



ShowController Replacement

ELECOMP Capstone Design Project 2022-2023

Sponsoring Company:

IGT Global Solutions Corporation

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Company Overview:

IGT is the world's leading end-to-end gaming company. It is listed on the New York Stock Exchange under the trading symbol "IGT." Its holding company headquarters are in the United Kingdom, with operating headquarters in Rome, Italy; Las Vegas, Nevada; and Providence, Rhode Island. IGT attracts the industry's top talent, with more than 10,500 employees across the globe.

We deliver entertaining and responsible gaming experiences for players across all channels and regulated segments, from Lotteries and Gaming Machines to Sports Betting and Digital. Leveraging a wealth of compelling content, substantial investment in innovation, player insights, operational expertise, and leading-edge technology, our solutions deliver unrivaled gaming experiences that engage players and drive growth.

IGT's integrated portfolio of technology, products, and services, including its best-in-class content, is shaping the future of the gaming industry by delivering the innovation that players want. It is IGT's mission to be the global innovation leader in the gaming industry.



Technical Director(s):

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Project Motivation:

IGT offers a digital signage video controller unit, with marketing brand name ShowController, as part of the Lottery product portfolio. This product was introduced into the marketplace in 2015 and is now reaching end of life, not only due to normal part obsolescence, but also impacts of the recent supply chain shortages. This project will focus on replacing IGT's ShowController with a new version.





Anticipated Best Outcome:

IGT's expectation is dependent on the projects initial Buy vs. Build analysis of a new video controller unit. If the decision is to buy a commercial off the shelf (COTS) product, the anticipated outcome is to have a fully functional device identified, integrated with IGT Platform software, integrated with IGT digital media software, performance tested, and released to be ready for order by IGT's customers by the end of April 2023.

The Anticipated Best Outcome for a build decision is to complete the engineering design package and bill of materials for the controller, develop an engineering prototype for Engineering Validation Testing, and complete IGT Platform Software integration on prototype hardware with the goal of transitioning the project to IGT's Engineering Team by the end of April 2023.

Project Details:

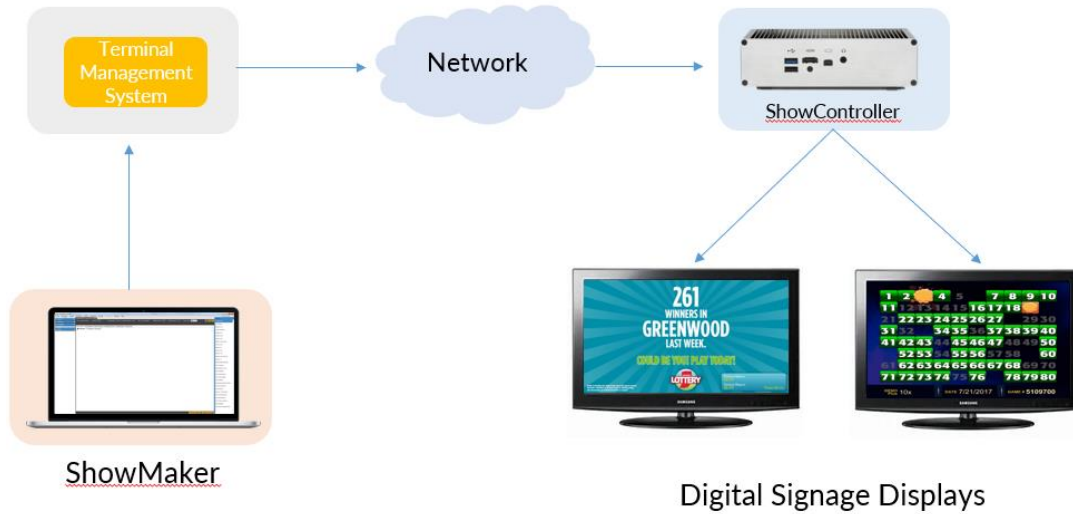
The primary function of the ShowController is to render single or dual channel multi-media content on digital signage displays. The ShowController is a network enabled device and control of the device is managed through IGT's Lottery Point of Sale terminal or directly from the Lotteries Central System.

IGT requests an engaging team of URI Electrical and Computer Engineering students to design, develop, and deploy a replacement ShowController. The initial phase of the project is to do a Buy vs. Build analysis to determine if there is a COTS solution on the market that will meet IGT's requirements. Based on the outcome of the Buy vs. Build analysis, the team will be responsible for sourcing or designing the new ShowController, targeting the Operating System, integrating IGT's Retail Digital Media player onto the platform, and releasing the product into the market.

The specified design shall support the following base requirements:



Category	Specification
Resolution	Support a range of popular resolutions currently in retail locations with the upper limit of 1920 x 1080: <ul style="list-style-type: none"> • 640 x 480 • 800 x 600 • 848 x 480 • 1024 x 768 • 1280 x 720 • 1280 x 1024 • 1366 x 768 • 1920 x 1080
Media Formats	Support both legacy and newer media file formats: <ul style="list-style-type: none"> • Static images – PNG, JPEG • HTML - Light (1 moving object) - Medium (25 moving objects) • Video – H.264 MP4, H.265 MP4, <u>WebM</u> • HTML (Light) over Video • Audio - MP3 and OGG
Media Performance	<ul style="list-style-type: none"> • 1080p decode @ 30 fps
Connectivity/IO	<ul style="list-style-type: none"> • (2) Integrated Ethernet Port • <u>WiFi</u> • (2) HDMI output • AC Power adapter • (4) USB ports
Wireless	<ul style="list-style-type: none"> • <u>WiFi</u> 802.11 ac (5 GHz) b/g/n (2.4 GHz) • Bluetooth 4.1 or later
Operating System	<ul style="list-style-type: none"> • Linux preferred • Android option is dictated by OTS vendor or design constraints.
Memory	<ul style="list-style-type: none"> • 2- 4 GB
Storage	<ul style="list-style-type: none"> • 16 GB



Hardware/Electrical Tasks:

- Requirements refinement
- Specification definition
- COTS Buy vs. Build analysis
- *Board Design
- *Development
- Prototyping
- Power budget analysis
- Bill of Material creation

*Board design and development tasks depend on outcome of Buy vs. Build analysis.

Firmware/Software Tasks:

- Target hardware with Linux OS
- Port IGT Multimedia Player to target device
- Design and develop diagnostics application
- Design and develop configuration utilities
- Evaluate performance
- Graphics stack optimization based on performance evaluation
- Network communication testing



Composition of Team:

1 Electrical Engineer & 2 Computer Engineers

Skills Required:

Electrical Engineering Skills Required:

- Familiar with Graphics Processing hardware
- Comfortable working with electrical component vendors
- Microprocessor board design
- Schematic design
- Board layout

Computer Engineering Skills Required:

- Embedded programming
- Linux OS (or Android) System programming
- Programming in C/C++
- GPU Chipset programming

Anticipated Best Outcome's Impact on Company's Business, and Economic Impact

Digital signage is a core requirement by IGT's lottery customers to support key lottery advertising and game draw results. The video controller device developed under this project will be used as part of IGT's standard product offering to IGT's Lottery customers for displaying multimedia content to digital signage displays.

Broader Implications of the Best Outcome on the Company's Industry:

Broader implications of this solution include integrating this device into other IGT products to provide more flexibility in designing new solutions for our Lottery and Gaming customer.