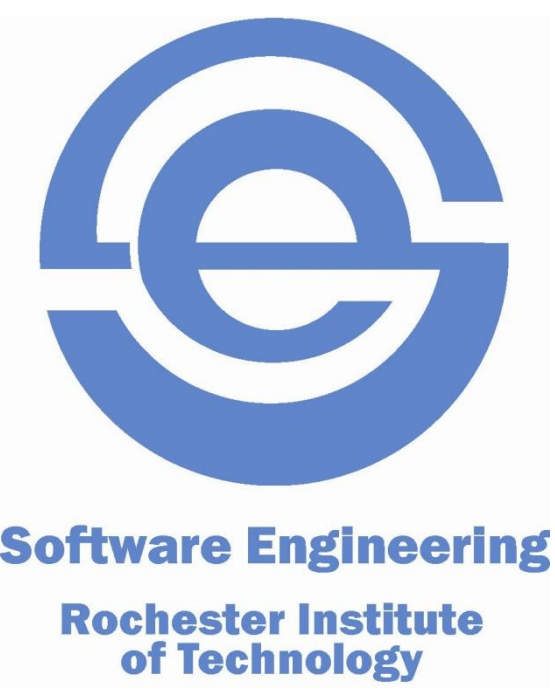


Embedded Menu UI Code Generation (eMUG)

Sponsored by Nathan Ransom – Harris Corporation – RF Communications



BACKGROUND

Harris Corporation - RF Communications uses a C++ Application Programming Interface (API) to program the Graphical User Interface (GUI) for their various production radios. As the complexity of the GUI code has grown, the time needed to modify and extend it has also increased. The primary goal of the eMUG project is to provide a simple, graphical interface to efficiently automate the creation of skeleton implementation code that complies with the current GUI API. The utility will be used internally by both technical and non-technical individuals employed by Harris Corporation. The final generated implementation skeleton provides the minimal amount of C++ implementation code to allow engineers to complete and finalize the integration on the target machine.

The menu hierarchy is stored in an Extensible Markup Language (XML) format with a schema agreed upon by both the sponsor and project team.

SCRUM METHODOLOGY

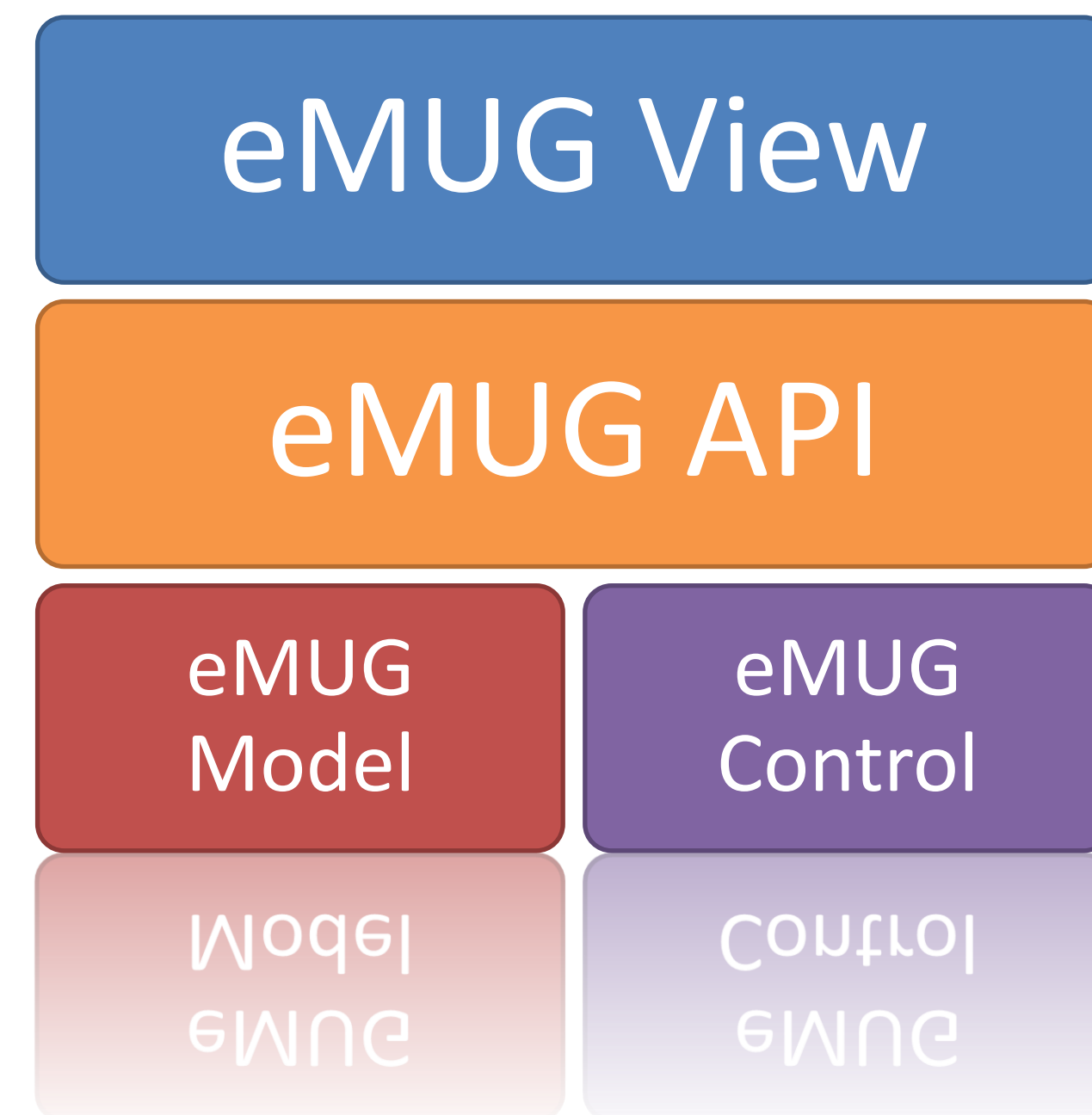
N Squared Solutions has employed a modified Scrum software development process methodology.

Traditionally, where sprints are composed of development tasks, N Squared Solutions allocated additional non-typical development tasks:

- Requirements Elicitation
- Software Architecture
- Detailed Software Design
- Testing



"Software to a higher power"



SOFTWARE ARCHITECTURE

The eMUG Software Architecture is a modified Model-View-Controller pattern where the Model and Control are contained behind a defined API.

Allows multiple view applications as opposed to traditional views in a single application by leveraging the eMUG API.

Supports a hybrid implementation strategy leveraging simultaneous top-down and bottom-up development.

Allows software developers to work independently of each other and promoted module-level code ownership.

SOFTWARE DESIGN

The eMUG application is designed with specific extensibility points to allow future developers to implement new functionality.

CODECS

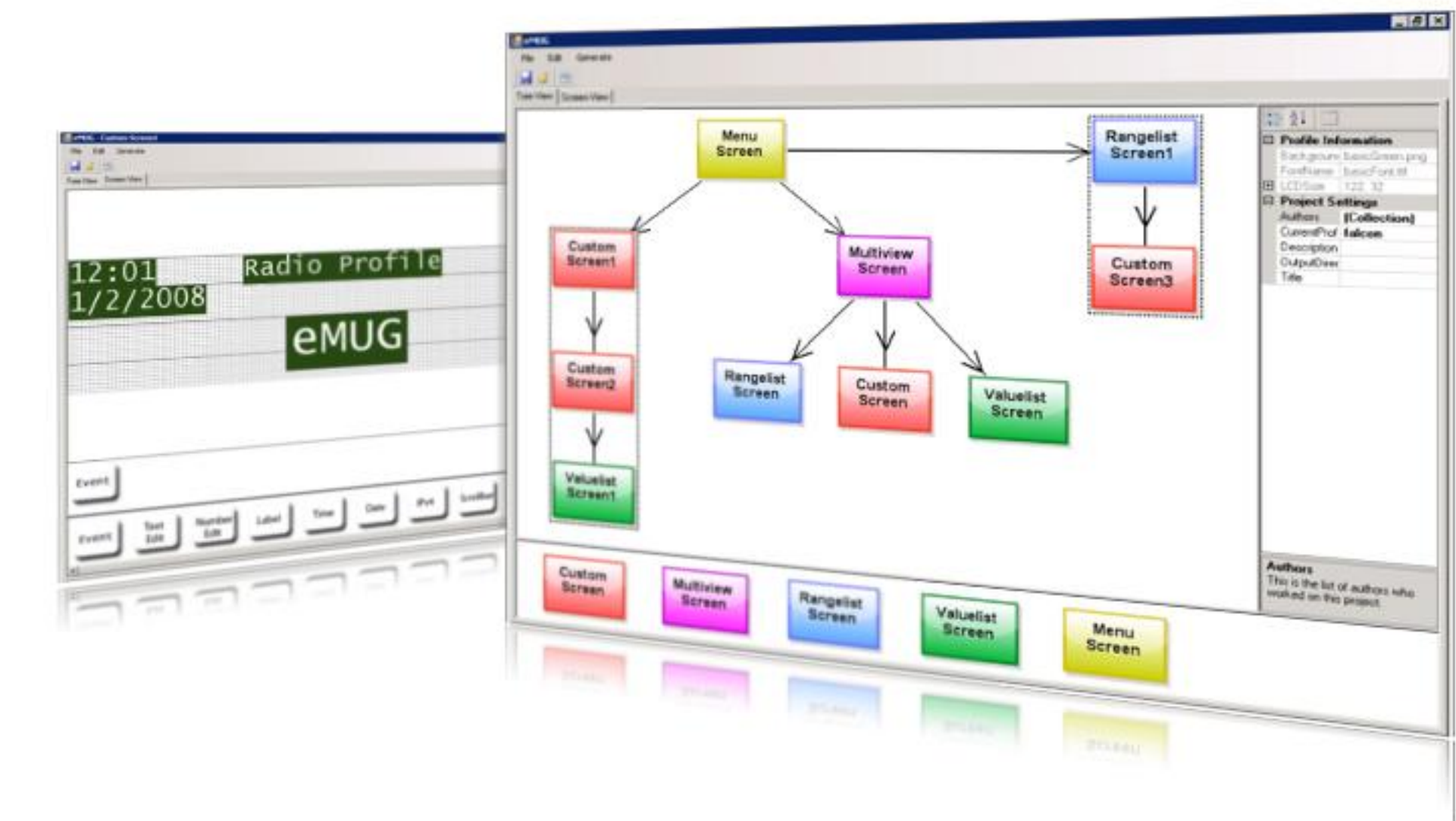
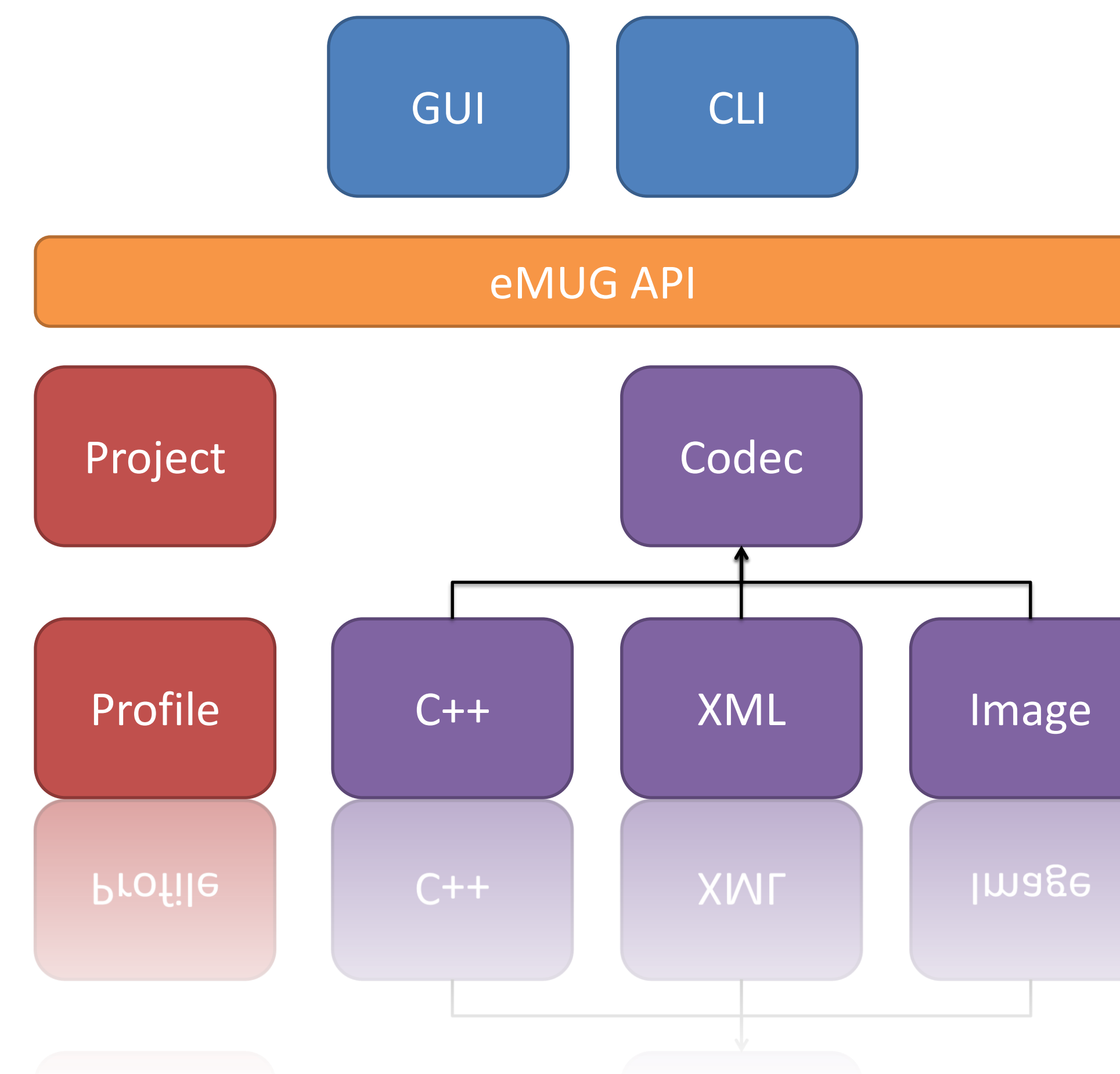
Modules that implement encoding and decoding of various file formats to or from an internal project representation. Developers can easily implement a new codec module and seamlessly integrate it into the application.

PROFILES

New profiles can be easily integrated into the eMUG Framework to represent the current and future production radios in development by Harris Corporation.

VIEWS

Developers can implement new user interfaces by simply including the eMUG Framework into their application.



EMUG SYSTEM FEATURES

DRAG AND DROP

eMUG provides an intuitive and easy to use drag and drop interface to create and modify menu structures and menu screens.

ONE-CLICK GENERATION

With one single click of a mouse button, eMUG can generate a menu structure's C++ source code and menu screen previews in BMP, PNG, and JPEG image formats.

FLEXIBILITY OF XML

Menu hierarchies are stored in XML allowing users to create and modify menu structures in eMUG or in any XML editor.

EXTENSIBILITY

eMUG was designed with extensibility in mind. Future developers can easily add new radio profiles and input/output formats by leveraging the eMUG Framework.

CUTTING EDGE TECHNOLOGY

eMUG was built on the Microsoft .NET Framework 3.5, implemented in the C# programming language, and produced in Microsoft Visual Studio 2008.

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