Business Modeling

OBJECTIVE
1.1.14: Business organization modeling

ontology
The study of how a particular knowledge domain, or system, is organized. An ontology is the product of an ontological study.

When discussing computer science and Web technology, **ontology** is the study of how a particular part of a company, called a domain, is organized. The product of an ontological study, called an ontology, describes how individual elements of a domain relate to each other. This relation is usually represented in hierarchical terms. An ontology also describes how individual elements process information within the domain. The result of this description is usually a vocabulary for that domain.

The resulting description and vocabulary can help programmers and designers of complex systems tailor their systems to the needs of a business. If systems are properly designed using a useful ontological model, these systems will be able to use and reuse data more easily.

Purpose of an ontology

An ontological study is a foundational step for programmers and designers of complex Information Technology systems. If properly conducted, an ontology allows software engineers and programmers to accurately map technology solutions to business needs. All parties will possess an objective understanding of how a domain processes information. An ontological study can also help ensure that data is formatted in a universal manner so that it can be reused from one complex system to another.

Table 1-1 describes ontology terms as they relate to a particular organization or business.

Table 1-1: Ontology terms

Ontology Term	Description
Domain	Represents an entire company or a division within a company.
Individual/object	The basic item within a domain. Also called an instance or an element. For example, a kayak manufacturing company would consider a kayak to be an object.
Class/set	A particular type of object. For example, a particular model of kayak would be an example of a particular class of individual object. Also called a concept in some ontologies.
Attribute	A unique characteristic pertaining to a class. A class can have multiple unique attributes. For example, a particular model of kayak will have various attributes, including: -Color. -Length. -Weight. -Displacement. -Type of construction materials.
Relation	Description of how one particular object or class is related to another, usually in a hierarchy. Helps create a taxonomy, which is a hierarchical relationship between objects or classes.
Schema	Hierarchical description and vocabulary concerning a particular domain.

Ontology and the business organization

A business ontology can be a description of the hierarchical organization structure of the business and how the various objects relate to each other. The business ontology model also illustrates the flow of information through the hierarchy. Figure 1-16 illustrates a typical business ontological model.

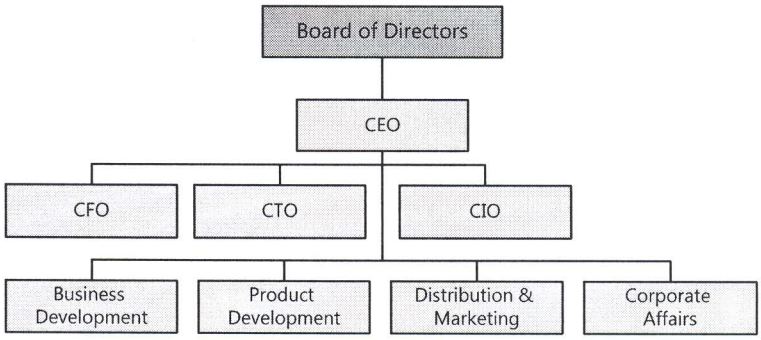

Figure 1-16: Typical business ontology model

The hierarchy illustrates the reporting structure of a typical large business that is publicly traded. The Chief Executive Officer is the highest-ranking officer to whom the other executive officers typically report. Table 1-2 describes each of the top-level objects (i.e., corporate officers) in the business ontology model.

Table 1-2: Business ontology model objects

Example Business Ontology Object	Description
Chief Executive Officer (CEO)	The highest-ranking corporate officer in charge of the total management of an organization, reporting to the board of directors.
Chief Information Officer (CIO)	In charge of the Information Technology (IT) and computer systems within the domain that support enterprise goals. Differs from a CTO in that a CIO is typically in charge of making sure technology fulfills business goals.
Chief Operations Officer (COO)	In charge of the operations management of the domain and is responsible for the design, development and operation of the systems that create and deliver the enterprise's products and services.
Chief Technology Officer (CTO)	In charge of making sure that IT resources are implemented and managed properly. The CTO role is usually different from the CIO role in that the CTO is responsible for how smoothly the technologies operate on a daily basis.
Chief Security Officer (CSO)	In charge of ensuring information security within an enterprise, and is responsible for the design, development and implementation of the systems that protect the organization's information from unauthorized access and use.
Chief Financial Officer (CFO)	In charge of managing the financial risks, planning, record-keeping and reporting of an enterprise.

Of course, not all companies and organizations follow this model exactly. However, all companies and organizations should create a model that ensures accountability among departments and reduces conflicts of interest. Conflicts of interest occur when the duties and responsibilities of corporate officers are vague or incomplete. One way to eliminate conflicts of interest is to implement a policy of segregation (or separation) of duties. Such a policy ensures that no individual is given responsibility for more than one related function.

Not included in the previous figure or table are the many levels below the chief executive level that an organization can have, depending on its size. Typically, the larger the organization, the deeper the hierarchy extends.

In a large organization, the top-level managers generally consist of the chief executives, and the vice presidents of various functions that report to the executives. Below the top-level managers are:

- **Middle-level managers** — directors and employees with managerial titles such as general manager, plant manager, regional manager, sales manager and so forth. Middle-level managers are responsible for carrying out the goals set by top management by directing the activities of particular departments or other business units.
- **First-level managers** —managers in the levels below middle managers who are generally known as first-line managers or supervisors. Typical titles include office manager, department manager, store manager, project manager and so forth. First-line managers are responsible for managing the employees who produce the products and offer the services.

Ontology and Information Technology (IT)

In business ontology, a domain and its data are described from the perspective of the business, without regard to how a particular application or system will process that data. An ontology does not study an individual application's understanding of data. Rather, it studies how the data is used by a business. In business ontology, the data is considered first, without any regard to how an application will process it.

To learn more about ontology as it relates to computer science, consider the following resources:

- *http://en.wikipedia.org/wiki/Ontology_(computer_science)*
- *http://askville.amazon.com/computer-science-ontology/AnswerViewer.do?requestId=457310*
- *http://tomgruber.org/writing/ontology-definition-2007.htm*

Following are examples of when an ontology is helpful to specific Information Technology (IT) implementations:

- Creation of complex accounting systems
- Web 2.0 and semantic Web implementations
- Artificial intelligence

Semantic Web implementations are Web applications that have the ability to contextualize data as they process it. Applications that have the ability to apply context to data can make complex judgments about data, and as a result provide better solutions without human intervention.

Web Ontology Language (OWL)

Various languages exist for defining ontological relationships. The Web Ontology Language (OWL) is the most current. You can learn more about OWL at the W3C's OWL Web Ontology Language Overview site at *www.w3.org/TR/owl2-overview/*.

OBJECTIVE
1.15.6: Information flow and reporting models

Data Modeling

Data modeling involves determining the requirements that a database must fulfill in order to function properly for an organization. When creating a data model, you first create a conceptual model, which documents the data and information within an

organization and how it is used. The actual implementation of the conceptual model is called a logical model.

When engaging in data modeling, you take the following steps:

- **Planning and analysis** — identifying business requirements
- **Conceptual design** — creating the model as a pure concept
- **Logical design** — encoding the concept into SQL programming
- **Physical design** — determining exactly where data will be stored
- **Implementation** — applying the design to an actual database application, such as MySQL or Oracle

Data modeling vs. ontology

A business ontological study is meant to help create various complex systems. Data modeling is meant for databases only. In data modeling, the most important consideration is the database's ability to process data.

A business ontology is meant to describe how a business (i.e., domain) is organized and how it processes data. In a business ontology, the way an application processes data is not considered.

OBJECTIVE
1.15.15: Quality management and assurance

The Importance of Standards

Generally speaking, standards help govern the ease with which information can be exchanged and understood between people, businesses and systems. If people, businesses and systems do not adhere to the same standards, communication between them is more difficult. In the ever-changing world of technology, the adoption of standards is a critical component to the success of businesses, hardware and software development, and the World Wide Web. The following sections will introduce some of the main standards organizations that provide the necessary framework for business, network and Internet-related success.

If you have ever used a telephone or connected to the Internet, you have done so using standards created by the organizations discussed in the following sections.

International Organization for Standardization (ISO) 9000

The International Organization for Standardization (ISO) is a grouping of national standards bodies from 157 countries. ISO develops technical specifications for intellectual, scientific, technological and economic activities worldwide. ISO is not an acronym; the name is derived from the Greek *isos*, which means equal. You can learn more about ISO at *www.iso.org*.

ISO offers a family of business management system standards called ISO 9000. ISO 9000 details the steps recommended to produce high-quality products and services using a quality-management system that maximizes time, money and resources. ISO 9000 outlines a systematic approach to managing business processes so that they consistently deliver quality products.

World Wide Web Consortium (W3C)

The World Wide Web Consortium (W3C) is a vendor-neutral forum whose mission is to create Web standards and guidelines. Tim Berners-Lee and others created W3C as an industry consortium whose primary mission is to build consensus around Web technologies. In order for the Web to reach its full potential, the W3C mandates that the most fundamental Web technologies be compatible with one another, and that any hardware and software used to access the Web be able to work together. The W3C refers to this goal as "Web interoperability." The W3C also serves as an open forum for discussions about the Web. You can learn more about the W3C at *www.w3.org*.

Since it was founded in 1994, the W3C has published more than 110 Web standards, called W3C Recommendations. The W3C does not force manufacturers to follow the Recommendations, but encourages them to do so. Many of the standards define levels of conformance, which manufacturers must follow if they want to label their products W3C-compliant. Because the W3C does not force manufacturer compliance, the Recommendations may be implemented only partially. The Recommendations are under a royalty-free patent license, allowing anyone to implement them.

Internet Engineering Task Force (IETF)

The Internet Engineering Task Force (IETF) is an open international community of network designers, operators, vendors and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. The IETF develops and promotes Internet standards for the TCP/IP and Internet protocol suites. The IETF works closely with the W3C and other standards organizations, such as ISO and the International Electrotechnical Commission (IEC). The actual technical work of the IETF is done in its working groups, which are organized by topic into several areas (e.g., routing, transport, security, etc.).

Requests for Comments (RFCs)

Request for Comments (RFC) A document published by the IETF that details information about standardized Internet protocols and those in various development stages.

Requests for Comments (RFCs) are documents of interest to the Internet community published by the IETF. These documents describe methods, behaviors, research or innovations applicable to the workings of the Internet and Internet-connected systems. They include detailed information about standardized Internet protocols, such as IP and TCP, and those in various stages of development. They also include informational documents regarding protocol standards, assigned numbers (e.g., port numbers), host requirements (e.g., data link, network, transport and application OSI layers) and router requirements.

RFCs are identified by number. The higher the number, the more recent the RFC. There are thousands of RFCs. You can learn more about RFCs at *www.rfc-editor.org/index.html*.

Institute of Electrical and Electronics Engineers (IEEE)

The Institute of Electrical and Electronics Engineers (IEEE) creates standards relating to various technologies, including those used on the Internet. The IEEE also sponsors technical projects and many journals. IEEE standards include the following:

- Ethernet (802.3)
- Wireless Ethernet (802.11)

IEEE publications include the following:

- *Communications Magazine*
- *Information Theory*
- *Computer Graphics and Applications*
- *Power and Energy Magazine*
- *Wireless Communications*

You can learn more about the IEEE at *www.ieee.org*.

Telecommunications Industry Association (TIA)

The Telecommunications Industry Association (TIA) is responsible for creating various standards, including:

- **TIA/EIA-568-B** — cabling standards that include the RJ-45 jacks and plugs used throughout the world to connect computers. This standard also includes RJ-11 plugs and jacks, which are used in various countries for traditional telephony.
- **TIA/EIA-598** — fiber-optics standards that ensure quality high-speed networks across the world.

You can learn more about TIA at *www.tiaonline.org*.

CIW Online Resources – Online Exercise

Visit CIW Online at *http://education.Certification-Partners.com/CIW* to complete an interactive exercise that will reinforce what you have learned about this topic.

Exercise 1-2: Standards organizations

CIW Online Resources – Course Mastery

Visit CIW Online at *http://education.Certification-Partners.com/CIW* to take the Course Mastery review of this lesson or lesson segment.

IBA Lesson 1 - Part B