



**Composite Application Framework in SAP NetWeaver**

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**SAP AG**

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**Composite Applications and CAF**

**Anatomy of CAF**

**Development of Composites with CAF**

**Current Composite Applications**

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The Business Challenge

**How do we promote  
business innovation  
while getting the most out of  
the business applications  
and technology  
our customers already own ?**

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The Answer

## Create composite applications.

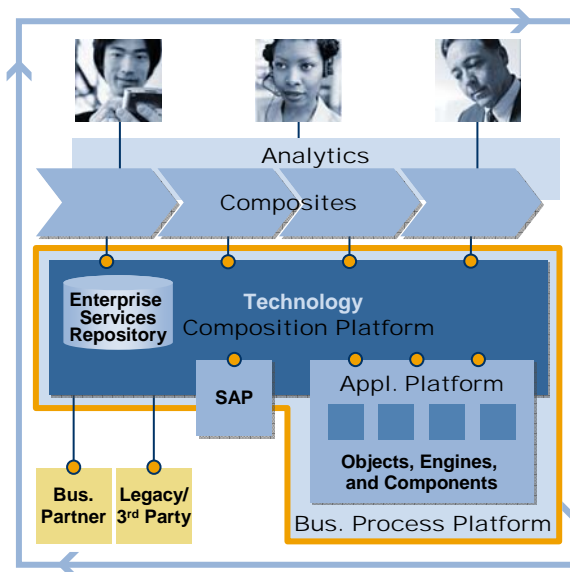
To combine the right parts  
of existing applications  
to initiate new business practices  
without having to  
start from scratch.

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## SAP Enterprise Service Architecture



Consolidation and Standardization of business processes and technologies for higher Productivity

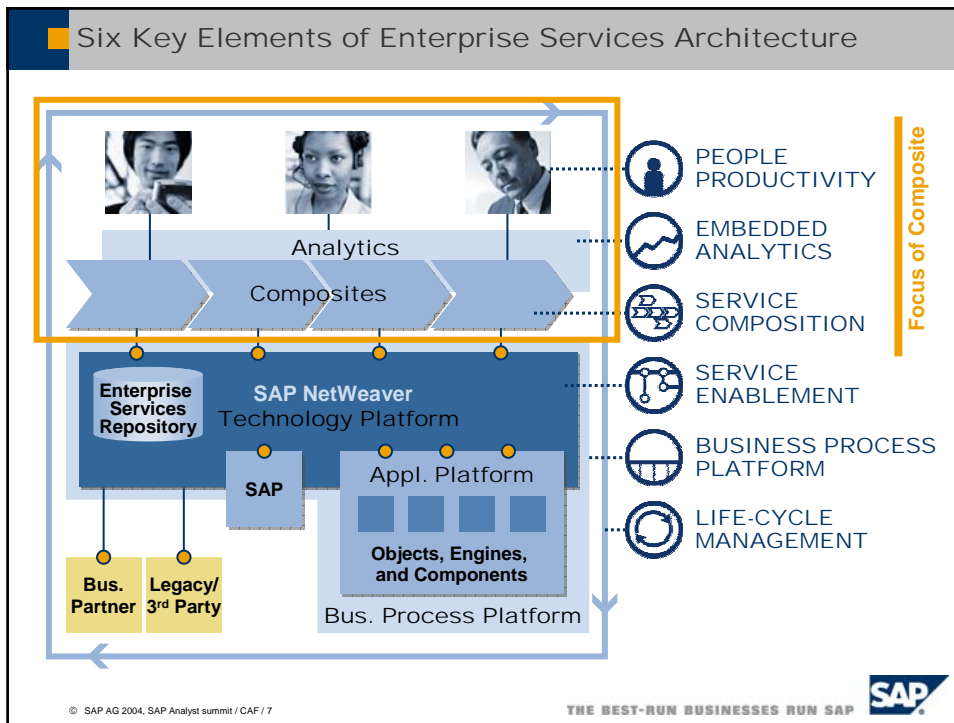
Composition for innovative differentiating business processes that leverage existing investments

Evolutionary adoption of Web Services and moving towards an open service-oriented architecture

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### Composite Applications at SAP

**Composite Applications**

- Composite Applications are built and deployed on top of the service operations provided by components, combining these service operations with new application logic, user interfaces, and business process orchestration.
- Composite Applications are loosely coupled to the components on which they are based, resulting in a new logical application tier which can be deployed and upgraded independently of the component infrastructure.

**xApps**

- xApps are packaged Composite Applications that are sold separately from mySAP Business Suite and Business One, with their own price tag and release schedule.
- xApps are stand-alone, packaged composite applications that deliver innovative, differentiated business processes.





Definitions

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## Indicators for Composite Apps

- 
**Adoption and Agility**
  - Is the process specific to industries, customers, or even customer divisions?
  - Does the process change quite often across time?
- 
**Composition and Reuse**
  - Does the process involve services or data from different application systems combined in a way specific to this application?
  - Does the process include non-OLTP data (analytics, documents)?
- 
**Industry- and End-User-Orientation**
  - Does the process involve a great deal of user interaction and collaboration between users?
  - Does the process involve people from other departments or companies which usually do not have access to the system of record?
  - Does the process require specific views on data, specific terminology, or specific UIs which are not part of the generic platform shipment?
- 
**Own Lifecycle**
  - Delivery of new versions requested by customers independent of upgrades of the underlying applications (platform)
  - Non-intrusive development of composite applications (no database appends or BADIs only calling public APIs (ideally as services))

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## Characteristics of Composite Applications in an ESA

- Enable** people to be productive by
  - describing, enabling highly flexible user-centric business processes
- Combine** infrastructure components
  - Transactions
  - Analytics
  - Documents
  - Collaboration
- Reuse** existing assets
  - reuse, integrate and orchestrate existing functionality as services
  - selectively fill gaps of missing functionality

**Summary: Think of composite applications as “apps-on-apps” – business applications that live on top of other applications. Composites transform disjointed data and functionality into a cohesive business process that spans multiple systems.**

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## Architectural Paradigms

### Service-oriented architecture

- Composite Applications consume services of underlying business applications and external Web Services
- Application logic and Object Access Interface implemented as services

### Domain-driven models for developing Composite Applications

- Process orchestration
- Service composition
- Entity modeling

### Patterns drive implementation of models

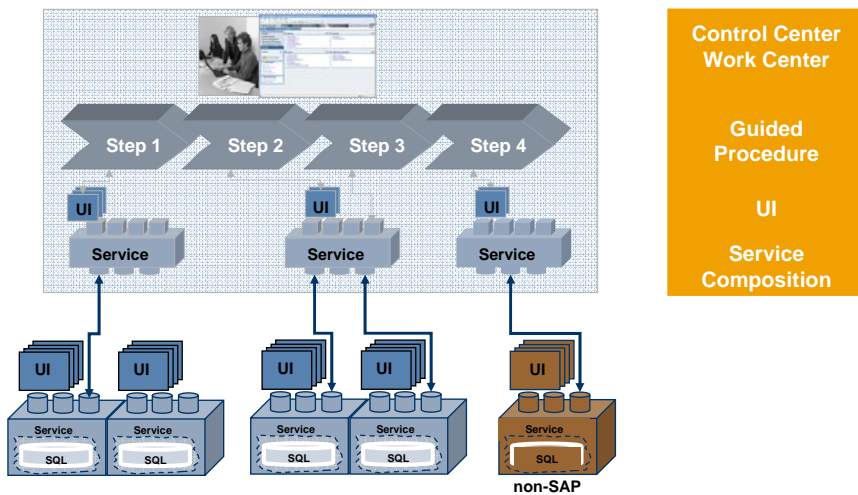
- Metadata-driven generation or configuration of default UI, Object Access Interface, data access methods, persistency, mappings

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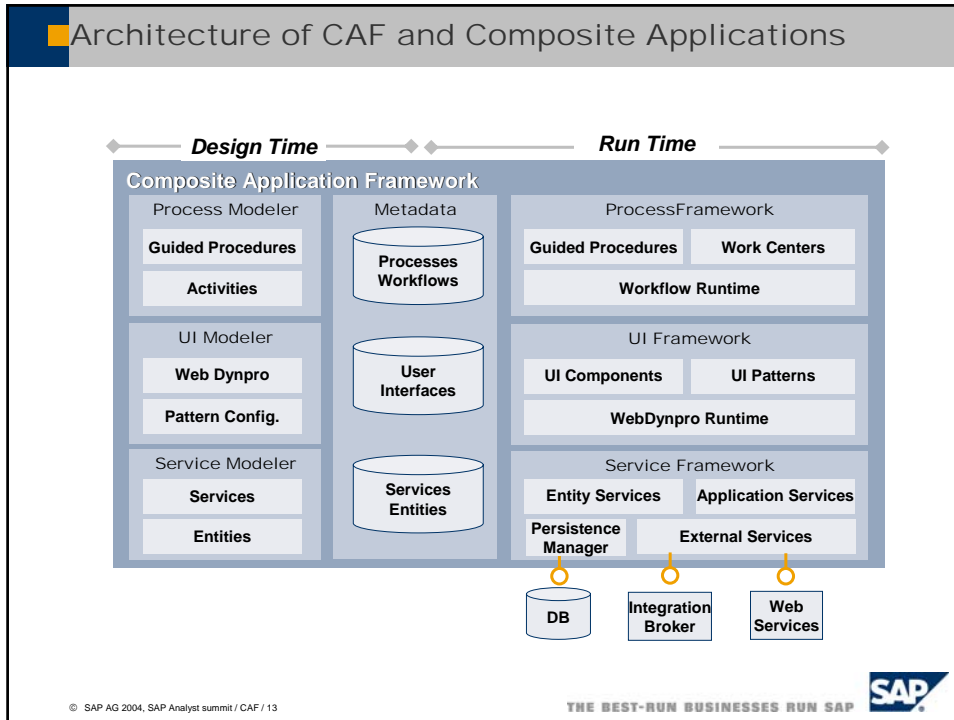
## Structure of Composite Applications



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### SAP NetWeaver and CAF

#### Leveraging NetWeaver capabilities with CAF

- Enable developers and business experts**
  - Model-driven, pattern-based approach to all layers relevant for Composite Application development
- Combine infrastructure components**
  - WebAS
  - WebDynpro for UI patterns and freestyle
  - KM Documents and Collaboration
  - BW for analytics
  - BPM for workflow support
- Reuse existing assets**
  - reuse, integrate and orchestrate existing functionality as services
  - selectively fill gaps of missing functionality

The SAP NetWeaver architecture diagram shows the following layers:

- PEOPLE INTEGRATION:** Multi channel access, Portal, Collaboration.
- INFORMATION INTEGRATION:** BI, KM, Master Data Management.
- PROCESS INTEGRATION:** Integration Broker, Bus. Process Mgmt.
- APPLICATION PLATFORM:** J2EE, ABAP, DB and OS Abstraction.

Vertical components include COMPOSITE APPLICATION FRAMEWORK, LIFE CYCLE MANAGEMENT, and WebSphere.

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**Anatomy of CAF**


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Current Composite Applications

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Control Center and Work Center

Control Center and Work Center as the central user entry points




**Key Capabilities**

- **Control Center**  
central business entry and control point for every user
- **Work Center**  
composition of activities a business user has in the respective role in the organization




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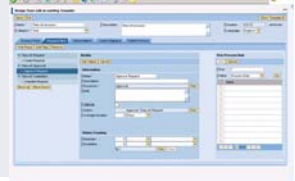
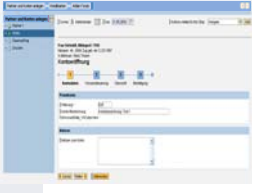
## The Process Layer

The CAF Process Layer supports the creation and execution of highly interactive Guided Procedures based on NW BPM




### Key Capabilities

- Guided Procedure Template Designer
- Action Designer
- Predefined Standard Processes
- BPM Workflow Integration
- Interactive Forms
- Context Mapping
- Monitoring




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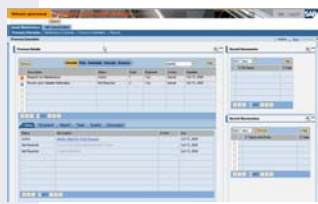
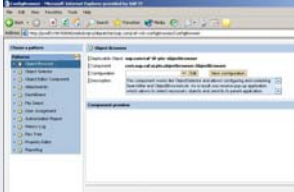
## The UI Layer

The CAF UI Layer leverages the power of WebDynpro and Patterns to enable quick and consistent creation of UIs




### Key Capabilities

- WebDynpro Patterns
- Configuration of WD Patterns
- Simple Pattern Composition
- Enabling Freestyle WebDynpro



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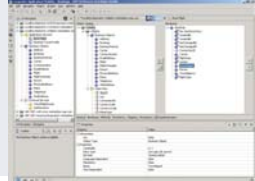


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## The Service Layer

The CAF Service Layer provides an abstraction to existing data and services, and includes existing as well as new business logic

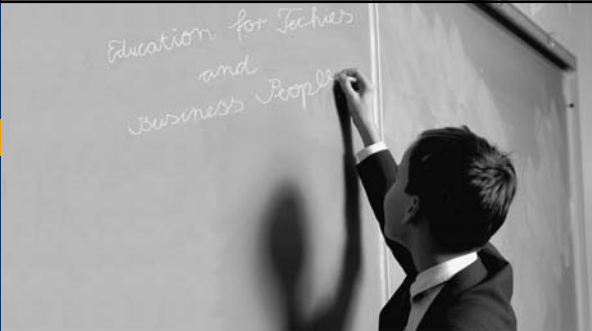

**Key Capabilities**

- Entity Modeling
- Access to External Services
- Data and Service Composition
- Code Generation (EJBs, DDIC, ...)
- Consistent Service Model (CRUD, unified tracing and logging, ...)
- WebDynpro Model Generation



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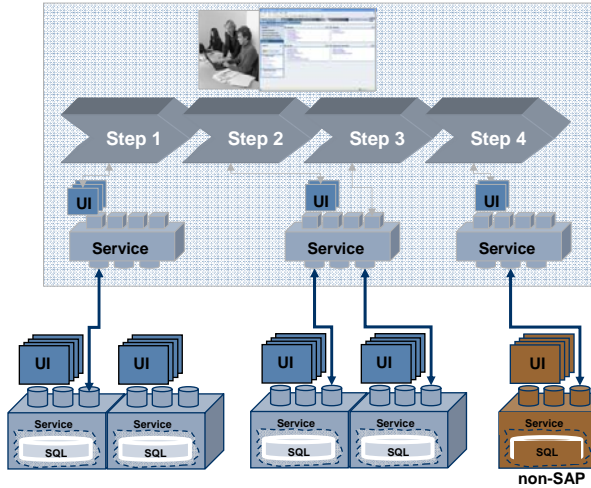
Current Composite Applications

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Composite Application Development

Service composition and orchestration on all levels



- Bind processes in role specific, user-centric work & control centers
- Model process in the GP design time. Bind Actions to UI-components.
- Bind UI-patterns and freestyle UIs to services
- Implement application logic using entity and application services
- Access backend systems through external services

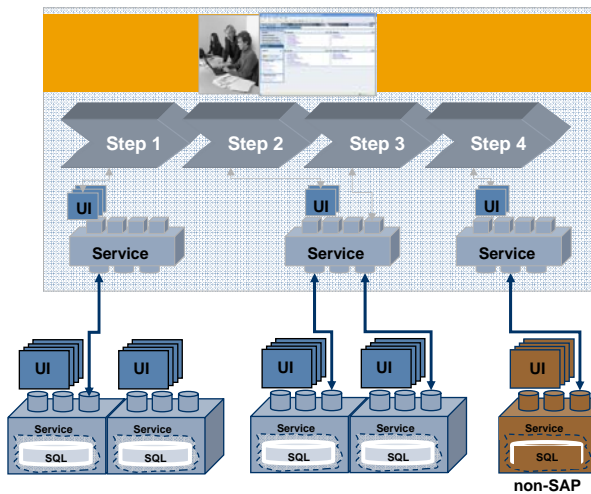
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**Composite Application Development**

### Service composition and orchestration on all levels

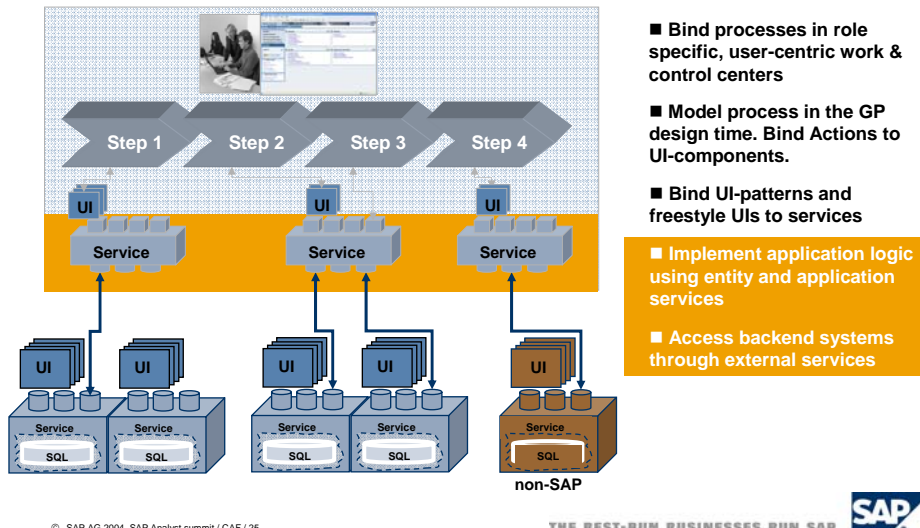
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Composite Application Development

Service composition and orchestration on all levels



Key-Questions for Application Design

Process

- What is the detailed business process which needs to be supported?
- Are there workflow-like processes, e.g. approval?
- How often does one need to change processes at design- or runtime?

User Interfaces

- Which UIs are needed? To what extent can one use existing patterns?
- Is there a need for other front-end tools, like interactive forms?

Services

- Do I need new business logic, which is not part of existing systems?
- Which business objects reside in the composite app. What is their relationship to business objects in the backend?
- Do I want to use services from NetWeaver components, e.g. document management, collaboration, or analytics?

Integration

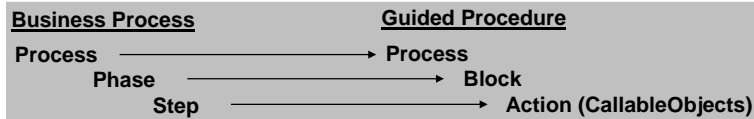
- Which data and information from other systems are re-used in the application?
- Into which systems and releases is integration necessary?
- Is an extension of backend systems required?



Process Design and Implementation

**Setup collaborative business processes using the Guided Procedures design time**

■ **Step 1: Design business process**



■ **Step 2: Re-use existing process templates**

- Leverage existing building blocks from the Guided Procedures Action Gallery

■ **Step 3: Build missing actions**

- Implement the CallableObject interface for application components, e.g. WebDynpro or BSP
- If needed, create appropriate services in the NetWeaver Development Studio

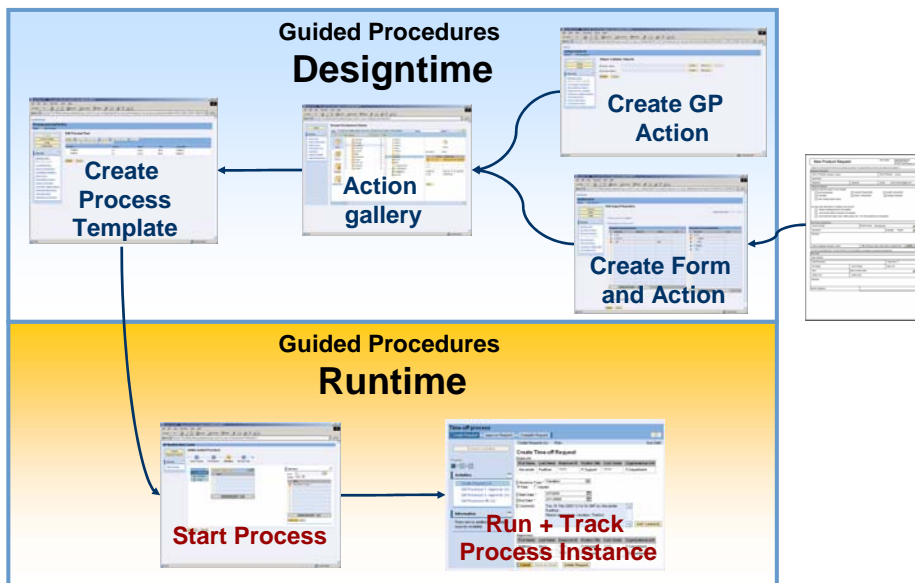
■ **Step 4: Define the Guided Procedure for the business process**

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Process Design and Implementation



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## Service Design and Implementation

### Define a consistent data model and logic, leveraging existing information and services

- **Step 1: Import external services**
  - Import Remote Function Calls (RFCs) and Web Services for usage in CAF
  - Read service descriptions for retrieving and manipulating data from remote system
- **Step 2: Define the data model**
  - Model new business objects, their attributes, properties and relations
  - Automatically generate code, including tables, relations, DDIC-elements, life-cycle methods and infrastructure services, like authorization, tracing and logging
- **Step 3: Create new business logic**
  - Implement business logic using External, Entity and Application Services
  - Generate code, including infrastructure services, like collaboration and authorization, as well as interfaces

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## UI Design and Implementation


### Bind UI patterns to services and compose user centric Work- & Control-Centers

- **Step 1: Re-use existing UI patterns**
  - Bind services to UI patterns through configuration, e.g. Object Browser, Object Editor, Object Selector, Search Bar, Attachment, File Select, Classification, FlexTree
- **Step 2: Create freestyle UI components**
  - Create individual, application specific UI components with WebDynpro on top of application services
- **Step 3: Define Portal content**
  - Compose Worksets from WebDynpro UI-components
  - Define Work- and Control Centers

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## SAP xApps - current Portfolio


- SAP xApp Product Definition
- SAP xApp Resource and Portfolio Management
- SAP xApp Cost and Quotation Management
- SAP Global Trade Services
- SAP xApp Emissions Management
- SAP xApp Integrated Exploration and Production

- Workspace Solution B2B Retail Mgmt by Accenture
- Pricing Analytics by Vendavo
- plannerDA by BristleCone
- Manufacturing Performance Intelligence by Lighthammer
- ServiceFlow by Digital Fuel
- RoHS/WEEE Compliance Solution by TechniData
- Visual Information for Plants by NRX

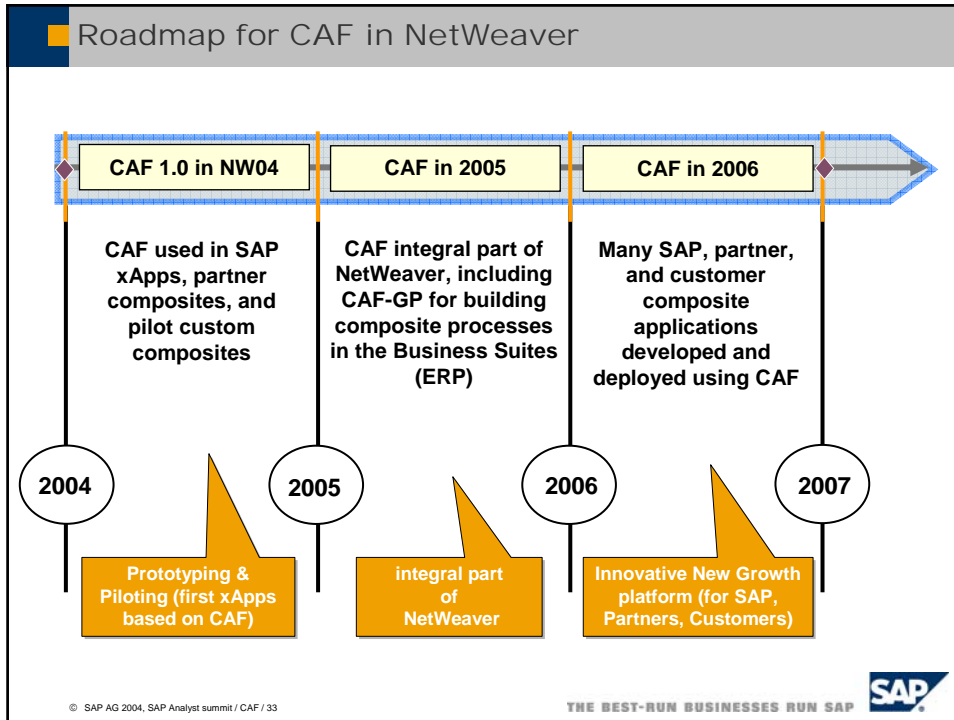


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# Thank You

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