

DESIGN DOCUMENT VERSION2.0

FOR GREENVILLE LICENSE MANAGER (GEM.LM)



WIREFRAMES, DB ARCHITECTURE, BUSINESS LOGIC & OTHER DETAILS

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SECTION 1. EXECUTIVE OVERVIEW

1.1 Definitions of Wireframes

Wireframes are Screen Layouts spanning an entire application. Although there are multiple ways to do screen layouts for Analysis work, this class has discussed using Figma Design and Make Tools with a combination of HTML and React Pages. That was the requirement for this assignment.

1.2 Figma Design

Figma design is similar to other tools from Microsoft and Adobe software and allows a user to create a layer Visual on a canvas. Unlike some tools however Figma has “SnapTo” tools which are built based on a Rendered Device output allowing for developers to make tools for a single type of output.

1.3 Figma Make

Figma Make takes a “Figma Design” or any other HTML file, or Graphic that a LLM AI Tool can ingest and builds HTML, React, and other developer finished tools which can be compiled into real programs. Figma has partnered with ClaudeAI which is Anthropic’s AI tool.

1.4 Greenville License Manager as part of Greenville Enterprise Manager

We believe the Greenville License Manager is a sub-component of the Greenville Enterprise Manager Tool and will allow the real-time monitoring of Application Use across an Enterprise which is the first of its kind, using location processing on a per station basis, per region, and hosting shard which are definitions beyond the scope of this document.

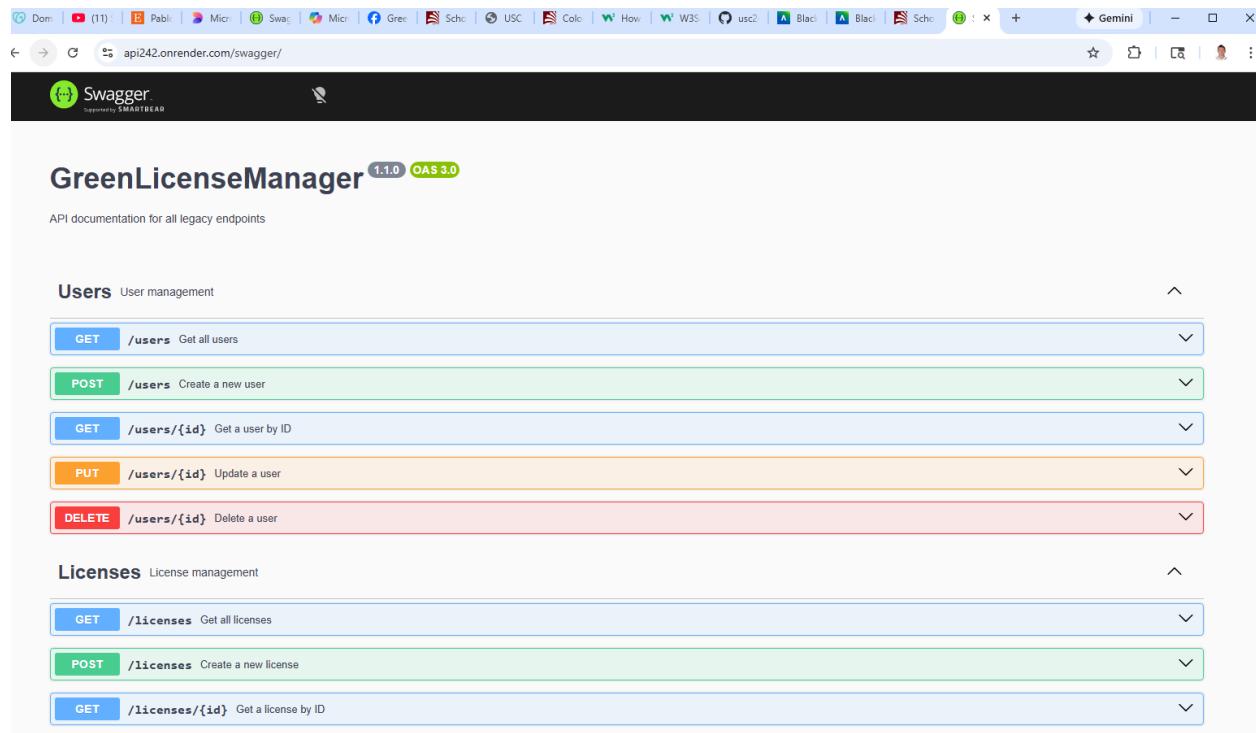
2.0 RENDER APIs IN PRODUCTION

2.1 Executive Summary

In our scope of work for the project we discussed building a 30+ table backoffice as we believed that was the minimal function design after completing 547, 590, 567, 587, and 498(1)/498(2). This includes User Mode Functions, Security, Cart Services, Enterprise Tools, and the specific module under development (Parks, ITIL Service Manager, Solution X, Solution Y). A 30 Table Backoffice without any prior work in this area is a significant design and development burden in itself. It is another thing to put in production in C# APIs, Host the API in a responsible manner, and or build Express NodeJS equivalents.

2.2 Porting And New Code from Azure and Google Cloud to Render

The instructor determined her target for our environment was student accounts on Render, and MongoDB databases connected to Express. This environment is now complete and in production. Initially we built and checked our work without swagger/OpenAPI, then asked various AI tools if it is supported on Express, and since it is we felt great to get to more or less the same code design for our backoffice supportable on NodeJS as it is on Microsoft Hosting platforms as DotNet Executables. Unlike Microsoft Tools, The Render Environment can actually run Yarn, and Vite/NPM development scripts to build the source code and is superior from a production environment as it doesn't require 16GB of RAM to Run Vscode/Visual Studio. A Beautiful Solution.



2.3 SCHEMA DESIGN FOR THE PROJECT

The current schema which we believe encompasses all the requirements of this project is approximately 31-40 tables on completion which is large project for a single developer by itself. We believe this is only possible as we have been working on a target operating schema for more than 18 months in 6 other classes. We advised the instructor that a 5-6 page project is doable for a single developer in a 2XX class but is not anywhere near production quality deliverables of 547/590 built by teams.

Nevertheless here is our proposed solution.

```
// -----
// ROUTES
// -----  
  
// Users & Accounts (4)
app.use("/users", require("./routes/userRoutes"));
app.use("/api/notices", require("./routes/userNoticeRoutes"));
app.use("/usercontacts", require("./routes/userContactRoutes"));
app.use("/userhelp", require("./routes/userHelpRoutes"));  
  
// Companies & Branches (3)
app.use("/companies", require("./routes/companyRoutes"));
app.use("/branches", require("./routes/branchRoutes"));
app.use("/instances", require("./routes/instanceRoutes"));  
  
// Logging & Security (5)
app.use("/api/apilogs", require("./routes/apiLogRoutes"));
app.use("/api/adminlogs", require("./routes/adminLogRoutes"));
app.use("/downloadlogs", require("./routes/downloadLogRoutes"));
app.use("/licenselogs", require("./routes/licenseLogRoutes"));
app.use("/userlogs", require("./routes/userLogRoutes"));  
  
// Licensing (1)
app.use("/licenses", require("./routes/licenseRoutes"));  
  
// Parks (1)
app.use("/parks", require("./routes/parkRoutes"));  
  
// DTOs (2)
app.use("/api/GCPARKS", require("./routes/gcParksRoutes"));
app.use("/api/gcparks", require("./routes/gcParksRoutes")); // lowercase alias
app.use("/api/CGCART", require("./routes/cgCartRoutes"));  
  
// Batch Processing (1)
app.use("/api/batches", require("./routes/batchRoutes"));  
  
// Commerce / Sales (7)
app.use("/products", require("./routes/productRoutes"));
app.use("/reviews", require("./routes/reviewRoutes"));
app.use("/salescatalogue", require("./routes/salesCatalogueRoutes"));
app.use("/invoices", require("./routes/invoiceRoutes"));
app.use("/invoicelineitems", require("./routes/invoiceLineItemRoutes"));
app.use("/payments", require("./routes/paymentRoutes"));
app.use("/refunds", require("./routes/refundRoutes"));  
  
// Cart System (3)
app.use("/cart", require("./routes/cartRoutes"));
app.use("/cartmaster", require("./routes/cartMasterRoutes"));
app.use("/cartitems", require("./routes/cartItemRoutes"));
```

```

// Reservations (1)
app.use("/reservations", require("./routes/reservationRoutes"));

// Cards (1)
app.use("/cards", require("./routes/cardsRoutes"));

// Scopes & Project Tasks (2)
app.use("/scopes", require("./routes/scopeRoutes"));
app.use("/projecttasks", require("./routes/projectTaskRoutes"));

// -----
// TOTAL ROUTES: 31
// -----

```

THESE ALL SUPPORT GET, AND PUT, AND GET, PUT AND DELETE BY ID OUT OF THE BOX (5 SETS OF ENDPOINTS FOR EACH TABLE). This is basic SQL support, and does not support additional items like capacity checks, user notification, and backoffice services which may need additional tables, and lots more Endpoint logic none of which are in scope for this class.

2.4 SWAGGER AND EXAMPLE OUTPUT FOR THE PROJECT – USERS

Swagger is returning the User Table Below

No parameters

Responses

Curl

```
curl -X 'GET' \
'https://api242.onrender.com/users' \
-H 'accept: application/json'
```

Request URL

<https://api242.onrender.com/users>

Server response

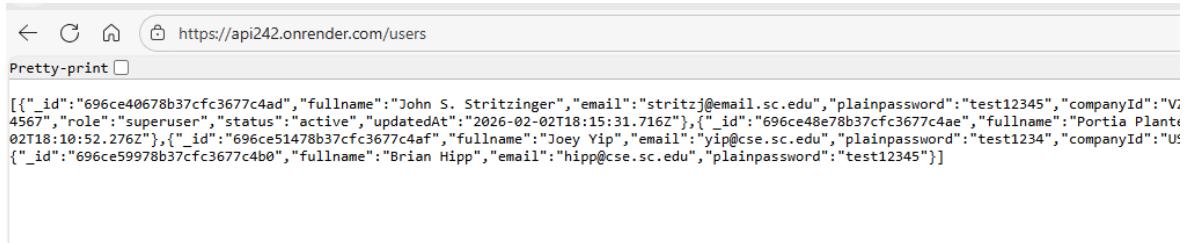
Code	Details
200	Response body

```
[
  {
    "_id": "690cce40678b37fcfc3677c4ad",
    "fullname": "John S. Stritzinger",
    "email": "stritz@email.sc.edu",
    "plainpassword": "test12345",
    "companyId": "VZFE0001",
    "corporateuser": "True",
    "password": "test1234",
    "phone": "+57-123-4567",
    "role": "superuser",
    "status": "active",
    "updatedAt": "2026-02-02T18:15:31.716Z"
  },
  {
    "_id": "690cce48e78b37fcfc3677c4ae",
    "fullname": "Pauline Planté",
    "email": "planté@se.sc.edu",
    "plainpassword": "test12345",
    "companyId": "VZFE0001",
    "password": "803-867-5309",
    "phone": "+57-123-4567",
    "role": "superuser",
    "status": "active",
    "updatedAt": "2026-02-02T18:10:52.276Z"
  },
  {
    "_id": "690cce51478b37fcfc3677c4af",
    "fullname": "Joey Vip",
    "email": "vip@email.sc.edu",
    "plainpassword": "test1234"
  }
]
```

Response headers

```
access-control-allow-origin: *
alt-svc: h3=":443"; ma=604800
```

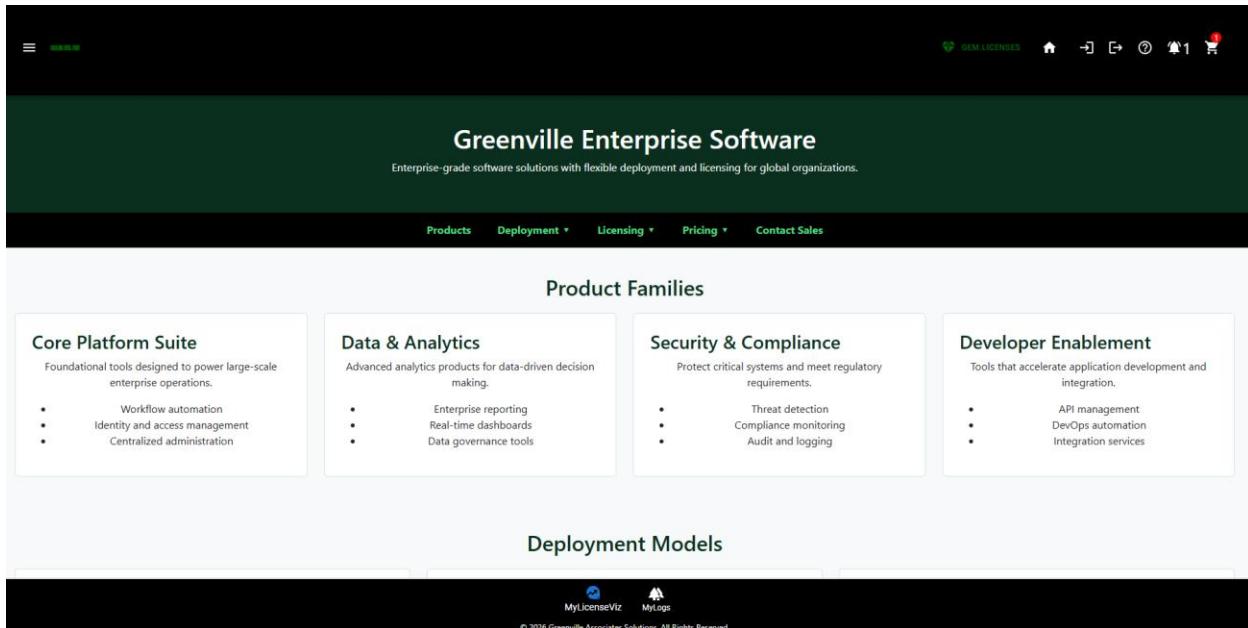
2.5 DIRECT ACCESS TO THE API FROM AN APPLICATION RETURNS A JSON



A screenshot of a web browser window displaying a JSON array of user objects. The URL in the address bar is <https://api242.onrender.com/users>. The page content shows a JSON object with three items, each representing a user with fields like _id, fullname, email, plainpassword, companyId, role, status, and updatedAt.

```
[{"_id": "696ce40678b37cf3677c4ad", "fullname": "John S. Stritzinger", "email": "stritzj@email.sc.edu", "plainpassword": "test12345", "companyId": "Vi4567", "role": "superuser", "status": "active", "updatedAt": "2026-02-02T18:15:31.716Z"}, {"_id": "696ce48e78b37cf3677c4ae", "fullname": "Portia Plant", "email": "portia@sc.edu", "plainpassword": "test1234", "companyId": "U02T18:10:52.276Z"}, {"_id": "696ce51478b37cf3677c4af", "fullname": "Joey Yip", "email": "yip@cse.sc.edu", "plainpassword": "test1234", "companyId": "U02T18:10:52.276Z"}, {"_id": "696ce59978b37cf3677c4b0", "fullname": "Brian Hipp", "email": "hipp@cse.sc.edu", "plainpassword": "test12345"}]
```

3.0 TARGET GREENVILLE LICENSE MANAGER WIREFRAMES – COMPLETE



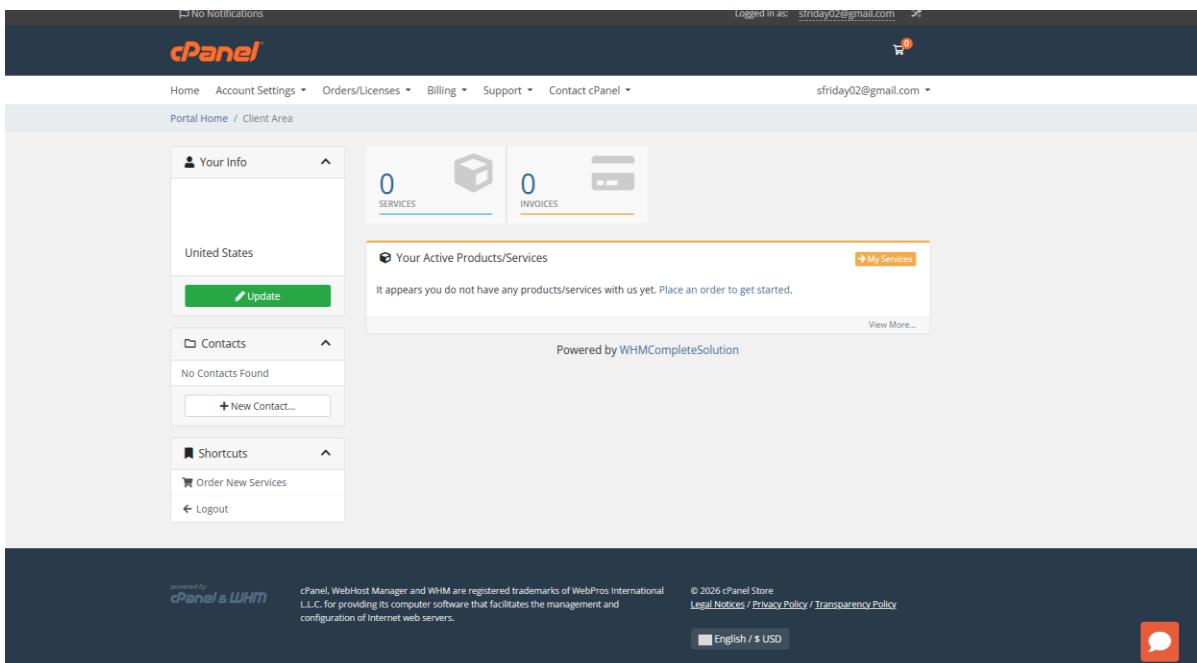
3.1 Executive Overview – Translating Scope of Work to Target Designs.

We have sought to build a Landing page for our LicenseManager which discusses what types of licenses we sell in the Greenville Enterprise Software(GES) Division of our company. The idea is after we logged in we would only see domain specific information

3.2 Competitive Analysis

Other competing products from 3CX VOIP tools, and cPanel which we think both do an excellent job handling Cloud Licenses and we look at their license managers as the gold standard which we are not trying to copy, but we think we can improve it substantially in the following ways:

- a) Our competitors tool only allows us to view our current licenses, add more and upgrade existing ones. This is significant code.
- b) Our competitors tools allows us to manage our business accounts, and purchase history. This is previous sales history. This is similar to restaurant companies like Sonic and Ihop restaurants which show your previous transactions online.



The screenshot shows the 3CX software interface. At the top, there's a dark header with the 3CX logo and a user profile for Stewart Friday (sfriday02@gmail.com). Below the header is a light-colored main area titled 'Your 3CX systems'. There's a blue 'ADD SYSTEM' button. Underneath, there are several dropdown filters: 'Search', 'All editions', 'All Subscriptions', and 'All statuses'. A table below these filters lists columns for Company, Product, Type, Expiry, and Manage. At the bottom of the table, there are pagination controls for 'Items per page: 10' and '0 of 0' items.

3.3 Significant Improvements over Competing Designs

The four competitors software tools we mentioned only show a single user or companies licenses. They have no view of enterprise licenses, or in a wholesale model the usage of agents. Furthermore these tools have no Administrative equivalents which show dashboard, and usage of platforms, although we think that our competitors have this information externally for investor purposes and for understanding the usage of their products in more detail.

We intend to provide aggregated information to Hosting Providers who have 5, 10, 100, or hundreds of containers of our software across multiple hosting regions, grids, and hybrid clouds.

We intend to use advanced logging and security tools to extend our SSO framework to a global platform and capability across our Global Managed Grid Infrastructure.

For the same reason they have no ability to provide any enterprise usage reports for their customers without professional services rollouts. We had intended to mirror these very successful companies deployments of license management which is superior even to Cisco or Microsoft in our opinion but she told us she thought it wasn't very good.

3.4 Structure of Final Workflow includes Up to 18 Pages All of Which are Designed and in near working form.

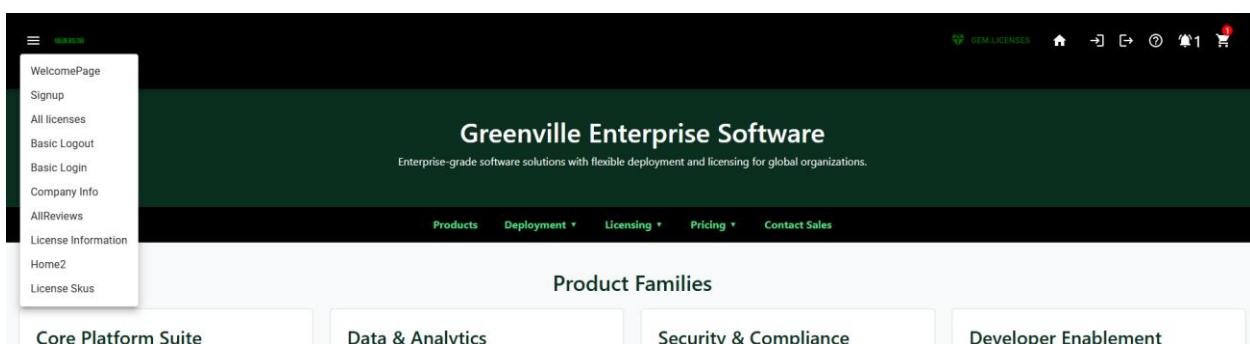
Major structures of our document include a TopBar, a BottomBar, and interior Mid-Page Navigation as seen in the diagram in 5.0 using Material-UI Tool bars. These engage the React-Router.

3.5 Menu Options DropDown & Pages Accessible via Top Nav Bar

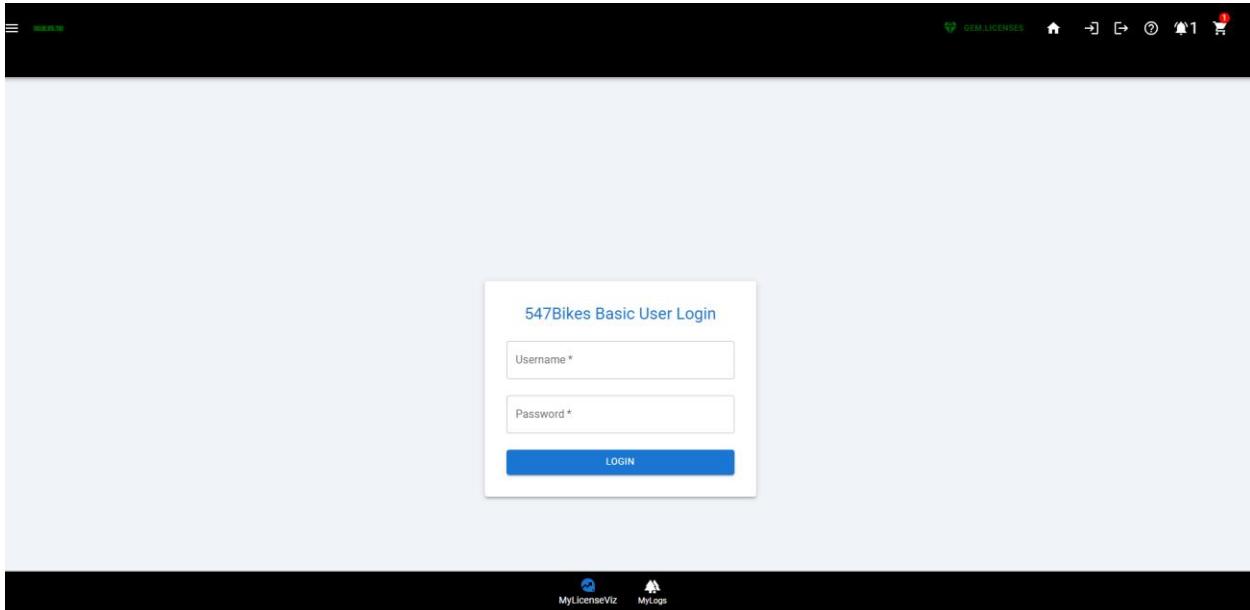
We intend to load the Sales Site as our Landing Page for the License Page with a General overview of the License Types available and where they can be used. Furthermore, the Login(1), Logout(2), UserNotices(3), UserHelp(4), And Cart(5) can be accessible from the Main Nav Bar and sized to work on all devices. The Menu Bar Supports additional information Welcome(SystemInfo)(6), Signup/Registration(7), All Licenses(8), Corporate Profile(9), ProductReviews(10), LicenseInformation(11), Home2(12), LicenseLogs(13).

The Bottom Nav Bar for End-Users is Operational. It shows Logs, and Current Licenses. On the Current Licenses Tool You can Buy More(14), or Upgrade Licenses(15) with default pricing level loaded. Then there is a cartreview(16), paymentreview(17), and cardmaintenance(18) page environment which is more than 3X the project requirements for the class, and with a much larger backoffice on Mongo DB our project is significantly more sophisticated.

These Screen #'s are included below for more information.



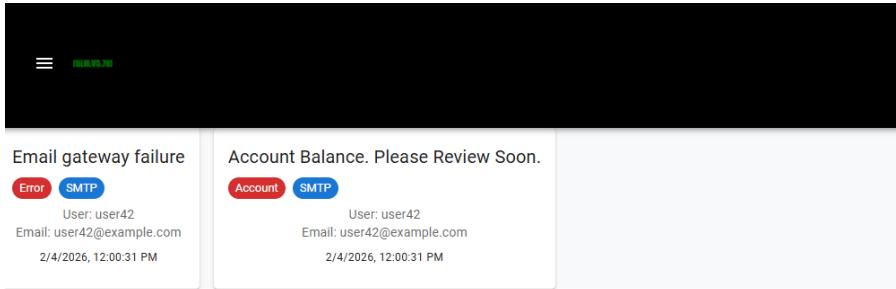
3.6 LOGIN(Screen1)



3.7 LOGOUT(Screen2)

Processed in the background with a spinner.

3.8 User Notices(Screen3)



3.9 User Help(Screen4)

The screenshot shows a modal window titled "Customer Contact". The window contains fields for Phone, Email, Address 1, Address 2, City, State, Zip, Country, and Fax. A "Submit" button is at the bottom. The background shows a navigation bar with "GEM.LICENSES" and other icons.

Customer Contact

Phone

Email

Address 1

Address 2

City

State

Zip

Country

Fax

Submit

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3.10(Screen5)

The screenshot shows a shopping cart interface. It displays a single item: "10CAL - FusionShell Professional V6.01" with a price of "\$179.99". The cart summary shows Subtotal: \$179.99, Tax (8%): \$14.40, and Total: \$194.39. Buttons for "Clear Cart" and "Proceed to Checkout" are visible.

GEM.LicenseManager

Shopping Cart 1

10CAL - FusionShell Professional V6.01

SKU: FSFROV601-10CAL

Vendor: Greenville Associates

VP Discount (10%)

\$199.99 **\$179.99**

Total **\$179.99**

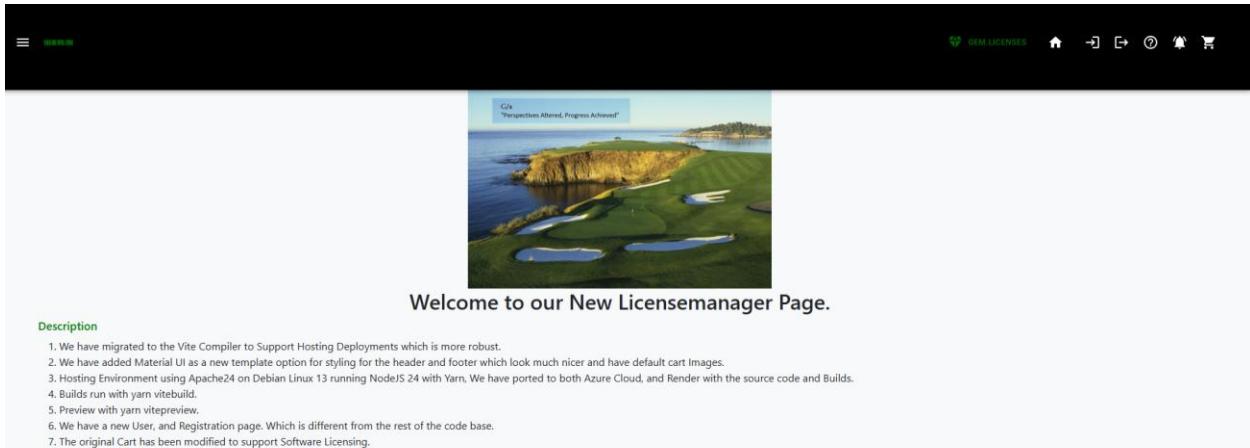
Subtotal: **\$179.99**

Tax (8%): **\$14.40**

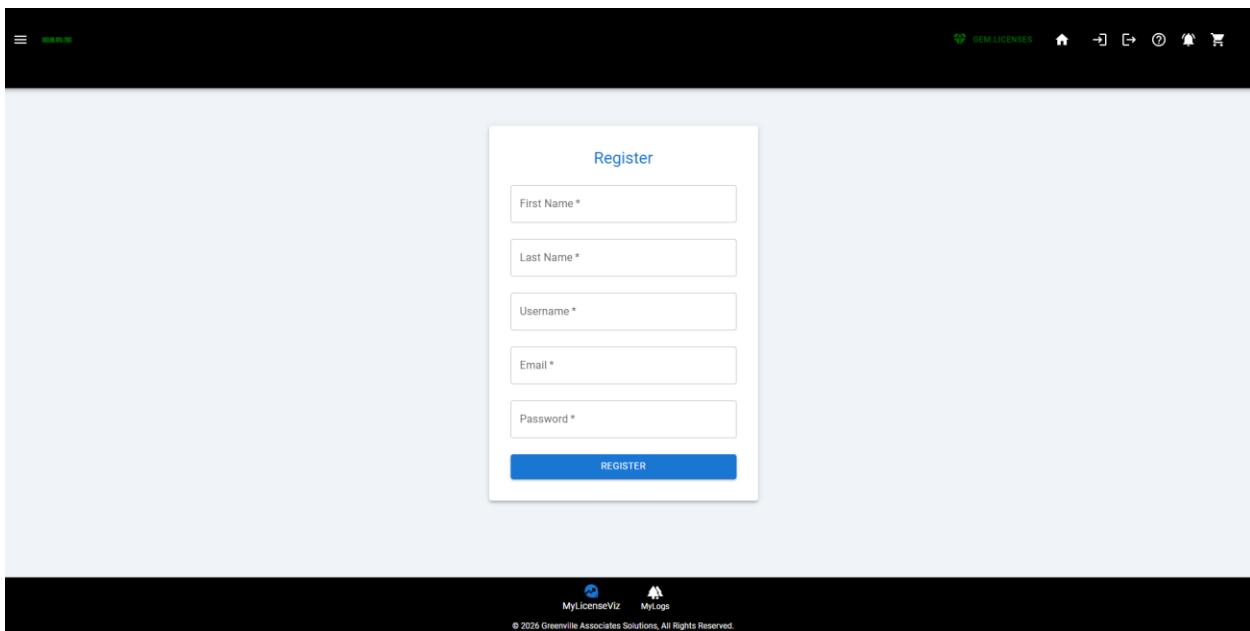
Total: **\$194.39**

Clear Cart Proceed to Checkout

3.11(6) Welcome(SystemInfo)(Screen6)



3.12 Signup/Registration(Screen7)



3.13 All Licenses(Screen8) Legacy

The screenshot shows a legacy web application for managing software licenses. At the top, there are two buttons: "BUY MORE LICENSES" (blue background) and "BUY ENTERPRISE LICENSE" (pink background). Below these are five license cards, each containing the following information:

License	Version	Install Date	End Date	Customer
ABC1234	Open25	1/1/2026	3/1/2029	ClearviewSoftware211
ABC1234	Open25	1/1/2026	3/1/2029	ClearviewSoftware211
LIC-001	1.0.0	2025-01-01	2026-01-01	COMP-001
LIC-001	1.0.0	2025-01-01	2026-01-01	COMP-001
LIC-331	1.1.0	2025-01-01	2026-01-01	VZF001

Each card also includes a "Created" timestamp at the bottom.

Legacy Licenses – Figma Design(Improvement)

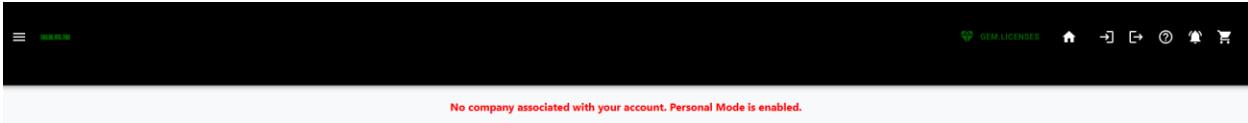
The Figma wireframe for the license manager interface is titled "License Manager" and displays the following components:

- Header:** "GEM.LicenseManager" with a menu icon, search bar, and notification badge.
- Top Bar:** "MyLicenseViz" and "MyLogs" icons.
- Main Area:**
 - Title:** "Active Licenses (5)"
 - Table:** A grid showing active licenses with columns: Software, Version, License Key, Seats, Expiry Date, and Status (all marked as "Active").

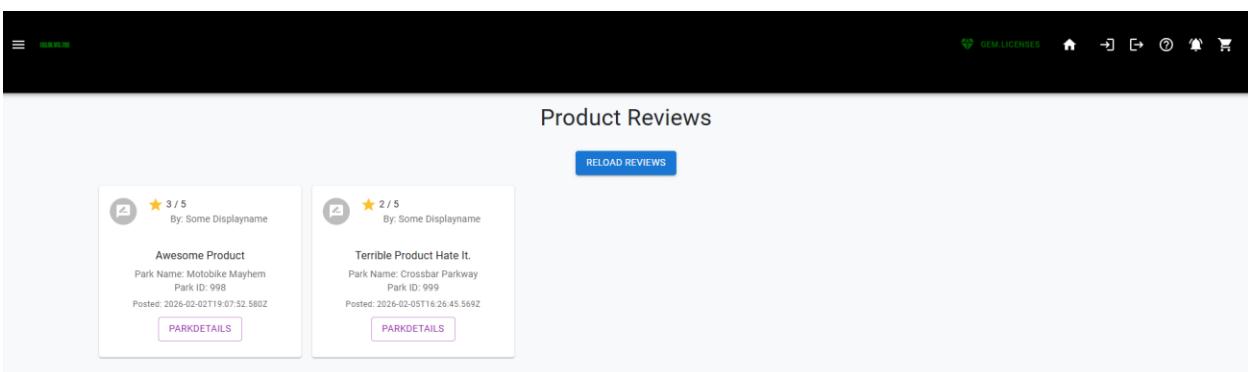
Software	Version	License Key	Seats	Expiry Date	Status
N/A	Open25	N/A	N/A	N/A	Active
N/A	Open25	N/A	N/A	N/A	Active
N/A	1.0.0	N/A	N/A	N/A	Active
N/A	1.0.0	N/A	N/A	N/A	Active
N/A	1.1.0	N/A	N/A	N/A	Active
 - Buttons:** "+ Add License", "Upgrade License", and "Logout".
- Bottom Navigation:** Icons for Dashboard, Licenses, Reports, and Settings.

3.14 Corporate Profile(Screen9)

This page is not in a good tangible form....Because I don't have a JOIN which works in the database so I can debug the result yet.... IE UserProfile to Corporate Account has to work.



3.15 ProductReviews(Screen10)



3.16 LicenseInformation(Screen11)

The screenshot shows the 'Enterprise Licensing' section of the GEM License Manager. At the top, there are three categories: 'Software On-Premise' (Installed and operated within your own data centers for maximum control.), 'Software in the Cloud' (Fully managed cloud-based solutions with elastic scalability.), and 'Hybrid Software' (Combine on-premise infrastructure with cloud-based services for flexible deployment.). Below these, the 'Enterprise Licensing' section is titled 'Enterprise Licensing' and describes flexible enterprise licensing models for organizations of all sizes and structures. It includes four boxes: 'Software Based on Utility Hours' (Pay only for the compute or usage hours consumed by your organization.), 'Named Users' (Licenses assigned to individual users for predictable cost and access control.), 'Business Unit Enterprise Licenses' (Licensing tailored to specific divisions or departments within your organization.), and 'Enterprise License Types' (Organization-wide licensing with unlimited usage across all business units.).

3.17 Home2(Screen12) – Different View of Products – All Products in All conditions.

This is a Full List of Products while the home page is supposed to be just a subset of key products.

The screenshot shows the 'Welcome to GEM License Manager' page. It features three product categories: 'Individual License - Per User' (Greenville, CA), 'Enterprise License - Per BU' (Greenville, OH), and 'Enterprise Site License - Global' (Greenville, OH). Each category has a large image of a landscape with a prominent letter 'G'. Below each image, there is a brief description: 'These are Individual FusionPro License.', 'This is an Enterprise License for One Business Unit.', and 'This is an Enterprise License for One Business Unit.' respectively. Each category also includes price information: 'Corporations: \$250 | Businesses: \$15' for the individual license, 'Corporations: \$2500 | Businesses: \$1500' for the enterprise license per BU, and 'Corporations: \$2500 | Businesses: \$1500' for the enterprise site license. Each category has three buttons: 'Purchase Now' (orange), 'Product Reviews' (grey), and 'License Info' (black).

3.18 LicenseLogs(13).

The screenshot shows a table titled "User License Logs". The columns are "License ID", "User", "Status", and "Accessed". There are seven rows of data. The first row has a "License ID" of "somelicenseid", a "User" of "john@glocation.info", a "Status" of "active", and an "Accessed" date of "1/18/2026, 12:00:00 AM". The subsequent six rows all have a "Status" of "active" and an "Accessed" date of "Invalid Date".

License ID	User	Status	Accessed
somelicenseid	john@glocation.info	active	1/18/2026, 12:00:00 AM
string	string	active	Invalid Date
string	string	active	Invalid Date
string	string	active	Invalid Date
string	string	active	Invalid Date
string	string	active	Invalid Date

MyLicenseViz MyLogs
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3.19 Buy More(Screen14)

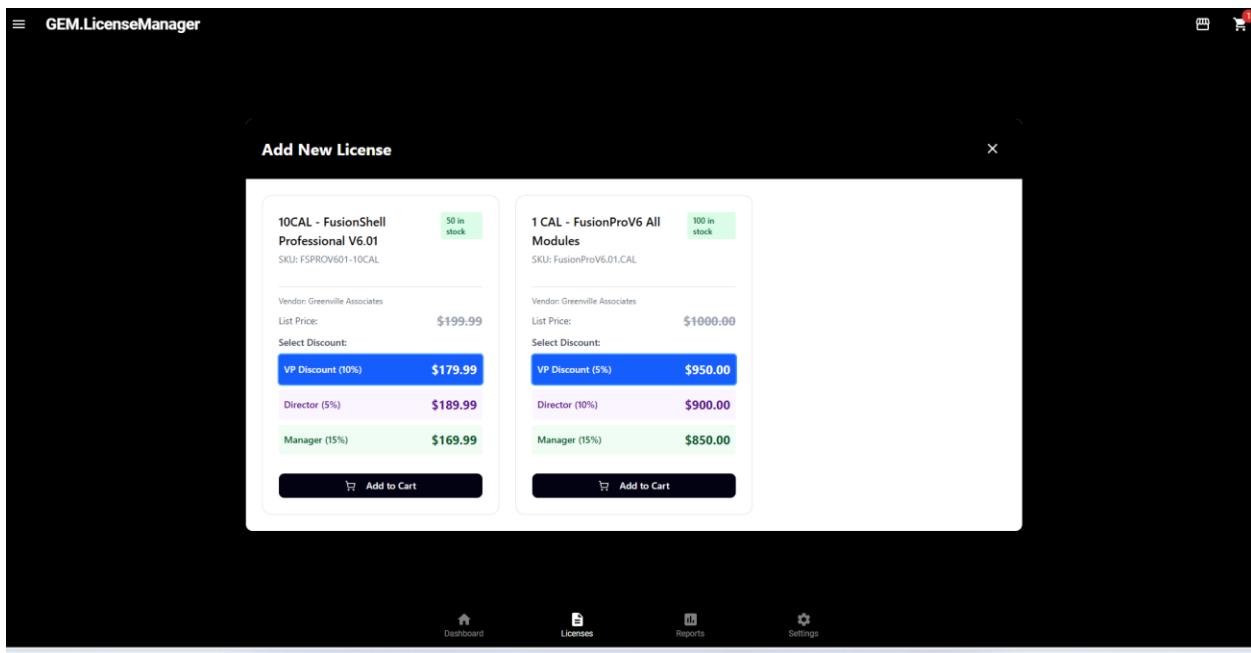
The screenshot shows a "Featured Products" section with two cards. The left card is for the "Individual License - Per User" and the right card is for the "Enterprise License - Per BU". Both cards feature a large image of a yellow letter "G" in a forest setting.

Individual License - Per User
Greenville, CA
★★★★★
5.00 (3 Reviews)
Purchase an Individual FusionPro License
Purchase License Options Product Reviews

Enterprise License - Per BU
Greenville, OH
★★★★★
3.00 (3 Reviews)
This is an Enterprise License for One Business Unit.
Purchase License Options Product Reviews

MyLicenseViz MyLogs

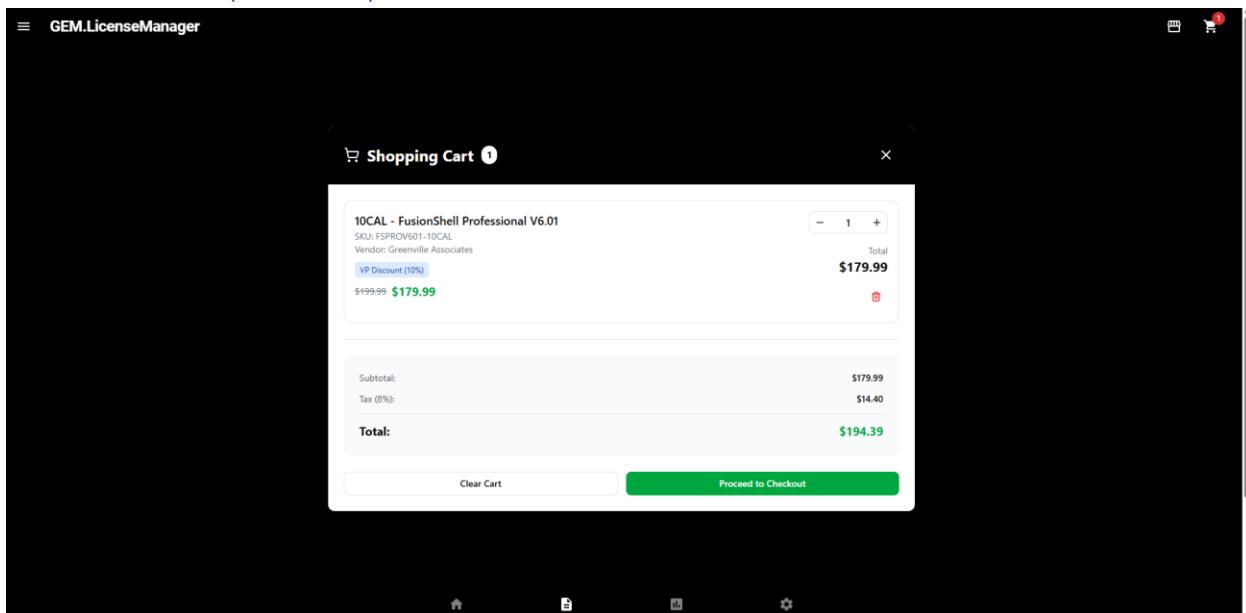
Inside the License Manager



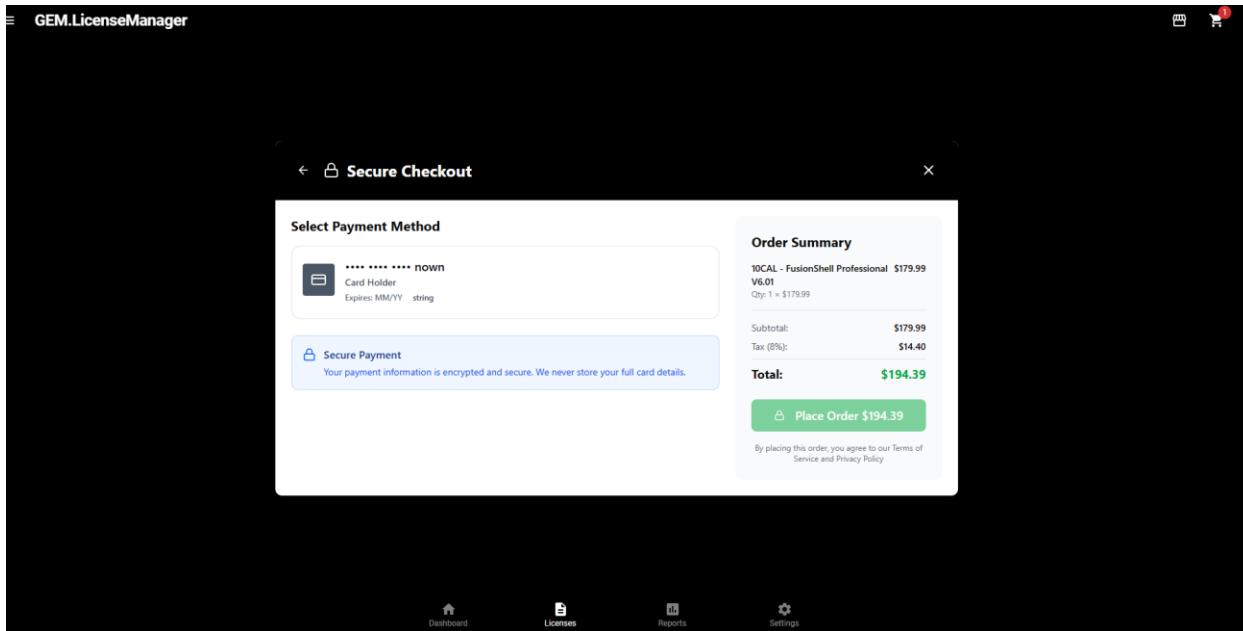
3.20 Upgrade Licenses(Screen15)

Same as Above right now... will eventually filter for only products which can be upgraded.

3.21 Cartreview(Screen16)



3.22 Payment Review(Screen17)



3.23 Card Maintenance(Screen18)

This is implemented in the CG Interface using custom Greenville Components. This button is not implemented in the Figma AI model as we ran out of credits.

3.24 Licenses.GreenvilleAssociates.com completely Rendered story board in itself.

We have built a website which more or less already expresses our wireframes in HTML. We also have a ReactEndUser Site, and ReactAdmin site which is in excess of this. In other words we have three working prototypes against one set of wireframes, and a 33 table database supporting them.