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쿠도커뮤니케이션㈜ CUDO COMMUNICATION CO.,LTD

Software Reuse and Components

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1

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OO Technologies

Continuously developed by Programming Language people.

Concepts	FClass, Inheritance, Polymorphism, etc.
Languages	FSmalltalk, C++, Java™, etc.

Advantages

Developers
Easy to develop apps by using software parts

Maintenance
Easy to enhance and easy to transport apps

Users
Simple and standardized operations of systems achieved by design and implementation with GUI common parts

2

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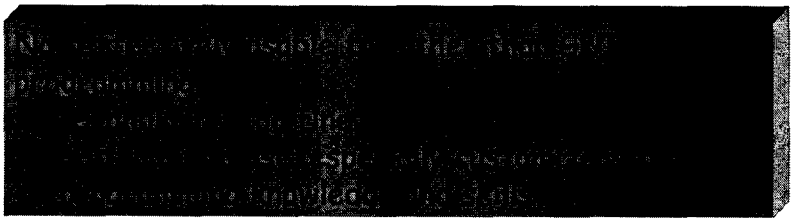
Reusable Objects to develop GUI

MVC Architecture
MacApp®
MFC



3

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Efforts to solve granularity unmatch

Efforts to solve the gap between granularity of the parts expected by app developers and achieved by classes

- **Patterns**
- **Frameworks**
- **Components**

4

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Patterns

A generalized combination of interacting classes commonly applicable to analysis and /or design of various problems. Patterns are catalogued in a document.

Example:GoF "Design Patterns" describing reusable 23 common design patterns

5

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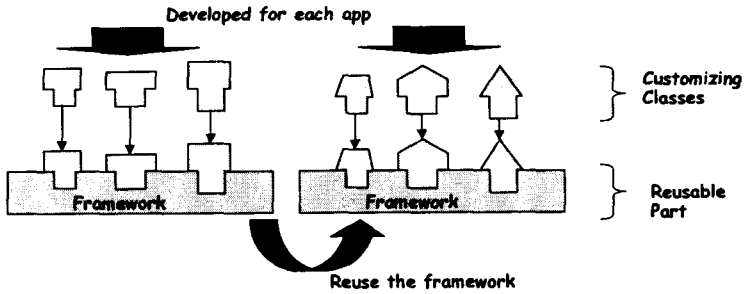
Frameworks

The basic structure of the software architecture. Defined for an area or a type of apps in the form of class definition.
The classes in the framework could be customized by "inheritance", or "subclass".



6

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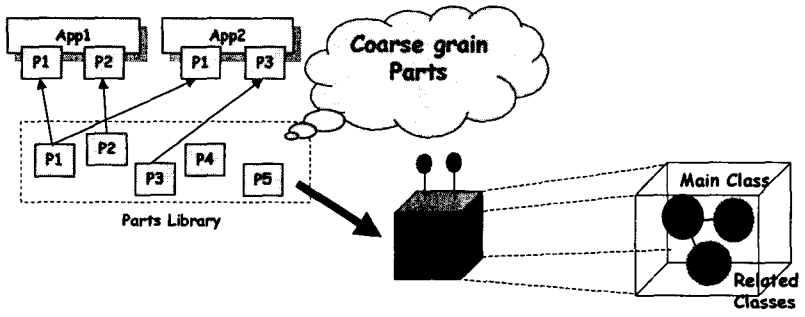
Components

Reusable parts consisting of one main class and the related classes. Only the methods defined in the main class and the interfaces to customize the component are externally visible.



7

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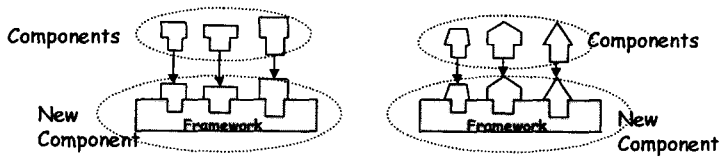
Frameworks and Components

- Frameworks as runtime environments for Components
  Frameworks provide APIs for processes common to Components, such as error processing, data exchange, the components invocation, and so on.
- Framework to glue components
  Framework glue components to form a new component of more coarse grain. This feature could make it easier to develop components.



8

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EJB™ Case

- EJB Container as a framework
  - Runtime environment for EJBeans(o)
  - Glue to combine EJBeans(o)
    But, the glued EJBeans could not be an EJBean(x)
- MVC model Framework
  - Runtime environment for EJBeans(o)
  - Glue to combine EJBeans(o)
    But, the glued EJBeans could not be an EJBean(x)

9

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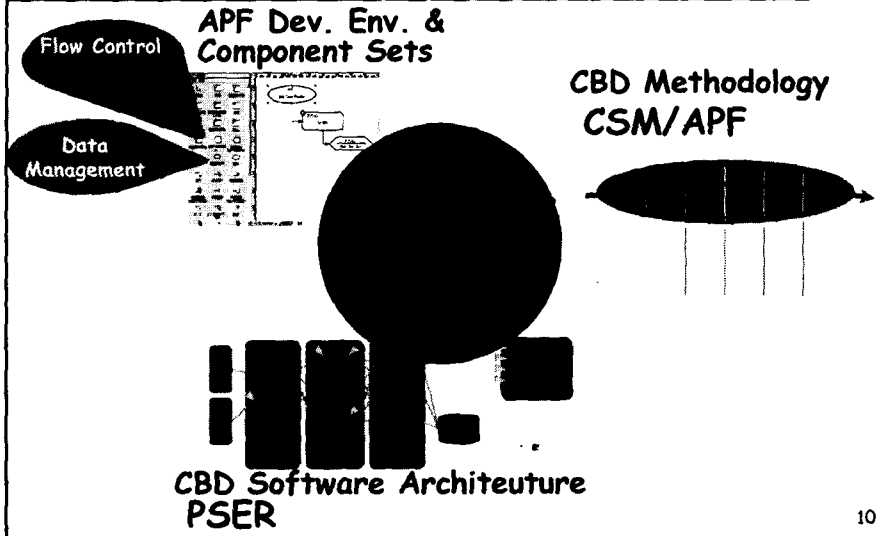
APF Case : TOSHIBA's Approach



10

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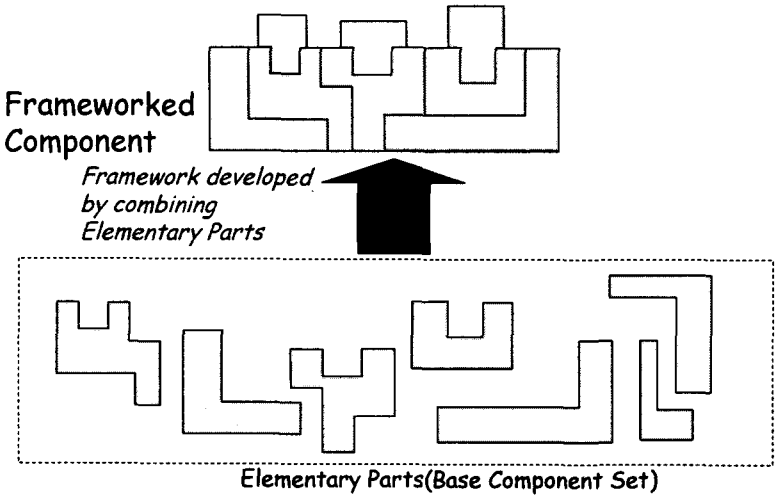
Integration of Components & Frameworks



11

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Base Components

Elementary parts to build the business processes and data handling.

Two sets for Flow Control and Data Management provided.

12

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Base Component Sets

Flow Control	To control the execution flow in the app, invoke other components and synchronize the execution with GUI.
Data Management	To manage(Insert. Search, Update, and Delete) the data in Database, and perform the related processes.
RDB Wrapper	The interface enabling access to RDB in an OO manner.

13

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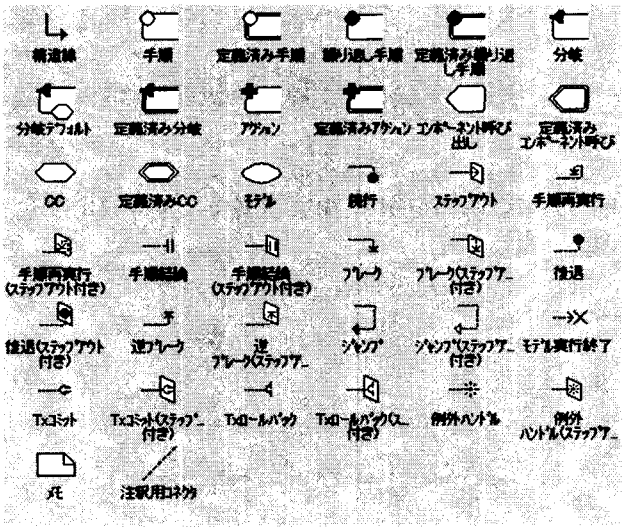
Flow Control Base Component Set



14

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Data Management Base Component Set

15

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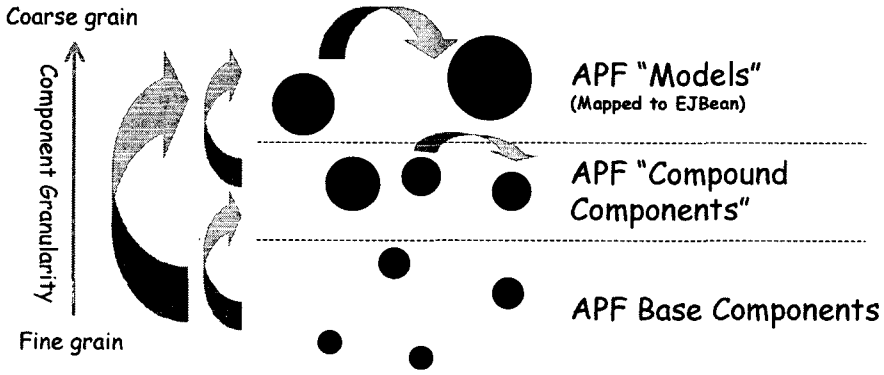
Component Bubbles

APF provides 3 levels of granularity of components.



16

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