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Application of Materials and Cost Model Decision System using Case-Based Reasoning

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Abstract: *This study has designing the model that uses case-based reasoning (CBR) in order to use materials model and cost mode in management application. It intends to improve system effect through expression the method for case, the method for retrieving materials model and cost model, the method for materials model, and cost modeling procedure through case-based reasoning then it ultimately aims at improving the productivity of design. The past similar cases and related modifying rules that are offered from case-based reasoning using materials model and cost model could replace an appropriate role of guideline that users give in the process of materials and cost modeling.*

Keywords: *Management information system, Materials model, Cost model, Decision systems, CBR.*

1. INTRODUCTION

The business environment is being efficient materials and cost much effort in order to raise productivity in competition. For better some decision modeling, the cost management and management system is progress to build the optimal information systems and their attempt is progress. To do this, some cost model is associated with materials management to control specific information regarding the utilization of very important strategic decision making process. This study is a case-based reasoning and the materials management, which is required in areas of specific information and the cost model that integrates the manager. Some decision maker can take advantage of strategic information to express business system strategy. This study of case-based reasoning method is the first feature for effective decisions in the materials and cost management strategic system. The variety of materials management and the right time to express how you can find the appropriate form. And a certain time or large amounts of data is exceeded. Also, more concise form for decision to convert the information is also included. Second, it is search of materials model and cost model approach makes it easier to modify. The cost model and materials model for decision makers to easily search across different environments by changing variables with providing information in cost model aggregation. This materials management allows to able strategic level decisions (Riesbeck and Schank, 2012). Third, information search, save, and modify data easy to use for administrators and decision maker. As such, even if system is capable of taking advantage of users' initial buyers can expect the effect of learning materials management has its advantages (Kass, 2013). This requires a large amount of data for efficient processing are required summary statistics such as search, database of the model design.

The process step of each planning, analysis, design, implementation and maintenance is defined to property entity for a domain. A system development life cycle of properties is included a performing step to the planning, analysis, design, implementation and maintenance. This is a systematic effort which is trying to use already developed output. Now more interest is concentrated on using the output in system analysis and design in the upper step of system development life cycle. The object concept discussed from the l990s practically enabled us to use this output in system development life cycle. Therefore, most researches being progressed, which are related to system use, are based on the object analysis. Meanwhile, the researches use by the case-based reasoning been recently suggested. Especially, case-based reasoning and object

approach are very similar to that human cerebration. And this is the reason why case-based reasoning is to be more concerned in the field of system use. This model has developing the model that uses case-based reasoning in order to use model. This paper intends to improve the system capability use effect through developing the method for case expression, for retrieving method, modifying method and object modeling procedure. This paper showed the model that uses the decision system by case-based reasoning which support to decision modeling using it. For that, it has studied the documents about system use materials and cost model and case-based reasoning. Also, it is suggested decision system by case-based reasoning in specific contents.

Therefore, it is designed the system for verifying the adequacy model which is for decision model and applied it to a real case. It is considered meaningful in terms of suggesting an each retrieval thing which is needed to actively business decision, the output of specific contents, which can maximize the effect of system analysis. This is expected that the problems in business modeling could be considerably mitigated. It can reduce spending time and efforts in business model. In addition to that a user who has knowledge about system analysis could receive any proper of specific contents model. The past similar cases and related modifying rules that are offered from some contents by case-based reasoning in same system analysis could replace an appropriate role of guideline that users give in the process of contents. A business decision making is significant in the use of corporation information and should be taken care of strategically. Currently, the efforts has been exerted which intend to systematize corporate decision making process that has been repeated and made in a various manner. But the set up in specific point is still in the beginning. The purpose of this paper is for the manager to support strategic decision and to design the real applicable system in specific business. This study employs the case-based reasoning method to embody decision making system. It is estimated at the moment that the case-based reasoning method is a desirable substitute of rule-based reasoning. In general, decision makers solve many problems by referring to the previous similar examples, and also apply the rules partially.

As a result, this investigation deals with the development of the decision system by the case-based reasoning method in some contents, besides, traditional decision making model and newly emerging corporate strategic model will be carried out for this. As the work is in process on the basis of that, it designs decision system by case-based reasoning. It is necessary to have and manage knowledge about business in order to design the decision systems. The system searches for examples similar to user's demands in the domain dependent case in the first place. If there are similar examples, it is needed to design that decision systems should respond through the least user's questions. If there are no similar examples, it is essential to design new structure satisfying with each other by asking more questions of users. This paper defines and suggests the relative notion of expressing users' demands and respective examples in the case base. It shows some examples to concrete users' demand with a view to designing decision system by domain independent case, and shows the process which is applied in real specific contents. In addition, it identifies class structure, examples composition, and proposes retrieval method, any decision making methods. This paper shows that it is possible to design structure by means of regular examples in the domain case and that possible to systematize of the decision making process, which can be made use of in a positive way (Benson et al, 2012).

2. AREAS OF CASE-BASED REASONING

2.1 Case-Based Reasoning Method

Case-based reasoning compared to past cases and issues that it would like to resolve current and most likely to find a solution to the problem of the past, a thing of past how to trouble problems with present (Nandakumar et al, 2012). Mainly related to the contextual knowledge and provides appropriate solutions by a partial match are broken up in problem solving and analysis. Problem solving domain in the past year is a way to provide a solution, and the new issue in relation to the region, to understand the problems of the past. In this case-based reasoning at an appropriate time to retrieve the appropriate cases and in accordance with the new archive is the automatic learning and enable (Kollins, 2007).

The problem solution is stored by certain practices, facilitates any knowledge acquisition and new issues when using past experiences or practices. In other words, the past to remember in case of new issues by applying results are even more efficient over time becomes the heuristic. Case-

based reasoning method from past practices by providing the results can be explained naturally. This is learned the lessons from experience in process of reasoning, this reasoning because it is generated as a result of a naturally and a means of acquiring knowledge. The figure 1 is process of retrieve, reuse, retain and revise (Aamodt and Plaza, 2012). The past data is willing to resolve the problems and the most similar case in the case of extraction step. The reuse is to re-use the cases that were retrieved from the discovery phase. The new retain step is to apply. Partially, the retrieve use cases that failed to correct problem, revise the practices to suit the problem. As a result, new retain practices are fixed to the store. Some system designer to write new programs in the past, just as recreated the program assumes the largest case-based reasoning already described to solve new problems rather than totally new. And most similar to current issue of the past, search it by using the retrieval is easy. The case-based reasoning to infer from experience because it performs the reasoning of learning that are created naturally can be seen as using product can be used as a means of knowledge acquisition.

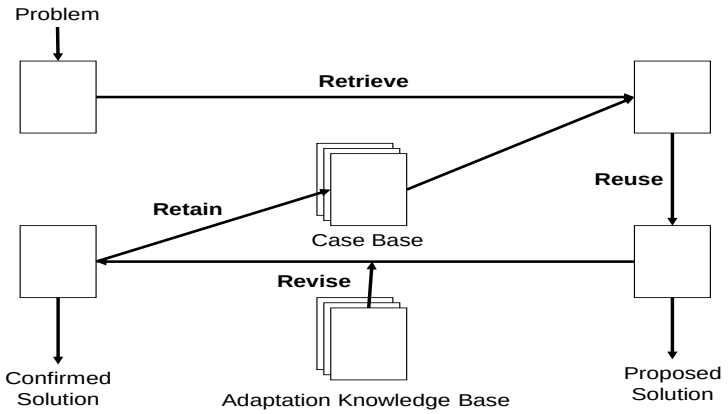

Fig. 1. *The process of case-based reasoning*

This is process of figure 1 as retrieve, reuse, revise and retain. The retrieve is of past cases to solve current issues and practices that derive the closest to the problem given the key attributes of the problem by extracts of these properties are steps to retrieve the cases. The reuse is total cases in the discovery step of reuse is a new steps for applying. One case is ten thousand and two retrieve results apply as soon as possible. But when it detects two or more similar cases, measure the similarity is most similar to the high selection practices. The revise is total cases this step does not resolve the issue using the new cases detected according to a new problem case is partially to retain the steps. The differences should retain to suit practices and problems each other if there are any problems. The retaining is after resolving the problem, cases stored in the database as a new case experience for reuse in the future. Such case-based reasoning problems are resolved by a single issue and can be divided multiple problems. Therefore, relatively easy to solve a single problem the number of efforts will increase exponentially. The case by stored database how to solve a problem is useful will be determined using concept. In general, new issues and practices of past because there is no difference between the retrieved cases to fit new that problem, the ability to determine the accuracy of the inference system can be an important factor.

The case-based reasoning for decision support is applicable everywhere, cost models such as financial analysis, investment models, models, process control, production planning management field and materials, quality control, manufacturing industries. As well as the knowledge needed discipline retrieves for case base new problems that past experience. The indexing rules are the rules to find appropriate index attribute from inside of case. This similarity matrix if more than one case will be retrieved from the case-base which is used to determine the cases in the new issue is similar. In other words, case-based reasoning problems index and to search for similar past cases, and the similarity matrix and similarity rules adapted to the search for new cases that were modified using the rules for the issue. This is being done about the areas of detail and the resulting index is the case. This causes some issues. First, in order to detect cases for a given situation its first need proper case, and found the appropriate portion is included in the following cases. Second, the practice that is in the form of information about the system than it is to have a lot of need.

Therefore, these cases are the index does not need to be included in the indexing and classification. This study is representation of the material model and cost model for strategic decision making in information systems.

2.2 System Modeling Method

The system analysis method is identified and design for a given problem domain from the object. And the object's attributes are identified and related to the association between them. This object's inheritance is defined an object in detail. It is represent an object model based on unified modeling language class diagrams notation of it (Riesbeck and Schank, 2012). The unified modeling language class diagrams are static relationships and their associated diagram representation. Also, these component elements are unified modeling language class diagram.

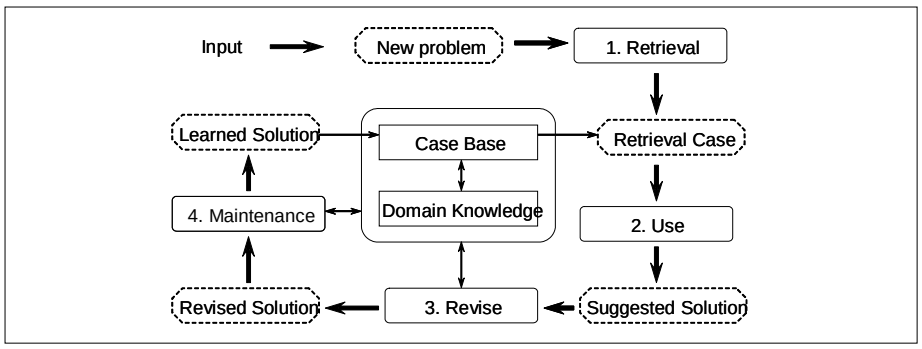

Fig. 2. *A process by case-based method*

The class is a similar data structure and behavior and related association with the objects. This class is the name and a data structure to represent a property. It is configured for the operation that represents the action. The display is the class name in the center of the rectangle, the properties and the operation in a straight line representation. The properties are public and distinguished as a property. The relevance of the two classes is related association. There is a special form of collectivization aggregation. This is related to part of relationship expresses one class has been configured with any multiple classes. And additional meaning is related rather than collectivization the actual analysis process, as shown in figure 2 and often difficult to distinguish related of collectivization. The generalization between classes share is similar characteristics while keeping each of the attributes for the technique. Any common generalization is the multiple classes. And it has a class other than class properties and operations and operations among the special relationship. The inheritance is a triangle and the straight line between the parent class and child class notation. The class ‘is-a’ is the generalization relationship taking over the attributes of the parent class. The multiplicity is to be displayed, along with the collectivization in the parent class to configure the number of child classes. The dependency is awarded when two or more this model element notation that represents relationship between some model elements. The case structure of database is query to process the structure of the tree. However the logical case is a diagram of the general structure. The database is composed of nearly identical. The entity-relationship diagram will help it find the data you need to cover every people. Any stored data helps to determine the structure. This case-based method can be very useful in the design. Therefore, the logical practices should be designed to determine the structure of the base case when the physical database structure. Also, the physical database design is no difference. This case of physical database is used in case-based reasoning include all of the knowledge structure.

3. METHOD APPLICATION

The result range of management is needed to define in order to control and manage a range of work breakdown structure. The deliverables have work breakdown structure on the substance. These deliverables is to create some project factor and the nature of the various documents (Nandakumar et al, 2012). In this case, the simplicity of the deliverables is based on degree and model's complexity of contribution. This is considering the deliverables degree for decision model. It was plus or minus to express personality or choice of the appropriate development in accordance. The decision model objectives and goals are the model by the model's complexity level one size fits all the deliverables a deliverable. The many institutions and companies in the model

development method is outcomes research on the creation. It is detailed information about a variety of projects significantly different and extremely difficult. In a case, the project deliverables plan is to apply a uniform scale of accident at task that exists within the development methodology of considering project type. This operation is quite dramatic in that selector. It can proactively in addition to the model type and a myriad of elements to consider among other things. This is range management objectives management.

4. MATERIALS AND COST MODEL PROCESSING

4.1 Materials Model Processing

The produce multiple folds of materials management do reveals exactly for the organization to take action (Taguchi, 2011). In relational model, the order and time does not take into account the concerns about. This means that each records is modified, the contents of some relations that does not affect the benefits. However, materials management for a specific point or time itself is one of the data because there is a need to tell users. Typically, materials data according to time or place and specific implications should be used to validate administrator. The amount of data increases, because it's difficult to keep the raw data in the form of a summary after it adds the information to change the time and place must be saved. These data are stored in several ways because of a problem with the need for input data. The time interval for collecting data in a continuous process is needed to consider and cases, sampling products for optimal spacing.

Particularly materials management, one of several materials in production field, is managing and supporting activities, materials (Ishikawa, 2013). The materials management in most business environment and a large portion of the cost prices and stock turnover accounted for the cost purchasing, inventory costs, labor costs and the ongoing supply and materials quality stabilization and content comprehensively. In addition, new materials and product development, establish some standardized approach to economic decisions regarding outsourced integration, includes product and even improve interdependent (Banks and Parmigiani, 2010). The business materials management, related materials necessary for production activity and management of activities to control the distribution of production materials need to enable the delivery in a timely manner in the areas of purchasing and managing plans. As a result, the functions of the planning, purchasing, materials and management, there are three basic elements of the archive. First, the plan is based on the criteria for the creation of product drawing materials per unit of production basis depending on the plan time. Next, you need to consider the current inventory remaining aggregate materials in the order. Second, the ability to buy raw materials for the purchase of necessary materials based on the planned activities. How to buy, quote, etc, with the nomination's decision is an important quantity of buying. The archiving features of the product in stock, inventory, warehousing, inventory control, and so this is an important feature. Retention of the required materials when needed is readily available to clarify the location of archived materials code. For firm outsourcing management, transportation management, warehouse management, and more are included here as well.

It can have one or more controls for the same materials attributes can have different ways of time. Therefore, it understands and measures the materials characteristics, priorities which are also important. Next, it needs to determine how to measure the characteristics of these materials but depending on the type of materials data, collection tools and data transfer system should decide about saving (Moskowitz and Tang, 2012). But, in some cases the inability to use the materials it wants to measure attributes directly. It got to collect data about the attributes of materials as inefficient or have difficulty in terms of the cost. In these cases it needs to determine how a material attributes. The materials management is features of statistical data and materials management. First of all materials management technique is to use automated tools for specimen from inspection to be a trend. Therefore, materials management data is collected in large quantities in a timely manner by real-time analysis. The statistical data and this system are required for automated production environments, sometimes due to the large amounts of data. The processing analysis will be summarized before being used. Therefore, only the portion can be used for the scheduling of the entire data. Also, a particular time intervals have been collected and some are randomly selected it can use. This system is exceeded when the other way to process the data entered in order to consider the data type requires information such as time, place, in real-time, gather as a result of issues that arise at certain time or certain volume. A raw data, standard deviation, variance, skewness coefficients, kurtosis coefficients etc should consider enough necessary

in many respects, points, rate analysis and statistical processing (Benson et al, 2012). It should be able to output raw data and statistical processing results are trend analysis or to express should be output. To determine criteria that might help determine the errors in data entry and more data should be added also the warning about outlier. The cause of the error or case-based knowledge features so that it can imagine, will have to be an expert systems and to make it easy for it with real user interface appropriate and easy application.

4.2 Cost Model Processing

The cost and management have been separated from the overall strategy. Separately, even if other this decisions and information provided at the same time became available in business systems will have to be in the direction of development. The collect, store, retrieve, and anytime, provide features that its can compare this essential real time materials management. The materials costs can vary depending on the items that are included. The check the items to be included in the materials and the associated costs and the product occurs beyond goal is for materials losses in materials cost.

The cost of the product's manufacturing process materials inspection is dynamic at some point in the inspection depending on the cost difference. In other words, from the design phase of products and the cost of the finished product to check in, the cost difference is because it may have to check. In some cases product manufacturing steps away from the goal of the cost model will vary depending on where its measure. Well known cost model is a step loss function and quadratic loss function (Kass, 2013). Considering these factors the quality loss and function loss, see the steps related to the cost of the materials it will see that the enemy or secondary function is in a relationship or any other subjective judgment. So decision making is within organization relationship. In other words, the cost of materials, management should be set to the row goal of materials when in the goal loss model building as production, process, knowledge management, and more manufactures materials for specific cost model.

5. REPRESENTATION OF MODEL

This study used the materials of the case-based reasoning decision making model is the data that it needs a strategy for an information system. And the system for randomly generated at regular intervals have be temporal begins with data classification and handling. The figure 3 is processed the form of the input and temporal data processing sequential processing.

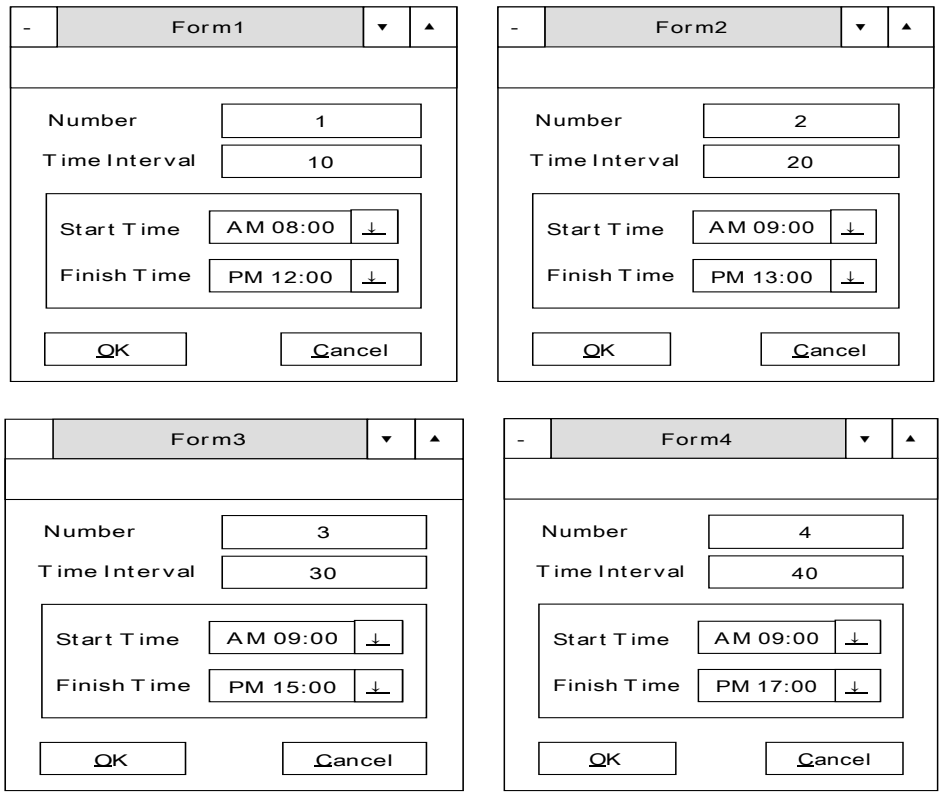

Fig. 3. *The data expression by time interval*

The statistical figures, the average is entered, the skewness, kurtosis coefficients, distributed including specific statistic points rate approximately 10,000 different is generated data to generate data that is closely in the normal distribution in the distribution. Temporal processing of data, it might not want to leave a sample interval of time by using the start time and end time and the time interval system by the user each time.

This results in a range of values using the statistical Xbar. This result shows the shape of various graphs based on them and this is result in system to a total database relations. This study used the strategy of information system on the representation of a material model and the cost model is a statistical summary of the data processing, storage and efficient search was done and how different representation aspects. In addition, a large amount of data in excess of certain amounts for proper history and show it how to deal. This materials management related model system based on an efficient decision making process can help it by impression. This system was meant to express in the process really an intrinsic model and cost model of materials. In particular, a representation in materials management filed during modeling techniques of case-based reasoning in respects search method for query to a variety of difficult problem to solve them. This system rather than in terms of how existing data modeling representation of materials model and cost model used in strategic decision making times are significantly reduced model generation. Therefore, the data modeling with appropriate experience and knowledge will be able to expect in the modeling process and cost a significant amount of productivity. The benefits from the results of these materials are using model and cost model to reduce the time spent on data and development of material management system for business. In addition, a non-materials model and cost model is mixed data model simply. Because it is provides to use way more than the existing data modeling. Finally, the data quality of new model for efficient retrieval can generate. In other words, the system modeling reduces the effort and time spent on this business will be able to improve productivity and efficiency. Therefore, system's search will enhance the quality of software companies in materials and cost management strategic decision making based on expect to be able to bring the efficiency.

Form1

Sampling Table	1	2	3	4	5	Xbar	R
08:00	0.2	0.3	0.3	0.2	0.3	1.2	2.1
09:00	0.2	0.1	0.5	0.1	0.2	1.3	2.1
10:00	-	-	-	-			
11:00	-	-	-	-			
12:00							
13:00							

Form2

Sampling Table	1	2	3	4	5	Xbar	R
09:00	0.2	0.1	0.1				
10:00	0.1	0.3	0.2				
11:00	0.3	0.3	0.3				
12:00	0.2	-	-				
13:00	0.2	-	-				
14:00	0.2	-	-				
15:00	0.1	-	-				
16:00	0.2						
17:00	0.2						

Fig. 4. *The process result by time interval (Xbar)*

Form3

Sampling Table	1	2	3	4	5	Xbar	R
12:00	0.5	0.4	0.3	0.3	-	-	-
13:00	0.1	0.3	0.2	0.5	-	0.3	0.5
14:00	0.3	0.3	0.3	0.4	-	-	0.3
15:00	0.3	0.2	0.4	0.3	-	-	- 0.5
16:00	0.3	0.2	0.4	0.3	0.4	0.3	0.3
17:00	0.3	0.3	0.3	0.4	-	-	0.3
18:00	0.4	0.2	0.2	0.3	0.3	0.4	0.4
19:00	0.3	0.3	0.2	0.4	0.5	0.3	0.3
20:00	0.2	0.2	0.3	0.3	0.4	0.30.2	0.4

Form4

Sampling Table	1	2	3	4	5	Xbar	R
12:00	0.3	0.4	0.3	0.3	0.2	0.2	0.2
13:00	0.2	0.3	0.2	0.5	0.3	0.3	0.5
14:00	0.3	0.3	0.3	0.4	0.2	0.3	0.3
15:00	0.3	0.2	0.4	0.3	0.2	0.2	0.5
16:00	0.3	0.2	0.4	0.3	0.4	0.4	0.3
17:00	0.3	0.3	0.3	0.4	0.5	0.2	0.3
18:00	0.4	0.2	0.2	0.3	0.4	0.4	0.4
19:00	0.3	0.3	0.2	0.4	0.5	0.3	0.3
20:00	0.2	0.2	0.3	0.3	0.4	0.3	0.4

Fig. 5. *The process result by time interval*

6. CONCLUSION

The materials and cost model in the manufacturing are a very important issue in the system. The material model and cost model strategies for effective decision making using information systems is characterized by multiple forms of data. And a large amount of data to collect and process must be managed in real time immediately as well. In order to use large amounts of data to standard deviation, variance, skewness and kurtosis coefficients, points, rate analysis and various statistical coefficients and appropriate process would have to go through the process. In addition, materials management as well as the executive officer of the strategy information system is a productive control decisions should be extended to supporting role as a strategic level. In order to do that and respond to real time executive of the system will have to be developed.

The materials management area system is a critical area during the manufacturing process. The materials management, manufacturing process control is used as a means of further corporate strategy on administration, from the role to be used should be expanded. Inspection automation or system is the problems of the materials management. Nevertheless, the systems for materials management information system using real time is very important and the automation of data collection and transport, real-time. At statistical data processing, materials and the use of the model and development environment for users is an important factor in a graphical user interface. In this study, these features can be used in material model and cost model to a business strategy for strategic decision making and the information system. The reality is that these elements represent a model of this quality, in addition to the integrated database system, distributed system. In addition, manufacture execution system, enterprise resources planning and supply chain management existing in their development should be developed such linkages are executive system and strategic information system.

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