



***BACHELOR THESIS DEFENCE:
BUSINESS PLAN
EFORCE FEE PRAGUE
FORMULA 2018***

Czech Technical University, KN:E-328

JUNE 19TH 2018

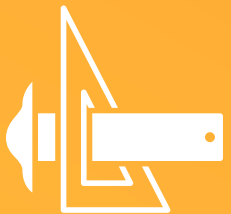


FORMULA STUDENT

Engineering competition

Started in the USA (1981)

More than 600 universities
participate



Design



Build



Race

FORCE



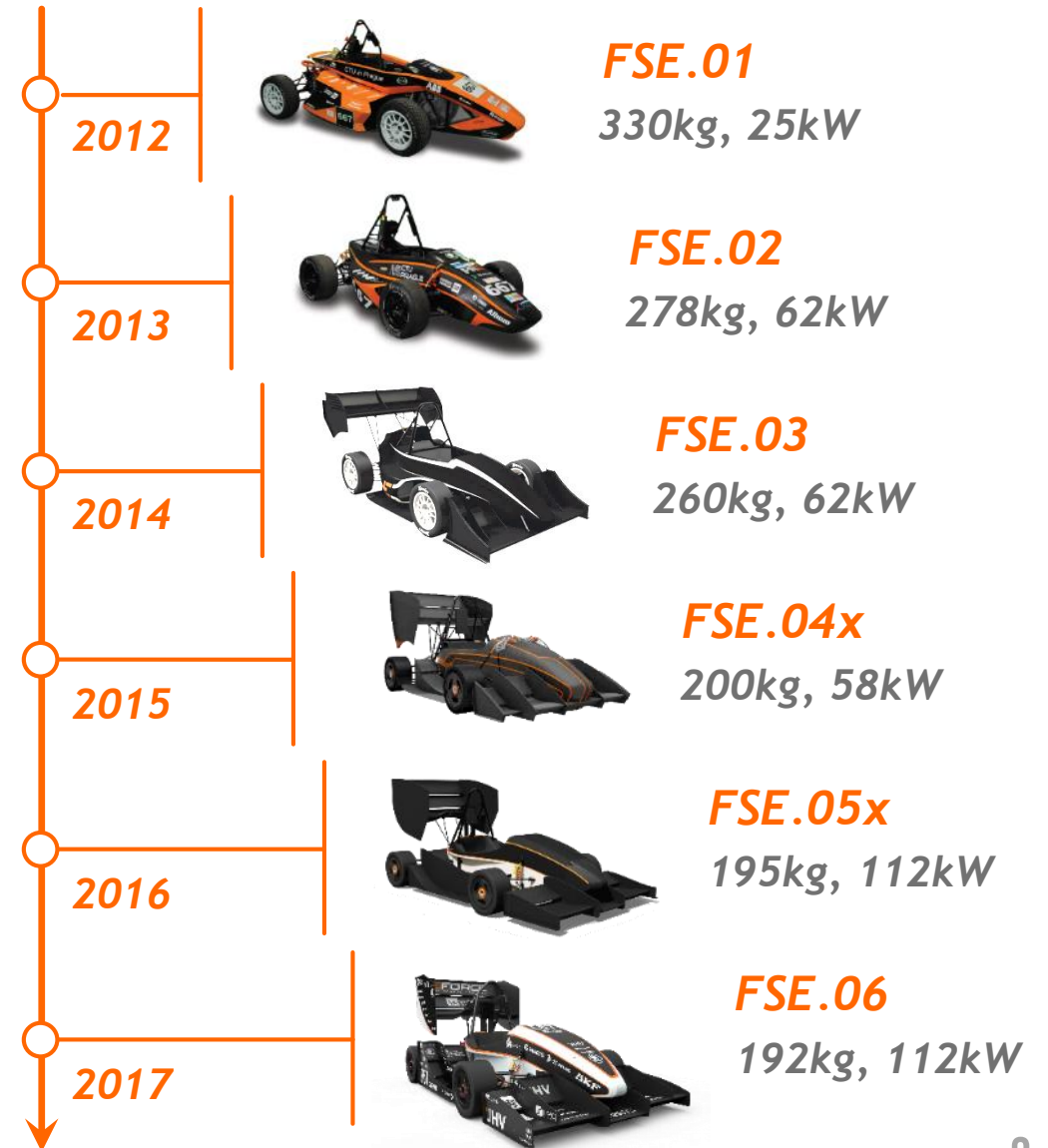
EFORCE IN NUMBERS

Only Czech electric team

Founded in 2010

30+ team members

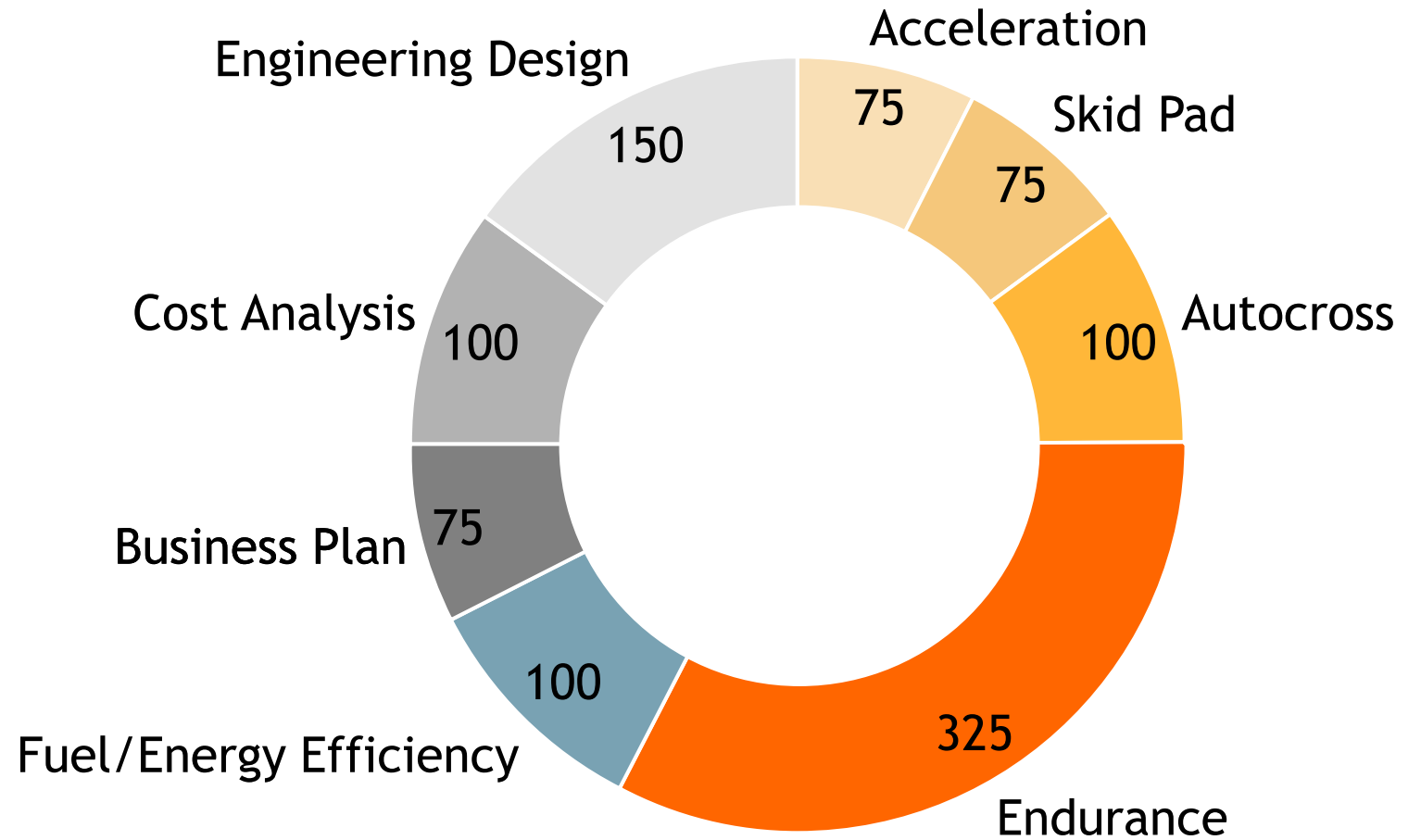
6+ custom formulas



RACES



Scrutineering



EFORCE HAD MIXED BP RESULTS IN THE PAST

Date	Event name	Type	Event rating	Business Plan points	eForce ranking Business Plan	Overall points	eForce ranking overall
20.7 - 23.7.2017	FS East ^[4]	official	0.99	64.3	11	527.8	12
3.8. - 6.8.2016	FS Czech ^[3]	official	0.85	71	3	366	8
15.6. - 18.6.2016	FS SAE Lincoln [□]	official	0.85	62	6	867.4	1
11.9. - 14.9.2015	FS Italy ^[5]	official	0.85	59.84	9	343.842	11
3.9. - 6.9.2015	FS Czech ^[3]	official	0.85	39.58	13	839.11	2
20.8. - 23.8.2015	FS Hungary ^[6]	official	0.90	44.5	29	352.5	28

OVERVIEW: WHY BUSINESS & SW ENGINEERING?

Aim of thesis

- *Describe Formula Student and its disciplines*
- *Identify the success factors in the Business Plan discipline*
- *Create a rigid Business Plan for eForce FEE 2018 season*
- *Complement the BP with supporting materials*
- *Evaluate output quality in a mock presentation with an expert jury*

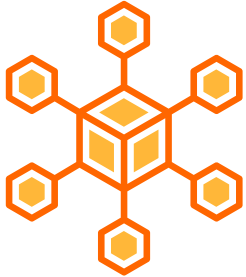
Motivation

- *It is a meaningful topic since it meant work on a practical output helping not only me, but the university as a whole*
- *I had success in this field in the past*



- *...The Business Plan is perfect for applying the knowledge from studying Software Engineering*

ALL 4 MINORS OVERVIEW



Networking expertise

≠ Cloud system implementation for data and knowledge management



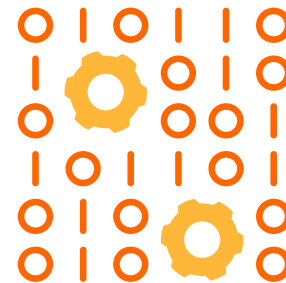
Multimedia technologies

≠ Graphical supporting materials, including this presentation template



Information Systems and Entrepreneurship

≠ Business Plan creation

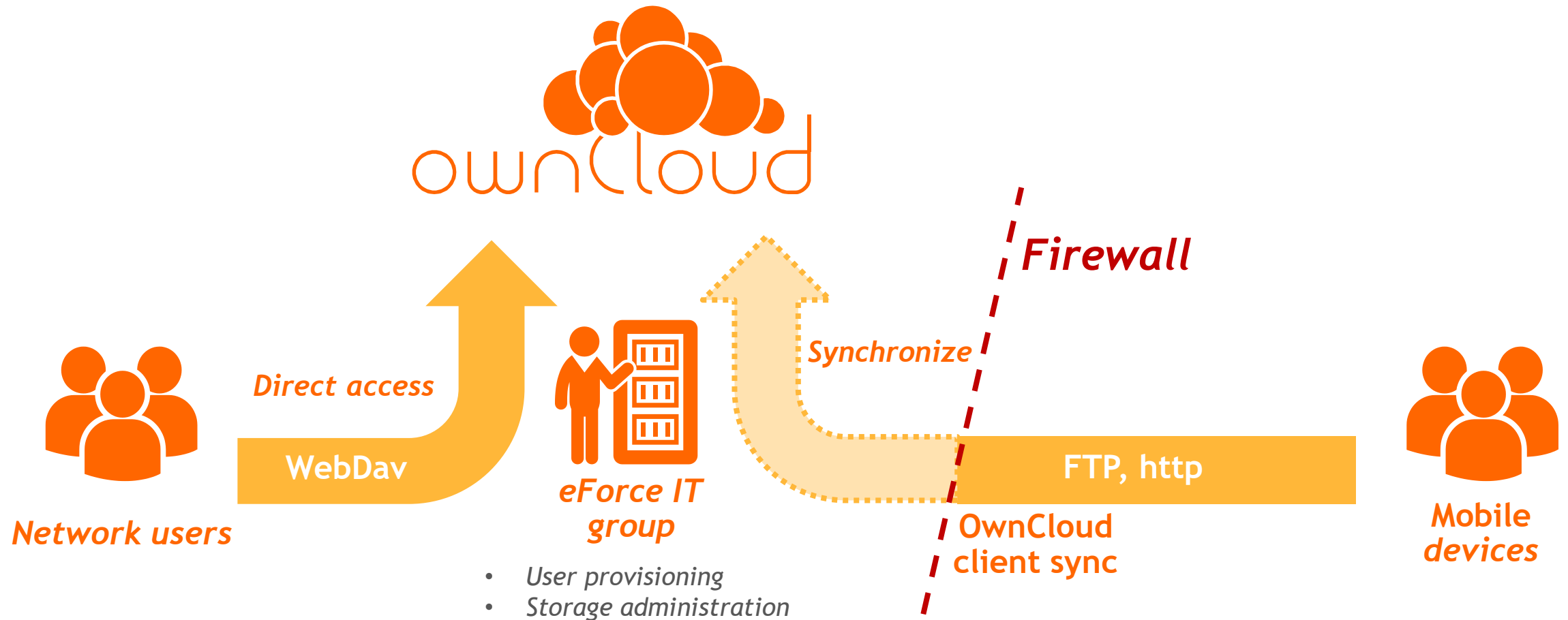


Programming and Application Architecture

≠ Created mobile applications supporting the BP concept

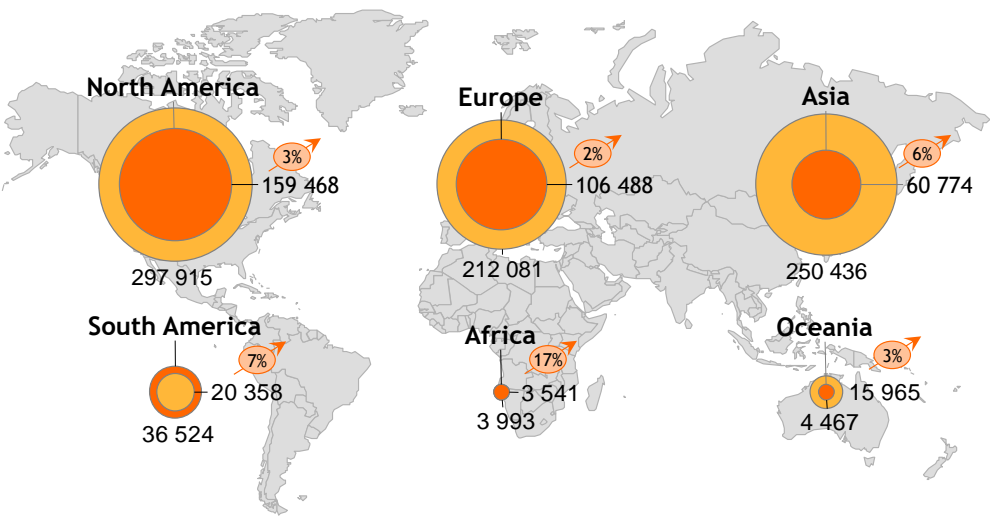


NETWORKING: IMPLEMENTED CLOUD STORAGE





BUSINESS: ENVIRONMENT ANALYSIS

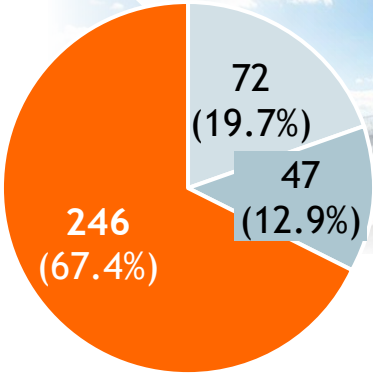


Market analysis

⇒ Both motorsport and digital markets analyzed as target segments



Days of use by occupation



Races Other events Unused

Opportunity detection

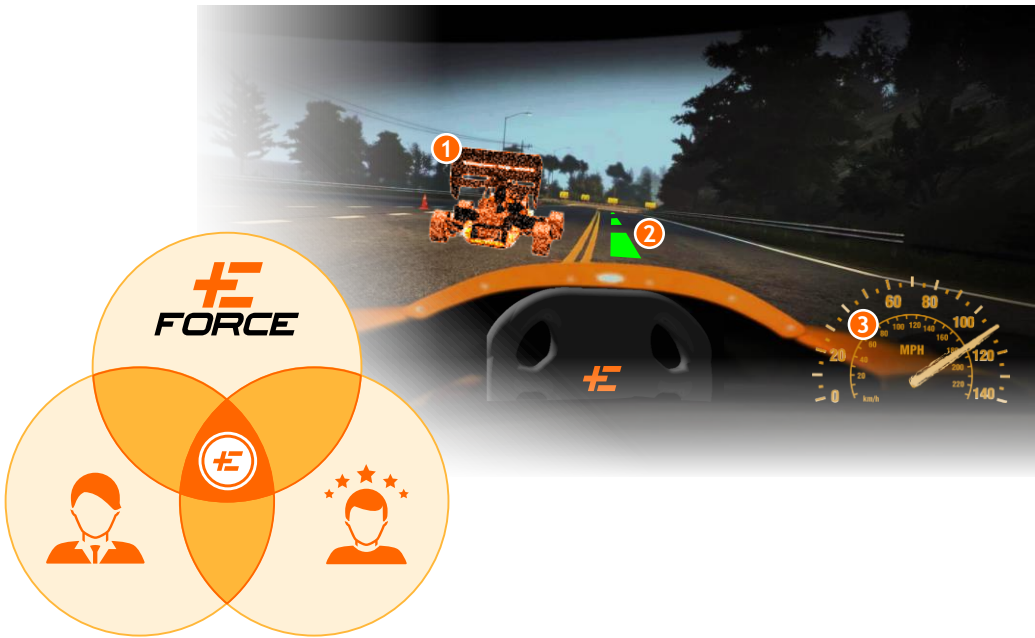
⇒ Two thirds of most racetracks' capacity is commercially unused





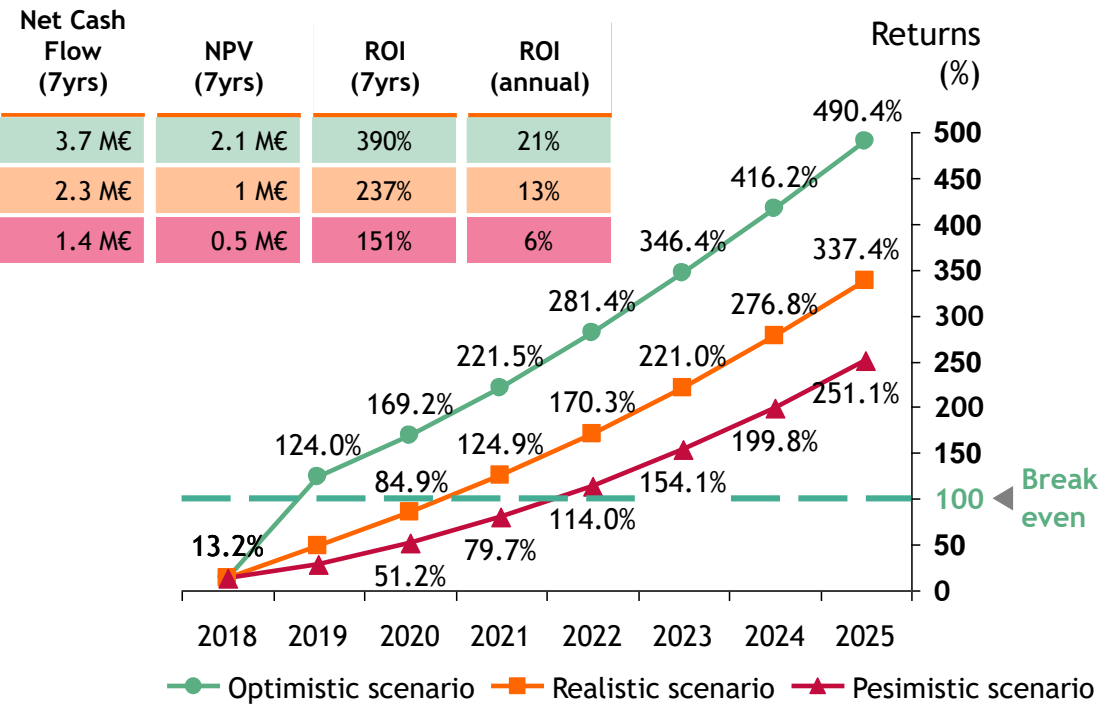
BUSINESS: CONCEPT AND RESULTS

- 1 Simulated opponents
- 2 Projected ideal apex
- 3 Projected GUI



Concept pitch

➤ AR-enhanced racing concept supported by a crypto token economy

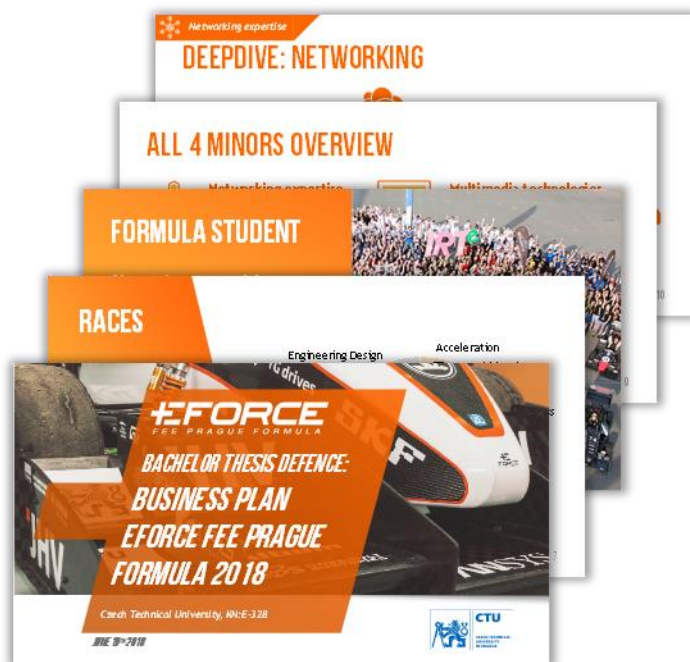


Financial analysis

➤ Investment pitch modelled in three scenarios, ranging from 0.5 to 2.1 M€ in net present value



GRAPHICS: EXTENSIVE MATERIALS CREATED



General-purpose eForce graphics

- Presentation template



Printed/digital Business Plan materials

- Preliminary documents for the competition
- Printed BP, Card, Folder

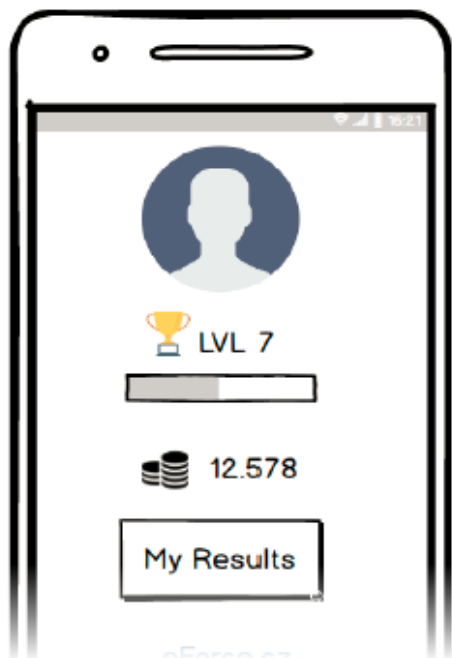


BP-related logos and user interfaces

- Project logos
- App user interfaces
- AR tracking target



DEVELOPMENT: ALL 3 DEVT STAGES USED



Low-Fidelity prototype design

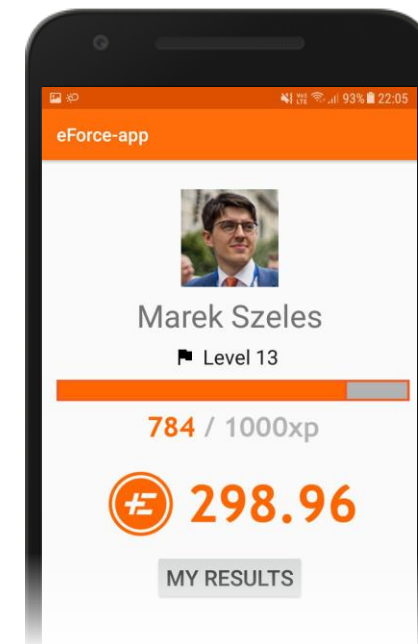
- ✚ Initial concept - interactive prototype



Findings	Importance	
S1HET2 S2HET2 S3HET2	2	Miss
S1CWQ2	3	Path boo
S3HET7 S3HET7	2	Red not
S1HET8 S2HET8 S3HET8	1	Re

Usability testing of output

- ✚ Identifying issues to be improved by cognitive walkthrough

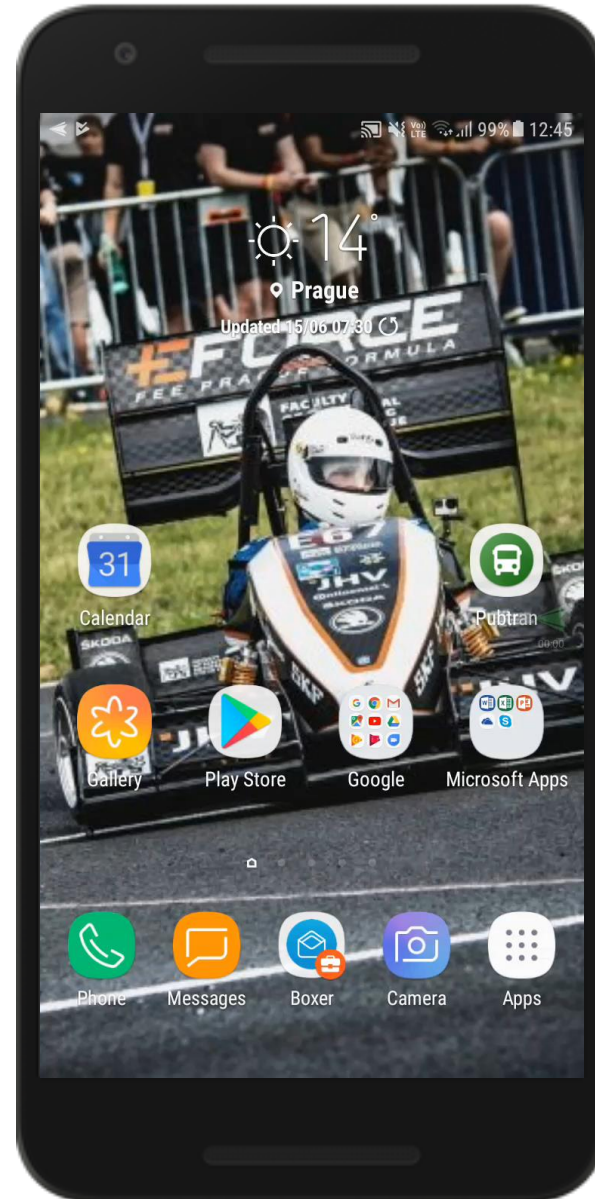


High-Fidelity app Implementation

- ✚ Kotlin-based Android application with Augmented Reality



APP DEMONSTRATION



OUTPUT OVERVIEW



Implemented

a cloud file sharing solution supporting the eForce Project Group



Created

a rigorous Business Plan to be presented at races



Designed

supporting graphical materials, both printed and digital to support the BP



Developed

an Android (Kotlin) eForce mobile app user experience with AR features

TESTING OF THE WHOLE BUSINESS PLAN



The eForce BP entered the contest “Present Around the World”

- *Organized by the Institution of Engineering and Technology*
- *Czech National Round on April 14th 2018*



The eForce Business Plan was awarded first place

- *150£ 1st place prize for eForce*
- *Invitation to international semi-final in Kazakhstan (August 2018)*

NEXT STEPS

- ⇒ Add “Deep Dive” sections to the Business Plan*
- ⇒ Print all BP materials*
- ⇒ Coordinate common strategy with team members working on other static disciplines*



**Compete for
CTU FEE
all over Europe!**

*THANK YOU FOR
YOUR ATTENTION!*

EFORCE
FEE PRAGUE FORMULA

Eforce.fel.cvut.cz



CTU

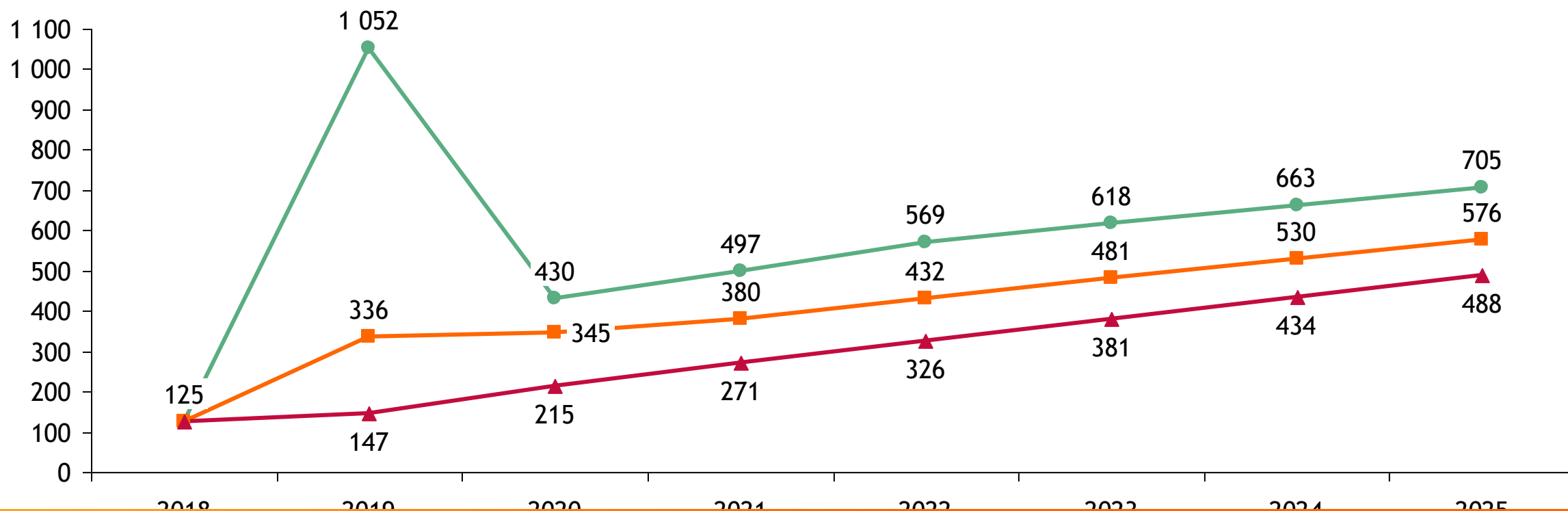
CZECH TECHNICAL
UNIVERSITY
IN PRAGUE

OTÁZKY NAVRŽENÉ OPONENTEM PRÁCE

- 1 Jaké jsou tržní výsledky ICO pro květen 2018?
- 2 Jaká je 100% kapacita okruhu (obr. 20), je to 16 hodin / den?
- 3 Bylo by vhodné zahrnout vliv hospodářského cyklu do analýzy trhu (kap. 6.5.5), který je jasně vidět v historické části grafu 22?
- 4 Jak a proč autor přisoudil vysokou prioritu k logu na str. 53 v tab. 7?

TRŽNÍ VÝSLEDKY ICO ZA KVĚTEN 2018

Returns
(US\$ K)



Se spuštěním ICO počítá Byznys plán až r. 2019

100% KAPACITA OKRUHU

Case example for
small package

Formulas: 3 vehicles
Investment: 300 000 US\$

	Product	
	2 laps	5 laps
Price for product	79\$	129\$
Time	5	12
Overhead	5	5
Total time	10	17
Total rounds	45	15
Total maintenance	4350	3450
Total profit	6315	2355

- Recalculated based on 60% realistic capacity

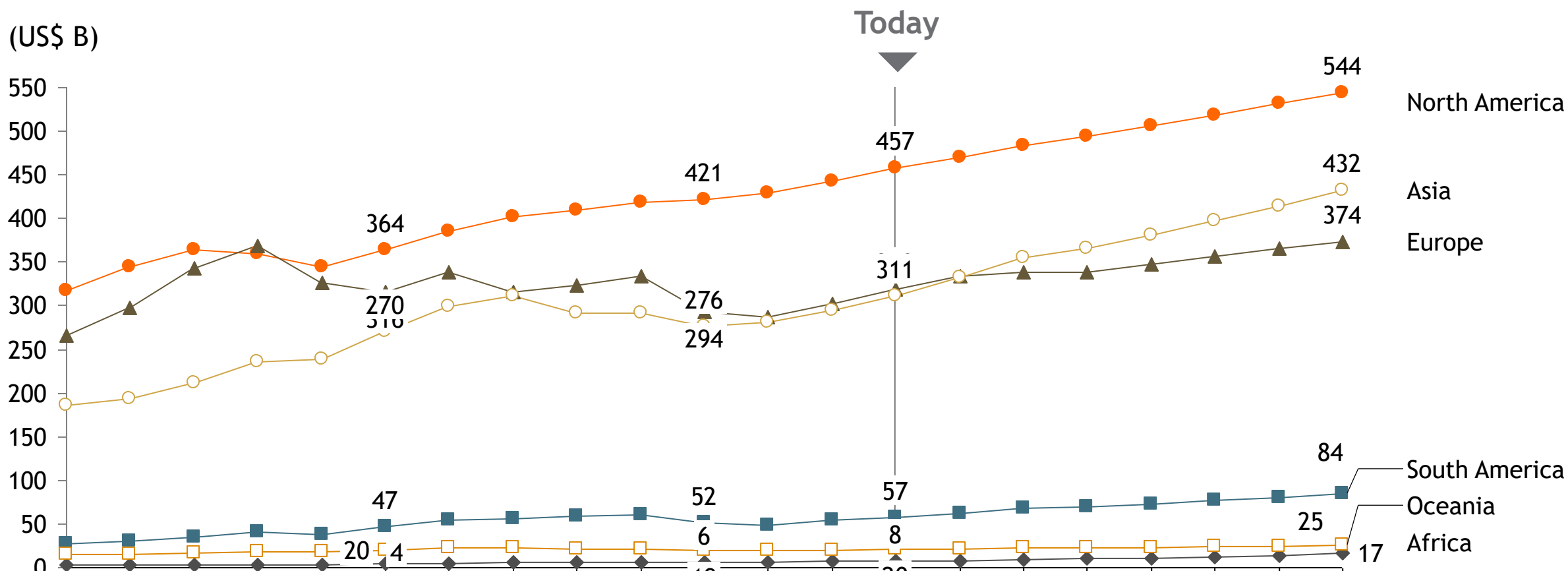
- Investment by trackowner could be theoretically paid off after 35 days when assuming full capacity

- Realistic break even

Kapacita, se kterou byl výpočet proveden, je 720 minut, tedy 12 hodin



SROVNÁNÍ: CELKOVÝ CÍLOVÝ TRH



...navíc při zvážení celého trhu (motorsport+digital) se cykly kromě Evropy linearizují

PRIORITA LOGA

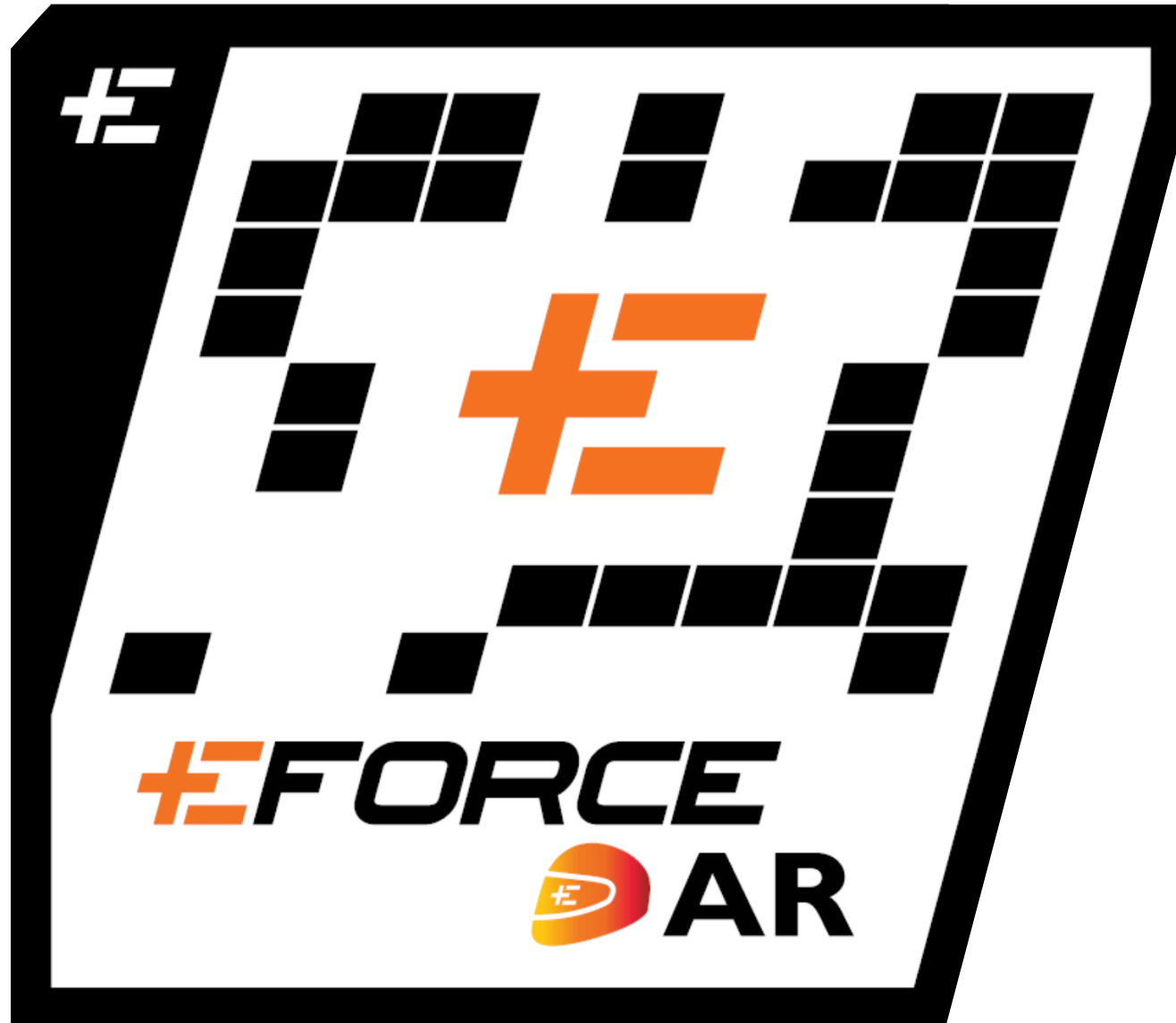
	Solution	Practicality	Impressiveness	Difficulty	Overall priority
Printed	Folder	High	Low	Low	High
	Printouts	High	Low	Low	High
	Handouts	Medium	Medium	Low	Medium
	Business Card	High	Low	Low	High
Digital	Logo	Low to Medium	Medium	Low	High
	Website	Low to medium	Medium	Medium	Low
	Video	Low	High	High	Medium
	Demo mobile application	Low to High	High	High	High

Vysoká priorita byla určena kvůli faktorům nezachyceným v analýze: velmi dobrý poměr „námaha/výkon“ a pozitivní ovlivnění ostatních položek, což násobí efekt ještě více



APPENDIX: EFORCE AR TARGET

TARGET



E FORCE



APPENDIX: EFORCE BUSINESS PLAN 2018