



## **CASE STUDY**

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## 1. PROJECT NAME

Elite Skills Arena - The 'ICON' Football Training Arena.



## 2. THE CLIENT

Elite Skills Arena Ltd. (ESA) is a sports technology company, formed to penetrate the underdeveloped market of professional football training equipment. Providing a range of innovative training arenas designed to improve sports performance, its main focus is football, working with everyone from major European clubs, to academies and large companies for event activation.

All of its products use revolutionary LED light and sound processing software, to create targets for players to hit and to record and analyse their performance.

The technology was developed entirely by **GreenHalse Electronics Ltd.** with whom ESA has several other products in development for alternative sports.

### 3. INDUSTRY/CATEGORY

Sports technology/multimedia.

### 4. EXECUTIVE SUMMARY

**GreenHalse Electronics Ltd.** provided ESA with the technical expertise to allow the realisation of the Icon project which is the invention of an entrepreneur from Bournemouth, himself an ex-football club chairman.

Different light sequences and challenges are provided as training modes to work on different aspects of training, providing a competitive environment for users to challenge themselves as they improve. A detailed scoring system and statistical feedback is provided to keep players enthused.

Essentially, using Icon arenas, players get more touches of the ball in less time, accelerating their development in core attributes. In professional training alone ESA products have been used over 25,000 times in the past 12 months.

An ability to 'think out of the box' is a genuine asset and a tight-knit team of engineers at **GHE** meant that by working closely with ESA staff, the project could be developed quickly and on-budget.

The technical aspects of the project required **GHE's** expertise in digital signal processing, real-time embedded Atmel microcontrollers, mobile data (GPRS, 3G, 4G/LTE) communications, relational database design and management, LAMP and UI web design.

### 5. PURPOSE OF PROJECT/CHALLENGES

The Icon was invented by a local entrepreneur, an ex-football chairman ambitious to continue working to develop the future of football. The concept of moving target lights and circular arena design was derived from a combination of a lifelong involvement in both sport and architecture.

However, to realise this vision, he needed an innovative technical team to work with him to research and develop the challenging technical aspects of the project.

With a strong background in many aspects of electronic engineering, **GreenHalse Electronics Ltd.** was approached by ESA to provide the technical expertise to allow the realisation of his vision.

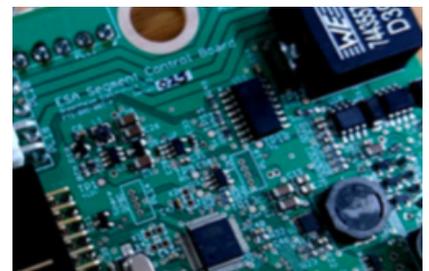
## 6. SOLUTION

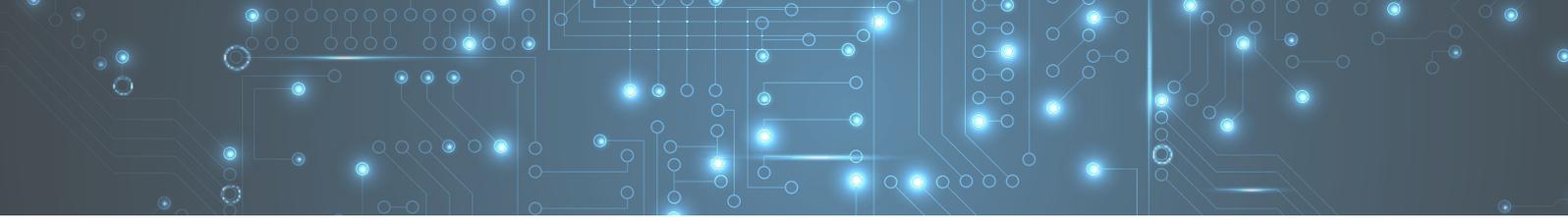
The analysis of the target hits and misses from the Icon's sensors required digital signal processing software to be developed and the further requirement for a compact, robust unit required the GHE team to develop custom circuit boards and firmware.

A web-based control interface was created to allow players to control the Icon from a mobile device using the Icon's built-in Wi-Fi access point and a relational database was created to allow central data gathering and analysis.

Further web based applications were developed to provide an interface for managers and trainers to monitor details of the progress of their players back in the office. The Icon units are all connected by a mobile data connection to ESA data servers in Dorset and a communications router module was selected and configured to provide monitoring and data gathering whenever the machine is in use, anywhere in the developed world. The secure database retains data on all sessions completed by all players.

The design objectives of producing a robust, stand-alone football training environment with a variety of training modes designed in a circular arena has now been realised and there are currently over 60 units worldwide. Clients include FC Barcelona, TAG Heuer and Adidas.





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