



GRADE

Exigen Graphical Re-Engineering Analysis & Design Environment

Overview

GRADE is a **system modeling tool and technique**, based on a graphical language, for representing in visual form the structure of systems, processes and information. It is particularly useful for describing complex “as is” or “to be” systems, such as business enterprises, in a manner that is consistent and can be understood by managers, business analysts and IT professionals. GRADE's intuitive, graphical representation of the given system makes this possible.

GRADE goes beyond system **representation** to offer **simulation**, as well. The visual representation that makes a system understandable can be “run” on the computer screen by means of GRADE's event simulator. Simulation parameters, such as cost and availability of resources or durations of tasks and triggering events, are simply added to the graphical symbols in the model. This allows dynamic simulation of “as is” and “to be” business models and comparison of the results. In this way, the user can determine whether the “to be” model would produce the expected improvements. Different scenarios may be dynamically simulated and results compared to determine the best “to be” alternative.

GRADE is based on the principle that the implementation of major process or structural changes in any enterprise requires a “**blueprint**,” analogous to those used when undertaking a major construction project. The blueprint defines in an unambiguous manner the “to be” solution to be implemented.

Exigen applies the GRADE technology in different ways:

- q For definition and continuous improvement of its internal organization and processes
- q For specifying the Exigen software products being developed
- q For explaining to potential customers the business processes supported by the Exigen solution
- q For capturing the customer-specific requirements for tailoring of the Exigen solution
- q For modeling selected standard vertical industry processes and the same processes as supported by the Exigen solution. The potential customer can then visually compare the industry standard “as is” process with Exigen's proposed process and assess whether the Exigen solution fits.
- q The Exigen business analyst can modify the industry standard “as is” model to reflect the potential customer’s “as is” situation and, with the aid of simulation, demonstrate the savings in cost, time and resources that the Exigen solution offers.

GRADE Origins and Uniqueness

GRADE is the result of a 13-year systems R&D effort with an investment of over 300 person-years. It permits the representation of all vital aspects of a business or technological system in a graphical model. GRADE development was driven by the following needs:

1. To effectively plan and communicate planned changes (e.g., introduced by re-engineering or a new IT system) to different audiences (management, IT professionals, change agents and affected individuals)
2. To understand and be able to “manage” the complexity inherent in today’s “sociotechnological” systems
3. To facilitate application of the engineering discipline to enterprise re-engineering, and avoid failures in complex system projects.

GRADE is built on the premise that complex “reality” can be most effectively understood when represented graphically, using intuitive symbology with defined syntax and semantics. “Reality” lends itself to being classified in terms of three **fundamental building blocks**:

- q Active objects – or result producers
- q Processes – the dynamics of active-object interaction and production of results
- q Passive objects – the results produced by active objects.

The ability to decompose each of the fundamental building blocks and hide details within the decomposition layer is essential for analyzing and optimizing a system at different abstraction levels. Relationships between the fundamental building blocks at all levels of their decomposition must be tracked to maintain model consistency. All names in a GRADE model are reflected in the model's global data dictionary, which functions as a sophisticated table of contents; this, together with the defined syntax and semantics of the visual symbols, facilitates consistent use of terminology and is the key to model consistency. Thus, even systems involving thousands of elements can be modeled efficiently and consistently in GRADE.

GRADE Model Views

Different modeling approaches and views of a model are required to serve different needs. GRADE supports the following:

- q **Business modeling**, primarily for the representation of organizational structures and business processes
- q **System modeling**, primarily for the representation of IT systems, with emphasis on developing software specifications
- q **Object modeling**, primarily for conceptual modeling with the Unified Modeling Language (UML).

Business Modeling

Exigen uses primarily the business modeling approach for:

- q Defining its own internal organization and business processes
- q Defining the life cycle of interaction with customers (from initial contact through deployment of the solution to disengagement)
- q Defining the requirements and user interface for Exigen software products being developed
- q Defining the vertical industry business processes supported by Exigen products. The resulting models are used by Exigen’s sales support team to explain the product and its application to potential customers. Exigen’s Professional Services consultants use these reference models to capture the customer-specific requirements and tailor the Exigen solution.

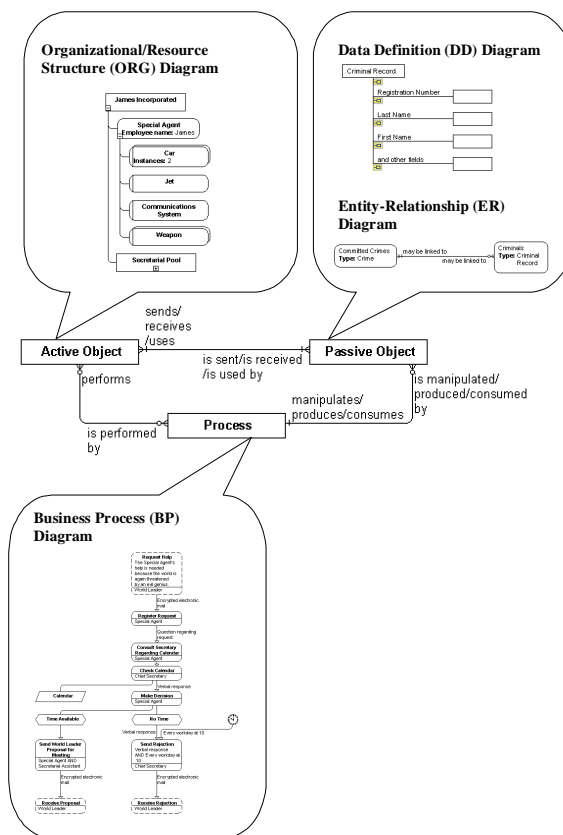


Figure 1: Overview of business modeling

System Modeling

The system modeling view (a draft of which can be generated automatically from a business model) provides a communications-oriented perspective on the system being modeled. It shows the information passed between the organizations and systems that support the process.

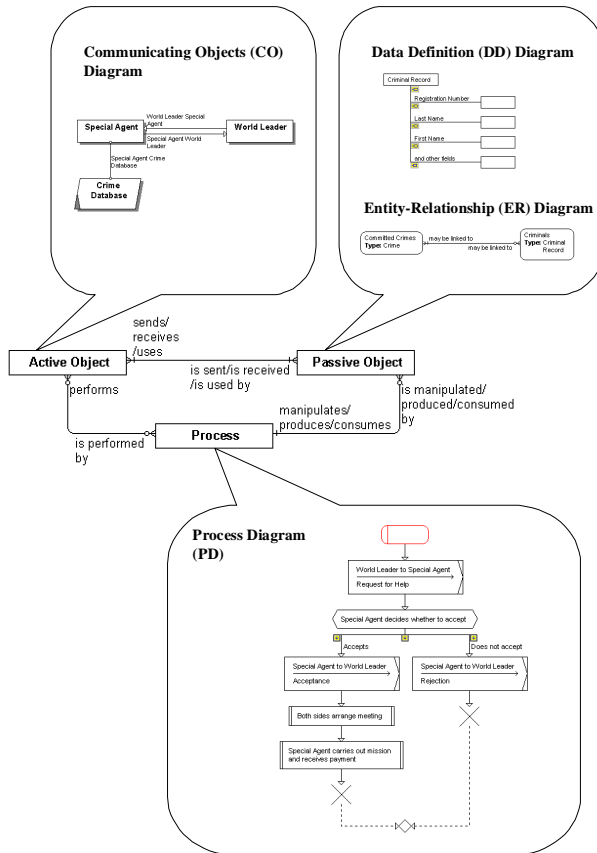


Figure 2: Overview of system modeling

Object Modeling

Object modeling is used by Exigen's software professionals to communicate relationships among business components and actors, and to define classes as part of software analysis and design activity. Additionally, it is used to define the virtual data model used in data mapping between customer legacy systems and the Exigen solution.

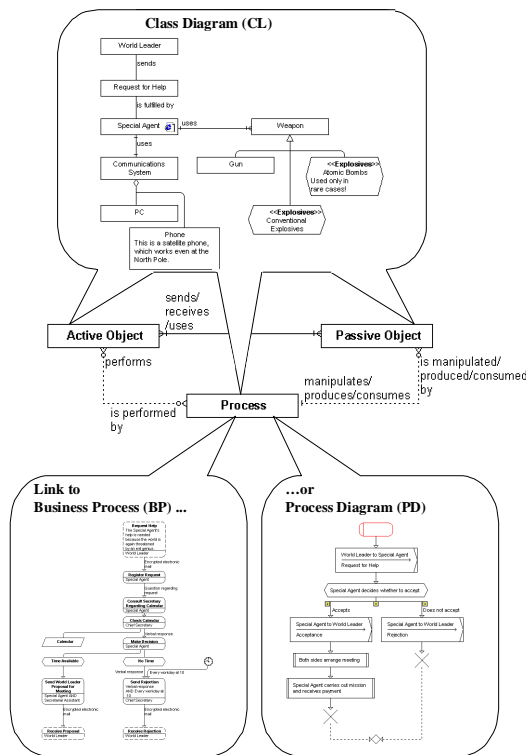


Figure 3: Overview of object modeling

The Bottom Line

Proper application of GRADE reduces the time, cost and risk of failure involved in any non-trivial business re-engineering or IT project, and significantly increases the probability of meeting cost and schedule targets. Through GRADE, Exigen's customers derive concrete business advantages. We approach major projects as an “engineering discipline,” which accounts for our speed to execute, predictable costs and schedules, and no surprises at the end. The potential customer sees what he/she will be getting in the form of a GRADE model before signing a contract with Exigen.

GRADE is an integrated language and tool providing support for business engineering, systems engineering and software engineering. With its wide-ranging functionality, it supports modeling of:

- q Business processes describing the dynamic behavior of an enterprise
- q IT processes reflecting the dynamic behavior of software systems
- q Organizational structures representing human and other resources
- q Interfaces among organizational elements and IT systems
- q Data models defining entity relationships and data structures
- q Object classes and their relationships
- q Information and material flow among organizational structures.