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- SAP Cloud Applications Studio
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  - Lifecycle Management
- Useful Resources
Extending SAP Cloud solutions

SAP Cloud Applications Studio

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Useful Resources
Extending SAP Cloud solutions

Multi Customer Solutions
- Native
- Complex business logic
- Built with SDK
- Run on SAP Cloud tenants
- Deployed to multiple customers

Customer-Specific Solutions
- Native
- Complex business logic
- Built with SDK
- Run on SAP Cloud tenant
- Specific to customer

Integrations
- Back-end integrations
- Defined interfaces
- E.g., SnapEngage, CRM OnPremise, ERP, Traxo, Hybris

Key User Tool Extensibility
- Add Custom Fields, Objects and Facets
- Modify Fields and Facets
- Manage Layouts
- Forms and Reports
- Data sources and web services for custom objects
- Mashups Enabling
  - UI integrations
  - Hosted at partner
  - E.g., Google Maps

C4C/BYD/CFT – Cloud For Customer, BYD – Business ByDesign, CFT – Cloud For Travel
Key User Tool – Capabilities

- **Extensibility**: Add, Edit, Remove extension fields.

- **Manage Master Layout**
  - Define new Query in data sets and search helps.
  - Reorder/Re-label Fields & Facets.
  - Change Field property – Mandatory, Read only, Invisible, hidden
  - Change facets and actions property as Invisible.

- **Managing Page layouts**
  - Change Field property – Mandatory, Read only, Invisible
  - Change facets and actions property as Invisible
  - Assign Page Layout to achieve Dynamic UIs based on Business role or business process

- **Code List Restriction**: Restrict dropdown values based on value in another fields and/or business roles of logged in user

- **Workflow Rules**: Create Notification, Send e-mails, Update fields when conditions are met.

- **Mash-up Authoring**: Enable Mash-ups for integration with external systems

- **Language Adaptation**: Change field Labels and Menu items to your own terminology

- **Custom Object**: Create Custom business objects, UIs, data sources, web services
Extending SAP Cloud solutions

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SAP Cloud Applications Studio

SAP Cloud Applications Studio is a software development kit, and an environment for partners, customers to enhance the functional capabilities of SAP’s Cloud solutions (SAP Cloud for Customer, SAP Business ByDesign & SAP Cloud for Travel). It is built to extend the reach of the underlying SAP Cloud solution in terms of fulfilling customer-specific requirements, legal requirements, or industry best-practices (“micro-verticals”).

Solution Attractiveness

Examples:
1. Mashups
   - Frontend integrations like
     - maps
     - company information

2. Integrated Software and Services
   - Backend integrations like
     - Credit card processing
     - Payroll services

3. Lightweights
   - Forms, Reports, Excel Workbooks, and UI Adaptations
     - Financial Health Check via MS Excel Download

4. Add-on solutions
   - Native solutions
     - Trade promotion management
     - Service help desk

5. (Micro-)vertical solutions
   - Pre-configured or native micro-verticals like
     - Pharmaceutical Solution
     - Wine yard Solution

Developed by SAP, operated by SAP
Developed by Partner, operated by partner / customer
Developed by Partner, customer operated by SAP
SAP Cloud Applications Studio
System Environment

Developers Desktop

SAP Cloud Applications Studio

Browser

SAP Cloud Solution

Hosted Development System

Repository

SAP Content

Partner Content

Develop

Deploy

Test

Runtime

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Extending SAP Cloud solutions

SAP Cloud Applications Studio

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Studio - Key Features in a nutshell

**Integrated development environment** based on Microsoft Visual Studio

**UI Designer** for new UIs or to adapt pre-generated UIs

Out of the box **Mobile enabled**

**Analytics** for own objects or for associated standard SAP objects

**Web Services** to communicate with other SAP LoB solutions or cloud solutions

**Extensibility** of standard SAP Business Objects, reports, UIs, and exits

**Integrated add-on lifecycle** with test environments, quality reviews, and deployment

**Published to SAP Store**, the commercial platform for partner and SAP add-ons

**Modification-Free - Multi-Tenant - Multi-Device**
Integrated Development Environment

- Build as Microsoft Visual Studio Shell application
  - runs with Isolated Shell
- C# like scripting language
  - Defining new Business Objects, or extensions to existing SAP Business Objects
  - Implementing Actions, Exits, Web Service consumption
- Wizards to define:
  - UIs, Reports, Print Forms, Workflows
  - Web Services
  - Business Configuration
- Field Extensibility
- Integrated Tracing, Debugger
- Compiles to standard Business Objects
New Business Objects

- Business objects contain nodes, elements, associations, and actions.
- The business objects are tree-like, and are structured by nodes and sub-nodes.
- The data of the elements is persisted in the database. Transient elements are also possible.
- Associations can point to other BOs within the add-on, or to Core solution BOs.
- Actions encapsulate the business logic.
- Authorization on instance level.
- Link standard BO to BO of the partners.
- Usage of address and dependent object within the partner BO.
Build Business Logic

Scripting

- Implement the business logic of add-ons. Examples: calculate bonus, initialize elements, check user input, and so on.
- Usual control structures like “if”, “while”, “foreach”, and so on.
- Read-write access to elements of own or associated BOs.
- Query BO instances.
- Exception handling.
- Library of reuse services.
- Usable in different contexts: BOs, process agents, service adaptations, exit implementation.
- Collection handling.
- Mass operations (SAP and Partner BO).
- Support multiple deployment units.
Scripting

- The Scripting Language:
  - is specifically tailored for core cloud solution add-on development
  - is easy to learn and use (C# like syntax)
  - is not a full-fledged programming language, but rather a light-weight scripting language
  - is focused on snippet-based code exit implementations
  - offers no support for meta programming and framework development
  - natively supports the core cloud solution programming model (development artifacts)
  - is strongly static typed (supporting type inference)
  - utilizes the common type system of the core solution (standardized CCTS/CDT/GDT types)
  - ensures sandbox execution (security and tenant separation)
Public Solution Model: Object Access via the Studio

- The Public Solution Model defines all objects of the corresponding cloud solution that can be used in the add-ons via the Studio.
- ~290 Business Objects
  - Example Business Partner, Sales Order, Opportunity, Invoice, and so on
  - Methods like ATP Check or Events can be directly used
  - Fields used for read/write via associations, retrieve, or queries
- ~2600+ Data Types
- ~1000+ UI Components
  - Stable anchor to enhance existing screens
  - Object Value Selectors, Embedded Components
- ~370 Reporting Sources
- ~95 Predefined Web Services
- ~25 Application Exits
UI Designer
Define new Partner UIs or extend Standard UIs

- Fine-tune the generated standardized UIs for new Business Objects.
- Extend SAP’s standard UIs with own fields, embedded components.
Out of the box Mobile enabled

- Same development environment for defining desktop or mobile apps.
- Various platforms supported
- Mobile Add-Ons are simply a part of it
  - UI adaptation via UI Designer
  - Development process the same as for Standard UIs (Floorplans and Business Logic development).
  - UIs only need to follow mobile development guidelines.

Workcenter / Views  Object Work List  Factsheet  Quick Activity
Analytics

- Data Sources for own Business Objects including fields from associated own or SAP Business Objects
- Create new reporting views and reports for partner objects
- Mobile Enabled
New & Extended Forms, Reports

Custom Analytics

- Custom reports (new or based on existing).
- Use (custom) fields.
- Create & personalize Excel workbook.
- Create formatted reports.
- Create new reporting views and reports for partner BOs.
- Join MDAVs (SAP or Partner).
- Add extension fields to SAP MDAV and reports.

Forms Maintenance

- Custom forms via highly accessible form editor.
- Define company settings (header, footer, logo).
- Use additional fields (custom or standard).
- Create new print forms for partner BOs and associated standard BOs.
Web Services

Provide own Web Services

- Provide synchronous Web Services to access new and existing Business Objects from the outside
- Push to and retrieve data via an external actor
- Wizard based creation

Web Service Consumption

- Access SOAP and REST services in the WEB
- Based on a WSDL file
- Business logic developed in an Action or an Event
Extensibility

Uniform Integration
- End-to-end
- Embedded into the infrastructure (e.g. transaction handling, change documents)
- Extensions appear as an 'integrated' part to consumers
- Operational aspects (e.g. lifecycle)

Use Cases
- UI adaptations
- Forms & reports
- Field extensions
- Functional logic extensions
- New business objects

Runtime Frameworks
Extending SAP Cloud solutions

SAP Cloud Applications Studio

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Lifecycle Overview – Customer Specific Solution

- Last Mile Customer Specific Solutions
- Development in Customer Environment
- Direct Life Cycle between Customers Test and Productive Tenant
- As part of Implementation Projects
- Templates as Jump-Start for Solutions
- Approval process before the development starts.
- Certification after the development is complete.
- Published in store.
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For more information on SAP Cloud Applications Studio refer to the help document
@ SAP Cloud Applications Studio Documentation

- SAP Community Network for Studio
- Wiki in Business Center
- Studio Training (Select your country and search for ‘SAP Cloud Applications Studio’ or C4C30)
- Studio Installation Corner
Thank you

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