

Workflow processing using SAP Objects

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The SAP, the developer of the leading Enterprise Resources Planning System in the World, has been providing business solutions in different areas required by the market for more than 40 years. The basic development environment of the SAP applications is smoothly implemented into the system. All business applications are developed in the internal ABAP (Advanced Business Application Programming) language. This language has its origin from the old style COBOL, PL1, but in the last 40 years the company had enough time to implement features from new technologies, programming languages. In the last ten years SAP implemented and uses for its own applications the object oriented programming paradigm, which is an extension of the original ABAP.

The business logic is implemented as reports, so-called transactions and function modules. Reports generate lists, transactions help to store, change business data in the system through many input and output screens defining a single logical unit of work. The function modules are special modularization units executing a determined functionality (like booking). Grouped function modules can share data through the main program of the group, which cannot be touched directly only via the connected function modules. This approach is similar to the static methods and attributes of an OOP class.

The Business Framework Architecture provides a special environment for internal and external usage of the system services by collecting them into Business Components and offering the real business entities as so-called Business Objects. The Business Objects (a determined entity from an entity type) are instances of the Business Object types. This Business Object layer extends the original report, transaction and function module layer with an object-oriented view, which is usable from outside as well. The Business Object Types contain as subcomponents attributes, methods, and events as well. There are special attributes, the key fields, which refer to the real, underlying data model. The other attributes can be simple fields, structures, arrays or even references to other Business Object Types. The events are information to the "world" about status changes of the Business Object. For example an employee can be hired or fired, an invoice can be approved, rejected, booked, parked as well. If a status change would be interesting for the system it can be publicized by an event. The methods execute the status changes of the business objects, like book, approve for an invoice. A method (as an attribute) can be instance specific or static (class level), and it can have parameters as well. There are special methods in the Business Object world, like CreateFromData, GetList, etc. These can get information from the available entities of the entity type or create a new instance, entity from scratch in the database. There is a unique meaning of public methods, because it means released for external availability. Only these methods can be called from outside of the system. These public methods of Business Objects are the BAPIs (Business Application Programming Interfaces).

The main constituent of process control is an object, which can store its current state; the state can be modified from outside, and the status changes can be publicized. The Business Objects are good candidate to be process control components. In our study we uncover the options to build up process flows or workflows within SAP systems and Microsoft Dynamics, and check the potential of creating outside driven workflows. We try to stretch the borders of the study to show the possibilities of creating and using system-wide workflows or processes by help of Business Objects.

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