



CBML INFORMATION MANAGEMENT ENVIRONMENT

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1. THE CBML INFORMATION MANAGEMENT ENVIRONMENT

INTRODUCTION

1. The CBML Information Management Environment has two distinct but mutually dependent methodologies:

- a. CBML a language and methodology for the definition of information.
- b. CBIE a methodology for the exploitation of information and data within the environment.

CBML

2. CBML is the Corporate Business Modelling Language.
3. CBML is an information description language and incorporates a methodology for describing business information.
4. CBML enables different business areas to define information from their own perspective.
5. CBML enables information to be defined from the perspective of an entire enterprise.

CBIE

6. CBIE is the Corporate Business Information Exploitation set of methodologies.
7. The CBIE methodologies are distinct and mutually independent.
8. The CBIE methodologies consist of:
 - a. The reconciliation of information models for the same information defined in CBML from different perspectives.
 - b. The reconciliation of information models for the same information defined in CBML from a business domain specific perspective and from the perspective of an entire enterprise.
 - c. The reconciliation of CBML information definitions with **extant data** structures.
 - d. The automated conversion of CBML defined information to other data modelling languages, these include:
 - (1) Entity relationship models.
 - (2) Object Oriented class diagrams.
 - (3) Specific generic data structures.
 - (4) Specific XML schemas.
 - (5) International message standards.

The reconciliation of the CBML information definitions to the automatically generated data definitions is an implicit by-product of the process.

CBML PRESENTATION

9. The generation of alternative forms of presentation for CBML definitions including:

- a. Diagrammatic.
- b. Verbalisation.
- c. XML schema for CBML.

CBML AND CBIE OVERALL CONCEPT

10. Figure 1.1 below shows the basic concepts for the exploitation of business information by CBIE using CBML.

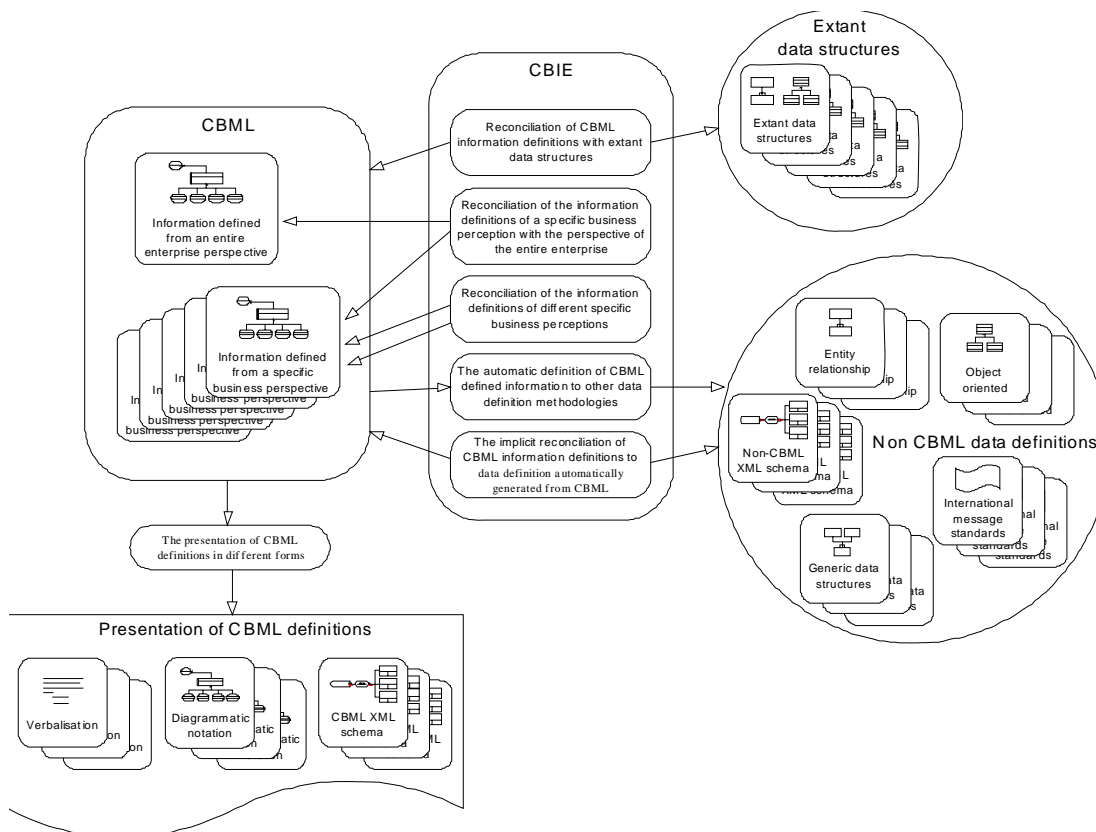


Figure 1.1 CBML and CBIE

2. OVERVIEW OF INFORMATION MANAGEMENT

OVERVIEW

1. If real benefit is to be gained from information then the information needs to be exploited.
2. The exploitation of information has two distinct but mutually dependent purposes:
 - a. The definition of business information in an enterprise.
 - b. The exploitation of the information and data within the environment.
3. The definition of business information in an enterprise has related but independent principles for the definition of business information in an enterprise:
 - a. The business information that is generated in one business domain must be capable of being exploited by any other business domain within the enterprise.
 - b. There is only one correct **model** for a specific business perception and different businesses will have different perceptions of the same **real world entities** and **real world substances**.
 - c. The different business domains must be free to define the information used in their business domain as it is perceived by their business and not as another business domain perceives the information.
4. The exploitation of the information and data within the environment includes:
 - a. **Extant data** however it is stored.
 - b. Ensuring the development of all new information systems meet the requirements of interoperability and re-use.

DEFINITION OF BUSINESS INFORMATION IN AN ENTERPRISE

5. The two principles for describing business information seem to be in conflict as:
 - a. Business information generated in one business domain is capable of being exploited by any other business domain within the enterprise if all business domains use the same semantics for the information.
 - b. If information users within a business domain are unable to describe the information used in their own terms the gathering and use of information will be seriously inhibited.
6. The CBIE by using CBML is designed to reconcile these principles and enable information systems to be established that permit real information sharing, are resilient, and established with less risk and less cost than information systems developed to meet a specific business domain requirement.

EXPLOITATION OF THE INFORMATION AND DATA WITHIN THE ENVIRONMENT

7. The reconciliation of CBML information definitions with **extant data** structures is achieved through the use of **level A** and **level B** to define the extant semantics in a form that enables rules to be applied in order to reconcile the **extant data** with the CBML information definitions.
8. The automated conversion of CBML defined information to other data definition languages is achieved by the definition and application of rules. One of the principles within the CBIE is that the generation of logical implementation structures for whatever platform should be rule based.

9. The list of possible platforms includes:
 - a. **Entity relationship models.**
 - b. Object Oriented class diagrams.
 - c. Specific generic data structures.
 - d. Specific XML schemas.
 - e. International message standards.
10. The generation of rules for the conversion of CBML **models** to data definition languages creates an implicit reconciliation of the CBML information definitions to the data definitions automatically generated from CBML

CBML PRESENTATION

11. Alternative forms of presentation for CBML definitions are generated through rules.
12. Diagrammatic: An official graphical notation has been defined for the gathering and presentation of CBML information.
13. Verbalisation: A verbal presentation of CBML information.
14. XML schema for CBML: This is seen as an export facility.
15. Specific XML: XML schemas used by third party tools may be generated by the application of rules.

CBML AND CBIE OVERALL CONCEPT

16. A diagram showing the basic concepts for the exploitation of business information by CBIE using CBML is shown in Figure 1.1 in section 1.

CBIE BENEFITS

17. Information need only be collected once and re-used throughout the enterprise with no risk of being misinterpreted thus achieving interoperability.
18. The information required for a business domain can be precisely defined and presented to the information system developers thus:
 - a. Providing clear requirements to the information system developers without dictating how the system should be built.
 - b. A clear requirement definition is available for system acceptance testing.
 - c. Because the system is built strictly on information requirement the reliability and longevity of the system is greatly improved.
 - d. The sharing of information enables the re-use of information system elements.

2.1 GENERAL CONCEPTS FOR INFORMATION MANAGEMENT

OVERVIEW

1. All CBML **elements** are defined as a version of that **element**.
2. All CBML **models** exist within a **context**.
3. All CBML **models** exist within a **model level**.
4. A **model** in a **context at a level** defines the information semantics of a business domain.
5. The same or different **element** versions may be used in the **models** of different business domains.
6. All the versions of the same **element** are defined implicitly as being the same **element**.
7. When two different **elements** are seen to be the same then these are mapped as being the same, an explicit form of versioning.

USE OF CONTEXT AND MODEL LEVEL

8. The **model** for a specific business domain is defined within a **context** that reflects the business domain and the scope of the **model**.
9. A **model** for a specific business domain is also defined within a **model level** to indicate how well the **model** meets the rigour of CBML **models**.
10. The **model** for the enterprise is at a **model level** expressly for the enterprise and the enterprise **model** will meet the full rigour of CBML.
11. The mapping between different CBML **models** need to be recorded.

PRESERVING AND PRESENTING CBML MODELS

12. A facility is required to provide an interface to **model** developers so that developing **models** may be recorded and validated.
13. All CBML **models** need to be stored in a form that allows the **elements** within the **model** to be re-used by other **models**.
14. Rules are needed for the **model** to be presented in different forms while ensuring the integrity of the presentation.
15. The **models**, the rules for validating the **models** and the rules for presenting the CBML **models** need to be recorded.

RECONCILIATION WITH EXTANT DATA

16. All **extant data** has its own semantic meaning that creates a **model**. The **models** of **extant data** will not be defined in CBML and cannot be relied upon to demonstrate the same rigour as CBML **models**. Rules need to be developed for the reconciliation of each specific **extant data model** with a CBML **model** of the business domain information.
17. The rules for the mapping of **extant data** items to CBML **elements** need to be recorded.

DEFINING STRUCTURES FOR IMPLEMENTATION

18. Rules need to be developed for the conversion of a CBML **model** of the business domain information to the structures needed for the development of information system data stores.
19. The rules for the conversion of a CBML **model** need to be recorded.

MANAGING THE INFORMATION

20. A repository is required to hold:
 - a. All the **models** with their **context** and **level**.
 - b. The mappings between the different CBML **models**.
 - c. The **extant data models**.
 - d. The mappings between the **extant data models** and CBML **models** and the rules required when the mapping is complex.
 - e. The required implementation structures.
 - f. The mappings between the required implementation structures and CBML **models** plus the rules required when the mapping is complex.
21. Repository facilities are required for:
 - a. The input and output of **models**.
 - b. A repository interrogation system to find relevant CBML **elements**, **extant data**, logical structures and the mapping between them.
 - c. Presenting CBML **models** in different forms.
 - d. Input of mappings between the **extant data models** and CBML **models** and for the definition of the rules.
 - e. The generation of required implementation structures, the relevant rules and the mappings.
 - f. A repository interrogation system to find mappings between all the different **elements** that mapping can exist between.
 - g. A reporting facility for all repository information.

2.2 CONTEXT, LEVEL AND STATUS OF A MODEL

OVERVIEW

1. A CBML **model** is developed for a particular purpose. This purpose is reflected in the **context** of the **model**.

CONTEXT DEFINITION

2. A **context** is the purpose of the **model**.

3. A **context** has two components:

a. The domain that it applies to; for example: Pay Office, Artillery troop.

b. The scope of the **model**; for example: payroll, pension, firing plan.

4. There is no limit on the detail of the domain or the scope and **contexts** may overlap or be entirely contained within another **context**.

5. A version of a CBML **element** may be included in any number of different **contexts**, the more an **element** version is used the more there is a common understanding of the information within an enterprise.

CBML MODEL LEVELS

6. There are three CBML information **model levels**. These are shown in Table 2-1.

Table 2-1 CBML information model levels

CBML Model Level	Description
Level C	A single model for each context using the terminology of the context and the information structure as perceived by the context . Each model has a single approved version of each CBML element . Different models for different contexts may use the same or different versions of a CBML element . No concession is made to reflect enterprise approved CBML element versions.
Level D	A single model for each context using, where possible, the terminology of the context ¹ but an information structure that is compatible with the enterprise information structure. Each model has a single approved version of each CBML element . Different models for different contexts may use the same or different versions of a CBML element .
Level E	A single model of the whole enterprise with a single approved version of each CBML element .

7. At **level D** and **level E** the **models** are validated using the full rigour of CBML.

8. At **level C** a prescribed relaxation of the full CBML rules is permitted to ensure the modeller concentrates on the information requirements of the business; not the rules of CBML.

¹ Sometimes the terminology used by the context is contrived and needs to be modified to assist understanding.

CBML CONTEXT AT A LEVEL

9. All CBML **models** are for a specific **context** and for a specific **level**. This is referred to as the **context at a level** for the **model**.
10. Each **context at a level** may define its own version of a CBML **element** or include a version defined elsewhere.
11. Only one version of a CBML **element** can be current within a **context at a level**.
12. Only one version of a CBML **element** can be current at **level E**.
13. An **element** version becomes part of a **context at a level** in two ways:
 - a. A new **element** version is created in the current **context at a level**.
 - b. An existing **element** version from another **context at a level** is included in the current **context at a level**.

CBML ELEMENT VERSIONS

14. All CBML **models** consist of CBML **element** versions.
15. Within a single **model** an **element** can belong to one and only one other **element** but a different version of the same **element**, that may or may not belong to a different **element**, may be contained within a different **model**.
16. A CBML **element** version is not progressive versioning as with the development of software but different versions of the same thing as with different recordings of the same piece of music.
17. The version of a **class** or **category** may not only change the **element** name and **element** description but also the **scheme** or **set** of which it is a **member**.
18. The version of a **scheme** or **set** may not only change the **element** name and **element** description but also the **class** or **category** that is the **owner** or **scope**.
19. The version of a **categorisation rule** may not only change the **class** or **category** to which it refers but also the **class** or **category** to which it belongs².
20. The version of a **characteristic** may not only change the **element** name and **element** description but also the **class** or **category** to which it belongs³.
21. An existing CBML **element** version should always be used in preference to creating a new one but the **element** version must be correct in the required **context** and if it is not precisely correct then a new version of the same **element** is required.
22. If the required **element** already exists but the **element** name or **element** description is considered not ideal for the current **context** then a new version of the same **element** should be created.
23. For **characteristics** and **categorisation rules** it may be required in the current **context** for the **characteristic** or **categorisation rule** to belong to another **class**, **scheme**, **category** or **set**. A new version of the same **element** should be created placing the **characteristic** correctly for the **context**.

² Within a single **model** a **categorisation rule** or **characteristic** can belong to one and only one **element** but a different **version** of the same **categorisation rule** or **characteristic**, that may or may not belong to a different **element**, may be contained within a different **model**.

³ Within a single **model** a **categorisation rule** or **characteristic** can belong to one and only one **element** but a different **version** of the same **categorisation rule** or **characteristic**, that may or may not belong to a different **element**, may be contained within a different **model**.

24. All **usage rules** are associated with the inclusion of a CBML **class**, **categorisation rule** or **characteristic** within a **context at a level** and do not effect whether or not an existing CBML **element** is usable by the current **context** without creating a new version.

DEFINING STRUCTURES FOR IMPLEMENTATION

25. Rules need to be developed for the conversion of a CBML **model** of the business domain information to the structures needed for the development of information system data stores.

26. The rules for the conversion of CBML **models** need to be recorded.

STATUS CONCEPTS

27. There are two related but independent status that are applied to a CBML **element** version in a **context at a level**; these are:

a. Overall status:

(1) An overall status is defined by those responsible for the development of the CBML **element** version in a **context at a level**. The value for overall status ranges from “working” to “approved”.

b. Status by authority:

(1) A number of different authorities may have a view on the merits of a particular CBML **element** version in a **context at a level** and these authorities may define a status by authority for a particular CBML **element** version in a **context at a level**.

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3. GENERAL CONCEPTS OF QUALITY ASSURANCE FOR INFORMATION MANAGEMENT

INTRODUCTION

1. To achieve the best quality for information management quality assurance needs to be part of the process of developing **CBML models**.
2. It is expected that quality procedures will vary from project to project but all will be based on the contents of this section.

PRINCIPLES IN CBML MODELLING

3. An underlying principle of CBML modelling is that for an explicit set of business information there is one and only one correct **model**.
4. In a **CBML model** each **class** and **category** is modelled independently of other **classes** and **categories**.

OBJECTIVES OF A CBML MODEL

5. The objectives of a CBML **model** vary with the **model** level as shown in **Error! Reference source not found.**

Table 3-1 CBML model levels and objectives

Model level	Objective of the model
C	To faithfully record the information used by a business domain using CBML.
D	To be a faithful transformation of a single level C model that fully meets CBML rigour.
E	To be a single model that is a faithful combination of all relevant level D models.

DEFINITION OF QUALITY IN A CBML MODEL

6. An underlying principle of CBML modelling is that for an explicit set of business information there is one and only one correct **model**.
7. The quality of a **CBML model** is not subjective; it is either correct or incorrect⁴. The **CBML model** may be incorrect due to one or many errors.
8. To satisfy the required quality standard a **CBML model** must be error free.

QUALITY IN THE DEVELOPMENT OF A CBML MODEL

9. Quality Assurance must be applied at all stages of the development of a **CBML model**. The key stages in the development are:
 - a. Understand the purpose of the **model**, this includes:
 - (1) What is the scope of the **model**?
 - (2) Who are the customers of the **model**?

⁴ It is acknowledge that dependent upon the explicit purpose some of the more rigorous rules of CBML modelling may be relaxed but the principle of a model being correct or incorrect remains.

- b. Identify the sources of information.
- c. Analyse the information provided by the information sources.
- d. Synthesise the information provided in information semantic terms and develop the **model**.
- e. Review the **model**. Note that a review should be undertaken as each stage of the process is completed and before moving on to the next stage. This should ensure that any errors or omissions are detected as early as possible in the development process.

10. The above stages are discussed further in Table 3-2.

Table 3-2 Quality aspects of the development of a CBML model

Development stage	Impact on Quality	Guidance
Understand the purpose of the model	The scope of the model must be fully understood. This does not mean that the scope cannot evolve but if the model is for a domain then it should be developed for that domain and not for how it may be used in another domain.	Modellers must stay within the current scope otherwise the model will fail to reflect the information perceptions of the information users in the current scope.
Identify the sources of information	The information to be modelled is for the business of a domain and sources often represent processes; not the business per se.	Great care must be taken to ensure that each source is relevant and that the correct interpretation is placed on sources.
Analyse the information	Understanding the information within the scope is critical. Failure to establish what information is relevant and what is not will lead to the model being incorrect.	Determining the relevant information and identifying its structure is probably the most difficult task. Every effort must be made to ensure that the information provided by the source is relevant to the business of a domain and is not, for example, an existing information process within the domain..
Develop the model	If the use of CBML is not correct then the model will fail to provide the functionality required.	CBML models must be developed strictly in accordance with the rules and syntax of CBML using the correct tool – currently CBML Lite.
Review the model	Each model must be formally reviewed and approved once it is complete and before it is released from development.	The whole process of developing a model is iterative and review should be ongoing using the appropriate personnel as circumstances demand.

4. CHANGE MANAGEMENT FOR CBML MODELS

OVERVIEW

1. The objective of change management is to ensure that, as **CBML models** evolve, the benefits from the changes are realised while any impact from the changes is minimised. It is expected that any organisation using CBML will have existing change management procedures and that change management of **CBML models** will be incorporated into those procedures. If such procedures are not in place then it is strongly recommended that they are set up and strictly adhered to.

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