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Information Resources Management in a Company*

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I. Introduction

1. IRM and Information Economy

Every business, whether service or manufacturing, traditional or emerging, large or small, needs to plan its strategy for the transition from doing business in an industrial economy to doing business in an information economy. The production, processing, and distribution of information is quickly becoming a major consumer good and an input in the production of all goods and services:it is the flow of knowledge by which energy and matter are made to serve us. The structural changes that have been occuring in the economies of advanced countries and other developing countries have major implications that affect every business firm. The composition of the work force, productivity, competitive battlefields, and business management philosophies, is all changing.

The key to competitive success in the information economy is to work smarter, not just harder. Labor, technology, capital, and *information resources* must be produced, consciously used, and effectively deployed. In the past, productivity

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improvement focused on labor, capital and technology. Today, business must add an *Information-oriented* approach to productivity improvement to be competitive in national and international markets.

Today I am going to talk a great deal about the concept, steps, and applications of *Information Resources Management(IRM)*. So far, very few companies have fully understood the process of IRM. Here I reorganized the concept and steps in managing a company's information resources. The broad outlines are: definition of IRM, overview, inventory survey, measure costs and assess values, analysis and synthesis corporate information resources, and so on.

2. Definition of IRM

IRM has been defined for the U. S. federal government by the Office of Management and Budget(1985, 41). IRM is the

> planning, budgeting, organizing, directing, training, and control associated with government information. The term encompasses both information itself and related sources, such as personnel equipment, funds, and technology.

The federal government definition is generally valid for IRM wherever practiced. IRM is fundamentally a management activity. It is applied to organizations, not mainly to individual, national, and international levels of society. It is concerned with information assets, or the content of information, as well as with information resources, or the equipment, supplies, and people through which an organization handles its information.

More specifically, IRM is an accumulation of information management functions recently integrated into a unified strategy. Thus IRM today includes management of paperwork, office procedures, archives, data processing, information services, telecommunications, and data administration. The unifying force for IRM is support of the organization's strategic direction.

The history of IRM as a stage over a century-long development of information management strategies and techniques shows a progression from a concern for efficiency to a concern for overall business performance, and from playing

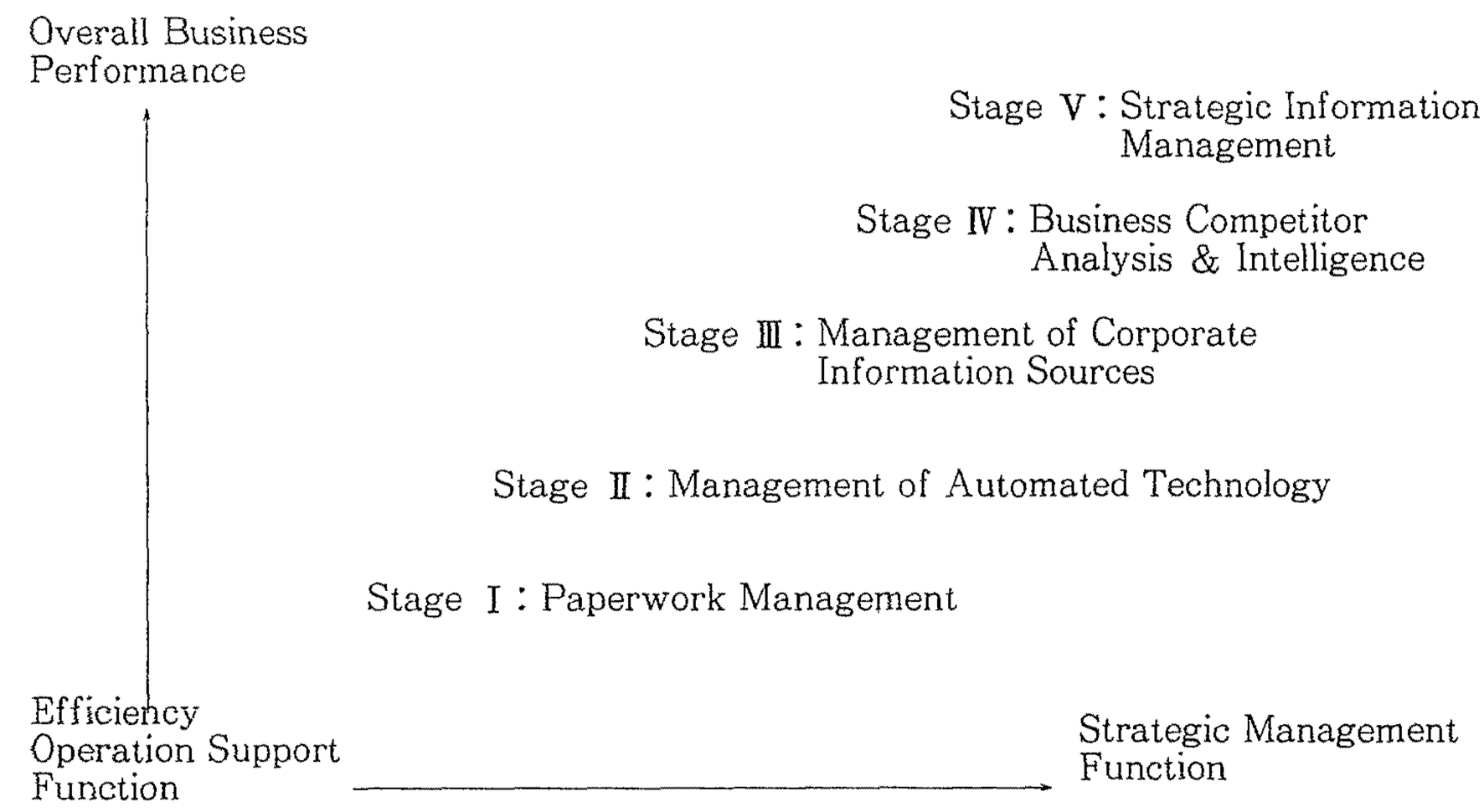
an operations support function to performing a strategic management function. Figure 1 shows that five stages can be recognized. Individual organizations evolve from non stage to the next, not by eliminating need for the previous stage(paperwork is still with us), but rather by absorbing it as the organization moves toward the highest stage of development.

Stage Ⅰ, fully developed by the 1950s, applies information management to *Paperwork management* and the environment in which paperwork and records management predominates. Information management was a supervisory, clerical and support function. Not many companies are still at stage Ⅰ, but a few are.

Stage Ⅱ, *Management of Corporate Automated Technologies*, focuses on the management of information technologies and technical attributes, mostly at the middle management level from about 1950 through the late 1970s. Since computers, telecommunications, and office automation were mostly isolated in their technical development and marketing, information management dealt with them separately. Technical efficiency is the main business objective served. Most companies and industries are current at this stage.

Stage Ⅲ, *Management of Corporate Information Resources*, focuses on cost-ef-

〈Figure 1〉 Five Stages of IRM



Source: Marchand, D. A. & F. W. Horton, Jr., 1986, p. 127.

fective management of information technologies and of both manual and automated information. As present stage of IRM, it addresses a major organizational concerns:applying information resources to achieve strategic objectives. It is a top management support function with primarily an internal focus. Stage Ⅲ represents a decided shift in objectives from, first, a support to a management function in business and, second, from a focus on efficiency to effectiveness.

Stage Ⅳ, *Business-Competitor Analysis and Intelligence*, is oriented to the business objective of gaining competitive advantage in business unit and corporate strategy. It is dependent on the quality of the intelligence analysis and information collection and processing performed by managers and staff, rather than solely on the use of information tools.

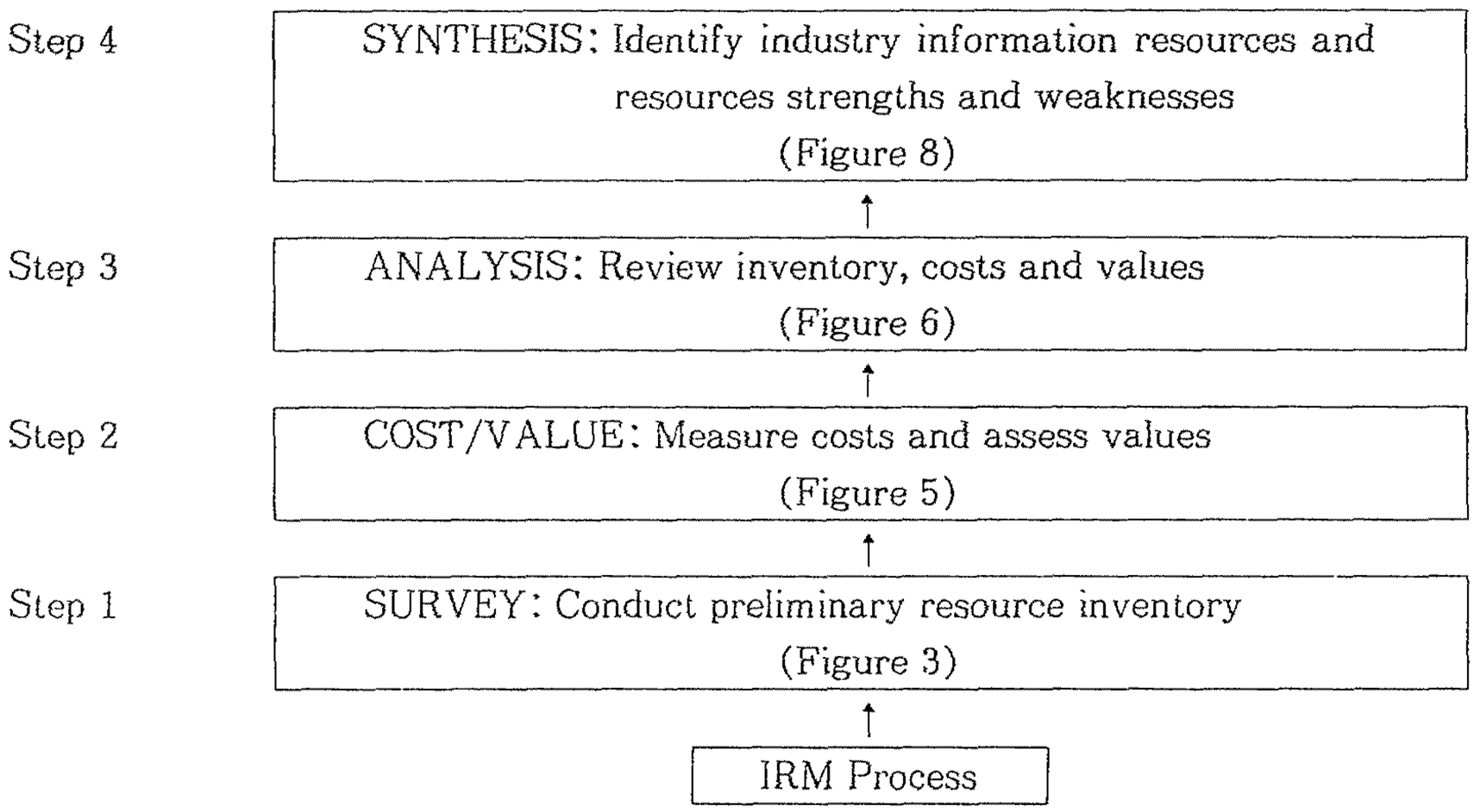
Stage Ⅴ, the highest level of IRM, is *Strategic Information Management* which aided by artificial intelligence applications. Organizations will manage knowledge by building information and technical resources to support their unique strategic purposes. It is primarily focused on corporate strategy and direction, and emphasizes the quality of decision making and information use needed to improve overall business performance. The strategic management focus provides linkage to the functional strategies of the business, for example finance, manufacturing, research and development. It is a top management strategic function.

Ⅱ. Steps and Applications of IRM

1. IRM Overview

IRM is the process within the information management arena that serves the corporate interest. IRM seeks to use information for the benefit of the organization as a whole by exploiting, developing and optimizing information resources. The interests of the organization are usually manifested by its corporate goals and objectives. Thus, IRM is the managerial link that connects corporate infor-

〈Figure 2〉 Overview of IRM Process



mation resources with the organization's goals and objectives.

The idea of IRM was developed by several scholars. Among them, Burk and Horton(1988) have developed the framework of IRM which is the process whereby organizations optimize the spending of their information resource dollars to achieve their strategic objectives. Figure 2 outlines the four basic steps, which is a management process that most organizations apply.

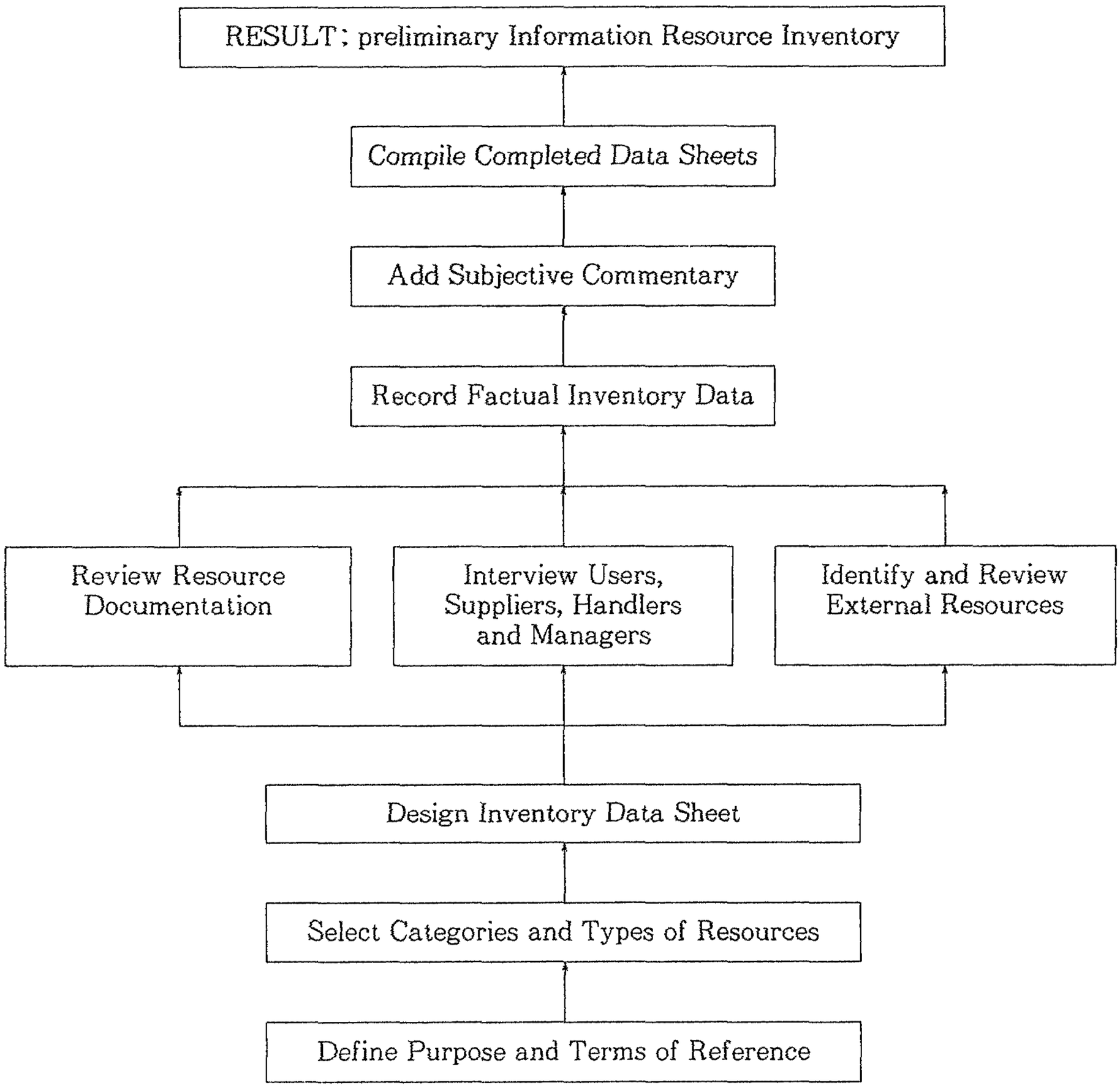
2. Inventory Survey

The establishment and maintenance of inventories is standard practice in the management of most resources. A counting process of some sort is implicit in the notion of resource management, since only quantities can be fully accounted for, itemized, valued and costed, whether the resources are financial, human, real property or raw materials.

During Step I in the IRM process, all information entities, sourcess, services and systems and other combinations of information contents and media used by the organization, will be identified as organizational resources(Figure 3).

The process of preparing the preliminary inventory, begins with a decision on the specific purpose and terms of reference, which will be influenced by the or-

〈Figure 3〉 Prelimary Resource Inventory process



ganization's current state of knowledge of its information resources, how the inventory will be carried out, who will do it and so on. Defining purpose and scope of the preliminary inventory should take place somewhere in the corporate planning process; ideally, flowing out of the company's strategic plans. This would ensure that purpose and scope are based on corporate-wide considerations and that they are endorsed by top management.

Next, a concept or model of the information resource entities you expect to discover will be developed and expressed in terms of various categories and types. General approach to classifying information resources, and thus to defin-

ing the basic unit of resource management, is to first categories all potential resources as *sources, services or systems*, then to subdivide each of these *Categories* into generic groupings.

You will design a simple one-page form to capture the essential data concerning each potential resource entity. A focus on data has emerged as a critical factor to IRM's support of an organization's strategic direction. What data are presently used by functions across the organization, and what data should be used by an organization to fulfill its mission or to excel over its competition? The major source of data for the inventory normally will be interviews with people in the organization involved in *using, handling, supplying, managing* and *counseling* on information and documents collected internal/external company(Figure 4).

〈Figure 4〉 Inventory Data Form

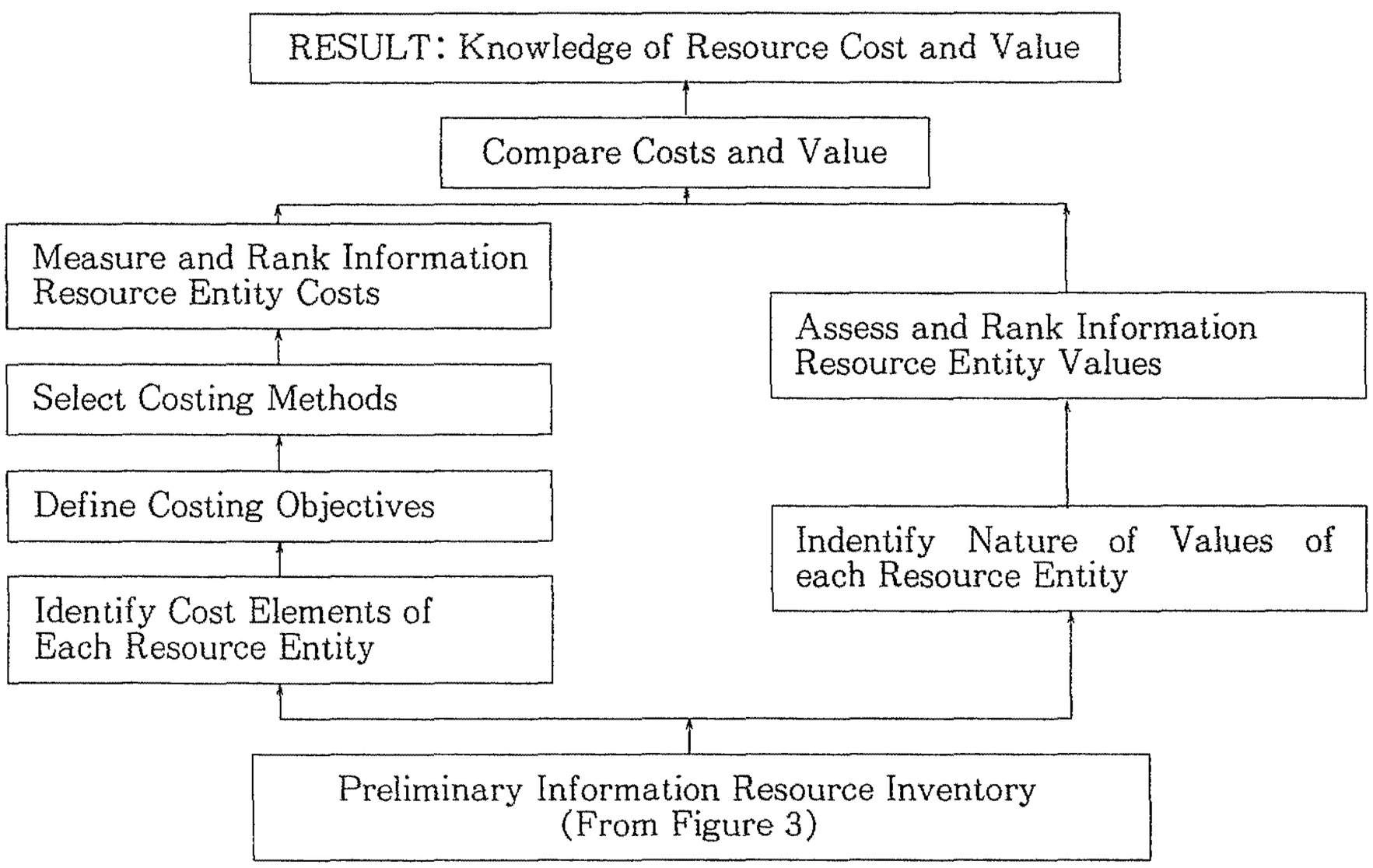
Identification (ID) Number:	Category:	Type:	Resource Name:
Location:	Organizational Unit:	Resource Manager:	Operating Contact:
Concise Statement of Goals/Mission/Purposes Supported:			
Description of Contents, Operations and Uses:			
Comments and Observations:			
Evaluation:			
Primary Inputs:	Primary Outputs:	Holdings/Storage Media:	
Prepared by/Date:	Review by/Date:	Approved by/Date:	

Finally, the inventory data will be collected and compiled. The completed preliminary inventory will take the form of a compilation of the one-page data sheets, sequenced in alphabetical order by entity name. By the end of Step I, you will have a reasonably complete inventory of all of the organization's information entities, both internal and external. However, only after completing Step Ⅱ, Ⅲ and Ⅳ of the discovery process you will know with certainty which of these entities are, in fact, corporate inventory. It could also be described as an inventory of potential resources which means incomplete at this point.

3. Cost and Value

The approach to evaluating the preliminary inventory will be to examine each entity individually and to consider separately 1) its cost and 2) its value: then the relations. In the Figure 5, the word "Measure" is used in connection with costs, while "assess" is used with values, with the intention of implying that, by and large, most *costs* can be quantified in dollors terms, while most *values* can determined only qualitative or in relative terms. However, yon can also expect cases involving qualitative assessments of costs and quantitative measurements of values.

〈Figure 5〉 Cost/Value Process



As set out at the left side in Figure 5, you have to determine the costs associated with an information resource entity in four stages. The first is identification of the *elements* of cost that can or should be considered—that is, to define precisely what "cost" means for each entity.

Next, an *Objective* for costing should be specified, so that you are clear about whether you are looking for, say, the total investment to date, current direct operating costs, replacement costs, amortized costs or some other aspect of cost. For example, you may want answers to questions such as; Cost over what period; costs for whom; direct or indirect costs? Or some other such general question.

Third, you must select an appropriate *method* or mehods to ascertain the costs of the entity. Organizations will in most cases find that no single method for measuring cost will suffice for each and every information resource entity listed in the preliminary inventory. There is a strong likelihood that one method or approach may be adequate for large cluster of potential resource entities, while other methods are necessary for other clusters.

The last stage of the costing exercise is to *measure* the costs, and then to rank the entities in order of decreasing cost. The cost data actually compiled would depend on the objectives and cost elements already decided upon.

Now, determining the *Values* of information is, in many cases, a formidable task, one that only recently has attracted serious attention from scholars, economists, and managers. As yet, while there are no generally available and applicable methods to quantitatively measure value with precision, resource management principles require you to take the approximate value of information into account.

Accepting for the time being that there are no fully objective methods for measuring value, you can approach assessment of the value dimension on two other fronts : 1) by describing the *nature* of the values associated with a resource entity, and 2) by determining the *relative* value of the entity.

To help you describe the nature of the values of information resources, Table 1 shows a list of elements of value, organized in two broad groups : First, values related closely to information itself (Quality of Information Itself, Utility of In-

formation Holdings), and second, values related to the impact of information resources on particular organizational attributes (Productivity, Effectiveness, Financial Position). This is not a complete list. Many others, known and imagined, could have been added to each category — and there are other categories of values ; for example, the impact on strategic activities, or values associated with information—handling capabilities.

Table 1. Categories and Elements of Value of Information Resource Entities 〈Examples〉

Quality of Information Itself	
Accuracy	Precision
Comprehensiveness	Relevance
Credibility	Reliability
Currency	Simplicity
Pertinence	Validity
Utility of Information Holdings	
Accessibility, Intellectual	Format and Presentation
Accessibility, Physical	Frequency of Use
Adaptability	Physical Stability
Browsability	Reproducibility
Ease of Access	Selectivity
Flexibility	Unreproducibility
Impact on Organizational Productivity	
Greater Returns for Employees and Management	Reducing Noise
Improvement in Decision—Making	Reducing Uncertainty
Improvement of Product Quality	Stimulation
Improvement of Working Condition	Timeliness of Actions
More Efficient Operations	Time—saving
Obtaining Needed Goods and Services	With holding Unneeded Information
Impact on Organizational Effectiveness	
Finding New Markets	Harmonious Relationships
Improved Customer Satisfaction	Part of a Product
Meeting Goals and Objectives	Part of a Service
Meeting Responsibility	Production Differentiation
Impact on Financial Position	
Cost Reduction	Exploitability of Existing Assets
Cost Saving	Improved Profits
Creation of New Assets	Insurable Interest
Displacement of More Expensive Resource Inputs	Lost opportunity Cost
Return on Investment (ROI)	

Having examined the *nature* of the values associated with each information resource entity, your next step is to compare and *rank* all information resource entities with one another in terms of overall value to the organization.

The final step is to compare the relations between the cost and the value of information resource entities for which they are responsible that is, so far, outlined ways of measuring costs and assessing values. One obvious way to relate one variable with another is to bring them together in a ratio. Information cost/value ratios are somewhat analogous to business and financial ratios. For example, financial managers use debt—to—equity, turnover, return on earnings and other such ratios. These might be seen to have their approximate informationl equivalents.

With the completion of Steps Ⅰ (Survey) and Ⅱ (Cost/Value), you have completed the essential fact—finding portion of the information resource discovery process. Your potential resources have been identified, individually discribed, costed and valued. Now you are ready to analyze the facts.

4. Analysis

Within the framework of the overall purpose and scope of the discovery process you established at the outset in Step Ⅰ, the survey director should now focus attention on what you hope to achieve through analysis of the inventory and cost/value data. You have stressed that your purpose overall is *discovery* of your information resources. And as additional benefits, a range of purely business and managerial purposes is also usually served by the various outputs and knowledge acquired as a result of the discovery process.

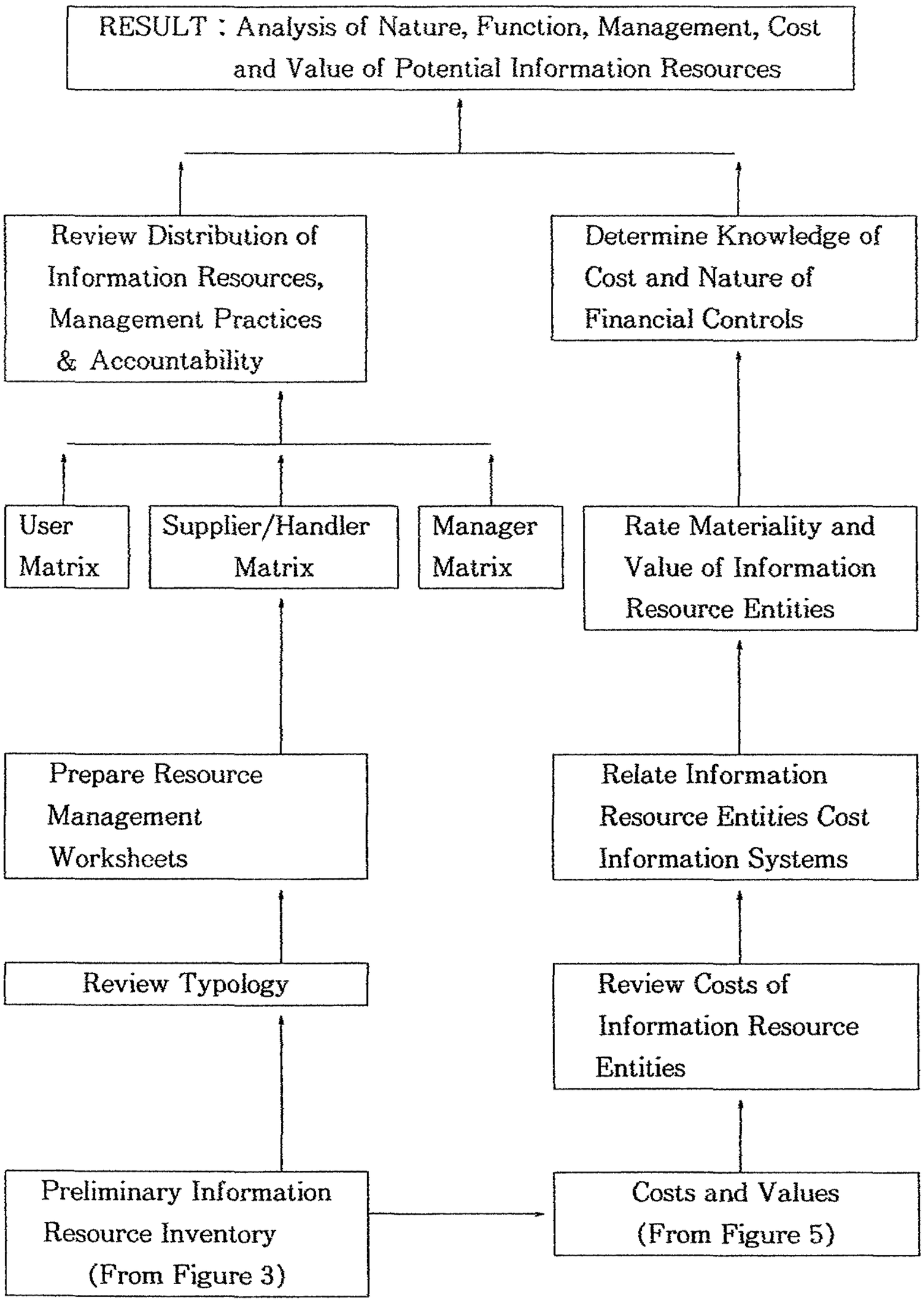
The purpose of analysis process (Figure 6) is discovery of where your information resource entities are distributed throughout the organization.

First, you should select the row headings listing the resource types (Figure 7). With the benefit of hindsight, you can assess the validity and utility of the classification scheme (typology) for information resources adopted at the beginning of Step Ⅰ. Having examined a large number of information entities that actually exist, some change in the typology will probably be called for. For example, some types initially selected types may turn out in reality not to exist at all, and

so on. Draw up the revised list of information resource types and enter them along the left side of your worksheet.

Next, select the column headings along the horizontal axis. The number of organizational units identified across the top of the worksheet will depend on scope of the survey and on the level of detail sought. However, as with the rows,

(Figure 6) Analysis Process



it is important to restrict the number of columns such that the entire organization can be portrayed on a single page or spreadsheet. The major purpose of the worksheets is to provide a summary or overview of corporate information resources : this purpose might be defeated by a detailed organizational breakdown requiring several pages of columns.

With your customized master worksheet in hand, you are now ready to plot the worksheet data. Users are the first of the three major information communities or players you will want to locate. The purpose of the User Worksheet is to show you which organizational units use which information resource types, or "Who is using what, and where." This is achieved by placing an X in those cells on the User Worksheet which represent the interaction of 1)a particular organizational unit in which a user or users are located, and 2)the resource type being used.

The various information resource charts and maps constructed in Step Ⅲ led

〈Figure 7〉 Model of Information Resource Typology

ORGANIZATIONAL UNIT / INFORMATION RESOURCE TYPES	UNIT A	UNIT B	UNIT C	etc.	TOTAL
SOURCES Type A Type B Type C etc.					
SERVICES Type A Type B Type C etc.					
SYSTEMS Type A Type B Type C etc.					
TOTAL					

to numerous discoveries. For example, you may have learned which and how many organizational units actually use a particular information service. Or how many record centers there are. Or how managerial responsibility for information systems is shared or not shared. You charted the locations within your company of the various information communities : Users, Suppliers, Handlers and Managers.

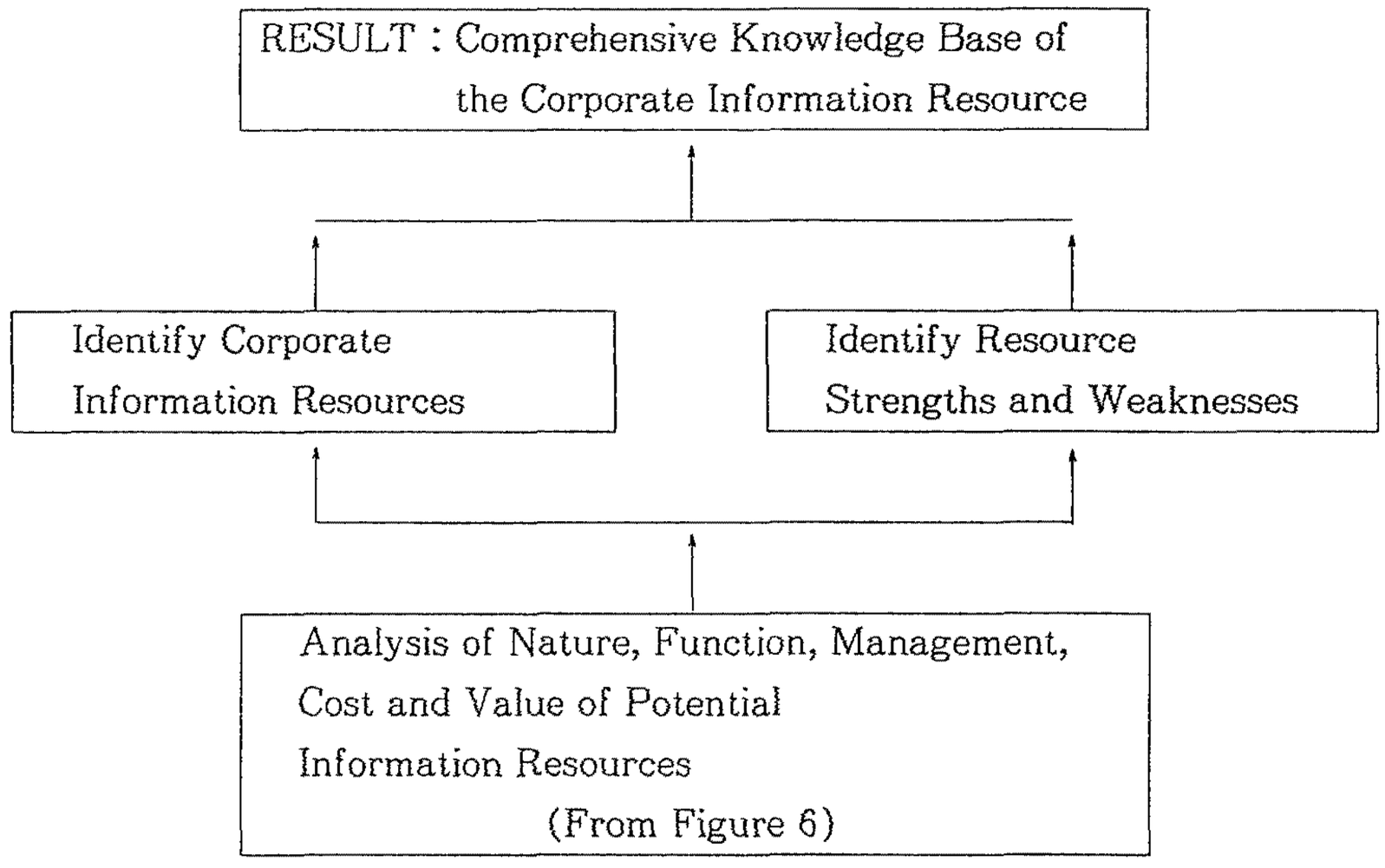
The information resource chart led to the discovery of natural clusters and groupings of your information resource entities. The positioning and nature of information resource entity groupings would have implications for how best they should be exploited and managed. Another probable discovery is that very few of your information resource entities appear as such in your accounting and financial control systems. Thus, there may be no means to track and control individual entity or total information costs.

5. Synthesis

The Step Ⅳ of the discovery process is called Synthesis (Figure 8). In this context, synthesis means drawing together all of the observations, facts, figures, judgements and preliminary evaluations that bear on two basic aspects of your corporate information resources : 1) What they are, and 2) how adequate they are. The main "drawing together" technique we will use is to develop and apply various criteria and standards designed to test for, in the case of the former, the *presence* of information resources, and in the case of the latter, their *strengths* and *weaknesses*.

In the initial step, all the data and information gathered by the previous steps were arranged for the purpose of discovering what your information resources are, and how effectively they have performed. To do this, resource criteria were developed and applied to isolate your information resources among the long list of information resource entities in preliminary inventory. Then, relative strengths and weaknesses of your information resources were evaluated by testing the performance against criteria statements designed to help determine how your resources compare, both one to another, and with the outside competition.

(Figure 8) Synthesis Process



In addition to discovering which of the information resource entities identified in the preliminary inventory are, in fact, your information resources —— those sources, services and systems that provide the information critical to meeting your corporate goals and objectives —— you also discovered a host of management issues. Some required immediate attention, others could be addressed over time.

At the end of the discovery process, after all four Steps had been completed, the overall result was a reconnaissance map of previously uncharted terrain —— the first of its kind —— providing a bird's eye view of your corporate information resources, their identification, location, nature and strategic significance.

Ⅲ. Conclusion

As society becomes more information intensive, managing information and information technologies assumes increasing importance for economic, political, cultural, and intellectual well being. Information and information technologies

are integral to organizational mission and should play increasingly central roles in strategic planning. Above all else, IRM must apply information in support of an organization's self-defined values and culture.

Information - and people - oriented issues must receive more attention. Organizations should adopt a more information-centered philosophy, devoting at least as much attention to what kind of information they require as to what kind of computers they need. IRM has made some progress toward managing information content as well as information technologies.

In conclusion, IRM is an integrative management technique. Deriving mostly from data processing, it has increasingly encompassed management and information areas as well. Further growth of IRM should draw on professional expertise in the information studies disciplines by bringing information professionals into the IRM arena, and on expertise's productive practices in the information company.

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