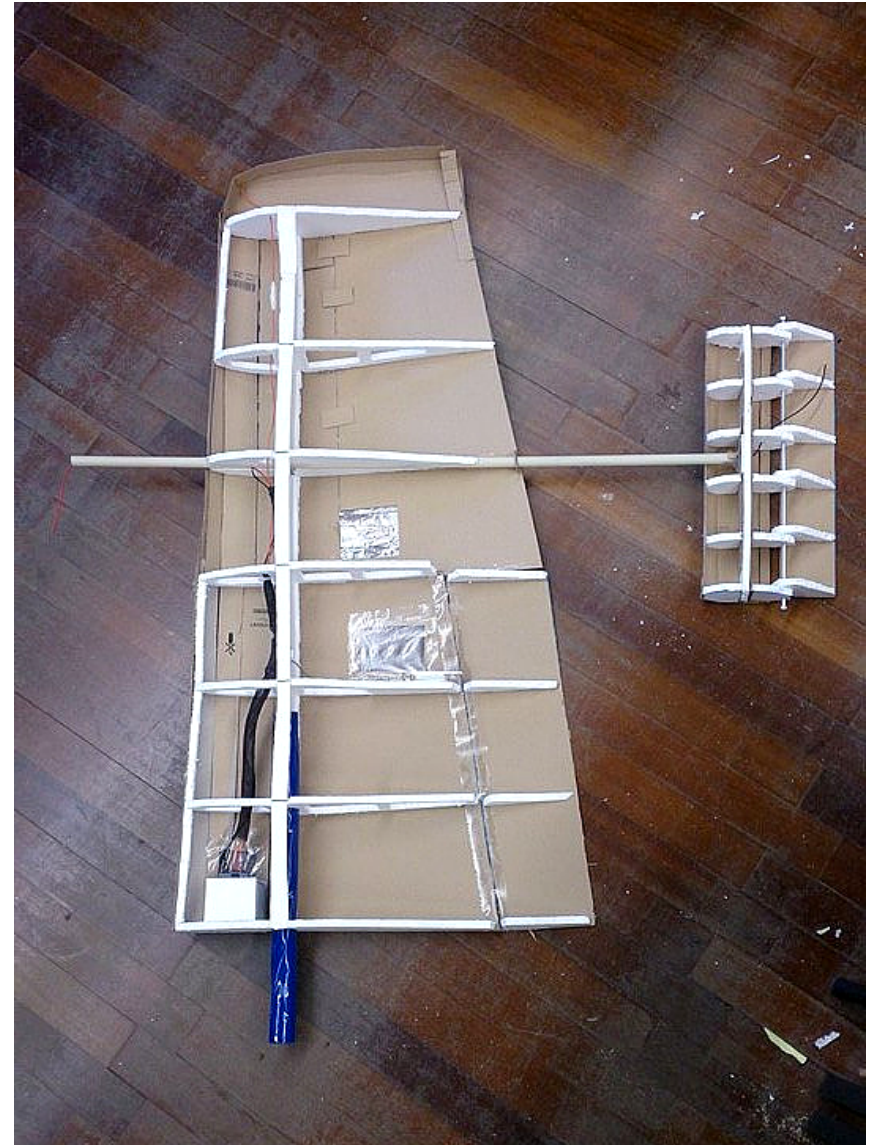
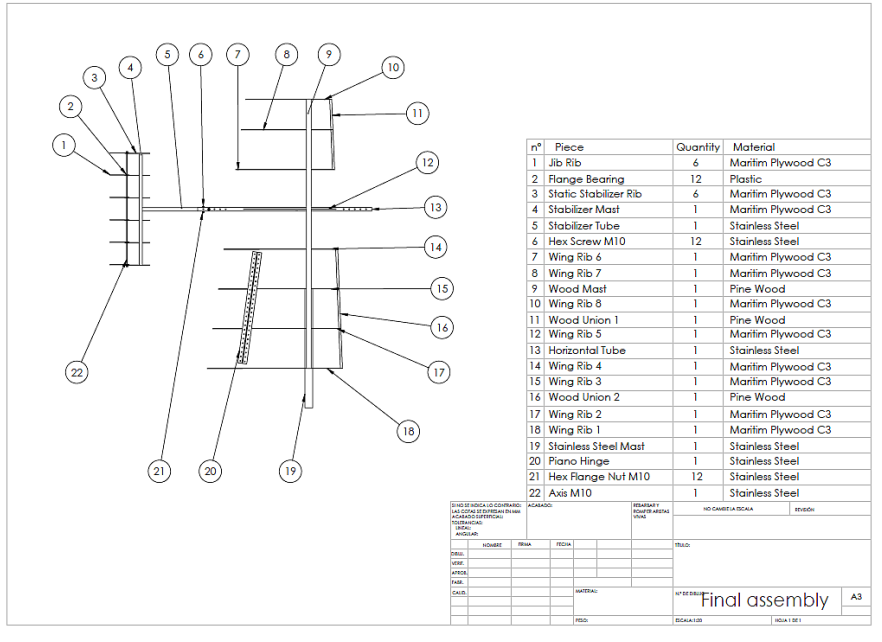
ELECTRONIC DEVICES



DEVELOPMENT



HORIZON SAIL

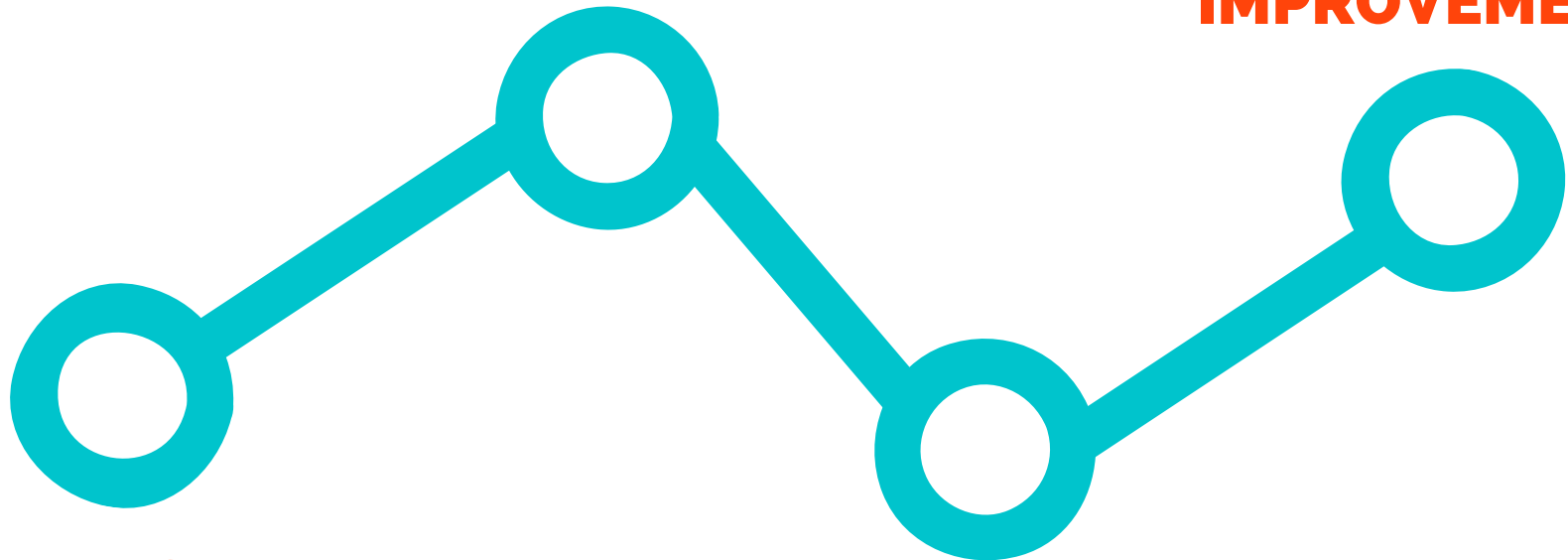


CONCLUSIONS



SKILL LIMITATIONS

**FUTURE
IMPROVEMENTS**



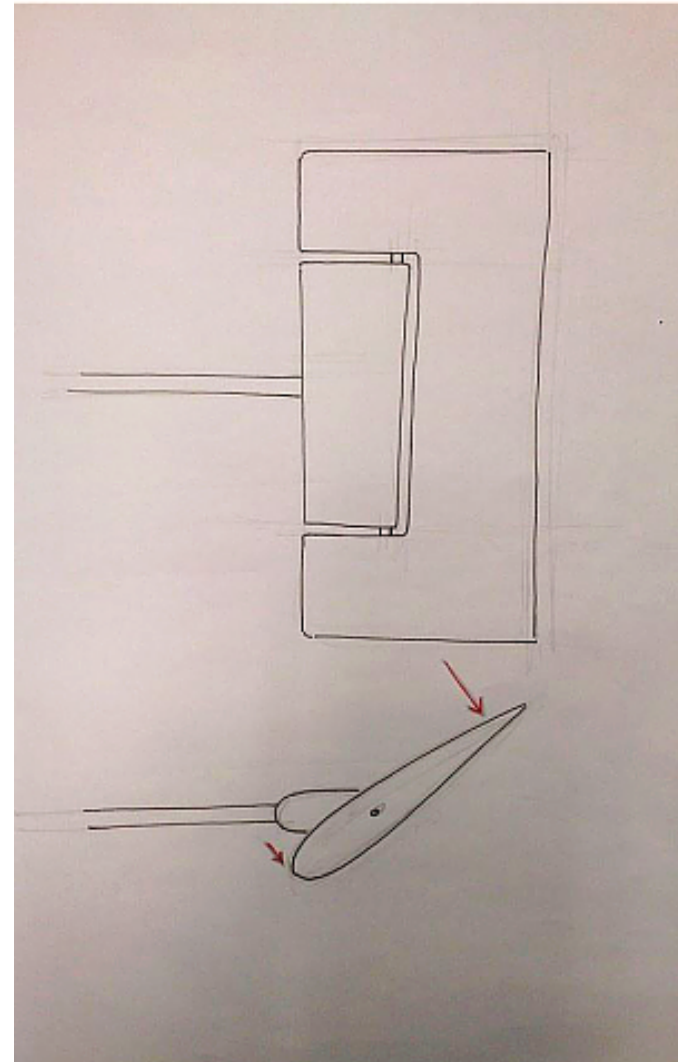
**EXTENSIVE
INVESTIGATION**

TIME MANAGEMENT

FUTURE IMPROVEMENTS



- OPTIMISE STABILIZER FUNCTIONALITY
- EASIER MANUFACTURING PROCESS



TEAM WORK



Click Here > www.youtube.com/watch?v=3PMgbGM_WYE



THANK YOU FOR YOUR TIME