Table Of Contents

↑ Top

1

Table of Contents

Revision History

Revision Date	Updated Contents
2012-10-01	Initial Version
2013-04-01	Version 2 Following additions and changes were made. ■ Added the column in [*intra-mart System Architecture*].
2014-01-01	Version 3 Following additions and changes were made. ■ Following products were added to [*intra-mart Product Configuration*]. 　■ intra-mart Accel Documents 　■ intra-mart Accel Archiver 　■ intra-mart Accel Kaiden! ■ Added TERASOLUNA Global Framework to [*intra-mart Application Development Summary*]. ■ Following products were added to [*im-BizAPI (Java Business Components) Overview*]. 　■ IM-PDF Coordinator for AccelPlatform 　■ intra-mart Document Link 　■ OpenRules 　■ Jaspersoft ■ Added links to each document. ■ Added/Changed the reference information in the column of [*UI Base Module (UI Components)*] of [*im-BizAPI (Java Business Components) Overview*].
2014-04-01	Version 4 Following changes and additions were made. ■ Changed the descriptions of [*Multi-tenant*] to show virtual tenant functions. ■ Added [*Multi-company Support*]. ■ Changed the descriptions of [*Building Multi-tenant type Applications*] for the virtual tenant functions. ■ Added descriptions about TERASOLUNA Global Framework to [*IM-JavaEE Framework / SAStruts+S2JDBC Framework / TERASOLUNA Global Framework Development Function*]. ■ Added [*Parallel Operations with the Previous Version*].
2014-08-01	Version 5 Following changes and additions were made. ■ Added [*iAP-iWP SSO Linkage Function IM-HybridSSO*].
2014-12-01	Version 6 Following changes and additions were made. ■ Added [*IM-Notice*]. ■ Added [*OAuth Authentication*].

What is intra-mart?

intra-mart Characteristics

> Topics
> - IT Platform that accelerates your business
> - Social Mobile
> - Multi-tenant
> - Multi-company Support
> - Expandability
> - Cloud Support

Requirements for IT have been shifting from the "Management Support" fields such as cost reduction and operations efficiency to the "Support of customer's mainline business promotion" fields. intra-mart Accel Platform, your system platform, is furnished with the frameworks that would accelerate your business growth.

IT Platform that accelerates your business
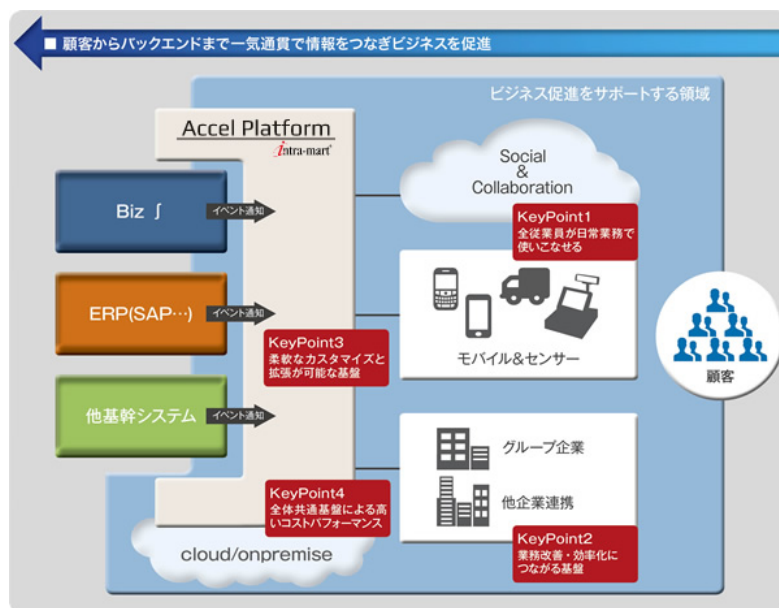
In the past IT investment was mainly focused on the base system or information system for the cost reduction purpose.

However, you would have a better chance of increasing the revenue by expanding the roles of IT to cover business areas that are essential to your business competitiveness. In this area there would be many interactions with your customers.

NTT DATA INTRAMART Corporation has been emphasizing the importance of IT platform. Now, we can offer the same IT platform that covers the fields of business promotion. By providing the seamless linkage of information from your customers to your back-end system, we can achive even bigger business contribution by the power of IT.

For the acceleration of IT platform business that contributes to the business, there are 4 major IT platform requirements :

Social Mobile

Innovative trends in social networking are something we cannot ignore from the business viewpoint.

On the intra-mart product, these social technologies were incorporated to the system platform in their early stage, and the messages from various information sources such as customers, employees, and systems were integrated. The flow of receiving real-time information, and judging and processing it is thus realized.

[IMBox], which is a collaboration function that is reinforced in intra-mart Accel Platform, can retrieve necessary information on a real-time basis as a Web front for total optimization. In other words, it is a place where all the communication messages that are generated in the enterprise are collected.

Since it watches the system (application) data that are operated on intra-mart Accel Platform, type of information you need can be automatically collected by following it.

You can use it for fostering your community by following the users, for creating the groups and allowing members to share messages and files, and for the place of various communications.

Since it supports smart phones and tables, not only workflows and groupwares but also user-specific business systems using smart phones can be quickly developed and utilized. Since it has the feature of minimizing device type dependencies of smart phones, it is supported by a wide variety of devices and it helps to reduce the test expenses.

Multi-tenant

intra-mart Accel Platform provides 2 different ways of building multi-tenant environment, and can support versatile requirements in multi-tenant environment.

1. Multi-tenant by Virtual Tenant function

By utilizing the virtual tenant function which logically splits tenants in one WAR file, you can build the multi-tenant environment with high accomodation rate which effectively utilizes resources such as memory.
Just like the multi-tenant by WAR file, database connection destination or storage region can be individually managed and controlled for each tenant, even though the same application is used by each tenant.
You do not need to worry about thus function while developing the application program. PaaS is an essential element in realizing "True Multi-tenant" such as this one.
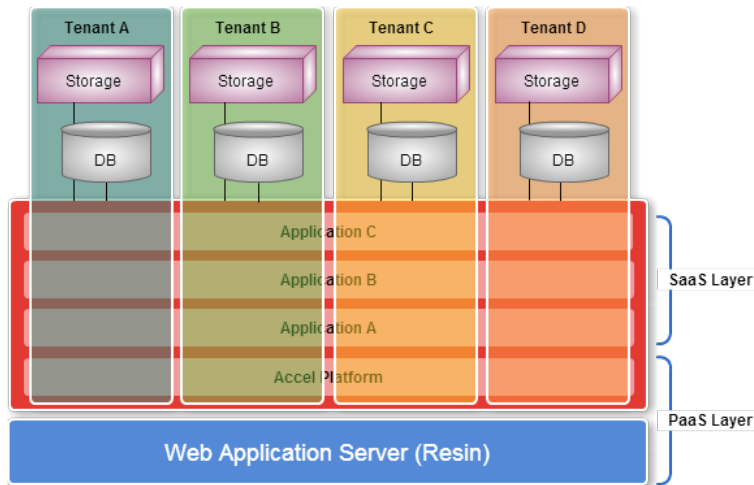
2. Multi-tenant by WAR file

In the multi-tenant by virtual tenant stated in 1, multi-tenant is realized by the same application program. Therefore, it is not possible to do individual customization for each company. By managing each tenant for each Web application (WAR file), and by managing database connection destination for each WAR file, it is possible to deploy unique cloud system for each individual company.
(Since modules are individually managed by WAR files, different application programs may be installed for each tenant.)
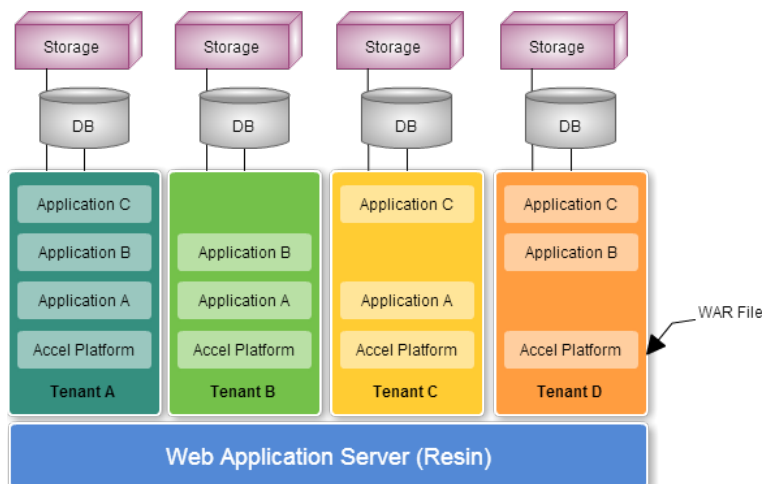
Through the proper combination of the two ways shown as above, you can maximize the commonality of application programs and at the same time allow flexibility and expandability of unique application programs for each company based on the same integrated platform.

> ℹ **Note**
>
> Please refer to [*Building Multi-tenant type Applications*] for details.

Multi-company Support

intra-mart products provide multi-company support as standard for the enterprise that incorporates multiple companies.
In the past while application programs were commonly used by each tenant, database was managed and operated by splitting schemas for each company. However, now it is possible on intra-mart Accel Platform to support multiple enterprises within 1 tenant (within 1 databse shema).
Moreover, you can logically separate the information for each company by the authorization function, share necessary information among these companies, and retain company-unique information only in the respective companies. This would allow increased number of enterprises to share applications, and along with the multi-tenant support and multi-company support described as above, this would bring about the benefit of application usage efficiency and centralization.

This would also allow the introduction of workflows that are valid across multiple group companies. For example, outsourcing of back office operations by the shared company across all companies in a group can be made possible, thus contributing to the improvement of operations efficiency for the entire group.

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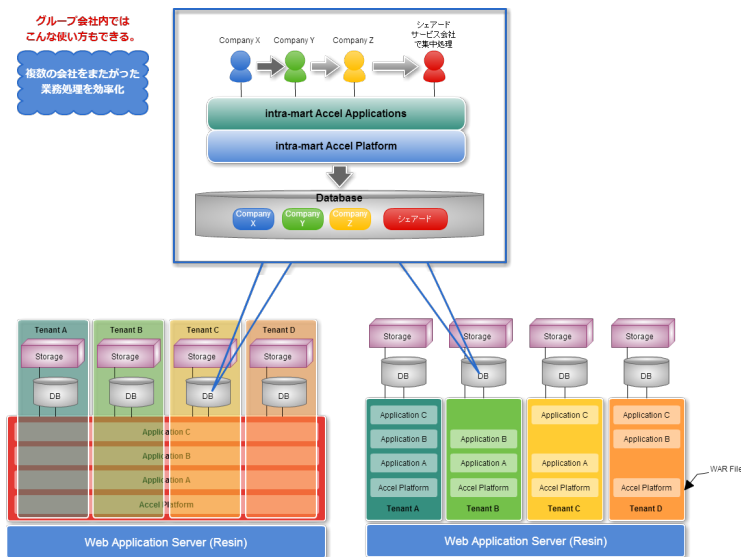
Expandability

IT platform should not be considered as completed once it has been built.

It should continue to grow and be refined to the optimized platform for the enterprise while aggressively incorporating the latest technology elements such as mobile and cloud computing.

In the past multiple different versions of system platforms independently existed, and functional verifications were needed for every version upgrade. Now, since necessary functions can be incorporated by each module basis, your application programs will continue to work and there would be no cost for the upgrade. You can thus establish your own unique system platform and use it for much longer term.

Cloud Support

intra-mart Accel Platform does not enforce an either-or selection such as on-premise only or cloud only.

You can make a proper selection for each business, and so hybrid operation that has combined on-premise and cloud can be offered. In other words, intra-mart Accel Platform will achieve total optimization with no system location boundary of on-premise or cloud. It is flexible enough to be connected with another cloud service to provide the combined solutions.

intra-mart Product Configuration

- intra-mart Accel Collaboration
- intra-mart Accel Documents
- intra-mart Accel Archiver
- intra-mart Accel Kaiden!

intra-mart Overall Structure

intra-mart products provide a variety of solutions to build the IT platform that accelerates your business.
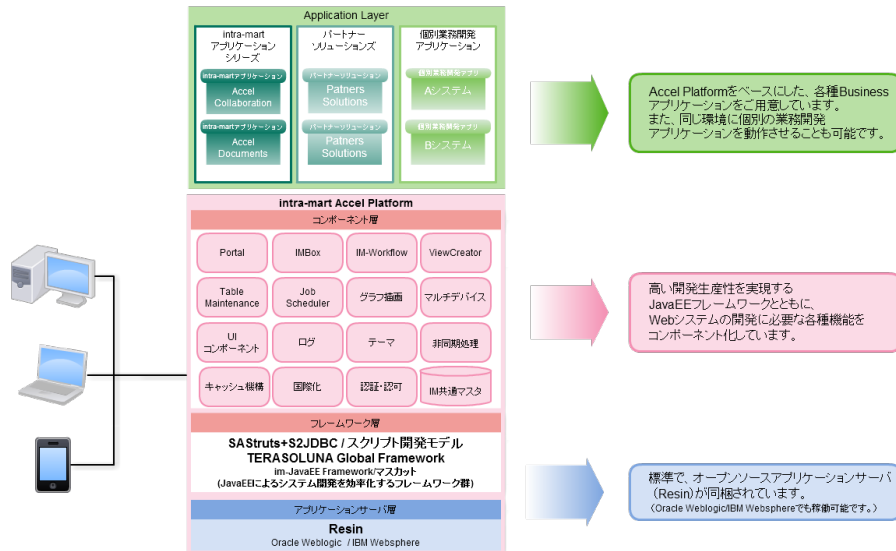
intra-mart Accel Platform (System Platform)

You can develop complex Web applications easily and in short period of time on intra-mart Accel Platform by utilizing frameworks. Frameworks are made up of various Java business components (authentication/authorization modules and workflow modules are combined and called as [im-BizAPI]) and JavaEE frameworks (Seasar2 (SAStruts+S2JDBC)). Moreover, since the script development model utilizing server side JavaScript is available together with JavaEE based development, the burden of Web system development would be greatly reduced. Resin, which is a JavaEE application server that has Cloud functions and high reliability, is also installed as standard. Version upgrades are made for a few times a year with the packaged function enhancement modules. You can pick and install only the necessary ones from them.

intra-mart Product Configuration

Following 3 products are offered by intra-mart Accel Platform.

Function	Standard	Advanced	Enterprise
Application Server <*1>	O	O	O
im-BizAPI	O	O	O
Access Security Function	O	O	O
Portal	O	O	O
IMBox	O	O	O
ViewCreator	O	O	O
Application Build by Script Development Model	O	O	O
Application Build by JavaEE Development Model	O	O	O
IM-Workflow		O	O
IM-Forma Designer			O
IM-BIS(BPM)			O

<*1> Resin that is included as standard may be replaced with another application server.

intra-mart Extension Series

Various tools and modules that are provided as options to the system platform [intra-mart Accel Platform] are listed here.
Wide range of rich offerings such as reports printing and whole-document search that support Web application deveopment to the ones needed for the linkage with other systems are included.
Following extensions are currently available.

- IM-FormaDesigner for Accel Platform (included in the Enterprise version)
- IM-ContentsSearch for Accel Platform
- IM-PDFDesigner for Accel Platform
- IM-PDF AutoConverter for Accel Platform
- IM-PDF Coordinator for Accel Platform
- IM-ERP RealConnect for Accel Platform
- IM-BIS for Accel Platform (included in the Enterprise version)
- intra-mart e Builder for Accel Platform
- OpenRules
- Jaspersoft

intra-mart Accel Applications

intra-mart Accel Applications are the integrated Web business application series built by the powerful frameworks.
Source code (*except for some products) of it has been published, and users are allowed to customize and enhance functions at their will.
Moreover, basic information of each application such as company/department information and customer information are correlated for operations.
These applications would help you achieve your business goals in a short period of time by sharing company-wide information that is linked with the existing base systems.
Following solutions are available for each application series product, and we will be further adding the supporting products.

intra-mart Accel Collaboration

intra-mart Accel Collaboration is a collaboration product that allows intra- and inter-company information sharing by supporting the social networking functions on top of the basic groupware functions (scheduler, ToDO, Memo, BBS, shared address book, file library).
[Workspace], which is a part of this product, would allow not only members of the same company but also selected members of group companies and partners share tasks, files, and calendars. By utilizing the real-time social engine IMBox (SNS interface included in intra-mart Accel Platform), you can promote collaborations across multiple companies.
Multi-language support (Japanese, English, and Chinese) and time zone support are also provided as standard on this product, which would contribute to the efficient business execution across multiple overseas locations. This product will support the collaboration and information sharing with overseas locations, which would be your important business issue in a business globalization environment.
Moreover, groupware functions such as scheduler, ToDo, and Memo are supported as standard for smart phones as well.
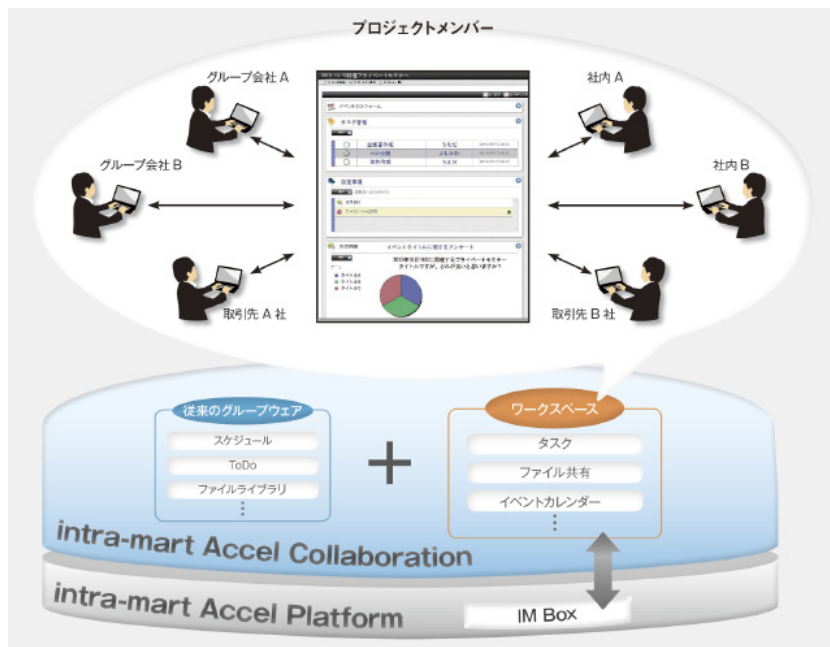
intra-mart Accel Documents

intra-mart Accel Documents is a company-wide Document Management System featuring "Ease of Use", "Governance", and "Expandability", which are based on the characteristics of the system platform [intra-mart Accel Platform].

- Feature 1 : Ease of Use

Intuitive and user-friendly interfaces such as thumbnail display of files, hierarchy structure, and drag & drop registration of document are provided allowing the quick and easy search and browsing of necessary information. You can also browse document which has been registered in the mobile environment such as smart phones.

- Feature 2 : Governance

Various types of governance functions to preserve security such as access authority setting functions, management, and browsing/auditing functions of operations history are provided.
You can apply or approve document registration through the linkage with Workflow, that is installed in intra-mart Accel Platform as standard and has a proven track record.

If there is no need to re-edit the information and only the browsing is needed, you can prevent falsification and secure the information reliability by automatically converting the secure document like Word or Excel to PDF when the document is downloaded. (Secure Download Function)
<*> Both [IM-PDF AutoConverter for Accel Platform] and [intra-mart Accel Documents Secure Download Option] are necessary to utilize "secure download". Data types that can be converted to PDF depend on the specifications of [IM-PDF AutoConverter for Accel Platform].

- Feature 3: Expandability

In the operations on the development platform intra-mart Accel Platform, customization that reflects customer's unique business requirements by utilizing as many as 2000 unique APIs offered by intra-mart Accel Documents can be made. Interface for handing document registration and deletion from the applications other than intra-mart Accel Documents is also provided.
Moreover, by utilizing intra-mart Document Link which is included in intra-mart Accel Documents, you can attach the document scanned by the multi-function printer when the workflow application of intra-mart Accel Platform is made, and register it to intra-mart Accel Documents.
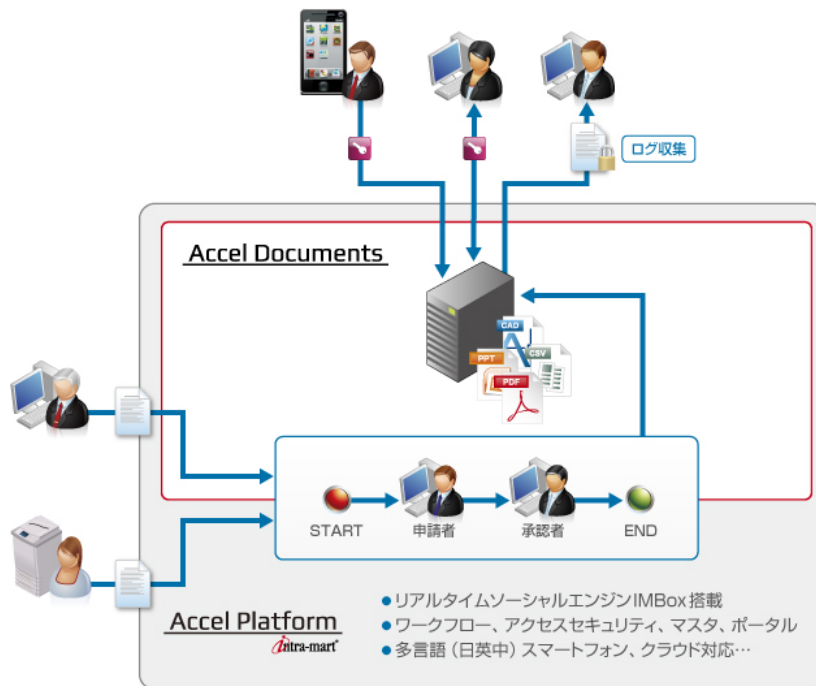
intra-mart Accel Archiver

intra-mart Accel Archiver is an application program which can handle all the document in the enterprise without difficulty and provide flexible and optimum management functions.

In intra-mart Accel Archiver various document that are saved can be efficiently operated by the intra-company rules for each company such as [Access Authority Setting], [Security Level Setting], and [Workflow Setting]. It also makes ISO Business Control functions easier to use while providing comprehensive support.

It also provides linkage with the workflow installed in intra-mart Accel Platform, linkage with the social engine [IMBox], and provides information sharing such as portals for the new arrival document.
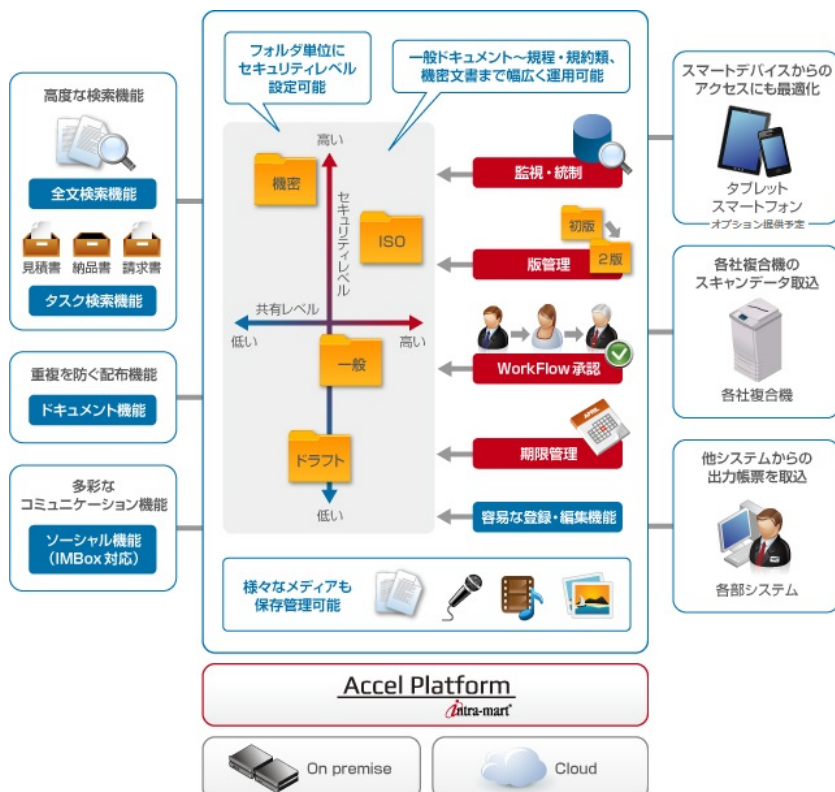
intra-mart Accel Kaiden!

intra-mart Accel Kaiden! is a business application program that could greatly enhance your business by providing major expense settlement tasks in accounting, various application forms of HR and Admin, and labor management.

- Expense Settlement

  Expense Advance Application, Expense Settlement Application, Entertainment Expense Advance Application, Entertainment Expense Settlement Application

- Travel Expense Settlement

  Domestic Trip Advance Application, Domestic Trip Settlement Application, Overseas Trip Advance Application, Overseas Trip Settlement Application

- HR and General Administration

Address Change Application, Commute Route Change Application
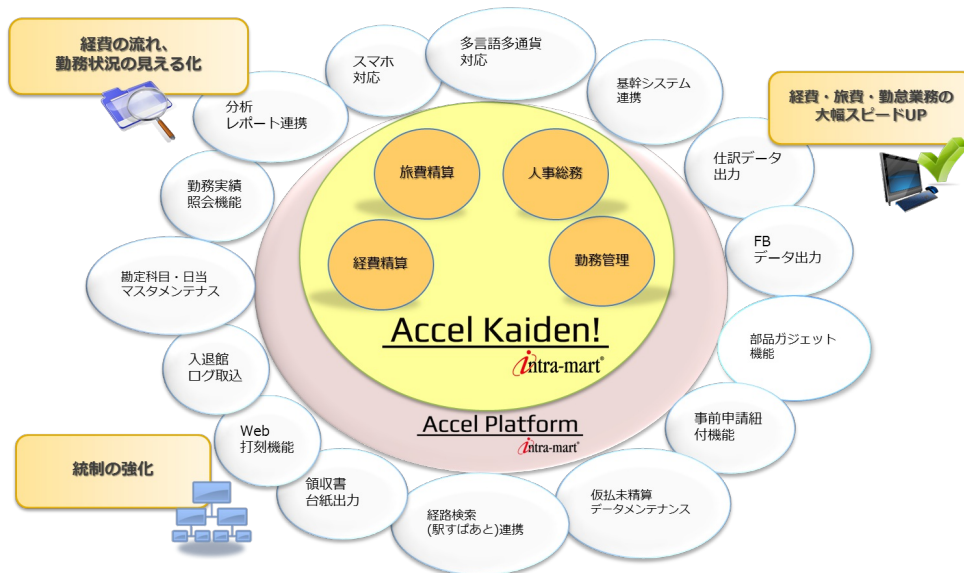
intra-mart will serve as a powerful total solution by providing a variety of products ranging from the system platform to various Web applications. Since source codes (*except for some products) for these application series are published, they can be easily customized by the users.

This document describes intra-mart Accel Platform, which is a core system platform tool in the intra-mart products.

For the details about intra-mart applications, please refer to the respective manuals.

intra-mart Standard Functions

im-BizAPI (Java Business Components) Overview

Topics
- Java Business Components (im-BizAPI)
- Business Platform Tool
    - Workflow Module (IM-Workflow)
    - Portal Module
    - IMBox
    - ViewCreator
    - TableMaintenance
    - IM-Notice
- Platform Functions (User Interface Layer)
    - UI Base Module (UI Components)
    - Standard Tag Library
    - Theme Function
    - Calendar Module
    - Graph Draw
- Platform Functions (Business Common Module)
    - Authentication/Authorization
    - IM-Common Master
    - Internationalization
    - Job Scheduler
    - Mail Module
    - Cache Mechanism (CAMI)
    - Report Print Module
    - Postal Code Search (Japan) Function
- Development Framework
    - IM-MobileFramework
    - Maskat Framework on Accel Platform
- Extension Series
    - IM-ContentsSearch for Accel Platform (sold separately)
    - IM-PDFDesigner for Accel Platform (sold separately)
    - IM-PDF AutoConverter for Accel Platform (sold separately)
    - IM-PDF Coordinator for Accel Platform (sold separately)
    - IM-ERP RealConnect for Accel Platform (sold separately)
    - IM-BIS for Accel Platform (sold separately)
    - IM-X Server (sold separately)

- IM-SecureSignOn for Accel Platform (Secure Sign On) (sold separately)
- intra-mart Document Link
- OpenRules (sold separately)
- Jaspersoft (sold separately)

intra-mart Accel Platform offers a number of [Java Components], which are the functions that are frequently used for the Web System build and can be re-utilized. Included among them are authentication/authorization modules, workflow modules, portal module, and IMBox which is a social module. They are collectively called as [im-BizAPI].

By utilizing the combination of Java business components that are provided, complicated functions that used to require development from scratch or require integration of third-party products can be implemented. Large-scale Web system can thus be built with high quality in a short period of time.
im-BizAPI can be called and used by the 2 application development models (Script Development Model and Java Development Model) in a similar way.

Java Business Components (im-BizAPI)

"Modules" that are provided by Java Business Components (im-BizAPI) have various usage forms, and they are classified as below. Please refer to API List etc. for detail contents of each module.

For the details about how to call them, please refer to [Script Development Model Programming Guide] and [SAStruts+S2JDBC Programming Guide].
Since the source codes for almost all the modules have been published, you can customize and extend these module functions.

im-BizAPI Standard Function

Business Platform Tool		- IM-Workflow - Portal - IMBox - ViewCreator - TableMaintenance
Platform Function	User Interface Layer	- UI Base Module - Standard Tag Library - Theme Function - Cadendar Module - Graph Draw
	Business Common Module	- IM-Common Master - Authentication Function - Authorization Function - Internationalization Function - Report Print Module - System Management Function - Tenant Management Function - Particular Usage Log Function - Routing Function - IM-Propagation - Cache Machanism (CAMI) - Database Access Module - Plugin Manager - Multi Device - Import/Export - Mail Module - Asynchronous Process - Job Scheduler - LDAP Authentication - Web Service - Password Reminder - Postal Code Search (Japan) Function
Development Framework		- Script Development Framework - IM-JavaEE Framework - TERASOLUNA GlobalFramework - IM-MobileFramework - SAStruts Framework on Accel Platform - Maskat Framework on Accel Platform

Optional Function (sold separately)

Optional Function (sold separately)

Extension Series	- IM-FormaDesigner for Accel Platform (included in the Enterprise Version) - IM-ContentsSearch for Accel Platform - IM-PDFDesigner for Accel Platform - IM-PDF AutoConverter for Accel Platform - IM-PDF Coordinator for Accel Platform - IM-ERP RealConnect for Accel Platform - IM-BIS for Accel Platform (included in the Enterprise Version) - intra-mart e Builder for Accel Platform - IM-X Server - IM-SecureSignOn for Accel Platform - intra-mart Document Link - OpenRules - Jaspersoft

Business Platform Tool

Workflow Module (IM-Workflow)

By utilizing this module, you can build the multi-layer approval workflow on the Web browser basis.
emails requesting approval and IMBox messages are transmitted to the approver according to the predefined approval route.
Approvers launch their approval pages there, and do the approval actions. Even more precise workflows such as checking the approval progress status can be built.

In addition to the workflow module which is provided as standard, [IM-FormaDesigner for Accel Platform (sold separately) or BPM tool [IM-BIS for Accel Platform (sold separately)] are provided as extension modules.

Arroval route can be set in advance, and it is also possible to dynamically select the next approver on the screen when Apply/Approve process is made. By linking with the existing HR System, time consuming setting of approval route would not be necessary.

Examples of advanced functions of workflow modules are as follows :

Send Back Function	Function to return the matter to the applicant or to any approver.
Delegation Apply/Approve Function	Function to let the delegated user do Apply/Approval in the absence of applicant/approver.
Batch Approve Function	Function to do the batch approval/disapproval for multiple applications to the approver.
Consecutive Approve Function	Function to do consective approval/disapproval of the specified application for multiple applications to the approver.
Negotiation Function	Function to let other users know by email that the request is currently being processed for approval
Automatic Prompt	Function to send email soliciting the process (approve/disapprove) of the application for which approval expiration is approaching.
Automatic Pass Function	Function to automatically approve the application for which approval expiration is due or passed, and sent the application to the next approver.
Approver Setting	With regard to the approver on the approval route, you can specify not only the person but also the department or the role (Route setting which is not easily influenced by the resource relocation or organization change can be made)
Pull Back Function	Applicant/Approver can pull back the matter by himself/herself.
Approve Master Transfer FUnction	Function to transfer the approval authority for a particular matter to third-party.
Work-in-Process Save Function	Function to save the registration contents being worked on before the application
IM Common Master Term Setting	Function to do route definition that supports history making of IM Common Master. You can create route information based on department information with future change planned.
Selecting of Term Set Route	The route the term is set for can be selected across the past and the future. Even in case the resource relocation takes place, can choose either previous position or current position for initiating the matter.
Display Setting of Items	Display items on the List Screen such as Apply, Apply Done, Not Processed, Processed, and Refer can be changed. Workflow administrator will provide a set of display items that have been edited in advance. General users can select any of the items shown.
Workflow Monitoring	It allows real-time monitoring of the status of completed matters and active matters.

> **Note**
> - Workflow module (IM-Workflow) is a function available only for the [Advanced Version] and [Enterprise Version].
> - For the details, please refer to [IM-Workflow Administrator Operations Guide] or [IM-Workflow User Operations Guide].

Portal Module

Portal functions with good usability are provided. By creating the pages that you want to display on the applications on intra-mart and registering them using the portlet management function,
you can use them as portlets. You can design the layout of portlet on the portal screen as you like.

IMBox

IMBox is an "SNS for Enterprise", which offeres social functions similar to twitter or Facebook for the easy use in the enterprise and additionally incorporates unique functions for enterprise. You can easily start the social collaboration among many users including your employees and customers.
Since the data of the applications that run on intra-mart is being watched by IMBox, you can automatically get related information from various applications by simply following the target information.
In other words, by integrating the messages from all the information sources, the work style "receive information, make a judgement, and take the action on a real-time basis" would be made possible.

IMBox uses [Apache Cassandra] which is NoSQL in order to support the increasing volume of data and maintain performance. Apache Cassandra is an open source database management system developed by Facebook corporation, and was donated to Apache Foundation in March, 2009. It was upgraded to the top-level project in February, 2010, and is used by many sites worldwide.

> **Note**
> - Please refer to [IMBox User Operations Guide] for detail.

ViewCreator

ViewCreator is a tool for creating various tables and graphs by utilizing the database data from the intra-mart screens.
Both the tenant database and shared database are available.

There are 2 major types of data that are handled by ViewCreator.

- Query

  SQL query is created by using the tables on database.
  You can create it by friendly GUI operation such as drag & drop.

- Data Reference

  This is a setting for query display method (table or graph etc.). You can produce multiple presentations (data reference) from one query.
  You can also set the viewing authority to data reference.

In the data reference which has been created, you can search data, filter display items, and change list sequence at the time of display.
You can add data reference to the portlet and can also output it as a CSV file.
As was described on the above, major advantage of ViewCreator is that various tables and graphs can be easily created/displayed on the Web browser based on database data.
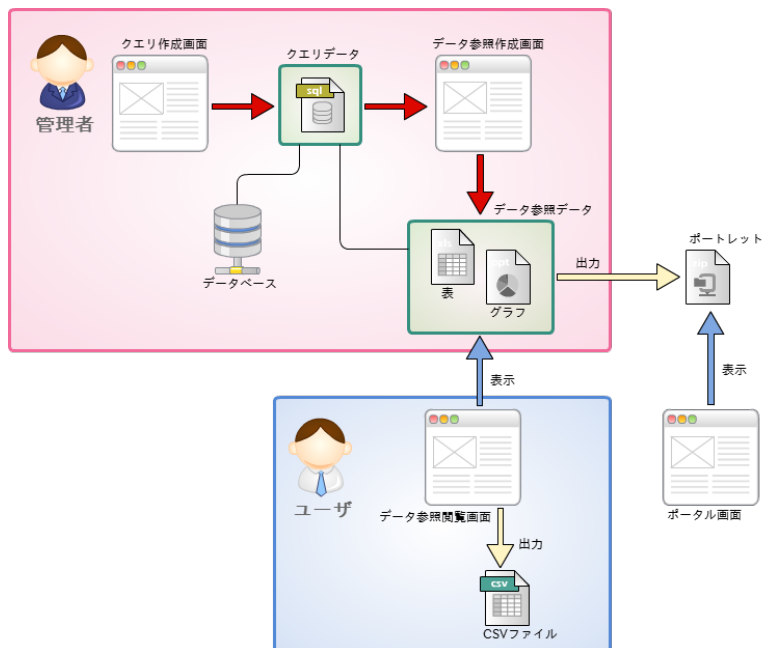
intra-mart Accel Platform can get data from various sources and display them __ not only from the RDB-type database but also from CSV data, and the data or log file generated by Hadoop.

> **Note**
> - For details, please refer to [ViewCreator Administrator Operations Guide]] and [ViewCreator User Operations Guide].

TableMaintenance

By TableMaintenance, new registration, update, and delete of record can be made against the existing table on the database.
Master maintenance function which would typically be required when the applications using database are created can be easily implemented by only the simple setting operations. The administrator can set access authority to the particular tables and may allow general users to edit these tables.

Operations of TableMaintenance can be classified into 3 categories as below.

- Table Management

  Tables on database are added as the subject for maintenance. You can set access authority to the tables and limit users who can manipulate these table. [Tenant Administrator] will do this operation.

- Data Editing

  Users who are given the access authority by the administrator can add, update, or delete data on the tables.

- Table Caption Registration

  Table names and field names of the database can be set to captions that have multi-language support.
  Denotations that are set here will be used as item names in TableMaintenance or ViewCreator.
  You are allowed to enter the comments too. By inputting the descriptions and comments to the tables and fields, you can use them as simple table definition document.
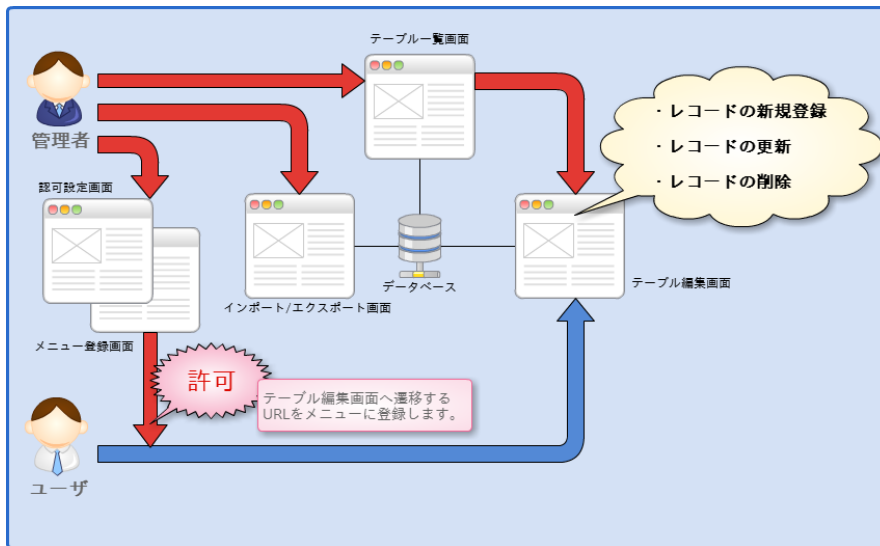
> **Note**
> - Please refer to [TableMaintenance Administrator Operations Guide] and [TableMaintenance User Operations Guide] for details.

IM-Notice

IM-Notice is a client application that can receive notifications from various applications which operate on intra-mart Accel Platform. Windows desktop version, iOS version, and Android versions are provided as standard.

By receiving notification of approval request from workflow in IM-Notice and tapping the notification in the list of IM-Notice, you can access the workflow approval screen of intra-mart Accel Platform and approve as it is.
Since the applications that can be notified are added as needed and you can complete the work by only using the smart phone.
Also, you can receive user's original notification by creating distribution process on intra-mart Accel Platform. This can help you to improve your business and your efficiency.

> **Note**
>
> Please refer to the following documents for details.
>
> - [IM-Notice User Operations Guide (Android version)]
> - [IM-Notice User Operations Guide (iOS version)]
> - [IM-Notice User Operations Guide (desktop version)]

> **Warning**
> - IM-Notice is a function that can be used from intra-mart Accel Platform 2014 Winter.
> - Following are the notification processes that can be received as of 2014 Winter :
>   - Receiving new arrival of MyBox in IMBox, Receiving DirectMessage, and Administrative operations in a group
>   - Approval request in IM-Workflow

Platform Functions (User Interface Layer)

UI Base Module (UI Components)

UI Base Module (UI Components) which is based on open-source jQuery (JavaScript library) has been integrated in intra-mart Accel Platform. jQuery is a light weight cross-platform product. Useful UI components that were uniquely added by INTRAMART Corporation are also included in addition to jQuery. This would allow the

development of dynamic screen parts such as screen operation navigations or alert generations by operations mistakes.

Standard Tag Library

This includes the modules of screen parts (input area, pop-up, and tag libraries such as tag) that are frequently used by the Web based GUI development.
User interface that collaborates with database can be created by setting the proper properties to each module. In the script development model all the modules listed below that are used by the presentation pages can be called by the [<IMART> tag] in HTML document. In JavaEE development model, [intra-mart tag library] should be used in JSP files.
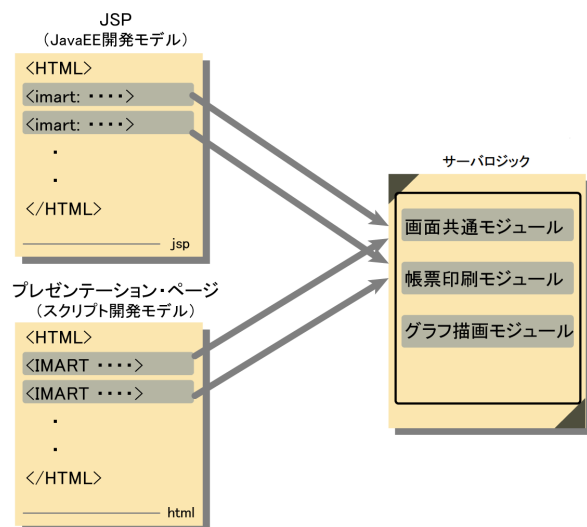
Theme Function

The mechanism to switch screen layouts by the theme function of screen design has been added to intra-mart Accel Platform.
A theme is made up of 1 HTML file. Application screen (HTML) created by developers will be incorporated into the Theme HTML. Users may select any theme that meets preferences from the Personal Setting Screen.
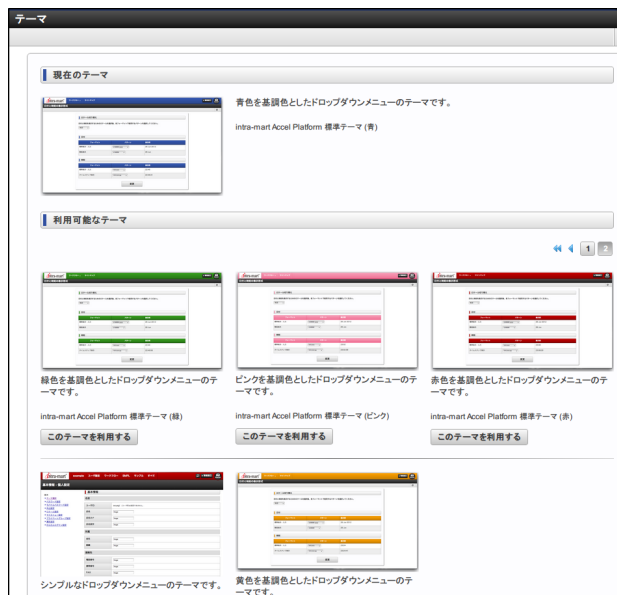
> **Note**
> - Please refer to [Theme Specifications] for details.

Calendar Module

This function is used for the entry of dates, and manages day of the week, holiday, work day, and so on. Company unique holidays are managed by [Calendar Maintenance] in [Tenant Management].

You are allowed to have multiple calendar settings. You can use separate calendars for the head office, factories, and overseas branches, or you can display the merged calendar of multiple calendars.
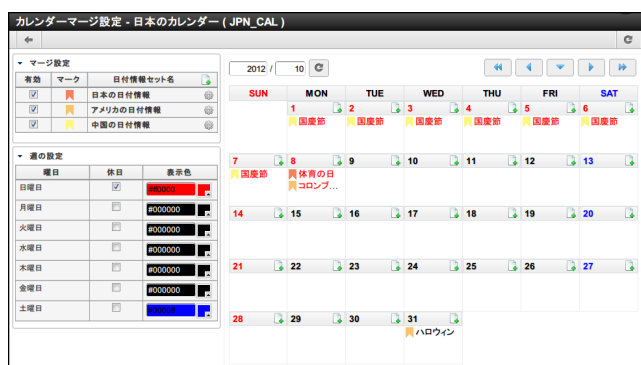
> **Note**
> - For the details, please refer to [Calendar Maintenance] and [Set Calendar Information]] of [Tenant Administrator Operations Guide].

Graph Draw

By utilizing the Graph Draw Module, numeric data can be made into graphs and displayed by HTML.

Following 5 types of graphs are provided in Graph Draw Module. It supports both the Script Development Model and JavaEE Development Model.

- Available Graph Types
    - Line Graph
    - Bar Graph
    - Pie Graph
    - Radar Chart
    - Portfolio
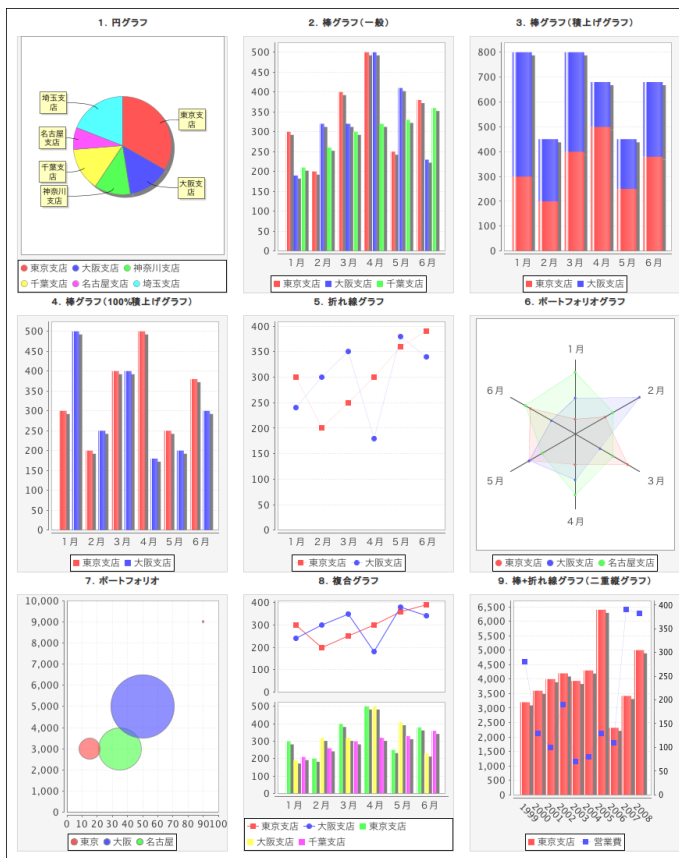
Platform Functions (Business Common Module)

Authentication/Authorization

This function provides user authentication function, display of unique Web pages according to the user access authority, and control of functions for use when intra-mart Accel Platform is used.

For example, the pages for which general employees do not have access authority are not displayed for them in the menu, and so the employees would not be aware of these pages. Even if they directly specify the URL on the browser, the pages are not displayed for users with no access authority. However, if the same page is accessed by the administrator, the page is displayed including the menu items that are available only for the administrator. By utilizing this authentication/authorization function, you can present different page structures depending on user types, and can limit the functions to be used.
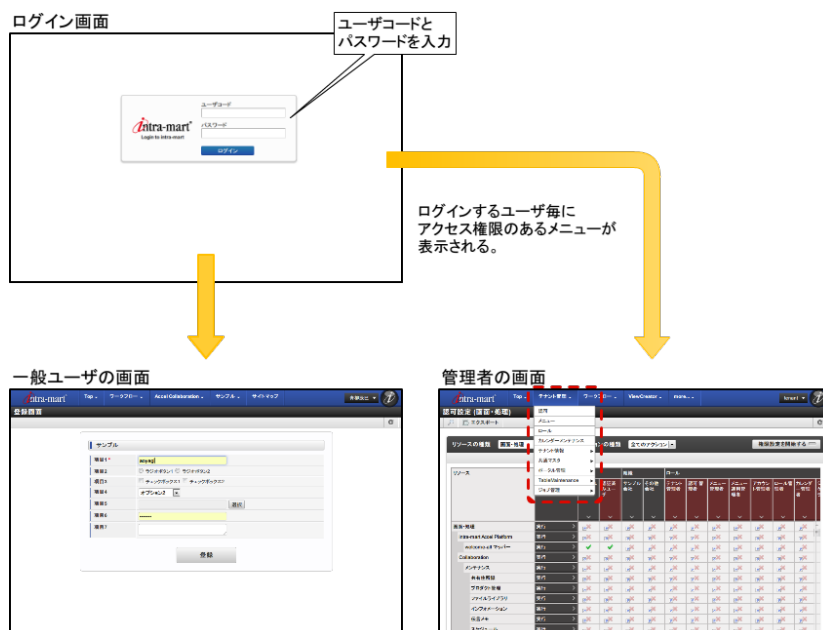
Administrator can precisely specify each screen of the applications that operate on intra-mart and limitations of executable functions according to the department categories and roles of the users. Since the users do not have access to screens or functions they do not have authority for, the risk of information leakage or data falsification would be reduced.

組織、役職、ロール、ユーザで分類

intra-mart上に構築された
アプリケーションの画面や
機能単位で認可を設定する。

ℹ Note

Access Security on intra-mart

Attributes such as Role, Department, and Post can be assigned to intra-mart users.

You can also set [Access Authority] such as roles, departments, and posts on the pages of intra-mart screens.

When any user logs in to intra-mart, only the folders and pages whose access authority matches with the user's attribute such as role, department or post are displayed.

APIs for access security have been published. intra-mart access security functions can be utilized by external user applications. It would be possible to provide central control of access security in the enterprise.

On intra-mart Accel Platform you can also create screens that do not require the log-in, and you may also develop screens that require log-in in the middle of screen transitions.

ロールによるアクセスセキュリティの設定例
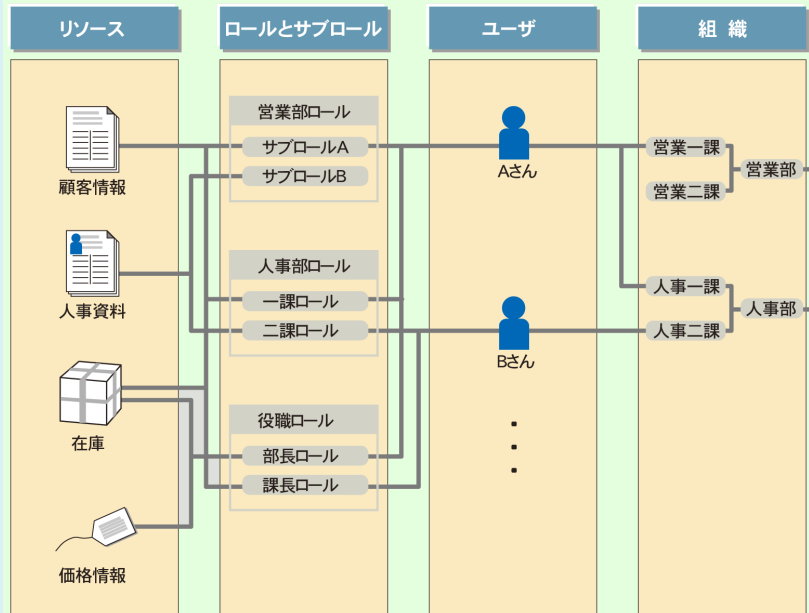
Note

LDAP Linkage

intra-mart supports LDAP (Lightweight Directory Access Protocol), which is a standard access method protocol for the directory service.
intra-mart users authentication module to do the authentication by the intra-mart standard authentication system or by connecting to LDAP servers.
Authentication system from various vendors can be supported by changing this authentication module.
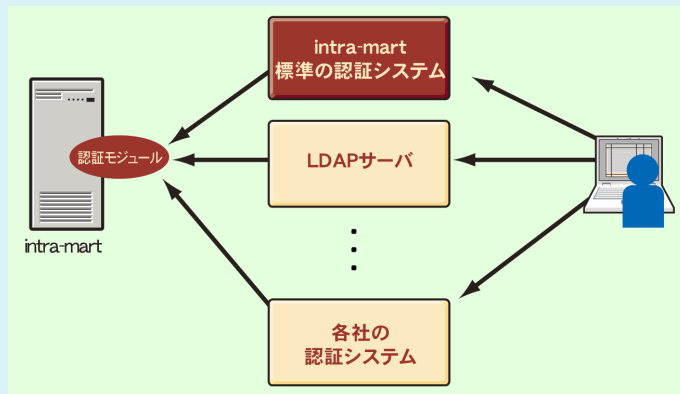
Note

Frequently used screens may be registered by [My Menu Setting]

Frequently used screens can be registered to [My Menu] on intra-mart.
Registered menu will be pop-up displayed on the upper part near the global navigation, and can be accessed by a single operation without traversing the menu layers. While any screen is being displayed, the page can be registered to [My Menu] by either registering it from the [*] symbol of My Menu or from My Menu setting in [My Menu].

IM-Common Master

Masters that are frequently used for system development __ such as company data, department data, corporate, customer data, user group data, item information, currency, and currency rate __ are provided as standard.
System development leadtime including the design phase can be reduced by using these masters. Since every intra-mart application series is built on this IM-Common Master, you can develop systems that work collaboratively with each intra-mart application series. APIs to access Masters are also provided as standard.
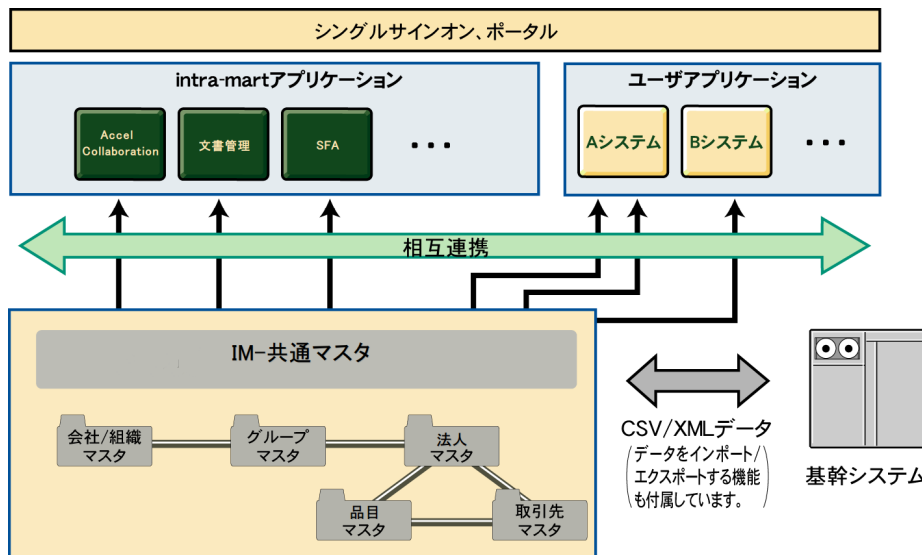
Database specifications for these masters are published, and user applications can be precisely created by using provided APIs.

Since each intra-mart application series is built by utilizing IM-Common Master, applications can be extended by mutually linking the necessary data.

> **Note**
> - For the details, please refer to [IM-Common Master Specifications].

Internationalization

You can develop application programs in which the language used can be switched for each log-in user.
If the language is switched, captions such as menu and item names as well as error messages will switch to the ones in the language specified by the user.
Japanese, English, and Chinese (Simplified) languages are installed as standard on intra-mart Accel Platform. Additional language set can be put easily.
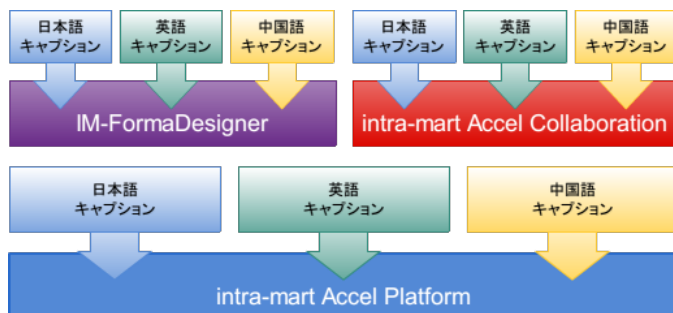
Moreover, timezone that corresponds to the location is displayed on intra-mart Accel Platform.
For example, in the past if the main server was operated in Japan, PCs installed at the overseas locations and accessing the server in Japan showed the time in Japan. New timezone function which has been installed as standard on the system platform side would show the time in respective regions even though the server in Japan is accessed.

Job Scheduler

Web server itself does not assume batch processing. However, when the business application is built, there are times when batch processing is more suitable. In order to satisfy such a requirement, batch management module provides the scheduler function which allows the batch execution of server side script program or Java program on the server.
On the setting screen of intra-mart, batch program (JavaScript or Java) and its execution time should be specified.
On intra-mart Accel Platform multiple jobs (process units) can now be set up and executed as one job net (a bundle of multiple jobs). You can set multiple schedules for one job, and therefore you can enjoy usability improvement through the capability of accessing execution history on the screen or eliminating session timeouts.

Mail Module

By utilizing this module, you can easily built the applications that are linked with the mails such as the Mail Send process to other SMTP-compatible mail server. For example, you can build such applications like creating an agent to send particular information on the bulletin board on the specified data to all the specified users by mail or sending sales information periodically.

Cache Mechanism (CAMI)

Cache function which is based on the In-Memory Computing Technology is installed on intra-mart Accel Platform.
Performance of application excution can be drastically improved by this function.

Report Print Module

Extension Series (sold separately) is offered for intra-mart for printing the reports.

- IM-PDFDesigner for Accel Platform

  This is an optional extension module, which supports complex report format by adopting PDF.

- IM-X Server (Total Report Function)

  By utilizing [IM-X Server], total solution for reports such as conversion of Web reports (PDF/XML), server bulk print, and FAX/Mail Send can be provided.

  - You can easily create fine-tuned reports, and can significantly reduce devepment workload.
  - History management, load balancing and reduandancy function, and FAX Send function can be added by adding options.

Postal Code Search (Japan) Function

Postal Code Search (Japan) Function is a function to load postal code data provided by Japan Post Co.,Ltd. and search address from part of postal code or address.
Search for the loaded postal code data can be made by the application built on intra-mart Accel Platform or external application.

> **Note**
> - For details of Postal Code Search (Japan) Function, please refer to Postal Code Search (Japan) Specifications.

Development Framework

IM-MobileFramework

By utilizing IM-MobileFramework, you can develop very intuitive UIs for smart mobile devices.
This framework uses [jQuery Mobile], which has high requtation as OSS mobile framework.
jQuery Mobile has already been extensively used for the development of application screens on the smart phone devices with prevailing OS, such as iOS for iPad and iPhone and Android.

Users who are familiar with the operations of scrolling the screens or selecting the files on the smart phone screen by finger tips would feel comfortable in using business

applications that were developed by IM-Mobile Framework. Moreover, there is no need to individually develop multiple UIs for different OS's browser types, or versions. Frames and tabs, placement of various buttons, changes of the sizes, and so on can be developed by the mouse-oriented operations like drag & drop.
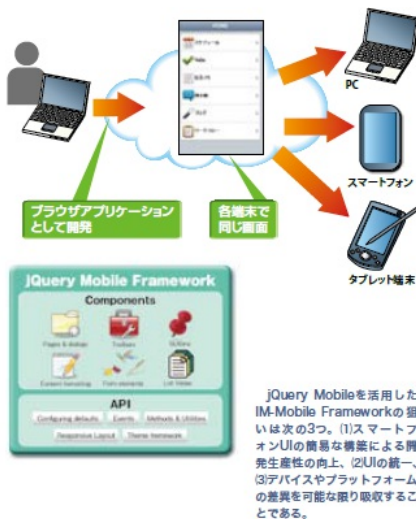
Maskat Framework on Accel Platform

Maskat is an open-source framework for developing Ajax based rich client that operates on the Web browser.
Rich client would be easily developed by 2 applications development models (Script Development Model and JavaEE Development Model) supported by intra-mart Accel Platform.

Extension Series

Extension Series is a group of extension modules (option product) that are provided separately from the modules that are attached as standard on intra-mart AccelPlatform.
This series is offered for users who would require modules with advanced functions, which are to be incorporated as required and used in the similar way as standard modules. Following modules are currently provided.

IM-FormaDesigner for Accel Platform (sold separately)

IM-FormaDesigner for Accel Platform is a tool to create workflow application screen or general Web application with no coding required.
You can create Web screen forms intuitively by simply pasting the screen components provided on the browser with the drag & drop operations. Therefore, the knowledge about Web screen creation languages such as HTML, JavaScript, and XML, or the knowledge about database would not be necessary. You can also implement input check functions like [mandatory input] or [number of letters] by specifying the settings.
Screens that have been created can be easily linked with intra-mart workflow on the dedicated linkage screen, and they will operate on various devices such as PCs, smart phones, and tablets.
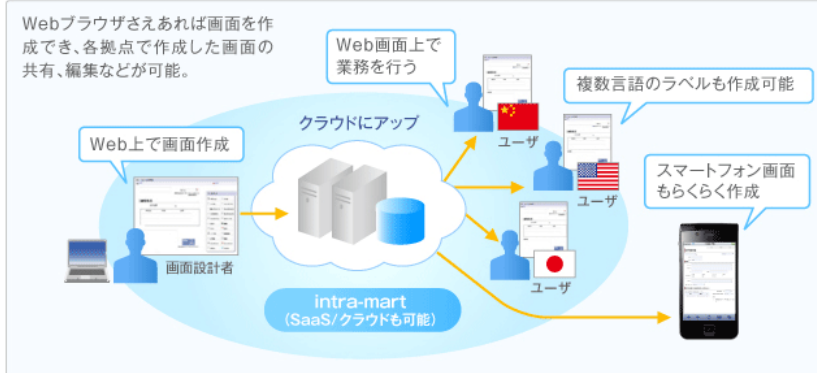
> ⓘ Note
> - IM-FormaDesigner for Accel Platform is separately sold, or is a function only available in the [Enterprise] version.

IM-ContentsSearch for Accel Platform (sold separately)

Apache Solr, which is an open-source full-text search server has been integrated.
This will allow not only the search for information about workflow, IMBox, collaboration etc. on intra-mart, but also for information horizontally across individual business system. Work efficiency should be drastically improved.

Search results can be filtered by the intra-mart access authorities. You can have different search results be displayed for the same search keyword depending on different access authorities of the users.

Search can be made into the file contents of Excel or Word document which are managed.
By doing the drill-down of information (additional filtering of search results by applications or by categories) across multiple business systems, information search can be performed with no difficulty.

intra-mart Accel Platform includes IM-ContentsSearch for Accel Platform as standard, and you can use it for up to 20,000 contents for free as a trial version.

> **Note**
>
> Trial version license allows up to 20,000 contents to be registered.
> Unit of created contents will vary depending on the specifications of applications which register contents information.
> By formally registering the license of IM-ContentsSearch for Accel Platform, you can register unlimited number of contents.

IM-PDFDesigner for Accel Platform (sold separately)

This module supports more complicated report format or page control by utilizing PDF. It supports both the single form and continuous form.
Report format is to be created by the visual design creation tool [IOWebDoc]. Data from the user applications are passed in CSV format or by using the memory space.
Then, PDF file is created before Acrobat is launched for printing the data.

IM-PDF AutoConverter for Accel Platform (sold separately)

Images or a large number of Word, Excel, and PowerPoint files can be automatically converted to PDF files on on-demand real-time basis.
Administration overhead would be greatly reduced by the centralized conversions by the server. Stable conversions would be provided.

Since IM-PDF AutoConverter for Accel Platform would allow the PDF file conversion function to be added to the system that outputs Excel or Word files, it is very suitable for systems that link Office software products and PDF such as e-application, workflow, drawings management system, and proposal circulation system.

IM-PDF Coordinator for Accel Platform (sold separately)

IM-PDF Coordinator for Accel Platform is a PDF modification/editing library that can operate on the server.
It provides additional functions on the server link centralized processing, security enhancement, electronic seal stamping, and digital watermarketing to the existing PDF files.

IM-ERP RealConnect for Accel Platform (sold separately)

This extension module provided by intra-mart allows real-time linkage with ERP.
SAP linkage APIs are put into the library using SAP JCo technology. Add-on development can be performed for a lower cost using the standard Java technology.
Potential of Web usage would be greatly enhanced by the migration from the conventional batch oriented linkage to the real-time transactions linkage.

IM-BIS for Accel Platform (sold separately)

IM-BIS for Accel Platform (Business Integration Suite) is a product that has integrated IM-FormaDesigner and Workflow into one. It will promote business efficiency of overall business processes including both the human beings and the systems.

On IM-BIS for Accel Platform, screens created by IM-FormaDesigner for Accel Platform are first incorporated into each task of IM-Workflow.
Connections to the existing systems are made by DataMapper. This would allow data linkage with external SOA. Processing time spent by each task can be analyzed by the standard BAM (Business Activity Monitoring) function, and it can be used for improving the bottle necks in the business process.

We are currently adding industry soecific templates (like templates for the insurance industry) that work on IM-BIS for Accel Platform.
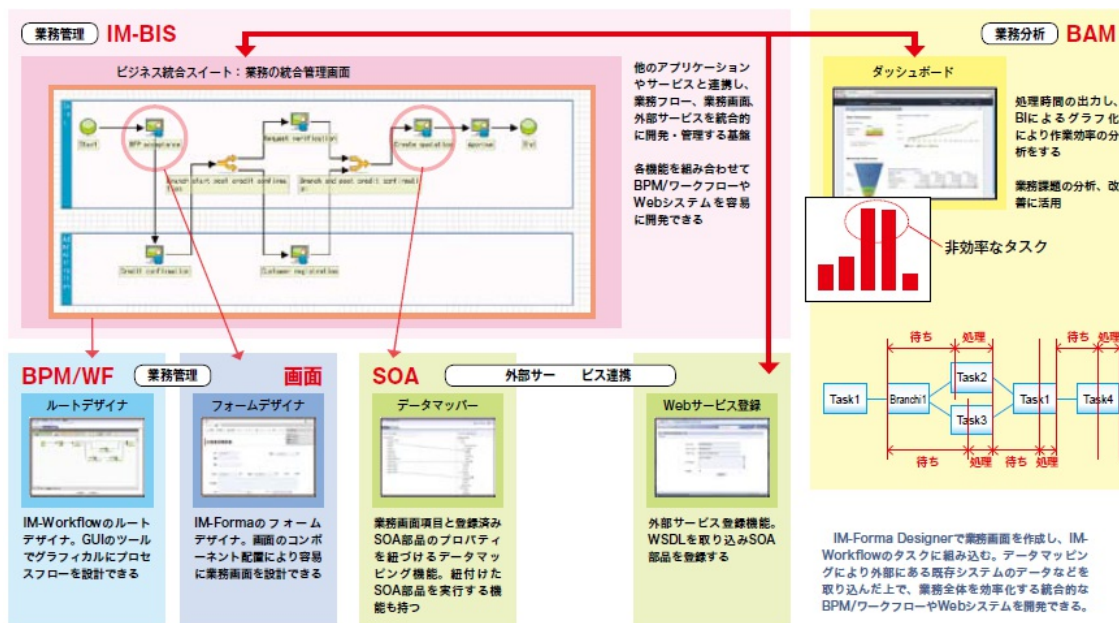
IM-X Server (sold separately)

This is a Print Module, which provides large volume reports output, direct output to printers, and the support for electronic signature and time stamping. It is an advanced function business report solution that supports XML, and provides versatile functions such as in-demand printing and direct output.

- Reports in various types of format can be created, outputted, and distributed

Since the report generation on IM-X Server is defined in XML, electronic reports (PDF, HTML, CSV, OPR), printing (direct printing, FAX transmission), and search/input forms can be generated in 1 source multi-format way, which leads to the reduction of development workload. Total solution which includes the generation of base business reports as well as the reports necessary for the daily operations can be provided.
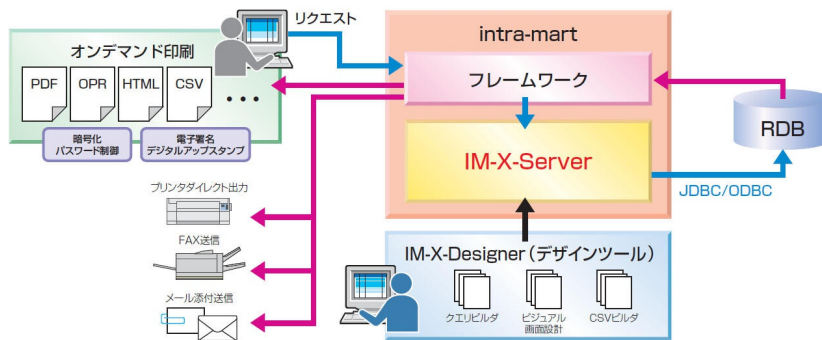
- Design tool that would allow the creation of fine-tuned reports is provided as well

It supports Japan unique complicated grid lines and page-wise reports, single and continuous forms, sub-reports, and design of labels and custom sizes.
It can support versatile business reports by its flexible expression capabilities such as dynamic generation of graphs, dynamic generation of bar codes, electronic signatures, table calculation, and column setting by grouping multiple objects.

[画面設計]
GUI部品の配置、プロパティ入力で直感的操作が可能。
各種ウィザードの利用で設定不要
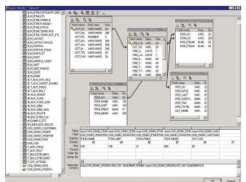
[クエリビルダ]
データベース種類を意識せずに設定が可能。
GUIでDB、CSV、XMLのデータを取得。

[アクセス制御にも対応]
PDFサンプル/ドキュメントセキュリティ・電子署名対応。
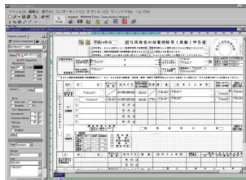オンデマンドパスワード。

IM-SecureSignOn for Accel Platform (Secure Sign On) (sold separately)

IM-SecureSignOn for Accel Platform is a tool that realizes Single Sign-On. By just logging in once to this IM-SecureSignOn for Accel Platform, authentications for all the log-in operations to various Web system in the company will be completed. This system is widely applicable and easy to install/operate because of its unique agent-type reverse proxy method.
Moreover, Easy Log-in Authentication Function would allow easy linkage with other system and packages.

設定したすべてのWebシステムに対し、ロールによる一貫したコンテンツアクセス制御とシングルサインオンが可能。
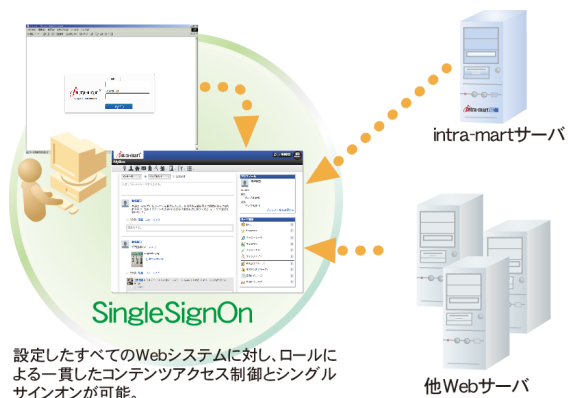
- Agent-type Reverse Proxy Method

Generally speaking, there are 2 methods available for offering Single Sign-On, which are Reverse Proxy Method and Agent Module Method.
On IM-SecureSignOn for Accel Platform the unique Agent-type Reverse Proxy Method is adopted, which has the advantages of both of these two methods.

方式名	主な用途	特 長	システムの概念図
エージェント型リバースプロキシー方式	管理分散型 イントラネットに適したシングルサインオンの方式	・負荷が集中しない ・各エージェントが直接アクセスを受ける ・大規模ユーザに対応可能 ・Webサーバの分散配置構成に対応可能 ・Webサーバ、ホストOSの種類を問わない	

intra-mart Document Link

intra-mart Document Link is a software module that collaborates with the Workflow of intra-mart Accel Platform, allowing the document scanned by multi-function printers to be attached to the workflow.

With the use of intra-mart Document Link, workflow can be utilized as follows:

- Display the workflow matter on the multi-function printer, attach the scanned document, and proceed with the workflow to the next step.
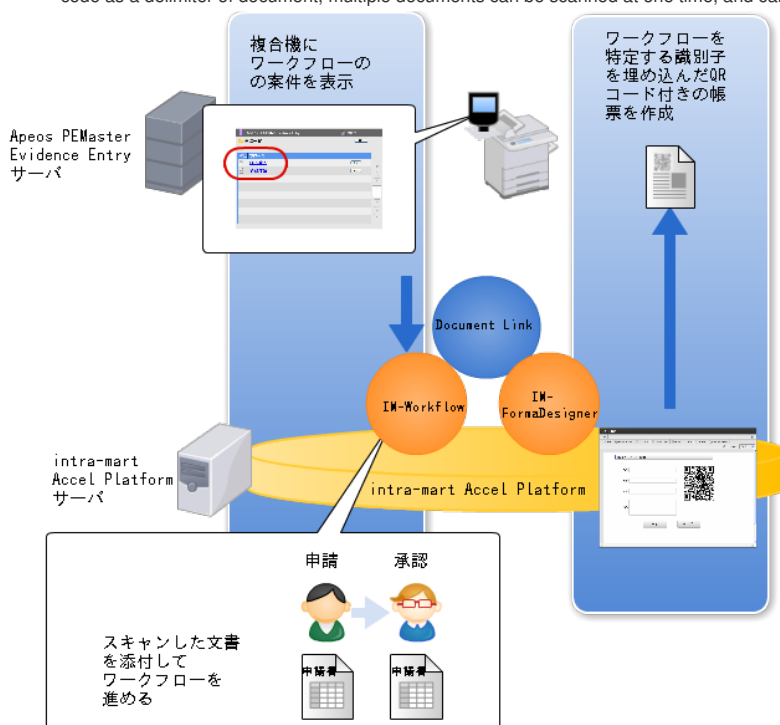- Reports with the QR code which has embedded identifier to identify the workflow can be generated on IM-FormaDesigner for Accel Platform. By using this QR code as a delimiter of document, multiple documents can be scanned at one time, and can still be attached to different workflows separately.

> **Note**
>
> In case you use intra-mart Document Link, Apeos PEMaster Evidence Entry from Fuji Xerox Corporation would be required.

OpenRules (sold separately)

OpenRules is an open-source rule engine product, by which you can create, run, and manage business rules.

Users can create rules using the spreadsheet tool like Microsoft Excel. It has the simple structure for easy inclusion into various systems. Business rules created by OpenRules will work collaboratively with the business flows of integrated BPM Tool [OpenRules].

By the introduction of rule engines, judgement, verification, computation, and instructions can be made easier and automated (robot operations). This would contribute to the improvement activites in the enterprises by the improved efficiency through the integrated operations between human beings the systems.

- OpenRules Effect and Advantages
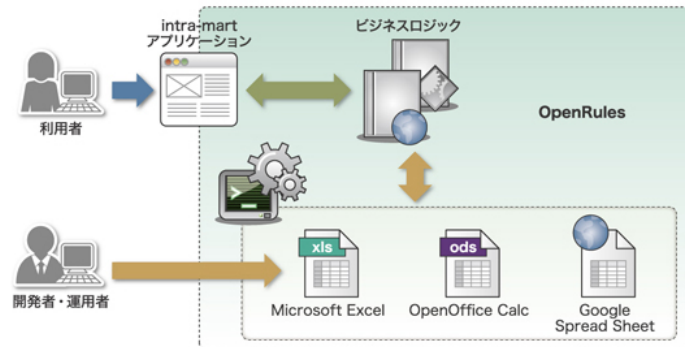
Jaspersoft (sold separately)

Jaspersoft is a BI (Business Intelligence) product which proveids function such as reporting, dash board, analysis, and data integration for the large volume of data accumulated by the enterprise business.

- Major Components
  - JasperReport Server

    It is a reporting server that provides interactive report, analysis view, and dash board.

  - Jaspersoft ETL

    It is an ETL tool with the leading edge data integration engine with Talend at its base.

  - JasperReports Library

    It is a reporting library that integrates data from multiple data sources and can display/print/output document in various format.

  - Jaspersoft OLAP

    It is a data analysis mechanism that quickly analyzes complicated requires or large volume data on a real-time basis, allowing the UI for easy access by users to be designed.

  - iReport Designer/Jaspersoft Studio

    It is a report designer for JasperReport Server/JasperReports Library.
    (iReport Desginer is based on NetBeans, and Jaspersoft Studio is based on eclipse.)

intra-mart Application Development Summary

Topics
- Application Development by Script Development Model
  - Presentation Page
  - Function Container
- Application Development by JavaEE Development Model
  - JavaEE Development Framework
    - Advantages of Frameworks in JavaEE Development Model
  - Seasar2
    - Positioning of SAStruts and S2JDBC
  - Application Development by SAStruts and S2JDBC
  - TERASOLUNA Global Framework

In the application development using intra-mart Accel Platform, developers are supposed to create user interface for display on the browser and the business logic that works on the Web server.

In the script development model, 2 files __ presentation page (HTML file) and function container (server side JavaScript file) __ are created. You can further enhance your productivity by utilizing the modules (im-BizAPI) prepared by the framework.
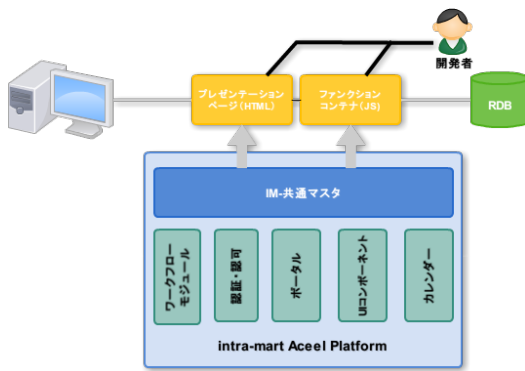
In the JavaEE development model, Java components such as JSP files and Servlets are used for development. In this case too, by utilizing the group of modules (im-BizAPI) prepared by the framework together with JavaEE framework (Seasar2(SAStruts+S2JDBC)), you can improve the efficiency of complicated Web system development by JavaEE and accelerate the re-utilization of business components.
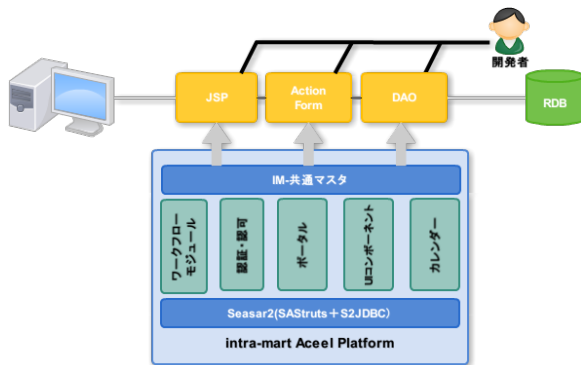
> **Note**
>
> How are these 2 Development Models used?
>
> - JavaEE Development Model
>   This development model would improve development productivity in large-scale system development project through component re-utilization or parallel distributed development.
> - Script Development Model
>   This development model would improve productivity in smaller system developmeent project, bacause business processes are stated in one file instead of depending on the component architecture.
>   - Even in the large-scale system development, you can reduce development cost by combining these 2 models like using the light programming method for screens with minimum component re-utilization (Master Maintenance Screen etc.). (There would be too much overhead in developing everything in JavaEE model.)
>   - im-BizAPI (Java business components) can be commonly used by both development models.

Application Development by Script Development Model

Business logic is stated in JavaScript inside the [Function Container], and it is called by the [Presentation Page] and executed. This linkage function is provided by intra-mart.

Presentation Page

Presentation page corresponds to the User Interface part. Its extension is fixed and is [.html].
Developers or end users would create Web-based presentation pages by utilizing "e Builder (Script Development Function)". Moreover, since the presentation pages are implemented as HTML files, user interface part can be extracted during Web system development and given to the home page designer for work.
By adding the <IMART> tag to the HTML files that are generated by the home page creation tools and so on, you can associate them with the JavaScript in the Function Container and call them. You can also add the <IMART> extension tag to call user definition function.
Completed HTML files would, immediately after their page presentation, operate at high speed with close linkage with the database.
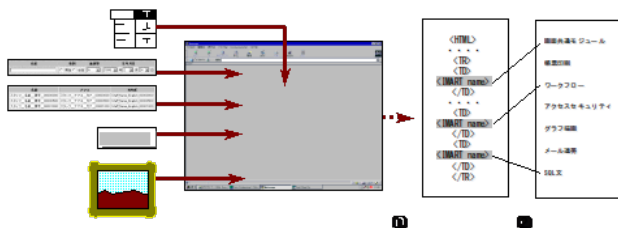
Function Container

Function Container corresponds to the Business Logic part that operates on Application Runtime in the multi-layer architecture. File extension is [.js] and fixed. Since a

Function Container and a Presentation Page make one pair, same file label names should be used for them.

Developers are supposed to state and create JavaScript in the function container, which will be called by the presentation page.
Specifically, developers will choose the necessary objects and functions from the functions provided by intra-mart Accel Platform, and then state and create the business logic in JavaScript utilizing "e Builder (Script Development Function)", which would use these objects and functions that operate on the server side. SQL statement for database should also be stated in the function container.
Actual connection to RDB or issuance of SQL is to be performed by intra-mart Accel Platform. Therefore, developers do not need to worry about the detail session management or transaction management.

Business logic which has been created will be called by the <IMART> tag of the presentation page and executed. Details of the functions provided by intra-mart Accel Platform are shown in [intra-mart API List].
Since developers can code these Scripts in JavaScript and not in the Java language that could be difficult to learn, they should be able to develop a full-scale Web system that collaborates with the database with an extended effort of conventional home page again.
It should also be noted that significant function echancement has been made in the Script Development Model of intra-mart Accel Platform to achieve productivity and maintenance improvement in the following areas :

- Updated JavaScript engine to the latest one and achieved high speed processing
- URLs got simpler. Linkage from other systems to each screen got easier.
- Supported exception processes
- Added Validation function
- Supported Stream for file processing (large capacity file can now be handled)
- Provided API for New Database (implemented exporting mechanism of SQL statement)

Application Development by JavaEE Development Model

Web system development by JavaEE has proliferated, because JavaEE is a common platform which is independent of particular OS or Web application server. However, since the development by JavaEE is based on Java, it would require advanced knowledge and experience such as object oriented development and JavaEE knowledge, which might be difficult for beginners. Moreover, because of the development flexibility where you can do anything as long as you conform to the JavaEE development conventions, different systems engineers would present different development styles.
intra-mart Accel Platform has resolved these problems by utilizing JavaEE Framework (Seasar2(SAStruts+S2JDBC)), and has significantly enhanced the productivity of JavaEE development model.

JavaEE Development Framework

With regard to Web system development by JavaEE, there are many common parts in structure, and development productivity would be significantly enhanced by utilizing this commonality. On intra-mart Accel Platform all the common processes required for JavaEE development are offered as JavaEE frameworks, and unique parts are created by developers as components.

Advantages of Frameworks in JavaEE Development Model

There are following advantages in utilizing JavaEE frameworks for JavaEE development.

JavaEE based Development Platform	Areas that require advanced knowledge are hidden, and developers create application logic as components. Even without the base knowledge, the completed system will become JavaEE recommended model, and MVC model can be implemented easily (program structure is integrated for better maintenance).
Productivity Improvement	All the common parts are provided in the Framework, and so reutilization of components is enhanced. Overall team productivity will be improved. (Sharing of components by team, Development Time reduction by parallel distributed development)

Maintenanceability Improvement

Base application program remains unchanged when the components are newly added.
In this mechanism, when there is a function change, only the affected components will be modified, and other parts would not be affected.

<フレームワークの適用の有無によるカスタマイズ範囲の違い：○は、影響のある箇所＞

順番	変更内容	フレームワーク適用：無			フレームワーク適用：有		
		JSP	Servlet	Bean	JSP	Servlet	Bean
画面カスタマイズ	画面レイアウト変更	○			○		
	画面表示項目追加	○	○	○	○		○
	画面表示形式変更	○	○	○	○		
	画面表示項目削除	○	○	○	○		
	画面フレーム分割	○	○	○	○		
	画面フレーム統合	○	○	○	○		
業務処理アドオン	業務処理追加	○	○	○			○
	業務処理変更	○	○	○			○
DBカスタマイズ	DB項目追加		○	○			○
	DB項目削除		○	○			○

Reduction of Test Phase Period and Quality Improvement

In this test phase it is not necessary to check the framework part.
It would be easy to classify the problems. DI container will allow easy replacement
of test mock (prototype, tentative implementation) and production components.

During the installation following rules should be observed in utilizing the framework.

- Roles and implementation contents are defined for each component.
  By just following the rules there would be no need to consider the mechanism for componentization or commonality at the system design time.
- An attempt to implement various functions into one component should be avoided.
  If you pack too many functions in one component, program readability, maintenanceability, and ease of reutilization would be affected.

By following these rules you can keep the application structure consistent. As long as you understand and use the frameworks, you can implement the structure that anybody can maintain.

Seasar2

Seasar2 is a framework for the efficient execution of large-scale development by J2EE/JavaEE. In Seasar2 highly productive program development has been made possible by reducing the required setting files than before and by the descriptions that have isolated dependencies.
A variety of related software and tools have been developed and published, namely [S2Container] of DI Container and [S2AOP] offering AOP function as the central elements, [S2Dao] and [S2JDBC] for database access, [S2Struts] and [SAStruts] for easier linkage with Struts framework, and [S2JSF] for the generation of dynamic Web pages.

Among these Seasar2 products, following 2 products have been adopted by intra-mart Accel Platform as JavaEE development frameworks.

- SAStruts(Super Agile Struts)

This product wraps Struts for easy use, which is a defacto standard of framework Web framework in the presentation layer (screen related).

- S2JDBC

This product is an O/R Mapper that aims at achieving the 10X productivity increase of Seasar2 standard database access framework database programming.

Positioning of SAStruts and S2JDBC

SAStruts and S2JDBC would cover the following areas from Java system architecture (JavaEE BluePrint) viewpoint.
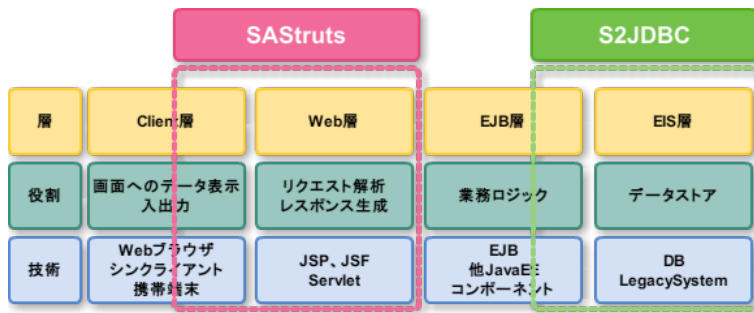
> **Note**
> - About JavaEE Blue Print
>   This is a development guideline for JavaEE applications. It does not include functional specifications. It will rather serve as a "textbook" which demonstrates how to design a system by presenting sample application programs.

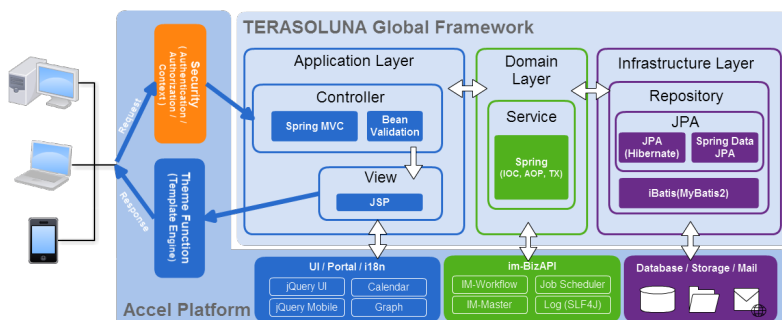## Application Development by SAStruts and S2JDBC

In the application development by SAStruts and S2JDBC, components such as Action, Form, JSP, DTO, Logic, Service, and Entity are created. Requests from the client will be processed in the sequence shown below. .. figure:: /_static/images/sa_s2jdbc.png :scale: 35%

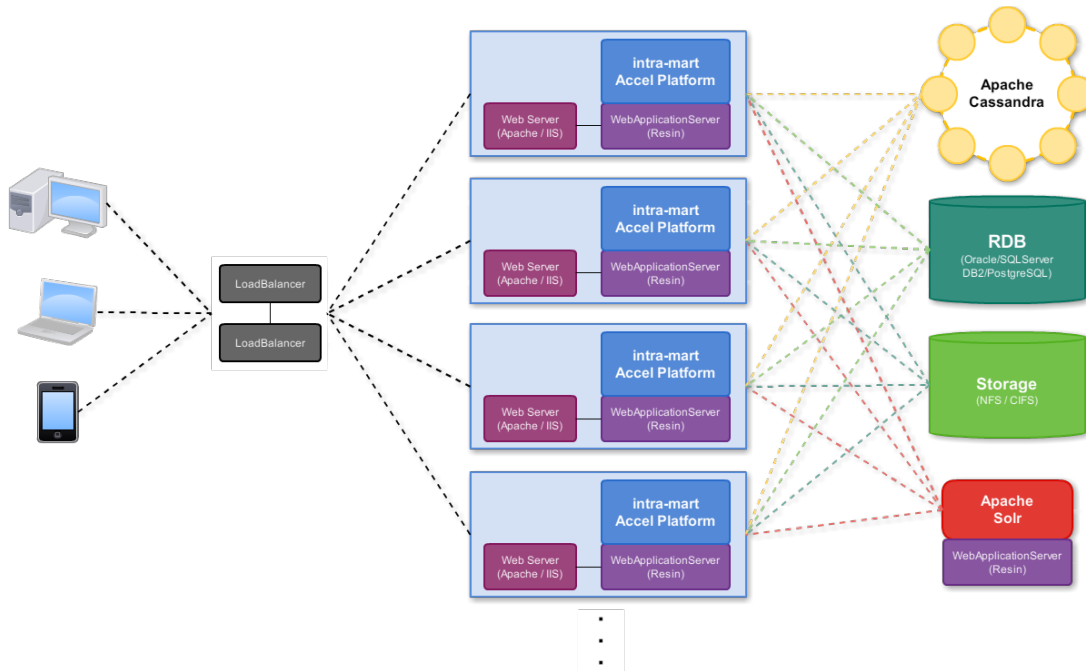| Component Name	Role
Action	- Receives the request (form) from the client, and executes business logic - Business logic is severed as a service and called by Action (it can also be defined inside Action)
Form	- Stores screen input information - It is on object that receives request parameter in Action - It corresponds to ActionForm class of Struts

JSP	- Screen
	- It is forwarded after Action is processed. HTML returned to the browser is generated
	- Uses the combination of SAStruts tag library, EL formula, JSTL etc.
	  - EL formula (Expression Language)
	  It is a formula which is stated in ${~} format and gives simple description of object access
	  - JSTL (Java Server Pages Standard Tag Library)
	  Tag which is standardized in JSP2.0

DTO	- Data Object - Stores data object other than Form or Entity Example : Object for Screen Display, Search Condition, etc.
Logic	- Business Logic - Accesses the DTO (Search Condition), and calls Service (DB Access)
Service	- Business Logic - Operations on Entity - Defines database access process If it is defined in Action, action process and database process will get mixed, and source code gets bigger. It is created to make database access process common and to separate database access process part from action.
Entity	It is an object that is mapped to the database table

TERASOLUNA Global Framework

TERASOLUNA Global Framwork is a Java Development Framework Stack published by NTT Data. (http://terasoluna.org/)
As a framework stack, it has the structure of [SpringMVC 3.2+SpringFramework 3.2+JPA2.0, MyBATIS2.3.5+Common Libraries] as shown in the figure below.

intra-mart System Architecture

System architecture of intra-mart Accel Platform is shown below.

LoadBalancer	It is an equipment to transfer connection request from client to Web server, and performs load balancing etc. Use of Load Balancer with the following functions is recommended on intra-mart. * Session maintenance function by Cookie * Health check function based on HTTP response contents * Capability to add redundancy to the Load Balancer itself
Web Server	Accel Platform supports Apache WebServer and IIS. In case Resin is used, it utilizes the module called Web Server Connector that is integrated into Web server. It functions as an interface between Web server and Accel Platform by sending the client request from Web server to Accel Platform on Resin, or receiving the execution result from Accel Platform and passing it to Web server. In case multiple Accel Platforms are set as the connection destination of Web Server Connector, automatic process allocation will be possible by the round-robin function.
WebApplicationServer	It is a server to run intra-mart Accel Platform, and it supports Resin included in intra-mart Accel Platform as standard, Oracle Weblogic Server, and IBM Websphere Application Server. intra-mart Accel Platform is placed (deployed) as WAR (Web archive) file on this Web application server.
intra-mart Accel Platform	This is the product we offer, which is placed (deployed) as WAR (Web Archive) file generated by IM-Juggling, and works on Web application server.

ℹ **Note**

What is WAR file?

It is a Web Application Archive file which is defined in JavaEE and
various types of files necessary for the operations of intra-mart Accel Platform are included.
WAR files for intra-mart Accel Platform are created by IM-Juggling.
Various types of files necessary for the operations of intra-mart Accel Platform are stored and
by placing (deploying) WAR files created by IM-Juggling in Web Application Server
such as Resin, and running Web Application Server,
intra-mart Accel Platform itself and various applications for intra-mart Accel Platform
that are stored in the WAR file are started and can be used.

Since WAR file would be the minimum unit of intra-mart Accel Platform product itself,
number of intra-mart Accel Platform licenses are counted by the number of WAR files.

RDB	It is used as a save location for various master data or transaction data of intra-mart Accel Platform. intra-mart Accel Platform supports Oracle, SQLServer, DB2, and PostgresSQL as RDB products at connection destination.
Storage	It is used as a save location of attachment files or electronic files for various document used on intra-mart Accel Platform. By the setting of intra-mart Accel Platform, you can specify any storage location. However, if you are operating multiple Web/AP servers, it is necessary to provide a Storage Server such as NFS or CIFS, which allows the operations of the same disk area on every Web/AP server.

Apache Cassandra	It is an open source NoSQL server provided by ApacheFoundation. It is needed separately if IMBox is in use. (If IMBox is not used, there is no need to install Apache Cassandra server.) While Cassandra itself provides the redundancy mechanism, operations with 3 or more Cassandra units are recommended from Cassandra/IMBox specifications viewpoint, if you need redundancy and data consistency.
Apache Solr	It is an open source search engine provided by ApacheFoundation and used by IM-ContentsSearch. Since Apacphe Solr is also a Web application server like intra-mart, Web application server such as Resin or Jetty must be provided for the operations environment of Apache Solr. (In case IM-ContentsSearch is not used, there is no need to install Solr server.)

> **Note**
>
> Cloud functions are greatly enhanced in [Resin4]
>
> [Resin Ver.4] which has major enhancement of Cloud functions is integrated into intra-mart Accel Platform.
> Web sites that are built upon Resin can not only cope with the periodic request increases such as the seasonal changes, but can also handle explosive occurrences of large-volume requests at a certain time in a flexible manner.
>
> Resin Ver.4 adopts the cluster with the [Triad] architecure, and hence 3 Resin servers (2 Resin servers are allowed too) work as a set, and achieve high availability with the mutual fail-over among them. It is also possible to handle drastic changes of requests by dynamically increasing/decreasing the number of Resin servers at the cluster with this mechanism. Triad can be also applied to Resin servers on the Cloud.
>
> Operation status of Resin servers is being monitored by the agent (Watchdog) that performs periodic monitoring. In case of any failure the report is automatically generated, which can be used for the cause investigation, recovery, and prevention of future occurrences.

intra-mart Other Features

Topics
- Cloud Support
- Multi-language Support and Time Zone
- Ease of Version Upgrade
    - Continuous Brushup of System Platform
- Rigid Security
    - Authentication by Access Security Module
    - Saving the Access Log
    - Building Multi-tenant type Applications
    - OAuth Authentication

intra-mart Accel Platform has the following superiorities :

- Cloud Support
- Multi-language Function and Time Zone
- Ease of Version Upgrade
- Rigid Security
- Building Multi-tenant type Applications
- Product Lineup and Configuration Edition

Cloud Support

intra-mart Accel Platform will provide a complete hybrid support by allowing installation not only in the on-premise environment but also in the private cloud and public cloud environment.

Applications that are installed can be operated in the same way anywhere, and therefore on-premise business applications can be deployed to the private/public cloud environment, allowing applications on each cloud environment to mutually collaborate. As a consequence, intra-mart can achieve seamless on-premise and cloud total optimization independent of the physical system locations.

Moreover, on intra-mart Accel Platform user authentication and log-in processes when the applications are used between clouds have been simplified. Authentication processes of intra-mart on-premise users and private/public cloud users can be integrated.
In other words, if you log in to intra-mart, various applications that operate at on-premise or at hybrid clouds are displayed in the menu all together. Users can deal with these applications all alike without worrying about which application is operated on which location.

Recently on the public clouds provided by Google or Amazon, global authentication platforms such as Open ID, SAML, and Oath that utilize open technologies are prevailing. intra-mart Accel Platform also supports these standard authentication platforms. (Separate products are required).
For example, employees who have logged-in to intra-mart can access cloud contents (Gmail, Google Apps for Business, etc.) on Google with the same ID.
Employees can access applications seamlessly without worrying about where their applications are physically located ___ on-premise, private cloud, or public cloud ___, by using your PC or smart device as a portal screen.
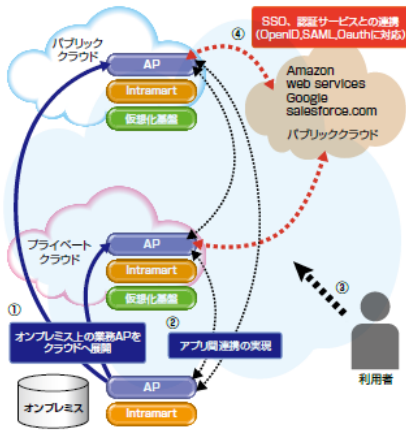
Multi-language Support and Time Zone

Applications in which you can switch the language in use for each log-in user may be developed. If the language is switched, the language of menu item names and others will be switched to the one the user has specified.

intra-mart Accel Platform has Japanese, English, and the Chinese (Simplified) languages installed as standard. Addition of other language sets can be made in a flexible manner.
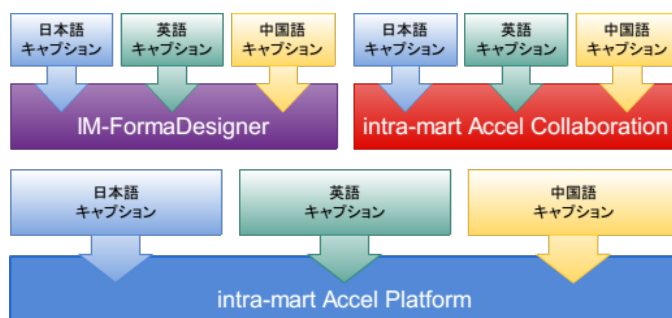
intra-mart Accel Platform also allows the time zone for the subject location to be displayed.

For example, in the past if the main server was operated in Japan, PCs that were installed at overseas branches accessing the server in Japan showed the time in Japan time zone. However, with the new time zone function installed on the system platform side as standard, time will be displayed in the time zone specified for each user even though the user is accessing the server in Japan.
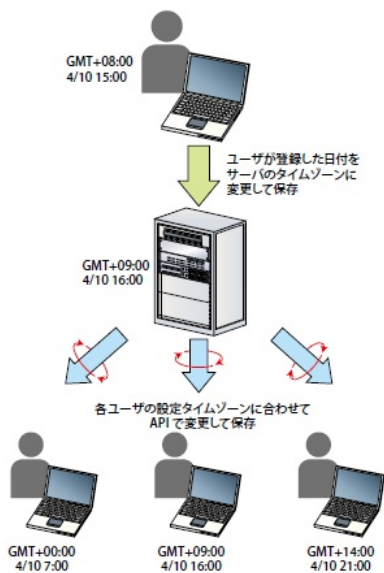
Ease of Version Upgrade

Continuous Brushup of System Platform

On the previous intra-mart products when the system platform was replaced with the upgraded version like Ver.5, Ver.6, — etc., [Functional Verification] to check if the existing applications correctly work on the system platform of new version was a mandatory requirement. As a consequence, system platforms with various different versions proliferated because of the cost burden for this functional verification, causing the increase of maintenance cost.

This problem has been resolved on intra-mart Accel Platform. You can continue to use existing business applications while you are upgrading the system platform version to the latest one.

Functional verification of business applications would no longer be required when the system platform version is upgraded. The key to this remarkable solution is the new mechanism, which is "Version Upgrade of System Platform by Module Basis".

At the time of version upgrade you can select only the modules that are necessary for your company, and incorporate them into your system platform. Thus, you can incorporate the latest technologies without replacing the system platform.
This mechanism has been made possible by the fact that IAP itself complies with the complete SOA architecture.

As long as you have the annual maintenance contract with our company, which includes the cost of version upgrade of system platform and the related modules, no additional expense would be required, and the annual maintenance cost could be kept low and flat. Your system platform will grow incorporating the latest technology all the time.

This mechanism is an essential requirement to establish your own system platform and to best utilize it continuously for the long term.
This mechanism would be extremely useful for the service providers offering SaaS type services based on intra-mart PaaS platform.
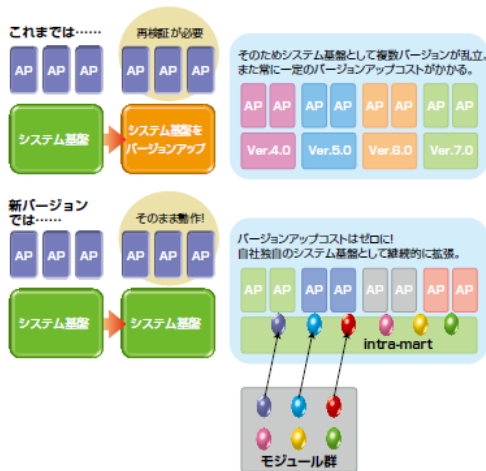
[Version Upgrae of System Platform by Module Basis] is controlled by the tool called IM-Juggling.
By just check-marking the necessary modules, associated downloads and installations will be done automatically, and system platform will be refreshed by the module basis.
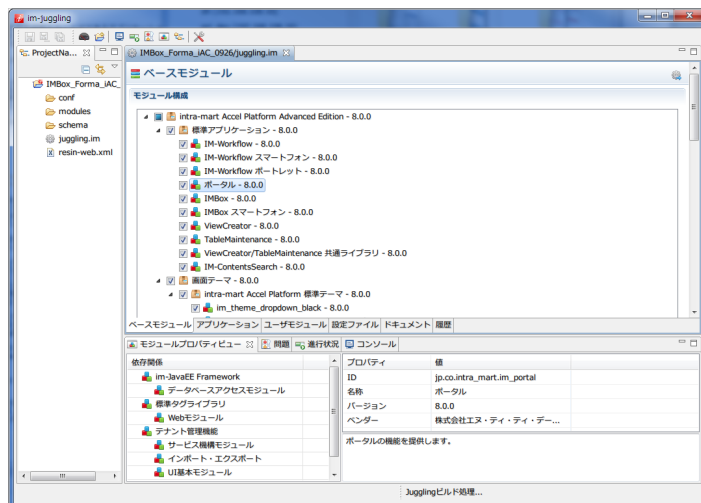
Rigid Security

Authentication by Access Security Module

Users of the system should be limited to avoid information leakage.

- Authentication Function of Log-in User (LDAP linkage is possible)
- Access Control <<Usage limitation by individual person level>>
- Multiple Companies Setting <<Usage limitation by department level>>

Saving the Access Log

In order to provide tracking/auditing capabilities for the information leakage cases, data about the person, time, system usage and operation shall be recorded.

- Access source can be identified by the access log
- Saving the Log-in/Log-out History
- Saving the User Operations Log

Building Multi-tenant type Applications

On intra-mart Accel Platform, multi-tenant type intra-mart system can be built using the 2 types of methods, [Multi-tenant by Virtual Tenant Function] or [Multi-tenant by WAR files], as are described in [*Multi-tenant*].

There are pros and cons for these 2 methods, and so you need to select the suitable method depending on the stated requirements and requests. It would also be possible to combine these 2 methods.

- Advantages of Multi-tenant by WAR files
    - Since modules or intra-mart applications to be used can be selected by IM-Juggling by each War file basis, different applications can be used for each tenant.
    - System startup, Stop, or Restart for each War file is possible.
    - Access by the independent URL for each tenant is possible.
    - Web Application Server can be also implemented by WebSphere Application Server 8.5.5 / Oracle WebLogic Server 12c (12.1.1).
- Disadvantages of Multi-tenant by WAR files
    - License set of intra-mart Accel Platform and intra-mart Accel Applications is required for each WAR file. So, you need multiple licenses.
    - In case you need to run multiple WAR files on the same Web application server, pertinent server resource such as sufficient amount of memory would be required.
- Advantages of Multi-tenant by Virtual Tenant
    - Since multiple tenants are logically built within one WAR file, system with high accomodation rate can be built.
    - intra-mart Accel Platform and intra-mart Accel Applications can be shared by each tenant. (License can be shared too.)
- Disadvantages of Multi-tenant by Virtual Tenant
    - Since the same application is shared for use, customization for each tenant would not be possible.
    - Maximum number of tenants within 1 War file are 100 tenants.
    - Access is made by the common URL in each tenant. Tenant ID must be entered on the log-in screen.
        (Specifications by sub-domain or support by request parameters is allowed.)
   - Only Resin is supported as a Web application server.

> **Warning**
> - Virtual Tenant Function is available from intra-mart Accel Platform 2014 Spring.
> - Processes and transactions made across multiple War files or multiple virtual tenants are not supported.
>   (If you need to implement them, please use the linkages in the Web services of IM-BIS for Accel Platform or ESB products.)

OAuth Authentication

By using OAuth authentication, you can permit the access without exposing password or other authentication information to the application when application accesses the resources.

Because of this, user does not have to log-in and the access from client application (such as smart phone application) to IM application will be permitted.
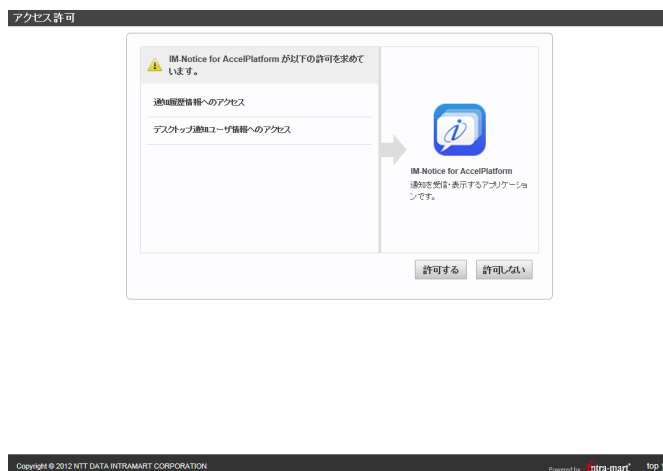
> **Note**
> - **Please refer to**
>   - [OAuth Authentication Module Specifications]
>   - [OAuth User Operations Guide]
>   - [OAuth Administrator Operations Guide]
>   - [OAuth Programming Guide]
>
>   for the details.

> **Warning**
> - OAuth authentication function is added from intra-mart Accel Platform 2014 Winter.

intra-mart e Builder for Accel Platform

intra-mart e Builder for Accel Platform has been implemented as a plugin to [eclipse], which is an open-source integrated development environment.

Development efficiency would be greatly enhanced by utilizing both the eclipse functions and eBuilder functions.

Since both the [Script Development Model] and [JavaEE Development Model] are supported at the same time, it can be used as an integrated development environment for any development scene.

> **Note**
>
> intra-mart Accel Platform includes intra-mart e Builder for Accel Platform as standard.
> We recommend that you give it a try.

Topics
- Module Project Creation Function
- Script Development Functions
- IM-JavaEE Framework / SAStruts+S2JDBC Framework / TERASOLUNA Global Framework Development Function

Module Project Creation Function

It is a function to create development projects for intra-mart Accel Platform. By this function, module projects for which development is completed are exported as user definition module files (imm files).

Script Development Functions

- HTML Editor

By this function, input completion and pallet menu for script development are added to the Web page editor provided by Eclipse WTP, and HTML which has been developed is displayed for development support.

- JS Editor

This is a development support function, which has added input completion to the JavaScript editor provided by VJET in script development.

- Debug Function

By this function, debugging of the JS files that have been developed is performed.

IM-JavaEE Framework / SAStruts+S2JDBC Framework / TERASOLUNA Global Framework Development Function

- IM-JavaEE Framework Editor

This provides editor function which supports the development in IM-JavaEE framework.
(It is available only in IM-JavaEE framework.)

- JSP Editor

This is a development support function which provides input completion and pallet addition for JSP development to the Web page editor provided by Eclipse WTP, and displays the preview of JSP that has been developed.

- Debug Function

By this function, debugging of the Java files that have been developed is performed

Compatibility with Previous Version

This product provides the mechanism to keep compatibility with the applications that were created by the previous version.

Topics
- API Compatibility
  - Deprecated Functions and APIs
- Compatibility of Database Structure

API Compatibility

With regard to APIs, compatibilities between 2 versions are maintained except for some APIs.
(Please pay special attention to the fact that compatibility is basically maintained for recommended APIs.)

- Compatibility Module

Deprecated functions and APIs are provided as compatibility module.
Only in the case compatible APIs are required, they will be made available in IM-Juggling by including them in the compatibility module.
Some of the compatible APIs are included in the official module.

> **Note**
> - In case compatibility module is used, migration from 7.2.x should be made.
> - In 7.2.x, please initiate the migration from the state in which IM-Common Master and Application Common Master are synchronized.
> - Compatibility module cannot be used after the new installation.
> - Types of Compatibility Modules

- Compatibility Module for Standard Version (Document Workflow (BPW) is not included)
  It can be selected in case Accel Platform Standard Module Pack has been selected.
- Compatibility Module for Advanced Version (Document Workflow (BPW) is included)
  It can be selected in case Accel Platform Advanced Module Pack has been selected.

Deprecated Functions and APIs

- Storage NetworkFile (VirtualFile)
  Support as Deprecated

  Part of the specifications is different by the architectural change. (handling of path separator)

- Access Security

  Support as Deprecated

  Access authority functions cannot be made compatible, because they are integrated into authorization.
  (Menu authorization, Web service authorization, Access controller authorization)

  New APIs are created to clearly show the old and new API specifications by architectural change and function addition.
  (Database access, Account, Calendar, Role, Batch)

- Application Common Master Document Workflow (BPW)

  Support as Deprecated

  Update-type APIs in Application Common Master cannot be used.
  Please make the update from IM-Common Master side, because Application Common Master and IM-Common Master are synchronized.

  Department classifications of Application Common Master and IM-Common Master are not synchronized.
  Although they were synchronized in 7.2, they are no longer synchronized because of the change of architecture in department classification.

> **Note**
> - IM-Workflow IM-Common Master will be the official functions.

> **Note**
>
> **Deleted Functions**
>
> Listed below are the functions deleted on intra-mart Accel Platform.
>
> - Menu Management (MenuManager)
> - Previous Access Security 4.x Compatible
> - Previous Workflow 4.x Compatible
> - JumpUp Module 4.x Compatible
> - IM-Curl
> - IM-FormatCreator
> - ViewCreator, TableMaintenance (7.2.x version)
>   Provided as new functions (data migration support is in place).
> - ServerManager, ServicePlatform Control-type API
>   They cannot be supported because of server architectural change.

Compatibility of Database Structure

Since there are some changes in the database structure, [Migration Tool] is provided.

> **Note**
> - Please refer to [Migration Guide] for details.

Parallel Operations with the Previous Version

This product provides a mechanism to allow parallel operations with intra-mart WebPlatform / intra-mart AppFramework Ver7.2 environment.

> Topics
> - Master Information Synchronization Function BackwardSync
> - External Menu Linkage Function
> - iAP-iWP SSO Linkage Function IM-HybridSSO

Master Information Synchronization Function BackwardSync

Because of the major architectural change on intra-mart Accel Platform from the previous version, functions that were uniquely developed or customized on intra-mart Webplatform / intra-mart AppFramework cannot be used as they are. Therefore, it is necessary that intra-mart WebPlatform / intra-mart AppFramework be used to utilize

the asset that was developed in the past with no change.

The problem in this approach is that the master information such as user information and company/department information should be managed on each platform.

BackwardSync function has been provided to avoid the complexity of this duplex management and allow one central control on intra-mart Accel Platform.
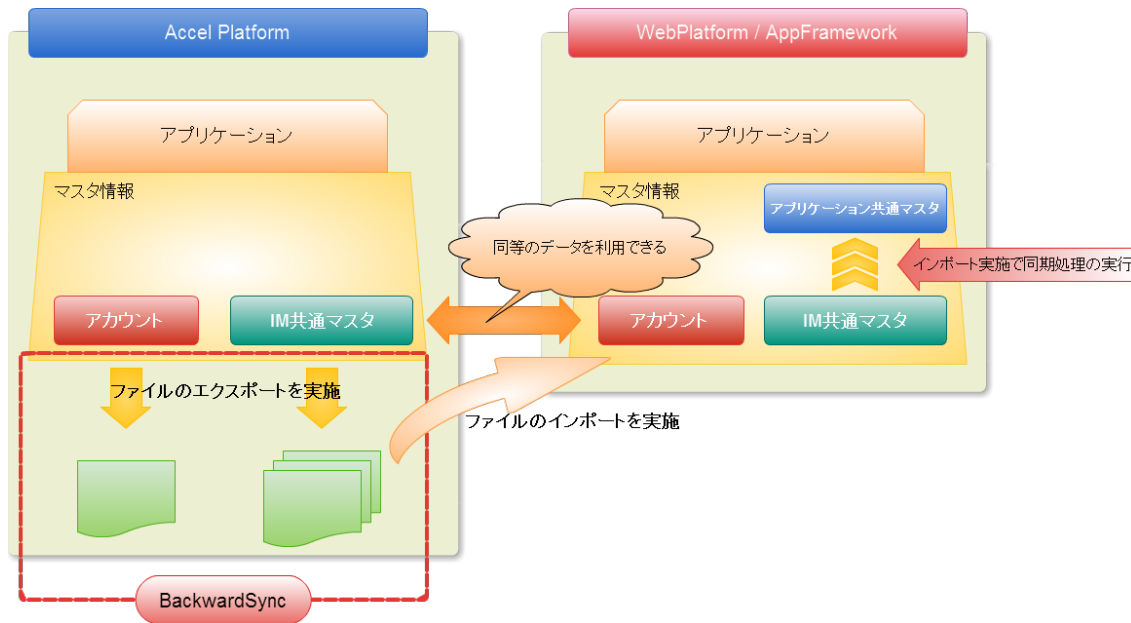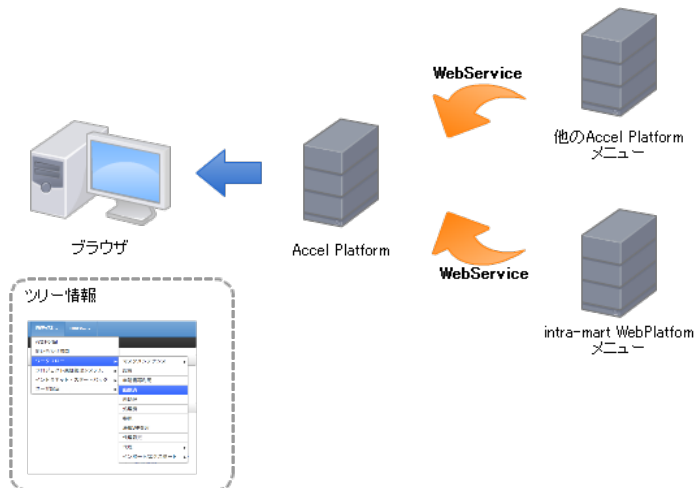

> **Note**
> - Please refer to [BackwardSync (Master Synchronization to version 7.2) Specifications] for details.

External Menu Linkage Function

In case both intra-mart Accel Platform and intra-mart WebPlatform/intra-mart AppFramework are operated in parallel, you need to log-in to each system and select the functions you need from the displayed menu in order to use each of these functions. This would result in poor usability.

In order to resolve this situation, intra-mart Accel Platform provides External Menu Linkage Function, by which menu information of intra-mart WebPlatform/intra-mart AppFramework and other intra-mart Accel Platform are obtained via the Web service, merged with other menu information in intra-mart Accel Platform, and displayed.

By utilizing this function, users can access functions of each system as if all the functions are on the same system.

> **Note**
> - Please refer to [*Setup Guide External Menu Linkage <http://www.intra-mart.jp/document/library/iap/public/setup/iap_setup_guide/texts/create_war/configuration_file_menu_provider.html#About_External_Menu_Linkage>*] for details.

> **Warning**
> - In case external menu linkage function is used, it is recommended that Single Sign-On authentication be made on each application server that is linked.

iAP-iWP SSO Linkage Function IM-HybridSSO

If you use [*External Menu Linkage Function*], which is described as above, some Single Sign-On mechanism is needed as shown in the description. If authentication is in place on intra-mart Accel Platform for intra-mart WebPlatform/intra-mart AppFramework Ver7.2, iAP-iWP SSO Linkage Function IM-HybridSSO is provided which allows Single Sign-On to intra-mart WebPlatform/intra-mart AppFramework Ver7.2.

By utilizing this function, users who operate intra-mart WebPlatform / intra-mart AppFramework Ver7.2 environment in parallel can use functions of each system smoothly without the need to prepare or install Single Sign-On product separately by combining [*External Menu Linkage Function*] described above.
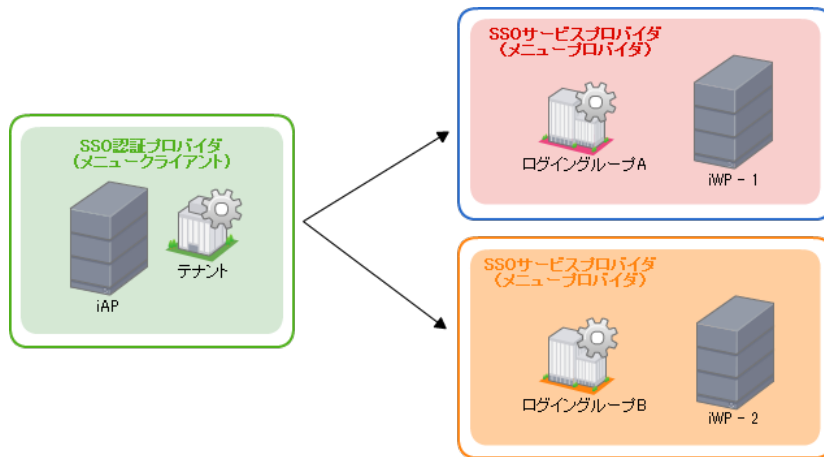
- Operations Image Figure

> **Note**
> - Please refer to [Setup Guide]-[iAP-iWP SSO Linkage] for details.

43