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# Goal-driven Requirement Modeling for Electronic Commerce Systems

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## Abstract

*This paper presents a goal-driven methodology for eliciting and modeling the requirements of an E-commerce system. This approach involves two phases: strategy development and requirement modeling. In the first phase, E-commerce value matrix is used to develop an electronic business's competitive strategies and value-added activities, and then identifying customized requirements for the e-services afforded by the E-commerce system. In the second phase, the goal-driven use-case approach and unified modeling language are applied to specify the system requirement based on the e-services strategy. This methodology enables an E-commerce system developer to derive high-level strategies concerning the value-added activities and potential competitive advantages and thereby determining the requirements of strategic e-service.*

## Keywords

Electronic commerce system, system development, requirement modeling, goal-driven approach

## 1. Introduction

The electronic commerce (E-commerce) on the Internet has introduced a new market space, which is highly complex, involves rapidly changing products or services, business strategies, marketing approaches, customer structures, and information technology. The domain complexity poses a fundamental problem in developing E-commerce systems - business strategies and software development and both are strongly intertwined (Kosiur 1997, Finger, 2000, Korper & Ellis 2000, McCarthy & Aronson 2001).

Due to the features of the E-commerce systems are inseparable from information technology and business expertise, an E-commerce system developer must understand both the marketing and technical issues of E-commerce system design (Plamer & Griffith 1998, Norris & West 2001). Confronting with these changes, system developers need a method to help identify a sustainable, changeable business strategy, so as to specify the essential system requirements (Bichler et al. 1998). The method should focus on the business logic, not on technology

details (Conallen 1999). In particular, it must include an integrated and seamless methodology from business strategies to software development (Finger 2000).

E-commerce has several specific features such as buyer-driven commerce, broad range of users, and service customization (Vedder et al. 1997, Guttman & Mars 1998, Elkind 1999, Wind & Majan 2000) and virtually none of E-commerce systems development methodology addresses the above issues. Therefore, this study presents a systemic methodology for modeling E-commerce system requirements, which takes these needs into consideration.

The remaining of the paper is organized as follows. In section 2, E-commerce value matrix is introduced to model an e-business's strategies. This includes the concepts of E-commerce value chain, value activities, and e-services. Section 3 presents the novel methodology for modeling the requirements of an E-commerce system. A general e-store (electronic store) case is used to illustrate the concept and modeling process. The last section provides a summary of this research and concludes the paper.

## 2. Related Work

Today, major e-business competes in two worlds: a physical world and a virtual world. The latter is the essence of the E-commerce world (Rayport & Sviokla 1995). By understanding the interplay between the physical world and the virtual world, we can see more clearly and comprehensively the strategic issues which the e-business faced. In the section, we review the virtual value chain approach (Rayport & Sviokla 1995) and the buyer decision process model (Engel 1995), and then derives an E-commerce value matrix model for the E-commerce world.

### 2.1 Buyer's Value Chain for E-commerce

A significant feature of the E-commerce market is the impetus that it has given to "buyer-driven commerce" (Elkind 1999). It means that a successful e-business must provide its customers with value-added products or services. Thus, it is important that the value-added activities of the e-businesses must be determined prior to the E-commerce system development (Kosiur 1997, Cusack 1998, Korper 2000). The buyer's value chain is a business logic model that defines a series of value-added activities connecting a buyer's needs. It is also a powerful tool for the differentiation of strategic planning (Porter 1985). We consider the tool is useful to answer the above question; how can we identify buyer's value-added activities?

In order to understand the buyer's value chain for e-commerce, we first identify what value-added activities could affect the business performance and buyer's value in an e-commerce market. Traditionally, the business operations involve interactions and transactions between companies and their customers. Although E-commerce is a new business type, the essentials of the marketing and the consumer's behavior are not necessarily different from the traditional business model (Cusack 1998, Iyer & Krylo 1998). In light of previous researches (Engel 1995, Porter 1995, O'Keefe & Mceachern 1998), we develop a buyer's value chain for E-commerce, which consists of five main value activities (see Figure 1):

- *Need recognition*: Buyers sense a difference between their actual state and desired state; their needs may be triggered by internal or external stimuli. Therefore, the businesses need to determine the factors that usually trigger buyer need recognition and find out, from

buyers, their needs, what bought them about, and how they led buyers to this particular product or service.

- *Search*: Buyers then search for more information about their needs, depending on its importance, its volume, difficulty in obtaining it and the value they place on it, and the satisfaction they get from the search. At this stage, the sellers should carefully identify buyers' sources of information and its importance. This information is critical in preparing effective communication to target markets.
- *Evaluation of alternatives*: At this stage, buyers usually use the collected information to choose among the possible alternatives. The buyer ranks them and forms purchasing intentions. How buyers evaluate the alternatives depends on the individual characteristic of the buyer and any specific buying needs. Sellers should study buyers to determine how they actually evaluate alternatives.
- *Choice*: Buyers then form their purchase decisions. Depending on the intent to purchase, the buyer will order the preferred good or service, forming the purchase decision depending on such factors as expected value and benefits of the product. Sellers can take steps to improve the buyer's expected value and hence trigger a buying decision.
- *Post-purchase*: Finally, there are many actions that must be performed: payment, delivery, return, logistics, and post-purchase service, etc. Here, the businesses must provide secure, convenient, and flexible payment mechanisms and also improve the quality of their post-purchase services to build a good impression of their service. Briefly, the goals of this stage focus on creating a reputation for post-purchase support that exceeds buyer's expectations, thus encouraging customer loyalty.

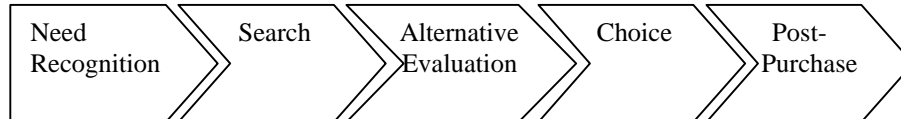


Figure 1. Buyer's value chain

## 2.2 E-commerce Value Matrix

According to Rayport & Sviokla (1995), the virtual value chain can be divided into five value-adding steps: gather the information, organize it for the customer, select what is valuable, synthesize it, and distribute it. These five value-added steps, in conjunction with the virtual value chain, make up a value matrix. In the E-commerce environment, each value activities in the buyer's value chain may involve information technology and create information. An e-business can use the information technology to enhance the value-added to the customer by offering them more useful information services, such as a web site, online catalog, search engine, electronic payment method, e-mail, and so on (Cusack 1998). The sequence of these virtual value activities is called the "E-commerce virtual value chain.

Here, we provide a value matrix model for an E-commerce world; it is an extension of the virtual value chain approach and the BDP model; it is also developed by considering the E-commerce world and the effect of the multi-buyer. The five stages of the BDP model can be derived by considering the value activities of the buyer's value chain for E-commerce. These value activities are shown as the building blocks by which an e-business creates a valuable product or service for its customers. Especially, because the customer base of the E-commerce market is broader than that of the traditional market, thus the features of the

buyer's value chain are multi-buyer driven (Guttman 1998, Gordijn & Vliet 2000). Therefore, we add a 'multi-buyer' dimension to illustrate their effect in the e-commerce world; we call this the "*E-commerce value matrix*;" it is shown in Figure 2.

The operation at the intersection of each information-related activity with each stage in the buyer's value chain provides an opportunity to add value to the buyer. Each cell in the value matrix shows the information-related services for one value activity of the buyer's value chain; we term this the relevant '*e-services*'. In general, the buyer's value chain is multi-buyer driven; they do not usually request a common e-service, are often discretionary, and do not follow a predictable service pattern. Thus, buyer customization is important in the E-commerce world. Some E-commerce systems are particularly effective in providing this; e.g. the product by Broadvision.com.

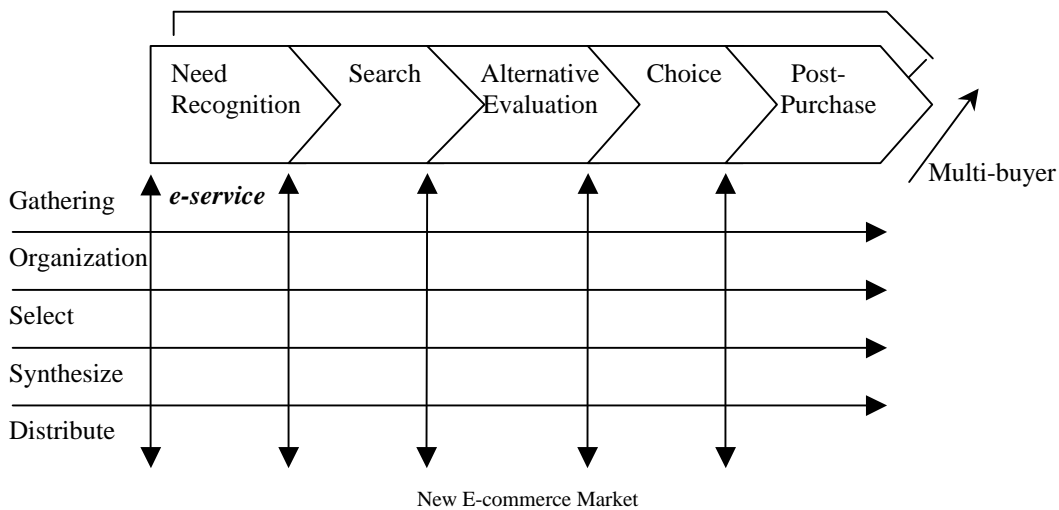


Figure 2. *E-commerce value matrix*

The e-service extracted from the value matrix provides an opportunity for creating value and the composition of these e-services can produce a valuable competitive advantage. In short, the E-commerce value matrix allows e-business to identify their competitive advantages and business strategies by differentiation or focus more effectively to fulfill them. According the business strategies that an E-commerce company can develop provides a strategic E-commerce system by implementing differentiation of e-services. For example, the Amazon.com focuses on providing customers with smart search e-services and online e-services to recommend new books. These unique e-services have successfully created a competitive advantage to Amazon. From a strategic perspective, each e-service extracted from the value matrix can be considered as an opportunity for creating valuable competitive advantages.

### 3. Methodology

Designing an effective E-commerce system is a real challenge to the developers. Designing an effective E-commerce solution is a real challenge to the developer. It requires collaboration directly between the stakeholders inside and outside the business, such as managers, developers, and multi-users (Frank 2002, Gordijn & Vliet 2000). Thus, a shared and communicable method should be developed to allow these stakeholders to invent their shared future. Our effort has resulted in a methodology for modeling E-commerce system

requirements. The methodology includes two phases: strategy development and requirement modeling. Figure 3 shows the process of the methodology. Additionally, a conceptual electronic store (e-store) example is used to illustrate the concept of each step.

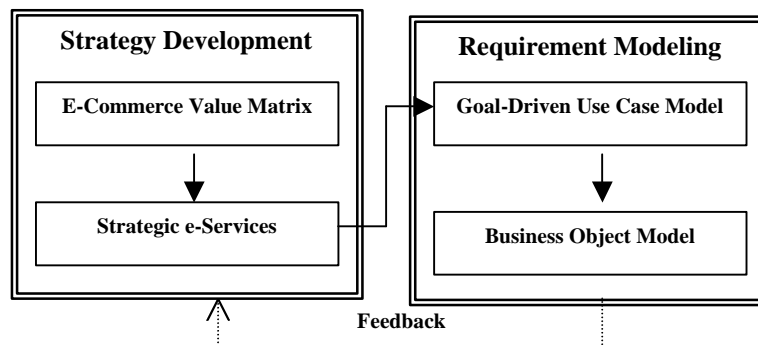


Figure 3. The generic framework of the methodology

### 3.1 Strategy Development

Organizations that compete in an E-commerce environment must develop a business strategy to guide and maintain their E-commerce systems development (McCarthy & Aronson 2001). Thus, the first phase involves developing the e-business's business strategy using the E-commerce value matrix. In the competitive E-commerce market, it is necessary for managers to design effective business strategies (Iyer & Krylo 1998, Finger 2000, Korper & Ellis 2000). Thus, the strategy development phase mainly identifies who are the buyers, what they need, and which type of services they employ. The result is then used to determine the strategic e-services needed by the various groups of buyers.

#### 3.1.1 Customer Segmentation

The E-commerce world is a multi-buyer driven market. Thus, providing customization or personalized online service has become a new strategic issue for E-commerce development (Kroper & Ellis 2000). E-commerce system requirements may vary considerably by target market segments, and in turn will require different operational e-services. A successful e-business is due to their abilities to devise customized e-services for the different market segments to attract buyers (Boyer et al. 2002). Therefore, clustering the potential customers into groups based on their different demographics and then providing different levels of e-service to them the e-business can gain competitive advantages.

#### 3.1.2 Identify Strategic e-Services

An e-business's competitive advantages are embedded in their unique services (Bichler et al. 1998, Boyer et al. 2002). Comparing the services provided by the competitors shows the differentiation of the unique services between them and thus gains competitive advantage (Porter 1985). These differences provide top managers a way to identify the important company e-services that are different from those of their competitors. The e-commerce value matrix is a useful tool that allows the managers to identify new opportunities. Because each of the value opportunities in the matrix map to an e-service, they can then be integrated into an E-commerce systems that differentiates the firm from its competitors.

In order to identify an e-business’s strategic e-services, firstly, top managers need to determine the critical value-added activities for each customer group, then the designers/managers must decide what differentiated e-services they can provide; for example, an e-store web site can provide an unique “intelligent agent” e-service to effectively collect product information and make the price comparison for customers. Once the strategic e-services are identified, they can be built into the conceptual framework of an E-commerce system.

We will use an ‘e-store’ example to illustrate this in the next. We assume that the ”Search” and “Choice” activities are considered the most important value-adding activities in the buyer’s value chain and the strategic e-services in each of the value-adding activities are, *Search\_Gathering*(e2.1), *Search\_Select*(e2.2), *Choice\_Select*(e4.3), and *Choice\_Synthesize*(e4.4). In practice, these activities can be implemented in a unique application. For instance, the *Search\_Gathering* e-service can be developed into any types of online search services, such as a general search engine, intelligent search agent, or merchant brokering agent and so on (see Figure 4).

Manager Views		Need Recognition			<i>Search</i>			Alternative Evaluation			<i>Choice</i>		Post-purchase			
		e1.1	e1..	e1.5	<i>e2.1</i>	<i>e2.3</i>	e2.5	e3.1	e3...	e3.5	e4.1	<i>e4.3</i>	<i>e4.4</i>	e5.1	e5..	e5.5
Designer Views		Gg1.1	Gg1..	Gg1.5	<i>Gg2.1</i>	<i>Gg2.3</i>	Gg2.5	Gg3.1	Gg3.	Gg3.5	Gg4.1	<i>Gg4.3</i>	<i>Gg4.4</i>	Gg5.1	Gg5..	Gg5.5
Multi-User Views	Group 1				<i>Ga2.1.1</i>	<i>Ga2.3.1</i>						<i>Ga4.3.1</i>	<i>Ga4.4.1</i>			
	...				<i>Ga2.1..</i>	<i>Ga2.3..</i>						<i>Ga4.3..</i>	<i>Ga4.4..</i>			
	Group n				<i>Ga2.1.n</i>	<i>Ga2.3.n</i>						<i>Ga4.3.n</i>	<i>Ga4.4.n</i>			

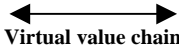

Notes e: e-services; Gg: Generic goals; Ga: Articulate goals

Figure 4. The E-commerce matrix for multi-user goals

### 3.2 Requirement Modeling

The requirements of E-commerce system usually depend for different stakeholders, upon the system to be built. In general, three stakeholder views are involved: the manager, designer, and multi-user (Gordijn & Vliet 2000, Frank 2002). The manager views concern the business strategy. The designer views focus on the E-commerce platform, system requirements and architecture. The multiple user views ask whether the e-services satisfy their total (functional or non-functional) requirements (see Figure 4).

The following describes how to model the different stakeholder requirements for e-services by using a goal-driven use case approach, and hence identify candidate business objects that must be addressed by the system designers.

#### 3.2.1 Building Goal-Driven Use Case Model

The outputs of the strategy development phase are the strategic e-services. Such strategic e-services represent the descriptions of the E-commerce system requirement. Next, we must determine the requirement specification based on these problem descriptions.

Requirement modeling usually starts by asking how the potential users interact with the system. The use case diagram in UML (Unified Modeling Language) is a graphic tool that

can be used to comprehensively define actor and capture system functional requirements (Booch et al. 1999). However, the E-commerce system requirements are multi-user driven and some of them are likely to be non-functional; e.g., security, convenience, efficiency, or effectiveness. Therefore, we apply the goal-driven use case approach which extended use cases with goals (Lee & Xue 1999, Lee et al. 2001) to model the requirement. It offers several benefits: (1) bridging the gaps between the domain descriptions and the system requirements; (2) integrating both functional and non-functional requirements; and (3) helping the designers to determine conflicting requirements. Therefore, we suggest that the approach is useful to model the multi-users' functional/non-functional requirements and handling the conflicts between requirements. The processes of requirements modeling are illustrated next.

### Step 1. Identify Multi-User Goals

A goal is a specific account of “what” the user wants. Here, for each strategic e-service, the designer must identify a *generic goal* ( $G_g$ ) that states the minimum system requirement; each user group must create *articulated goals* ( $G_a$ ) based on the original goal. These goals result in a goal-driven use case model (see Figure 5). Each goal can be classified by three facets: *competence*, whether a goal is rigid (R) or soft (S); *view*, which may be actor-specific (A) or system-specific (Y); and *content*, which classifies a goal into functional (F) or non-functional (N) based on their content (Lee & Xue 1999, Lee et al. 2001).

In our example, we assume that designing a completely *Search\_Gathering* (e2.1) e-service is accomplished by a sequence of different user's requirements (use cases). Thus, the original use case- *General Search* is made up of the extension use cases: *Advanced Search*, *Intelligent Search*, *Merchant Brokering*, and *Product Brokering* (see Figure5). The corresponding five goals are: *Relative query results* ( $G_g$  2.1), *Max-similarity results* ( $G_a$  2.1.1), *Adaptation and Efficiency* ( $G_a$  2.1.2), *Max-number catalogs* ( $G_a$  2.1.3), and *Max-utility products* ( $G_a$  2.1.4).

### Step 2. Create Essential Use Case Model

For each strategic e-service, a designer must consider the original use cases to guarantee that the e-service will, at least, satisfy the user's minimum requirement. Each original use case is associated with an actor and the use case must satisfy all actors' goals. To extend the original model to take into account different types of goals, multi-user cared, extension use cases are created. The combination of original use cases and extension use cases, we term an *essential use case model*. This is a model of what the e-service must do in order to satisfy the multi-user goals. The various user goals are shown as triples  $\langle x, y, z \rangle$  for each e-service, shown as a box.



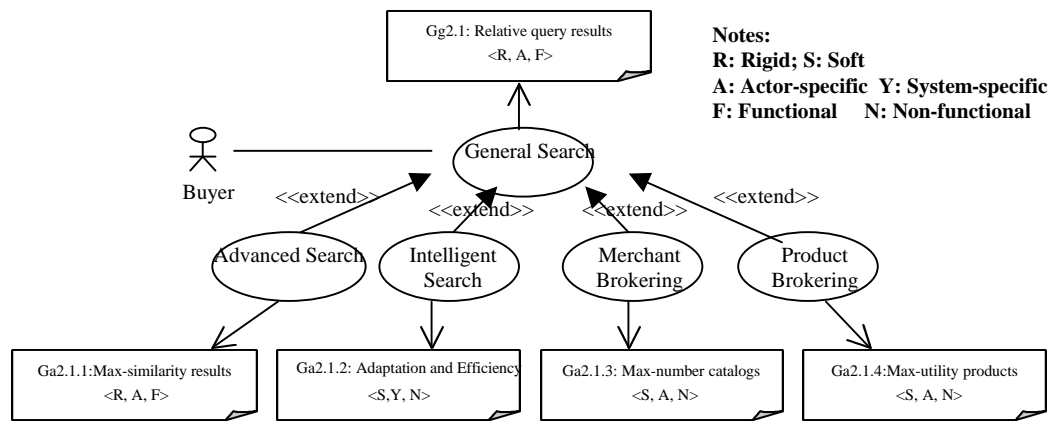


Figure 5. The essential use case model for the Search\_Gathering e-service

### Step 3. Evaluation of Goals

Once the essential use cases model is developed, the designer must handle any conflicts and contradictions resulting from different users. The details of each sub steps are described as the following.

#### Sub-step 3.1. Analyze the Relationships between Use Cases and Goals

To characterize the relationships between use cases and goals, the goal can be either *satisfied* or *denied*, depending on its having been achieved or abandoned. On the other hand, the predicates *satisfiable* and *deniable* can be used to describe a goal that is not yet finalized. In addition, the predicate independent is used to describe a goal that will not be affected by performing a designated use case. In our *Search\_Gathering* e-service example, the relationships between goals and use cases are given in Table 1.

Use Cases	Goals	Relative results (Gg2.1)	Max-Similarity (Ga2.1.1)	Adaptation and Efficiency (Ga2.1.2)	Max-Number catalogs (Ga2.1.3)	Max-Utility products (Ga2.1.4)
General search (U2.1)		Satisfied	Satisfiable	Deniable	Satisfiable	Satisfiable
Advanced search (U2.1.1)		Satisfied	Satisfied	Satisfiable	Deniable	Satisfiable
Intelligent search (U2.1.2)		Satisfied	Satisfiable	Satisfiable	Deniable	Satisfiable
Merchant brokering (U2.1.3)			Deniable	Deniable	Satisfiable	
Product brokering (U2.1.4)			Satisfiable			Satisfiable

Table 1. The relationship between use cases and goals for the Search\_Gathering e-service

#### Sub-step 3.2. Analyze the Interactions between Goals in the Use Case Level

The interactions between goals must be considered at two different levels: use case and e-service. The former concerns the interactions between goals with respect to a specific use cases, and the latter focuses on an e-service. At the use case level, the relationship between two goals can be one of four types: *conflicting*, *positively cooperative*, *negatively cooperative*, or *irrelevant*. Interactions between two goals in a use case can be derived from the use case and goals; for detailed descriptions, see (Lee & Xue 1999, Lee et al. 2001). Table 2 shows the interactions between goals for the *Search\_Gathering* e-service at use case level.

For instance, the first row of the table shows that the interactions of the ( $G_g$  2.1,  $G_a$  2.1.2), ( $G_a$  2.1.1,  $G_a$  2.1.2), of a *General search* use case are in conflict.

Goals Pair	Gg2.2 Ga2.2.1	Gg2.1 Ga2.1.2	Gg2.1 Ga2.1.3	Gg2.1 Ga2.1.4	Ga2.1.1 Ga2.1.2	Ga2.1.1 Ga2.1.3	Ga2.1.1 Ga2.1.4	Ga2.1.2 Ga2.1.3	Ga2.1.2 Ga2.1.4	Ga2.1.3 Ga2.1.4
Use Cases										
General search (U2.2)	C+	Cf	C+	C+	Cf	C+	C+	Cf	Cf	C+
Advanced search (U2.2.1)	C+	C+	Cf	C+	C+	Cf	C+	Cf	C+	Cf
Intelligent search (U2.2.2)	C+	C+	Cf	C+	C+	Cf	C+	Cf	C+	Cf
Merchant brokering (U2.2.3)	I	I	I	I	C-	Cf	I	Cf	I	I
Product brokering (U2.2.4)	I	I	I	I	I	I	C+	I	I	I

Notes: Cf: conflicting; C+: positively cooperative; C-: negatively cooperative; I: irrelevant

Table 2. The interactions between goals in the Search\_Gathering e-service use case level

Sub-step 3.3. Derive the Interactions between Goals at e-Service Level

The interactions between goals at e-service level can be derived from the use case models. The interaction at e-service level can be either: *conflicting*, *cooperative*, *counterbalance*, or *irrelevant*. The methodology of classification is given in (Lee & Xue 1999, Lee et al. 2001).

The interactions between goals in the *Search\_Gathering* e-service level are shown in Table 3, which indicates that the interactions of *Relative query results* ( $G_g$  2.1), *Adaptation and Efficiency* ( $G_a$  2.1.1) and *Max-utility products* ( $G_a$  2.1.4) are cooperative, while the relationship between *Max-similarity results* ( $G_a$  2.1.2) and *Max-number catalogs* ( $G_a$  2.1.3) is conflicting, while the others are in counterbalance.

Goals Pair	Gg2.1 Ga2.1.1	Gg2.1 Ga2.1.2	Gg2.1 Ga2.1.3	Gg2.1 Ga2.1.4	Ga2.1.1 Ga2.1.2	Ga2.1.1 Ga2.1.3	Ga2.1.1 Ga2.1.4	Ga2.1.2 Ga2.1.3	Ga2.1.2 Ga2.1.4	Ga2.1.3 Ga2.1.4
e-Service Level										
Search-_gathering e-service	C	B	B	C	B	B	C	Cf	B	B

Notes: Cf: conflicting; C: cooperative; B: counterbalance; I: irrelevant

Table 3. The relationships between goals in the Search\_Gathering e-service

Step 4. Integrating Alternatives and Tradeoff

By analyzing the interactions between goals at e-service level, a designer can easily identify the alternative solutions for an e-service requirement. Firstly, designers must focus on the original goals and then search their paired goals to determine whether it is cooperative, counterbalance, or irrelevant. Secondly, based on these goals, designers must search the values of the partners of such goals. Finally, designers should integrate the goal pairs to construct the set of feasible alternatives.

Tradeoff analysis is based on the company’s business strategies and how the strategy modeling phase can satisfy (or "satisfice") the user by slightly modifying the strategic e-service and key customer requirements. The choice of alternative solutions differs across different business strategies. Based on this analysis, the essential use case model needs to be refined to create a feasible implementation use case model.

Thus from Table 3, the alternative solutions are the conjunction of all goals except  $G_a$  2.1.2 and  $G_a$  2.1.3. If the objective of the e-service is to maximize the users, satisfaction, then, the combination of  $G_g$  2.1,  $G_a$  2.1.1 and  $G_a$  2.1.4 is an appropriate solution, because these goals can enhance each other. The implementation of use cases model for *Seach\_Gathering* e-service is then illustrated in Figure 6; then the description of the use case model is shown in Table 4.

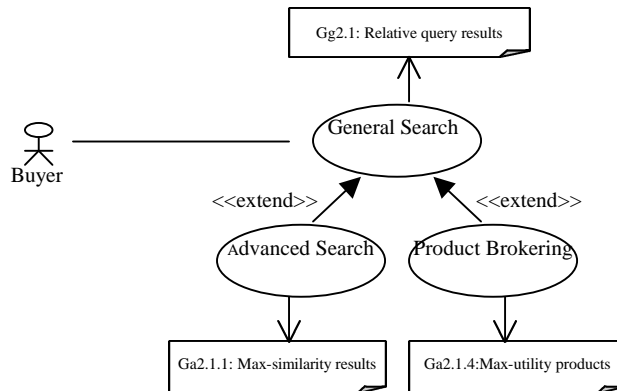


Figure 6. The implementation use case model for *Search\_Gathering* e-service

Use Case Description	
<b>Name</b>	Search_Gathering e-service
<b>Initiator</b>	Customer
<b>Generic Goal</b>	Find relative query results (Gg2.1)
<b>Extension Goals</b>	Maximum similarity Results (Ga2.1.1), Maximum utility products (Ga2.1.4)
<b>Pre-conditions</b>	Criteria_Items are available and valid
<b>Begin when</b>	Customer initiates a Query Search Request
<b>Scenarios</b>	<p><b>Main Scenarios</b></p> <p>S1: System create a relative Query_Request                      Customer selects a search service,such as general query search, advanced search and product brokering.                      Customer inputs the relative query Criteria_Items                      S2: System receives the query Criteria_Items                      S3: System checks the validation of this Criteria_Items                      S4: System translates the Criteria_Items into a language understood by the Product Information sources                      S5: System searches the information sources that contain information relevant to the query Criteria_Items.                      S6: System collecting the corresponding result and returns the response to the Customer                      S7: System cancel the Query_Request</p> <p><b>Extension Scenarios</b></p> <p>S1: Customer requests Advanced Search or Product Brokering service                      a. Customer must provide member ID and Password                      S1: The Criteria_Items that the customer inputs for the different Query_Request                      General query search: Keyword                      Advanced search: Product classification, Product PriceRange, DateRange, and SafeSearch                      Product brokering: . Product name, Delivery DateRange, Payment mechanism, and Discount rate</p>
<b>Exceptions</b>	<p>S1: Authentication is not available                      Reject the query request                      S2: Criteria_Items are not valid or available                      The query request fails                      S4: The query results are not found                      Discard the query request                      Resume main scenario 1</p>
<b>Post-conditions</b>	Customer has a query result, a rejection of the Query_Request, or the request has been discard.

Table 4. The use case description of use case model for the *Search\_Gathering* e-service

### 3.2.2 Building the business object model

The main task of building the business object model is in identifying a candidate set of classes that can perform as indicated in the use case. The class diagram is used to capture the structural aspects of the system by defining business objects/classes, their attributes, operations, and the association relationships (Booch et al., 1999). Usually, there are three types of classes within a system: *entity*, *control*, and *interface*. Entity classes describe the structure and operation of data. Control classes provide coordination behavior within a use case. Interface classes provide the interfaces to the actors (Booch et al., 1999). Through analyzing the use case descriptions, a designer can identify the different types of class. Figure 7 shows the class diagram of the *Search\_Gathering* e-service, based on the use case description.

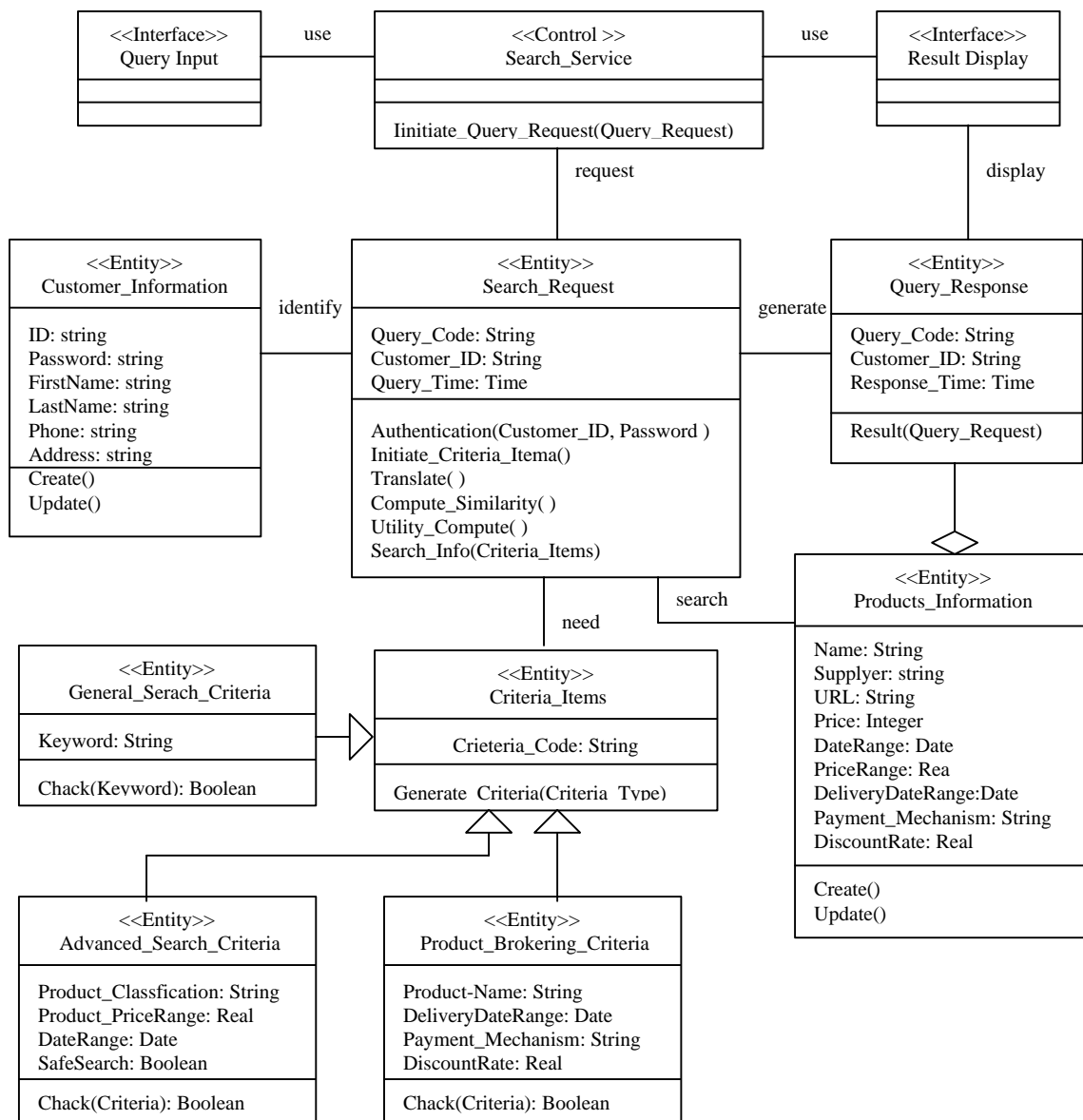


Figure 7. Class diagram for Search\_Gathering e-service

## 4. Concluding Remarks

In this paper, we presented a strategy-to-specification methodology for modeling E-commerce system requirement from the business strategy. The methodology includes: strategy development and requirement modeling. Strategy development involves classifying the customers into groups based on the e-business's segmentation policy and identifying value activity and strategic e-services by using the tool of E-commerce value matrix. Requirement modeling identifies what customized requirements and different stakeholders' that need to be satisfied by analyzing goals and comprised strategic e-services among the multi-user, managers, and designers.

The methodology provides a systematic methodology for modeling the E-commerce system specification. It can help managers determine their company's value opportunities and potential competitive advantages and thereby determine the value-added services for their customers and hence develop an effective E-commerce system. This study primary focuses on the strategy development and requirement modeling. Several related research issues are worth to pursue in the future, for instance the real-world E-commerce system implementation through the application of the proposed methodology.

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