

A study for Vehicle-IT convergence services development using repository integration tool

YongYoon. SHIN*, ByungYun. LEE*, YoungIl. CHOI*

*ETRI(Electronics and Telecommunications Research Institute), KOREA

uni2u@etri.re.kr, bylee@etri.re.kr, yichoi@etri.re.kr

Abstract— In this paper, the common components for vehicle-IT information on repository and tools to the convergence of IT services for vehicles and vehicle-IT to provide a platform for the vehicle's components that provide common information store it in the repository and repository and tool that works in the repository by using common components of the new vehicle-IT convergence service that allows you to easily develop services for vehicle-IT is a platform technology research.

Keywords— Vehicle-IT, Repository, Eclipse, MDA, Tool

I. INTRODUCTION

Vehicle-IT for the common components, Repository, and Tools of the vehicle-IT-based convergence services and solutions to develop medium sized companies, the most of available services, or features that provide components and these components of the unit features and services to effectively manage and configure Repository system and a tool in this work is composed.

The complexity of automotive mechatronic systems are increasing, steady increase in number functionality & interactions between systems. Vehicle IT developers want shorter development times and financial resources for big variety of product lines, models and variant[1].

In this paper, the vehicle-IT-based convergence services and to develop solutions to small businesses about barriers to entry, lowering the sharing and through the participation of small businesses generate new revenues to help, to low cost/high efficiency of the vehicle-based solutions to develop of platform technologies that deal with information about the repository and tool.

II. REPOSITORY SYSTEM

Utilizing information of the vehicle to provide IT services expert need the help of the vehicle and the vehicle to obtain information on the program is created for each service.

Repeat the same operation should be continued and complete development of the expertise of the vehicle until the moment it is needed. However, companies that manufacture vehicles in the car do not want to share information on service development, a lot of trouble.

Repository in order to solve these issues, the component provides the vehicle information on the vehicle without knowledge of the general developers easily can produce the vehicle-IT services.

Repository provided by the tool in connection with each component at low cost to enable the creation of vehicle-IT services and information for developers to quickly and easily on the vehicle that provides an interface is fundamental to the vehicle-IT platform.

We define 6 common software components. It consists of In-Vehicle component, Out-Vehicle component, Status information of the wayside component, Multiple Communication Selection component based on context awareness, Monitoring component, Virtual Vehicle Test component, Repository system[2].

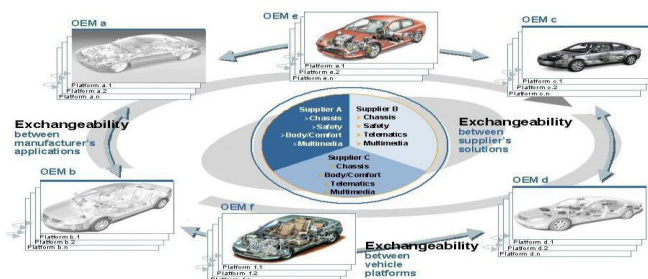


Figure 1. Trend of Vehicle-IT Software development

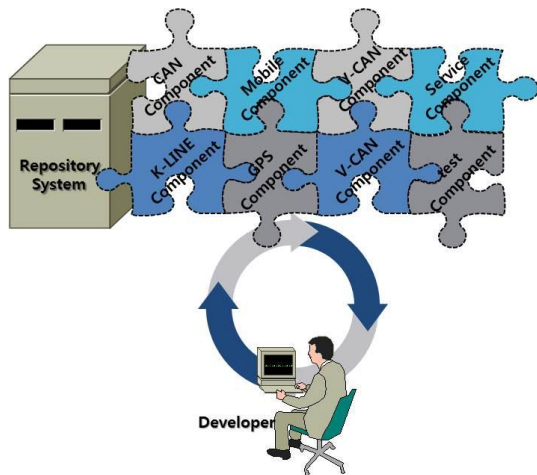


Figure 2. Component based Repository System

Using this components, small Vehicle-IT developers can communicate the information of the vehicle information occurred in the vehicle easily, and it reduce the costs and time for development and test[3].

A. Repository

Repository is a Web server type system component of the database search/management in the form of a web page to be available to developers.

Component through a web page search/download/upload service receives each component reuse, and verification is complete, secure components.

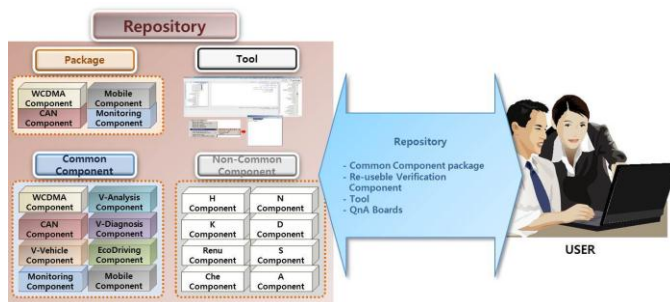


Figure 3. Repository provide components to user

B. Database

Components of the Repository, is stored in the database management.

Developers to search all the information into a database using a database management, and providing search results and the download is performed.

Repository developers are uploaded to a component or service, the database will be stored and managed server, administrator, for information about the database tables are provided

C. Web Service

Repository in order to work with the tool will be developed as a Web service.

The Web Service is using all of Repository from Tool, and to be able to use a database development tool that is able to upload all of the services.

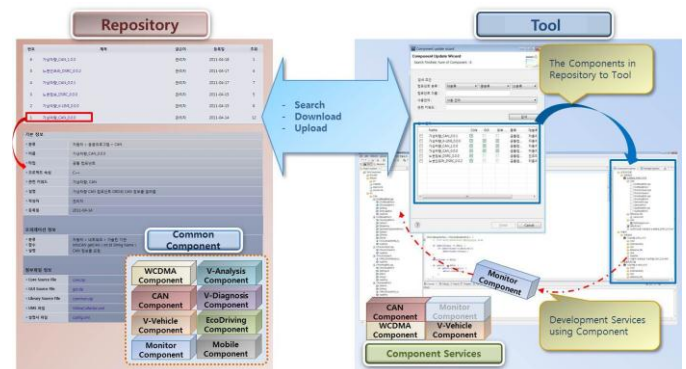


Figure 4. Repository Web connection Tool

III.TOOL

Components are stored repository is integrated with components utilizing easy for developers to develop services, development tools was developed as an Eclipse-based.

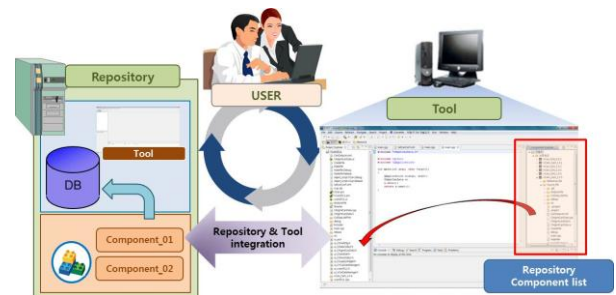


Figure 5. Repository and Tool Integration

The feature is primarily used by developers to re-use proven components to create a functional unit that provides a component by component, in connection with repository so that developers can use the tool easily.

A. Connection to repository

Components stored in the Repository and associated tools to search and can be downloaded and completed the development of services and components can be managed by uploading them to the Repository.

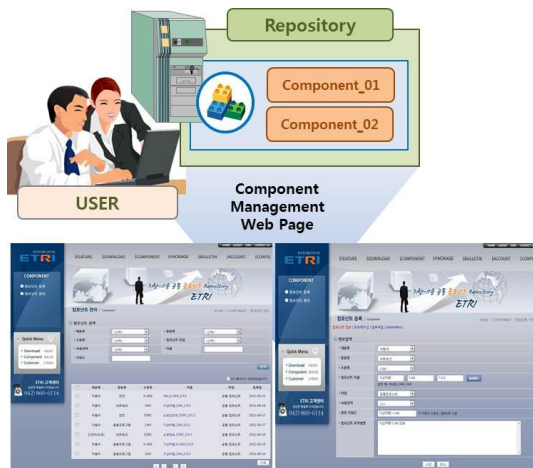


Figure 6. Repository Management Web Page

1) Search Component

- Search Repository component is located in the brief description of each component should check the details.

2) Download Components

- Developers select and download the component is executed.
- The downloaded file to check the components that comprise the file you want to use.
- Components used to develop the service.

3) Upload Services or Components

- Development is completed the service will be uploaded to Repository.

B. MDA (Model Driven Architecture)

Historical development of services for the design and development services, and testing was completed via the service tool to create source code from design specifications to define and develop a flow helps the developer without the use of special tools, all within the tool feature allows to use.

Class diagramming capabilities by developing a plug-in scalable Eclipse-based plug-ins for the tool have been added to the diagramming capabilities.

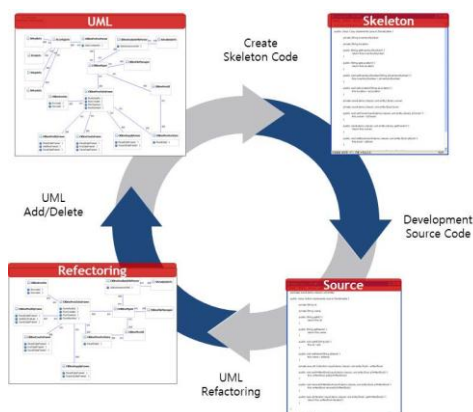


Figure 7. MDA based component development cycle

1) UML To Code

- Developers created during the development phase diagram based on the source code to create.
- UML is the skeleton code that converts the source code.
- The source code typically Java/CPP/C language.



Figure 8. UML information based Code convert

2) Code To UML

- Create UML is based on the source code.
- Transform UML Java/CPP/C is available in the language.

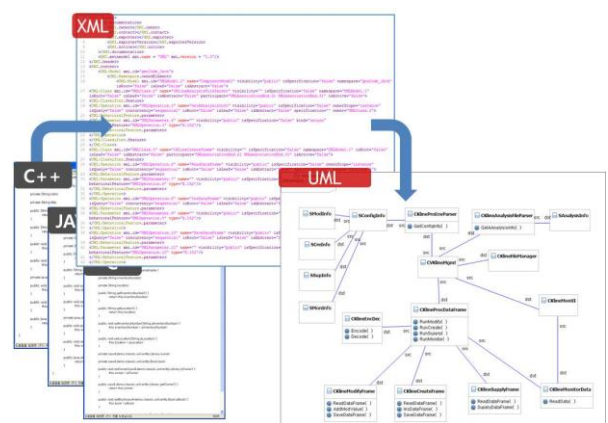


Figure 9. Code based UML Refactoring

C. Code Generations

Vehicle-IT sector, the service's use of language can vary depending on the characteristics typically only have C/CPP/Java language is utilized.

That is the nature of the services they provide can be used not only because of the language in the development of a service outside of the various tools available in the tool, but C/CPP/Java compiler available on the service by using the developer tools to develop.

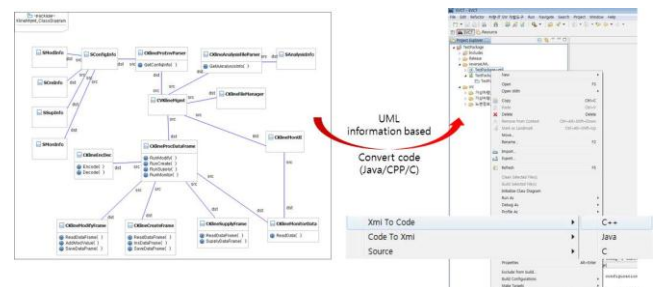


Figure 10. UML based source code convert

1) Java Language:

- Tools are written using the Eclipse-based support for JDK 1.6 or later.

2) CPP Language:

- CDT, Qt and utilize plug-in support for CPP compiler and debugging.

3) C Language:

- CDT plug-ins using the C language compiler and debugging.

D. Plug-ins Add

Both developers use other tools to develop code to apply the characteristics of the tool.

Authoring tool dedicated development tool for the nature of the tool by removing the code that provides a code-based stabilization and user-friendliness.

If the authoring tool to add special features to the development of plug-in feature of the authoring tool can be added.

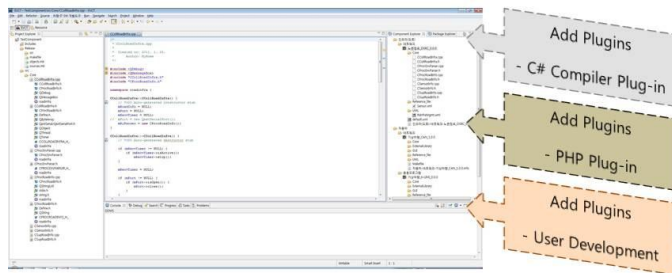


Figure 11. Plug-ins Added by user

IV. CONCLUSIONS

In this paper, component reuse and verification is completed, the stored Repository and Repository using a tool that works with the development of vehicle-IT Service is to quickly and easily.

Developers are when developing vehicle-IT services from design using UML to code, working to create a flow.

And, regardless of the language of a particular development is available and code-based design model can be extracted.

UML tools are based on information from Java/CPP/C can be converted freely in the language and using open-source developer tools you can add functionality.

Software usage for electronic devices in a vehicle has recently been gradually increasing[4].

Vehicle-IT only Repository and tool for small and medium-sized businesses to easily enter the vehicle and vehicle-IT sectors-IT convergence will create a variety of services.

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