Fortnite Corporation

Lab Section 1 – Group 4

Deliverable C – Design Criteria

Engineering Design - GNG1103

Team Members

Robert Lavallee (300229720)

Shazan Abbas (300236313)

Amro Tabche (300219476)

Ali Sherry (300239471)

Dan Bonakdari (300256506)

Faculty of Engineering

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Abstract

The goal of this lab was to create design criteria from the needs found from the earlier deliverable. The criteria have been split into three categories, functional, non-functional, and constraints. Benchmarking has been done between Dartfish, Quintic sports and Kinovea to define the target specifications for our product.

Comparing the benchmarking results, we have decided that Quintic sports is the most ideal comparison to target for the criteria we are looking for in our product.

I- Introduction

During the las deliverable we created a list of client needs, this report organizes them into importance in comparison to each other. The goal of this is to split these into distinct categories being functional, non-functional, and constraints. Then being able to use these as comparable functions for benchmarking. The table below (Table 1) shows the client needs and the relative rating of their importance.

Number	Client Needs	Importance (Out of 5)
1	Capture Ball trajectories in real time	5
2	Game analysis	4
3	Athlete performance	3
4	Animations and 3D Digital Replica	5
5	Modular Setup	4
6	Motion Capture System	5
7	Stats (Speed, force, etc.)	4

Table 1 (Table 1, Client needs with importance)

II- Design Criteria

For the purpose of our product the needs of the client have been defined more in depth as design criteria. These design criteria are used to satisfy the needs of the client. These criteria have also been organized into functional, non-functional and design constraints. Functional criteria are functions that directly affect the functionality of the products while non-functional do not. Design constraints are requirements that must be factored into the design of the product.

Number	Needs of the Client	Design Criteria
1	Capture Ball trajectories in real time	- 3D coordinate system - Accurate - Live updates
2	Game analysis	- Accessibility
3	Athlete performance	- Trackable - Recorded
4	Animations and 3D Digital Replica	- Representation - Software
5	Modular Setup	- User friendly - Multiple views
6	Motion Capture System	- Precise - Consistent
7	Stats (Speed, force, etc.)	- Accurate

Table 2 (Table 2, Needs interpreted as Design Criteria)

Functional Needs	Non-Functional Criteria	Constraints
- Accurately track acceleration and velocity measurements - List measurements automatically via data sheet - Time & Position marker - Storage Location - Video Editing/Viewing - Camera Tracking Software - Software Tutorial/How-To	- Has steady and easily visible frames during any time of capture - Multi-Platform Use - Athletic Performance tracking - Reliable software (does not encounter lag and/or bugs)	- Rendering time must be as minimal as possible - Device cost < **50$** - Operating Systems - File Storage - Device RAM

Table 3 (Table 3, Design Criteria & Constraints)

III- Benchmarking

While researching related products Dartfish, Quintic sports and Kinovea all appear as comparable products to what we intend to create, making good benchmarking comparisons. We decided on using these as they were they had related products to what the goal of our project is. We will compare our product to Quintic sports as it supplies the closes results.

Specifications	Competition Video and Data Analysis Software		
	Dartfish	Quintic Sports	Kinovea
Cost	104$/Month	7500$ (Price includes full kit, not just software)	Free
Velocity and Acceleration Measurements	No	Yes	Yes
Time and Position Markers	No	Yes	Yes
Tagging Moments	Yes	Yes	Yes
Multi-Platform	iOS AND Android, Windows and MacOS	No phone Application, Windows and MacOS	No Phone Application, Windows Only
Data Sheet	Yes	Yes	Yes
Memo	Yes	Yes	No
Video Editing	No	Yes	No
Overlay Comparison	No	Yes	Yes

Table 4 (Table 4, Benchmarking the values from Design Criteria of similar products [1]–[3])

Specifications	Competition Video and Data Analysis Software			
	Importance	Dartfish	Quintic Sports	Kinovea
Cost	4	2	1	3
Velocity and Acceleration Measurements	5	1	3	3
Time and Position Markers	5	1	3	3
Tagging Moments	4	3	3	3
Multi-Platform	3	3	2	1
Data Sheet	4	3	3	3
Memo	3	3	3	1
Video Editing	3	1	3	1
Overlay Comparison	4	1	3	3
Total		67	94	87

Table 5 (Table 5, Benchmarking of similar products using Design Criteria [1]-[3])

IV- Conclusion

While comparable products are limited there are a few options to compare to. Overall, the highest performing in terms of our target specifications is Quintic sports, we will continue to use Quintic sports as a comparison. The product produced is estimated to be over 94 when compared to the criteria listed in table 4.

Bibliography

Charmant, J. (n.d.). Kinovea. Retrieved October 2, 2022, from https://www.kinovea.org/

Dartfish. (n.d.). *Dartfish video and Data Analysis Tools for tennis coaches*. Dartfish. Retrieved October 2, 2022, from https://www.dartfish.com/tennis

Multi-body system simulation: Altair MotionSolve. Default. (n.d.). Retrieved October 2, 2022, from https://www.altair.com/motionsolve/motionview/

Quintic Sports. (n.d.). Retrieved October 2, 2022, from https://www.quinticsports.com/sports-software/