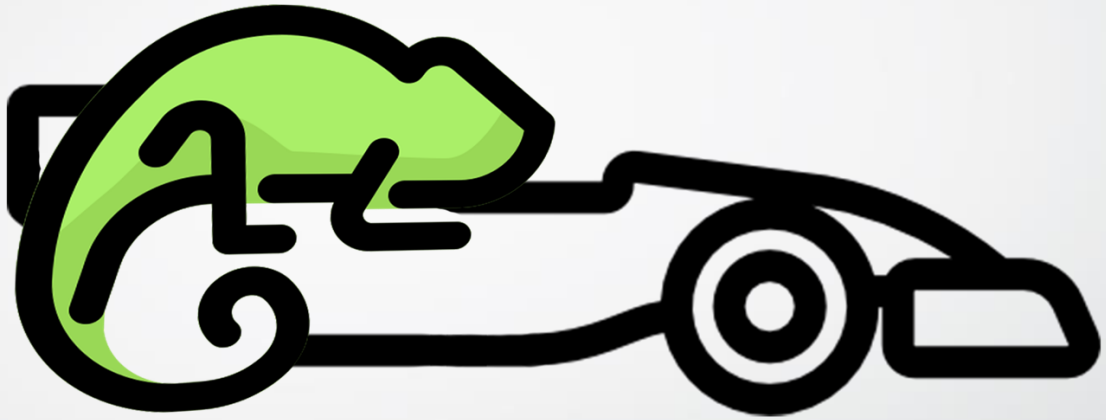
SEPM_PCOM7E

presents



Chameleo Car

Proof of Concept and Software Demonstration

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Chameleo Car

Concept Introduction

Mission	To create a toy that encourages diversity and inclusion in car racing
Vision	To increase diversity in gender, age, ethnic representation, and sexual orientation in top-tier racing leagues, such as Formula 1
Approach	Build an engaging smart phone-controlled race car that allows users to customise the driver's appearance and car colour
Output & Current State	Software that enables desired functionalities in the toy car, and a simulation environment to test these functions

Chameleo Car

Requirements: 'Child' Persona

Child			
#	Requirement	Type	Priority
1	Control race car's movement	Functional	High
2	Control race car's speed	Functional	High
3	Honk the horn	Non-functional	Low
4	Change race car's colour	Functional	High
5	Customise driver's appearance	Functional	High
6	Display battery status	Non-functional	Medium
7	Send alert when battery is lower than 20%	Non-functional	Low

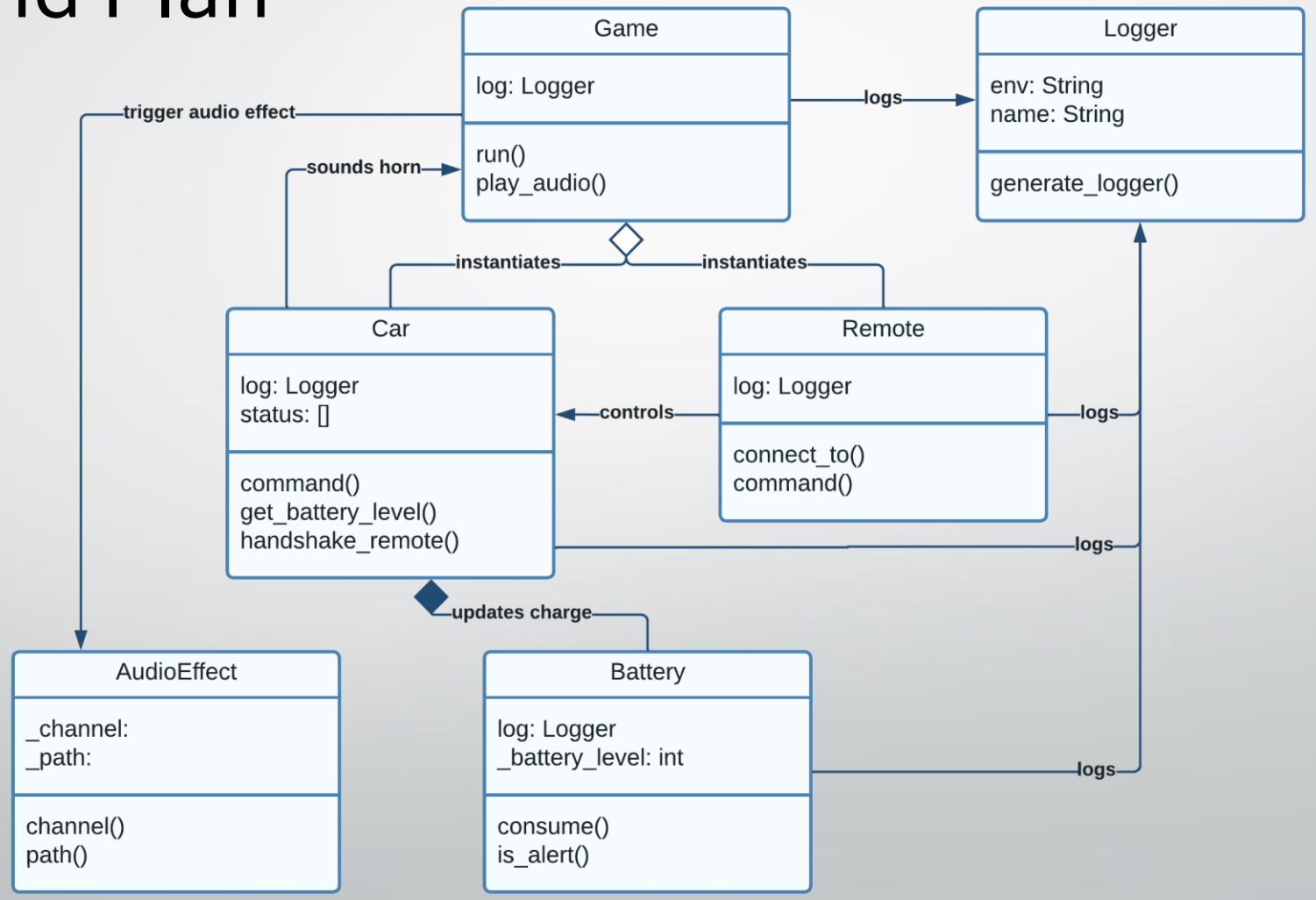
Requirements: ‘Guardian’ & ‘Producer’ Personas

Guardian			
#	Requirement	Type	Priority
1	Password-protected parental control access	Functional	Medium
2	Limit maximum speed in the parental control menu	Functional	Medium
3	Set driver’s appearance as a photo	Non-functional	Low

Producer			
#	Requirement	Type	Priority
1	Receive usage-related statistics	Non-functional	Low
2	Receive diagnostic reports	Non-functional	Medium
3	Implement CI/CD for future software updates	Non-functional	Medium

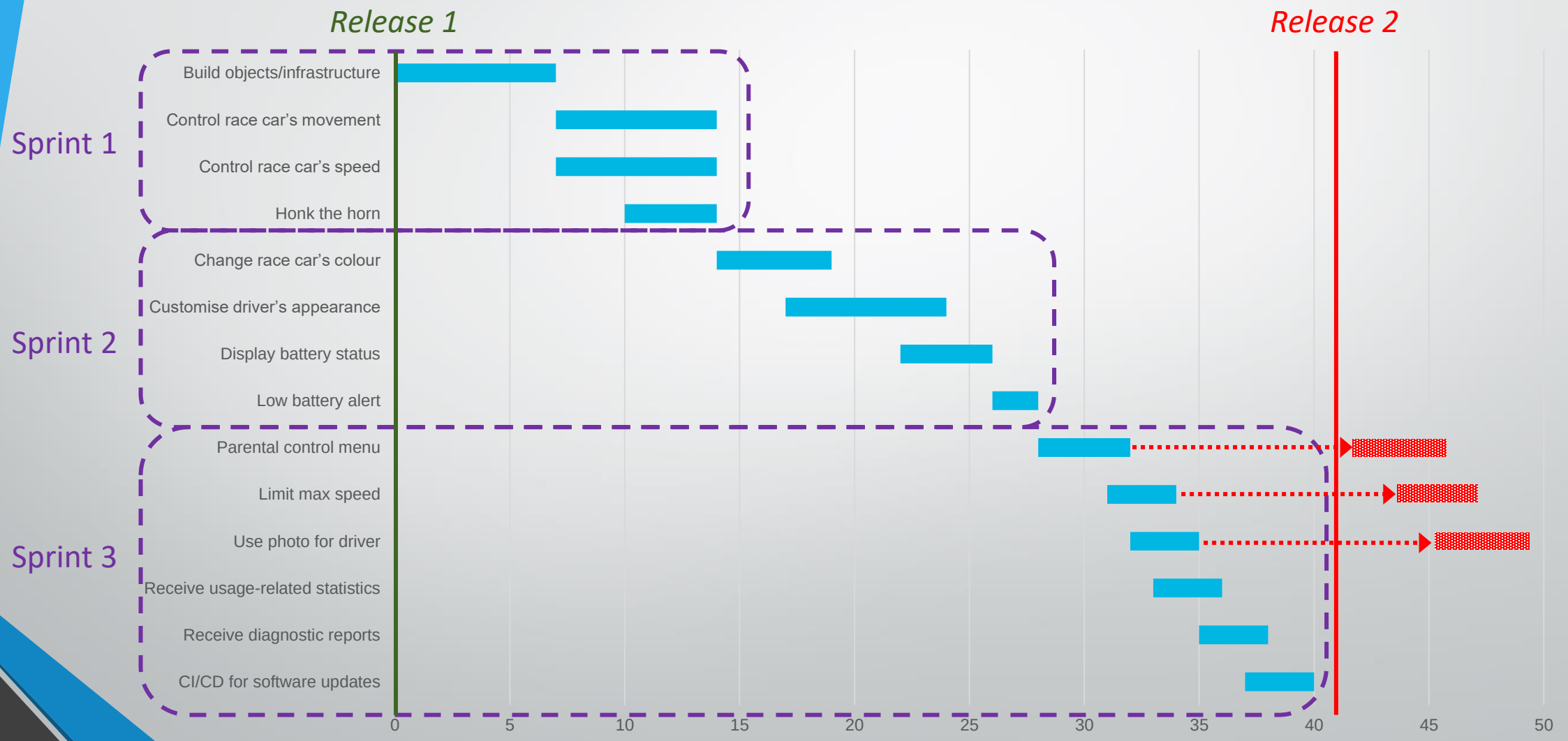
Chameleo Car

Design and Plan



Chameleo Car

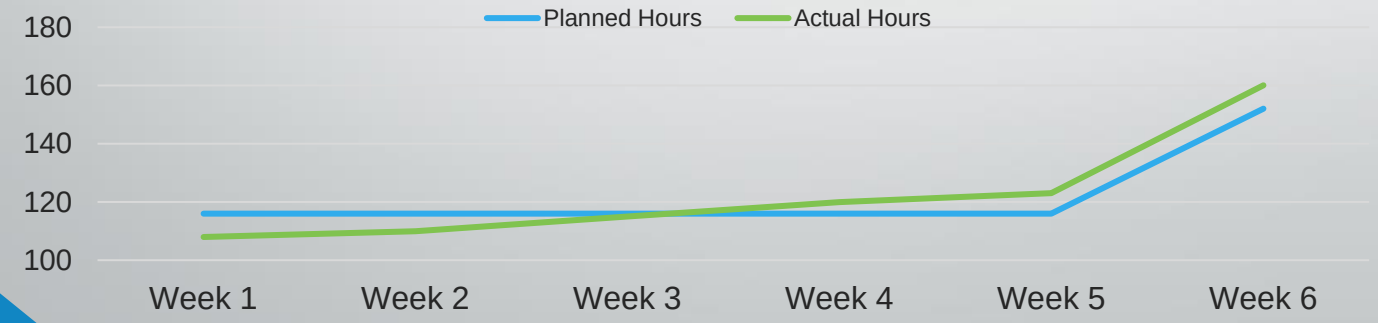
Sprint Progress and Project Status



Chameleo Car

Budgets and Summary

Labour Category		Hourly Rate (GBP)	Sprint 1		Sprint 2		Sprint 3		Total Hours	Total Cost (GBP)
			Week 1	*Week 2*	*Week 3*	*Week 4*	*Week 5*	*Week 6*		
Project Manager	Planned	140.00	24	12	12	12	12	24	96	13,440.00
	Actual	*140.00*	*25*	*11*	*10*	*10*	*13*	*22*	*91*	*12,740.00*
	Delta		*-1*	*1*	*2*	*2*	*-1*	*2*	*Delta*	*700.00*
Developer	Planned	130.00	80	80	80	80	80	80	480	62,400.00
	Actual	*130.00*	*75*	*79*	*80*	*80*	*80*	*85*	*479*	*62,270.00*
	Delta		*5*	*1*	*0*	*0*	*0*	*-5*	*Delta*	*130.00*
Tester	Planned	80.00	12	24	24	24	24	48	156	12,480.00
	Actual	*80.00*	*8*	*20*	*25*	*30*	*30*	*53*	*166*	*13,280.00*
	Delta		*4*	*4*	*-1*	*-6*	*-6*	*-5*	*Delta*	*(800.00)*



Total Planned Cost:	88,320.00
Total Actual Cost:	88,290.00
Budget Remaining (GBP):	30.00
Deviation (%):	-0.03%

Chameleo Car

Development and Testing

- Developed with **Agile Scrum**, using **GitHub** as a VCS and requirement tracker, and **GitHub Actions** for CI/CD
- Uses **pygame** module for implementation, **Gherkin** for requirements testing, **pytest** for testing, **bandit** and **safety** for security checks
- User acceptance testing validated each requirement for Release 1



Chameleo Car

Challenges and Solutions

Challenge	Solution
Geographically and temporally disbursed development team	Weekly progress meetings and continuous collaboration over Slack, GitHub
Development in different environments	Modular Python package-like structure and a common environment.yml
Complex codebase for linting and quality control	Enabled linting through GitHub Actions

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