Business Understanding Milestone

BGET - Data Driven Analytics Tool for Breda Guardians Esports

Breda University of Applied Sciences

Endijs K. Jack W. Kamil Ł. Louie D. Raf S. Tiago S. Rachit R. Kees K.

1. Executive Summary

The Problem

- Long manual reviewing times (3-4 hours)
- Lack of physiological data integration
- Limited software usage

Consequence -> Missing insights that improve performance

Our Solution: Upgraded Play-O-Meter

- One platform combining all data sources
- Turn data into automated action points
- Cheap and effective e-sport coaching

The Problem

3-4 hours per match
manual review by BUas coaches

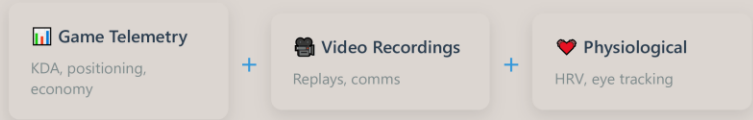
✗ Still can't connect player **stress/focus** to game decisions

✗ Result: Missing the insights that actually improve performance

Current Reality:

Our Solution: Upgraded Play-O-Meter

✓ One dashboard combining **3 data streams**



✓ Shows **WHY** players make decisions, not just what happened

✓ Cost-effective alternative to expensive coaching staff

✓ Automated insights = faster training improvements

🎯 Unified Performance Intelligence Platform

1. Executive Summary

Value Delivered

- Less video review time
- Measurable performance gains
- Potential lead in esports research

What We Need

- Stakeholder Access
- Sensors & development
- Occasional pro team access

Bottom Line:

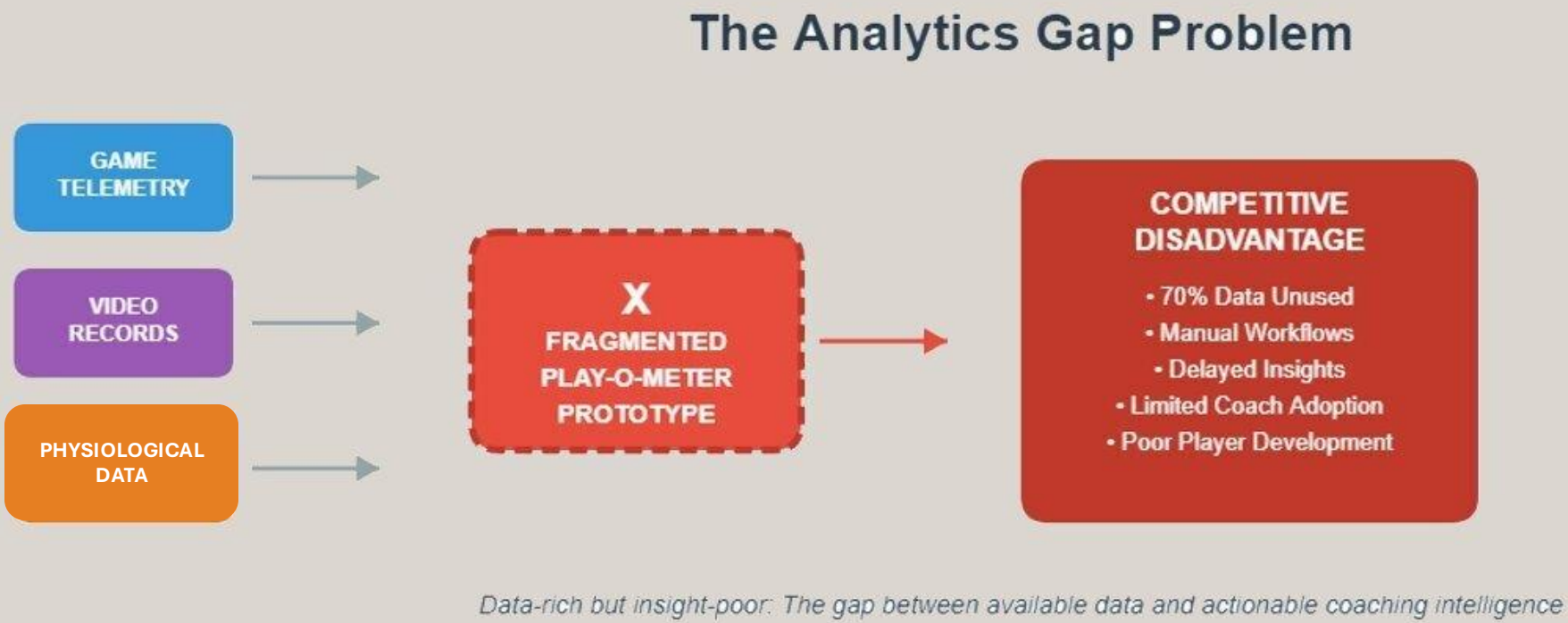
Transform complex data into simple coaching insights

KPI’S

KPI	Primary Data	Secondary Data
Decision-Making Speed	Game recording	Speech-to-text
Reaction Time	Game recording	Keypress
Focus and Attention	Gaze data	Game recording
Communication Efficiency	Speech-to-text	Game recording
Team Cohesion	Game recording	Speech-to-text Post Questionnaire
Consistency	Emotion	Speech-to-text Post Questionnaire

Manual Reviewing-Time	A/B Testing	Post review feedback
Player Positioning	API Data	Game recording

2. Problem Understanding & Research Insights



Data-rich but insight-poor: The gap between available data and actionable coaching intelligence

2. Problem Understanding & **Research Insights**

Key Findings

Performance:

- Professional e-sports see **10-15% performance gains** (1)
- Research validates physiological-gameplay correlation in multi-model data (2)
- Industry confirms market shift toward comprehensive toolkits (3)

Technical Feasibility:

- Riot Games API supports **sub-100ms** latency telemetry extraction (4)
- GDPR Article 9 compliance for physiological data (5)
- BUas computational resources

Current Deficiencies:

- **70% data underutilisation** due to accessibility barriers
- **15+ weekly hours** manual data compilation across coaching staff

2. Problem Understanding & **Research Insights**

Evidence Supporting Project Need

Competitive Analysis:

- Analytics adoption -> Better tournament ranking (6)
- Current **52%** match **win rate** versus competitors

Organizational Impact:

- **24-48** h post-match analysis delay limits tactical adaptation capabilities
- Player development shows **8%** seasonal **improvement** versus **15-20%** industry benchmarks

Strategic Value:

- Aligns with BUas priorities in applied gaming research and esports innovation
- Target improvements: **40%** reduction in manual processing time, **75%** user adoption, sub-2-second dashboard response

3. Proposed Approach & Methodology – Research Methodology and Approach

Biometric Collection:

- Heart rate sensors
- Eye tracking device
- Webcam-based facial emotion classification

Gameplay & Communication:

- OBS API
- Audio recording with speech-to-text transcription
- Riot API integration

Data Pipeline:

- Multi-threaded Python synchronization across all streams
- Server-Side Processing

3. Proposed Approach & Methodology – Research Methodology and Approach

Separate pipelines for qualitative/quantitative data

Quantitative Data Sources:

- Heart rate (BPM measurements)
- Reaction time (milliseconds)
- Eye tracking coordinates (pupil position data)
- Timestamp data
- Game performance statistics (K/D ratios, damage dealt)
- Game replay files

Qualitative Data Sources:

- Video feed
- Communication transcript
- Emotion classifier output
- Keypresses
- Match metadata (game mode, map names, character/agent selections)
- Eye tracking gaze patterns (fixation locations, scan paths)

3. Proposed Approach & Methodology – Research Methodology and Approach

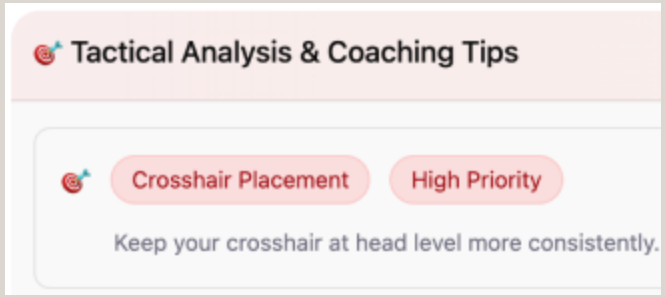
Quantitative Data Sources:

Qualitative Data Sources:

[00:05] ROUND START - Pistol Round (Attack)
[00:08] [Phoenix_Mike] [confident] "Alright team, let's rush A site hard and fast"
[00:12] [Sage_Anna] [calm] "I'll wall off long A, watch for rotates"
[00:15] [Jett_Carlos] [excited] "I'm dashing in first, trade me if I die"
[00:18] GAME EVENT - Sage wall deployed (A Long)
[00:22] [Omen_Dave] [focused] "Smoking heaven, go go go!"
[00:25] GAME EVENT - Omen smoke deployed (A Heaven)
[00:28] [Jett_Carlos] [intense] "Contact A site! Two players default!"
[00:31] GAME EVENT - Jett_Carlos eliminated Cypher_Enemy1 (Headshot)
[00:32] [Phoenix_Mike] [pumped] "Nice shot! I'm flashing over the box!"
[00:35] GAME EVENT - Phoenix flash deployed

3. Proposed Approach & Methodology – Transforming Data into Actionable Performance Insights

1. Game Telemetry & CV Integration



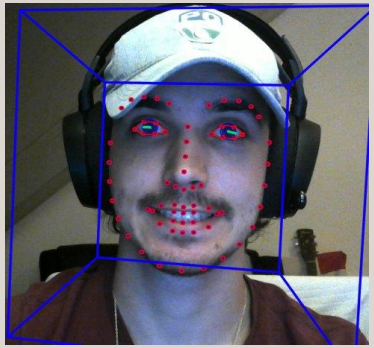
In Game API data – visualized in dashboard

In Game CV Model – recognizes team and enemy players

Camera CV Model – emotion recognition for situational reaction validation

Eye Tracker – insights on player visual awareness

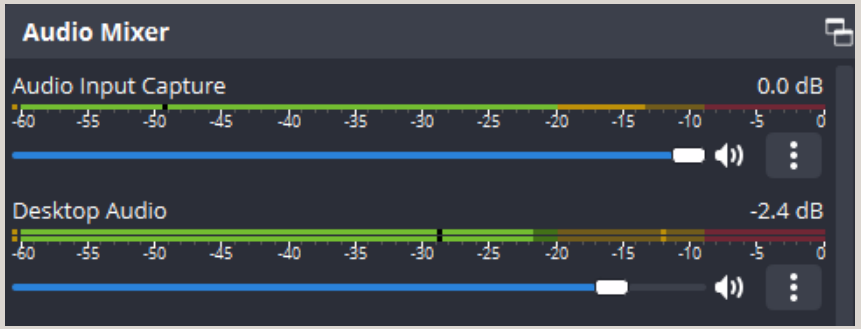
2. Physiological Data Application



unix_time	gaze_screen_x	gaze_screen_y
1,75E+09	214.0	242.0
1,75E+09	1189.0	1030.0
1,75E+09	1192.0	1026.0
1,75E+09	1190.0	1024.0
1,75E+09	1194.0	1024.0
1,75E+09	1192.0	1024.0

3. Proposed Approach & Methodology – Transforming Data into Actionable Performance Insights

3. Communication Analysis

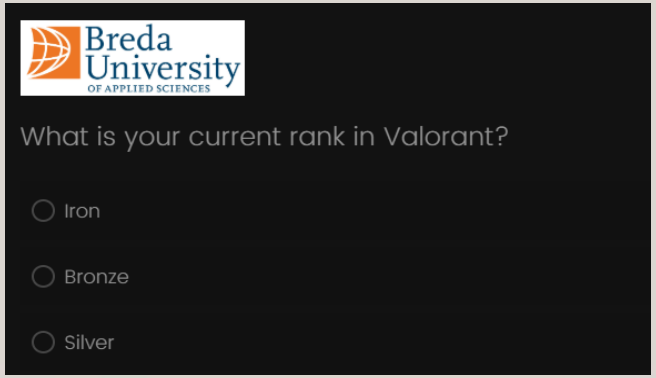


Player Communication Transcripts – communication presence tracking for critical moments

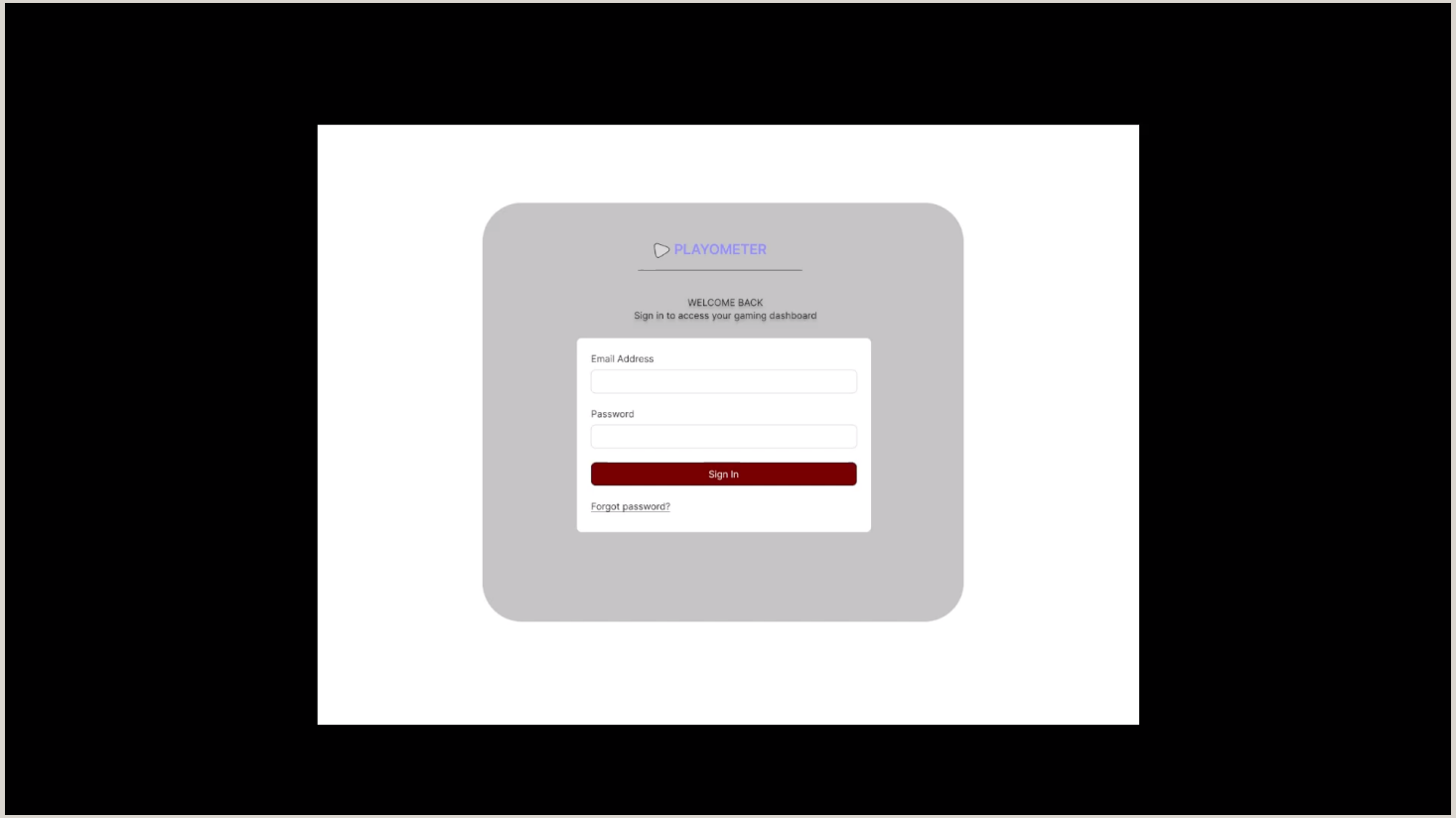
Survey Results – by asking players what they want to see we aim to bring the best product

Pro Coach Input – approach and result validation from industry specialists

4. Validation & Refinement



3. Proposed Approach & Methodology – Performance Insight App Drafts



Explore for yourself - https://www.figma.com/proto/8OIPQFKXrDJo2phddnRPoG/Untitled?page-id=0%3A1&node-id=11-4470&p=f&viewport=460%2C280%2C0.15&t=QS3w2p58nqnxqulq-1&scaling=min-zoom&content-scaling=fixed&starting-point-node-id=11%3A4470

4. Business Requirements Document Overview

What is the BRD:

Defines the goals, scope, and success criteria.

Project Objective:
Deliver a real-time, coach-friendly analytics ToolKit

Success Criteria:
- Dashboards load swiftly with **high data accuracy**.
- At least **one competitive match** successfully analysed using the system.

5. Resource Requirements & Risk Management

Hardware & Toolkit	**Eye-tracker** 
	Webcam 
	Heart-rate sensor 
	Workstations/PCs 
Software & Tools	**Play-O-Meter GitHub repository –** foundation for data collection and syncing
	Riot API & OBS – post-match data
	Python libraries – preprocess and clean signals
	Dashboard frameworks – develop visual, coach-friendly interfaces

Stakeholder Access

- Breda Guardians players and coaches for testing, scrim participation, and feedback.
- Support from mentor for technical guidance and scope alignment.
- Lectures and domain knowledge in areas such as physiology, communication, coordination, and player performance.

5. Resource Requirements & Risk Management

Key Risks and Mitigation:

- **Scope creep (High):** Expanding beyond the 18-week window.

→ Define MVP, use agile sprints, apply formal change control.

- **Data Granularity (High):** API timelines can be too coarse for detailed play breakdowns.

→ Post-match workflow, replay parsing and screen/video capture for accuracy.

- **Stakeholder availability (Medium):** Coaches/players unavailable due to scrims/tournaments.

→ Align testing with training schedules, flexible sessions, early commitments.

- **Usability and adoption (Medium):** Coaches find dashboards too complex.

→ Iterative feedback, usability testing, follow dashboard design best practices.

6. Next Steps – Work Distribution

We distributed the project in different sections.

A team is assigned per section as follows:

Project Managers

Endijs (main)
Kamil (assistant)

Supervises teams, manages DevOps, and ensures clarity for stakeholders.

App Team (A)

Rachit (Valorant)
Endijs (LoL)

Common app setup, developing game-specific UIs to compare approaches. Connect with Data Team using different game and replay systems

Data Team (B)

Kees (Valorant)
Tiago (Valorant)
Raf (LoL)
Jack (LoL)

Refining the OBS toolkit and collecting in-game data for player analysis and future model training. The team will distribute tasks evenly.

Research Team (C)

Kamil (Valorant)
Louie (LoL)

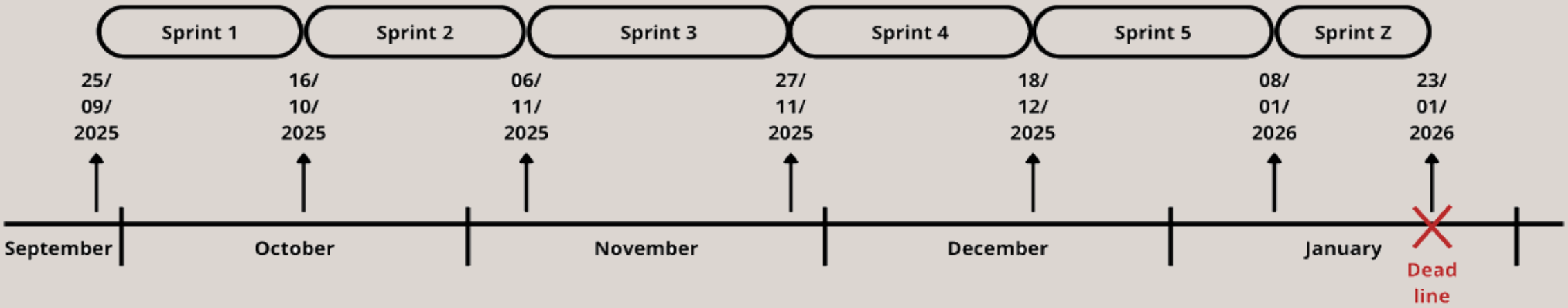
Focuses on future planning, setting up an annotation system for the second semester. They also handle documentation and research to make the project clear for future teams and explore modeling.

We believe splitting up into smaller groups will increase our productivity.
We will continuously help each other out and work together as one big team.

6. Next Steps – Timeline Management

We plan to work using 3-week sprints.

That means we need specific deliverables for each sprint.



At each end of a sprint, we will plan the next one the same day.

Those will immediately be shared with our stakeholders.

6. Next Steps – Deliverables

Our first technical sprint began previous week, until 16 October.

Deliverables for this sprint are set.

Sprint 1 - Deliverables

App Team (A)

Rachit (Valorant)
Endijs (LoL)

Web App Skeleton
Basic web app structure with core pages set up.

User Management PoC
Differentiate player/coach accounts.

Replay Viewer PoC
Load & display video placeholders.

Data Team (B)

Kees (Valorant)
Tiago (Valorant)
Raf (LoL)
Jack (LoL)

OBS Automation PoC
Auto-start/stop recording with game.

Timestamp Mapping PoC
Link game timestamps to video recording.

Initial Data Pipeline
Structured extraction of key in-game data and physiological data.

Toolkit simplification PoC
Automate the use and setup of the current ToolKit.

Research Team (C)

Kamil (Valorant)
Louie (LoL)

Annotation System Proposal
Detailed plan & tool choice.

Annotation Test Results
Initial test run and findings.

Training Data Plan
How to use Data Team's output for future models.

Handover Plan V1
Outline documentation & future recommendations.

7. Additional Project Suggestion – Sim Racing/ Drifting

Sim Racing/ Drifting interest provides additional **research potential**

Problem -

General difficulty of learning sim racing

Solution -

AI Coach for analysing runs and giving first hand feedback on how to improve

- This will help anyone improve
- Easily approachable, as there are set success criteria (Drift Masters 2024 Rulebook)
- Translatable from main project to both racing and drifting competitions

7. Additional Project Suggestion – Sim Racing/ Drifting

Here is how we plan on attacking the project:

4 hours / week

56 hours total

The data collection pipeline is ready, we will focus on:

- Annotation system Prio. 1
- Data collection (best runs) Prio. 2
- Modelling Prio. 3

We can't promise a fully functional model, but we will work towards best results.

8. Sources

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