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AUTHOR Krotseng, Marsha V.; McLaughlin, Gerald W.
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ABSTRACT

This paper examines the many facets of administrative information management on the college or university campus. It is argued that, depending on the situation, an effective information manager can adopt the outlook of an architect/designer, data administrator, editor, analyst, reporter, planner, broker, collaborator, interpreter, or marketer. These roles are discussed in the context of an information management model that begins with the campus office or department that supplies the raw data and moves from data base development and administration to the production of analyses and subsequent presentation of these analyses to the customer (the president, deans, committees, governing board, or legislature) who ultimately uses the information in implementing a policy or strategic decision. This model is discussed in relation to Sheehan's (1977) Three-Hat Theory (which focuses on the roles of decision maker, intermediary, and technician), and extends his theory by positing numerous personae who are integral to effective institutional research. One of these many faces--the evaluator--transcends Sheehan's three hats and suggests a further linkage with the Plan-Do-Check-Act sequence as detailed by McLaughlin and Snyder (1993). (Contains 18 references.) (MDM)

# THE MANY FACES OF INFORMATION MANAGEMENT

Marsha V. Krotseng
Director, Research and Information Systems
State College and University Systems of West Virginia
1018 Kanawha Boulevard, East
Charleston, West Virginia 25301
(304) 558-1112

Gerald W. McLaughlin
Director, Institutional Research and Planning Analysis
Virginia Polytechnic Institute and State University
129 Smyth Hall
Blacksburg, Virginia 24061
(540) 231-6002



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# THE MANY FACES OF INFORMATION MANAGEMENT


## Abstract

Skilled information management on any college or university campus has many facets -- and faces. Depending on the situation, an effective information manager can adopt the outlook of an architect/designer, data administrator, editor, analyst, reporter, planner, broker, collaborator, interpreter, or marketer. These roles are presented in the context of an information management model which begins with the campus office or department that supplies the raw data and moves from data base development and administration to the production of analyses and subsequent presentation of these analyses to the customer (e.g., president, deans, committee, governing board/coordinating agency, or legislature) who ultimately uses the information in implementing a policy or strategic decision. The paper relates this model to Sheehan's (1977) less complicated "Three-Hat Theory" and extends his theory by positing numerous personae which are integral to effective institutional research. One of these many faces -- the Evaluator -- transcends Sheehan's three hats and suggests a further linkage with the Plan-Do-Check-Act sequence as detailed by McLaughlin and Snyder (1993).

# THE MANY FACES OF INFORMATION MANAGEMENT

## Introduction

As we approach the close of the twentieth century, higher education faces a multitude of critical policy questions and issues (AGB, 1997; Krotseng, 1997). How does technology affect course accessibility, enrollment, and student learning? In what areas might we better contain costs? What is an appropriate level of tuition for our institution? To what extent are we effective at retaining students? Have our students achieved appropriate skill levels upon completion of their program of study? These -- and many related -- issues in higher education have focused greater attention on data and information than during any previous period. It is not surprising that one result of this current environment is a heightened "need both for institutional research and for effective collaboration between researchers and administrators" (Delaney, 1997, p. 2). At the federal level, the National Postsecondary Education Cooperative (NPEC) offers one such avenue for collaboration with decision makers. Created in 1995 "to promote the quality, comparability, and utility of postsecondary data and information that support policy development, implementation, and evaluation," NPEC emphasizes the need for "better decisions through better data" (NPEC, 1998). This linkage of data to decisions responds, in part, to commentators' calls for higher education research to be more "relevant" (Layzell, 1990) and for information managers to be "responsive, flexible, and knowledgeable" in undertaking such research (Keller, 1993, p. 15).

As "institutional research is. . .called upon increasingly to serve critical roles informing decision making, planning, and policy formulation" (Delaney, 1997, p. 2), "institutional researchers will need to possess or expand their methodological and technical competence" to address complex policy questions (p. 12). For instance, those who occupy information management roles in higher education must be able "to supply information with [an]. . .understanding of the institution and its environment, the issues and decisions that are most vital, and the preferences of decision makers about how information is presented" (Keller, 1993, p. 15). Numerous authors such as Presley (1990) describe specific competencies that are vital to the institutional research professional, including strong quantitative skills, oral and written presentation skills, communication skills, and expertise in measurement, assessment, or survey research. Matier, Sidle, and Hurst (1994) expand upon this list, suggesting that effective institutional researchers also must become information architects, change agents, and consultants of choice in their

institutions. Indeed, skilled information management on any college or university campus has many intriguing facets -- and faces. Given the importance of linking data with policy and of ensuring the appropriate consideration of data by decision makers, what are these various roles that institutional researchers must assume in the normal course of work? This paper focuses on the vital aspects of higher education information management and highlights critical connections between this process and the institutional researcher's multifaceted role.

## The Classic Roles of Institutional Research

The multiple facets of institutional research are apparent in the literature associated with the profession's emergence. According to Suslow's (1972) A Declaration on Institutional Research, "The institutional researcher's basic role encompasses the systematic appraisal of the higher education effort. . .No single or simple combination of disciplines provides sufficient knowledge to analyse the effectiveness of universities and colleges in a systematic and critical manner. The range of problems associated with assessing higher education's effectiveness preclude a limited methodology. The quality of the institutional researcher lies in his [or her] ability to discern which methodologies are appropriate to the problem" (p. 1). Several years later, Sheehan (1977) designated the following responsibilities of institutional research:

(1) Data and analyses provided by institutional research seem to be useful in decision making.

(2) Analytical tools are useful to institutional researchers in providing the information.

(3) The use of these models lends credibility to the information that results.

(4) As institutional researchers use their tools, more people want more information from more tools.

(5) The customers expect more quality and more comparisons between institutions.

## Institutional Research in the Information Management Flow

With data and the knowledge of various methodological or analytical tools as their primary currency, institutional researchers offer a linkage between data sources (such as the registrar) and a variety of customers who desire information. Figure 1 represents a model of information management that begins with the campus office or department that supplies the raw data and moves from data base development and administration to the production of analyses and the presentation of these analyses to the customer who ultimately utilizes the information in implementing a policy or strategic decision. The information management process originates with the custodians of raw data which has been obtained through forms, surveys, assessment instruments, or various other paper or

electronic documents. Every campus fosters numerous data sources or custodians which can include individuals in the Admissions, Registrar's, Finance, Financial Aid, Personnel, Provost's, Assessment, Alumni/Development, and Facilities offices. The custodians "are responsible for data access and security for their systems and must ensure that any changes made to the systems fit the institutional information architecture so that the changes do not compromise data integrity" (Miselis, 1990, p. 62). The next step in this process is the vital linkage which transforms these data into information. With the assistance of information technology (both hardware and software), the data are stored, analyzed, and retrieved as information in the form of statistics, SAS or SPSS output, spreadsheets, or a wide array of other formats. Institutional researchers, with their requisite technical and analytical skills, are most frequently identified with this stage of the process. As the bridge between data source and customer, the institutional researcher then translates or incorporates the output of these analyses into such written products as reports, analyses, key indicators, outcomes assessment, or policy recommendations. Once finalized, these documents are presented to the specific internal customers (president, board, deans/department chairs, committees/task forces, faculty, and students) or external customers (e.g., governing board/coordinating agency, state legislature, federal policy makers, State Department of Education) who originally expressed a need for the information. The customers ultimately apply this information to resolving the issue(s) which prompted their initial request and take action through reaching a strategic decision, formulating institutional policy, preparing or updating a strategic plan, completing a self-study report, or allocating financial or human resources.

Beyond "Technician" to Other "Hats"

As observed above, the institutional researcher is most closely aligned with the linkage step of the information management model where raw data are transformed into meaningful information. The data storage, retrieval, and analysis functions integral to this phase coincide with the institutional research role which Sheehan (1977) characterizes as the "Technician." He portrays the Technician as a searcher who discovers and implements the best and most appropriate technological methods, including the network, software, hardware, and "people ware." This role also involves the actual data input, analysis, and the evaluation of the process which led to these results. To the Technician, the "practical and technical aspects of gathering information are clear and the meaning of the resultant data is unmistakable" (Sheehan, 1977, p. 93).

However, the institutional researcher's role extends well beyond this more technical aspect. Sheehan's (1977) "Three-Hat Theory," distinguishes two additional roles or "hats" which are crucial to the effective institutional researcher: those of the "Intermediary" and the "Decision Maker." The Intermediary also relates to the bridging function depicted in Figure 1, connecting the data source to the customer. The Intermediary or analyst translates "information needed into terms that will admit a solution. . .taking into account the imprecisions of the question, inadequacies of the data base, limitations of available tools and techniques, time, talent, and other resources for proper analysis" (Sheehan, 1977, p. 93). This is the decision support role. It requires not only the general anticipation of the key issues and questions but also a clear understanding of the feasible strategies for dealing with the problems. The Intermediary has developed the ability to clarify questions, offer alternatives, and negotiate possible alternatives with the Technician, as well as a managerial ability to create and complete projects that support decision making. In addition, the Intermediary holds "ongoing responsibility for evaluation of the solutions actually presented and of all processes involved in arriving at them" (Sheehan, 1985, p. 90). To fully perform this responsibility, however, the institutional researcher must don a third hat, that of the "Decision Maker." The Decision Maker is the problem solver who may approach the problem in various ways from the rational to the incremental/remedial that deals with solving the most critical problem. The Decision Maker is sensitive to the situation, the critical issues, and political considerations. Alternatives are generated, decision criteria are selected in a group decision process, a change is promulgated, and results are assessed.

The three-hat theory asserts that institutional researchers "must be sufficiently versatile to assume the perspectives of [these] three people" in responding to the need for planning and management information (Sheehan, 1977, p. 93). Such versatility is crucial to achieving high quality results. In this paradigm, the Decision Maker and the Intermediary negotiate the focus of a study. The Intermediary and the Technician then negotiate the availability of the data and conducting of the analysis. The Technician, using appropriate computers and software, conducts the integration and analysis of the data. The results of this analysis are discussed and reviewed for technical issues with the Intermediary. The Intermediary then interprets the results and provides them to the Decision Maker, highlighting key aspects of the analysis or report. "Given the administrative reality that there is never enough time to complete everything that needs to be done. . .administrators [decision makers] will read summaries and read *at* rather than *digest* extensive amounts of analytical work" (Mortimer, 1992, p. 83). Suslow's

(1972) earlier work similarly depicts the institutional researcher as a mediator between the technologist and educator-administrator, providing a communication link that assists the educator-administrator in using the technical tools and procedures that can benefit the institution. In a slightly modified version of Sheehan's (1984) original graphic, Figure 2 identifies four interactions which are integral to decision support: Decision Maker to Intermediary, Intermediary to Technician, Technician to Intermediary, and Intermediary to Decision Maker. Sheehan also portrays the actual Decision Support System as linked to the Technician; thus, the Decision Maker may choose to solve a problem either through the Intermediary's expertise or by going directly to the Decision Support System. Consequently, Figure 2 includes the two interactions associated with this latter alternative.

When an institutional researcher performs one of the processes related to a given role, he or she temporarily assumes that role, regardless of official organizational position, title, or institutional responsibilities. "A single person may play all three roles, and any role may be played by more than one person. Often, the decision maker is a committee, and the intermediary is a team of analysts" (Sheehan, 1985, p. 91).

Sheehan's challenge issued to the institutional research community fourteen years ago remains relevant today: "What is, under these highly automated circumstances, the most likely, practical, productive role for [an Office of Institutional Research] to play during this period of the information technology revolution?" (Sheehan, 1984, p. 209). Data warehouses and other tools have augmented the direct link between the decision support system and the Decision Maker when the Decision Maker avails himself/herself of that alternative. As a result, the need for structured, well-defined, and clear data and analyses is more critical than ever, and the institutional researcher must assume the Decision Maker's perspective to anticipate future questions and potential demands. Precise explanation and straightforward design facilitate the Decision Maker's use of the decision support system. Hence, a fourth hat -- Data Administrator -- might be connected with that of Technician. An Expediter also may be necessary for coordination among these various roles and assurance of adequate progress. Although similar to the Intermediary, the Expediter involves communication among all parties rather than the Intermediary's two-way series of relationships pictured in Figure 2. Therefore, we contend that the effective institutional researcher cannot be defined by or reduced to any single role but, rather, is multifaceted, able to draw upon an abundance of personalities, skills, and perspectives depending on the issue(s), specific needs, and special circumstances underlying a request for information.

A Function with Many Faces

In a contemporary novel revolving around a large computer corporation, the chief executive's spouse inquires one evening, "And who were you today?" According to the executive's reply, "Father confessor from 8:30 to 9:00, Simon Legree in a meeting with poor Don Banks, Moses returned from the Mount in a telephone interview with *Datamation* magazine, big brother to Louise Bowman. . .John Housman playing the chief justice of the United States for the boys in the Storage Products Division, a druid wizard with the controller, Andrew Carnegie for. . .I had to spin through my entire repertoire today, and create some new roles in the bargain" (Garber, 1989, p. 315).

Likewise, the skilled institutional researcher displays many diverse faces. Building upon the three-hat theory, Figure 2 also identifies a variety of specialized institutional research roles which relate to Sheehan's Technician, Intermediary, and Decision Maker perspectives. The specific personae subsumed within each of these three hats are described below.

Technician and related Decision Support System. Specialized roles which reflect the technical aspects of institutional research and information management involve knowledge of the intricacies of the data base(s), hardware and software requirements, data storage, data and model processing, the best methods for extracting data, and generating results. Among these roles are:

*Architect/Designer*: An individual performing this role understands the intricacies of a particular issue, identifies the key data elements, establishes the definitions of the elements and corresponding codes, creates the data base structure, and is thoroughly acquainted with the details of each data element.

*Data Base Administrator*: This persona allocates file space, maintains security levels for access to the system and to specific data bases, and assigns passwords.

*Data Administrator*: The primary responsibilities intrinsic to this role are maintaining and updating the data base, fully documenting the file structure and data elements, and assisting the architect/designer with precise definitions.

*Data Doer*: This involves putting the data together, entering data from eternal sources, and occasionally writing programs to create data through combining several individual elements.

*Network Navigator*: This role assists others in sorting through and "untangling" the net or World Wide Web to locate desired data and move it to an appropriate area for analysis. In addition, it encompasses the ability to transmit data through the network to other individuals.

*Software Savior*: The individual wearing this hat provides assistance in identifying the software needed for a particular task and helps others learn how to use this software. The responsibilities may include educating customers in the use of particular spreadsheets, word processors, e-mail, browsers, and the World Wide Web.

*Auditor*: Affording the requisite quality assurance, the auditor verifies the accuracy and consistency of data by comparing the data base with original records.

*Evaluator*: This role involves continual review of all technical processes to ensure a high quality product and to suggest any improvements necessary to attain (or sustain) this level of excellence.

Intermediary. The Intermediary embraces a wide range of roles that appear while serving as a linkage between the Technician and Decision Maker. This hat involves all aspects of transforming raw data into meaningful information and, as described above, anticipates critical issues, helps define the relevant questions, and generates alternative solutions for consideration. Throughout this process, numerous distinctive roles can emerge; as outlined below, these roles are grouped into the categories of **Process/Interpersonal, Task/Technical,** and **Spanning** which more clearly delineate their primary focus.

**Process/Interpersonal.** The various roles subsumed within this category relate to the linkage process undertaken by the Intermediary as well as to the communications and interactions required to successfully fulfill the information need. These "faces" tend to be the organizational set that the institutional researcher employs most in looking "up" on Figure 2 toward the decision maker/customer.

*Broker/Negotiator*: This persona is the go-between who obtains the data required to address an issue at hand. A critical component of this role is building trust and respect through integrity. As Sheehan (1977) asserts, the effectiveness of communication with "the decision maker depends on the confidence they have in each other" (p. 93). Similarly, the broker/negotiator fosters mutual understanding and cooperation to help achieve agreement as to what is required to solve the problem and what efforts are feasible or most desirable.

*Facilitator*: The individual assuming this role engages several parties in discussion to resolve a specific issue or to address a problem or concern. The facilitator fosters open communication and candid dialogue, encouraging participants to work together as a team.

*Expediter*: A primary goal of the expediter is communicating with all parties to keep the information management process on track and moving forward. This includes eliminating any obstructions or barriers to progress such as hardware, software or human concerns.

*Collaborator*: As a collaborator, the institutional researcher engages in a cooperative effort across several departments, functions, and/or levels of the institution. All participants share ownership of and responsibility for the project while contributing their unique perspective or expertise. This helps achieve a more accurate, comprehensive, and widely accepted product.

*Questioner*: The questioner probes for an in-depth understanding of the issue, expected information or end product desired, key data elements, and resulting analysis. Through encouraging clear articulation of the reasons underlying the analysis, participants can focus attention on the customer's primary concerns and more fully answer the critical question(s). An individual performing this role also may uncover any potential flaws or *caveats* in the analysis which require further evaluation and, ultimately, may pose further issues raised by the analysis itself.

*Interpreter*: In performing this role, the institutional researcher helps identify or clarify the customer's data and information requirements, translates the customer's questions for the "Technician," translates and explains the meaning of statistical results to the customer, and identifies the implications of the research.

**Task/Technical.** The "faces" listed below are those product-oriented roles most often employed by the Intermediary in looking back toward the Technician (Figure 2).

*Analyst*: An expert with statistical systems and various research methodologies, the analyst reviews the results generated from the data and discerns their meaning.

*Organizer*: This role involves systematizing the results of the analysis, placing the meaning in context, and preparing the information for dissemination by the "Reporter."

*Reporter*: The reporter compiles the results in an appropriate and meaningful format for presentation to the customer, describes the methodology and findings of the study, and identifies areas for further analysis.

*Editor*: This hat encompasses checking for data quality, validity, and consistency; making any necessary revisions to the data; proofreading the report or final product; reviewing the report content for consistency and validity; identifying areas for further clarification or expansion; and recommending revisions to the report.

*Instructor*: Several facets of this hat include helping the customer frame better questions, offering technical assistance (e.g., with the methodology), imparting any special knowledge such as coding details, and explaining the meaning of the results to the customer as well as appropriate uses of the findings. As Suslow (1972) suggests, customers must be educated as to the correct interpretation of the products.

*Advisor*: The advisor acts as a consultant based on a particular expertise, for example in constructing an effective survey instrument. Additional responsibilities of this role entail recommending an appropriate methodology or technical approach to studying an issue, recommending alternative courses of action based on the data, and warning the customer of possible *caveats* discovered by the "Questioner."

**Spanning**. The following three roles cross all aspects of the Intermediary function, bridging the Process/Interpersonal and Task/Technical categories. Consequently, these "faces" are continuously looking both upward to the Decision Maker and back to the Technician as depicted in Figure 2.

*Marketer*: An individual assuming this hat serves as an excellent communicator, is able to convince other participants of the need for the research or of special data requirements, packages and delivers the final results and/or recommendations to the customer, and "sells" the recommendations or alternatives generated.

*Magician*: The magician is viewed as capable of producing any data or information, any time, in any format, with little or no advance notice.

*Evaluator*: This role involves continual review of all interactions and results achieved through the Intermediary to ensure a high quality product that meets the customer's requirements.

Decision Maker. The Decision Maker identifies, understands, and communicates the key issues to the Intermediary and also serves as the chief problem solver after receiving the recommendations which emerge from research and analysis. Hackman (1983) astutely observes that "awareness and understanding of the decision styles

of those for whom information is prepared can lead to more effective communication" (p. 200). Several of the distinct hats encompassed by this persona include:

*Manager*: This role holds overall responsibility for coordination of people, projects, priorities, data, and analytical systems.

*Planner*: Representative actions of this role include establishing and communicating a vision consistent with the institutional or departmental mission, identifying objectives to achieve this vision, setting a strategic course of action based on data and recommendations, setting priorities consistent with the mission to meet deadlines and institutional objectives, implementing actions, and monitoring progress toward the vision.

*Environmental Scanner*: Perceived as a generalist, the environmental scanner continually monitors national, regional, and campus trends and patterns; seeks broad input; identifies potential issues; and offers a proactive approach to understanding or resolving these issues.

*Evaluator*: The evaluator continually reviews feedback from the decisions reached and actions implemented as a result of the information received from the Technician through the Intermediary.

At some time during his or her professional career, the effective institutional researcher will likely display characteristics inherent in each of the above roles. In fact, it may be that the most successful individuals are intimately acquainted with these roles and have developed the capacity to instantly shift from one hat to another. On the other hand, all of these roles will not be apparent all the time, and certain roles may overshadow others. Nevertheless, the various personae described all represent critical responsibilities that must be completed in managing information, and the institutional researcher should be conscious of the distinct role he or she is playing at any given time.

The Ubiquitous Evaluator and Plan-Do-Check-Act

It is significant that Sheehan (1985) relates evaluation and follow-up with the original three hats he posited. For that reason, the "Evaluator" appears under each of the above categories, the only role with the distinction of occurring more than once. This role relates to the "Checking" phase of the "Plan-Do-Check-Act" cycle detailed by McLaughlin and Snyder (1993). In fact, several of the multiple faces presented above clearly connect with one of the four stages of this cycle. The Planning stage is reflected in the Decision Maker's explicit "Planner" face; the Advisor and Reporter faces of the Intermediary must anticipate the needs of the customer and

plan appropriate communication while the Technician's Architect/Designer persona constructs the plans and foundation for a data base. The second phase -- Doing -- becomes evident as the Decision Maker manages his or her responsibilities and seeks information. The Analyst and Magician faces of the Intermediary undertake actions necessary to determine the information or alternatives sought, and the Date Doer and Network Navigator engage in performing technical activities. Upon completing the vital "Check" stage, the Technician, Intermediary, and Decision Maker should move forward to the final phase of "Acting" on the feedback received from the evaluation, adjusting procedures, techniques, or interactions to more precisely focus on the desired result. "Acting" activity is evidenced as the Manager responds to the results of an environmental scan as well as in the Collaborator's and Data Administrator's key efforts to continuously improve their processes.

As previously observed, the Technician, Intermediary, and Decision Maker all hold responsibility for "Checking" or constantly evaluating the process or work underway to ensure that it is on course and consistent with expectations. Specific "checking" activities represented in Figure 2 include the Environmental Scanner who unceasingly inspects and evaluates the surroundings/situation, the Questioner and Editor who offer checks throughout the process, and the Auditor who verifies the accuracy and consistency of data.

Checking is integral to the effective performance of institutional research as discussed by McLaughlin and Snyder (1993). A logical further extension of this relationship of information management's multiple faces and Plan-Do-Check-Act may involve development of a checklist of critical and key activities which institutional researchers are expected to perform as we adopt each of these multiple "faces." This checklist would define the roles objectively and delineate specific responsibilities associated with each of their various aspects. In turn, this would enable the institutional researcher to determine the importance of various skills and, thus, identify any gap between his or her current knowledge and skills and those required for more effective performance of a particular responsibility. The institutional researcher could then work to develop appropriate skills and knowledge for the technical/analytical intelligence, issues intelligence, and contextual intelligence which Terenzini (1993) describes as integral to institutional research.

## Conclusion and Implications

Effective information management involves numerous parties and a wide range of perspectives. This paper outlines an information management model which represents the highly complex environment and sets of

interrelationships in which institutional research professionals work each day. Given this environment, the primary challenges of information managers include effective coordination and communication of information to customers/policy makers, data sources, and technical experts. Sheehan's "Three-Hat Theory" affords a less complex structure which focuses directly on institutional research functions and emphasizes the importance of adopting multiple outlooks appropriate to the situation. However, upon reflection, each of these three hats comprises multiple faces or personalities required for optimum performance. This paper extends Sheehan's theory by developing a set of faces that portray the many specific characteristics which institutional researchers must assume in their relationships with other higher education colleagues. One such role -- the Evaluator -- transcends Sheehan's Technician, Intermediary, and Decision Maker hats and serves as a further linkage with the Plan-Do-Check-Act sequence. This evaluation or checking facet of institutional research may be enhanced by development of a checklist of key activities and skills which relate to each of the profession's numerous faces, thus enabling the practitioner to develop this complex array and achieve his or her full potential within the institution.

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# Information Management Model

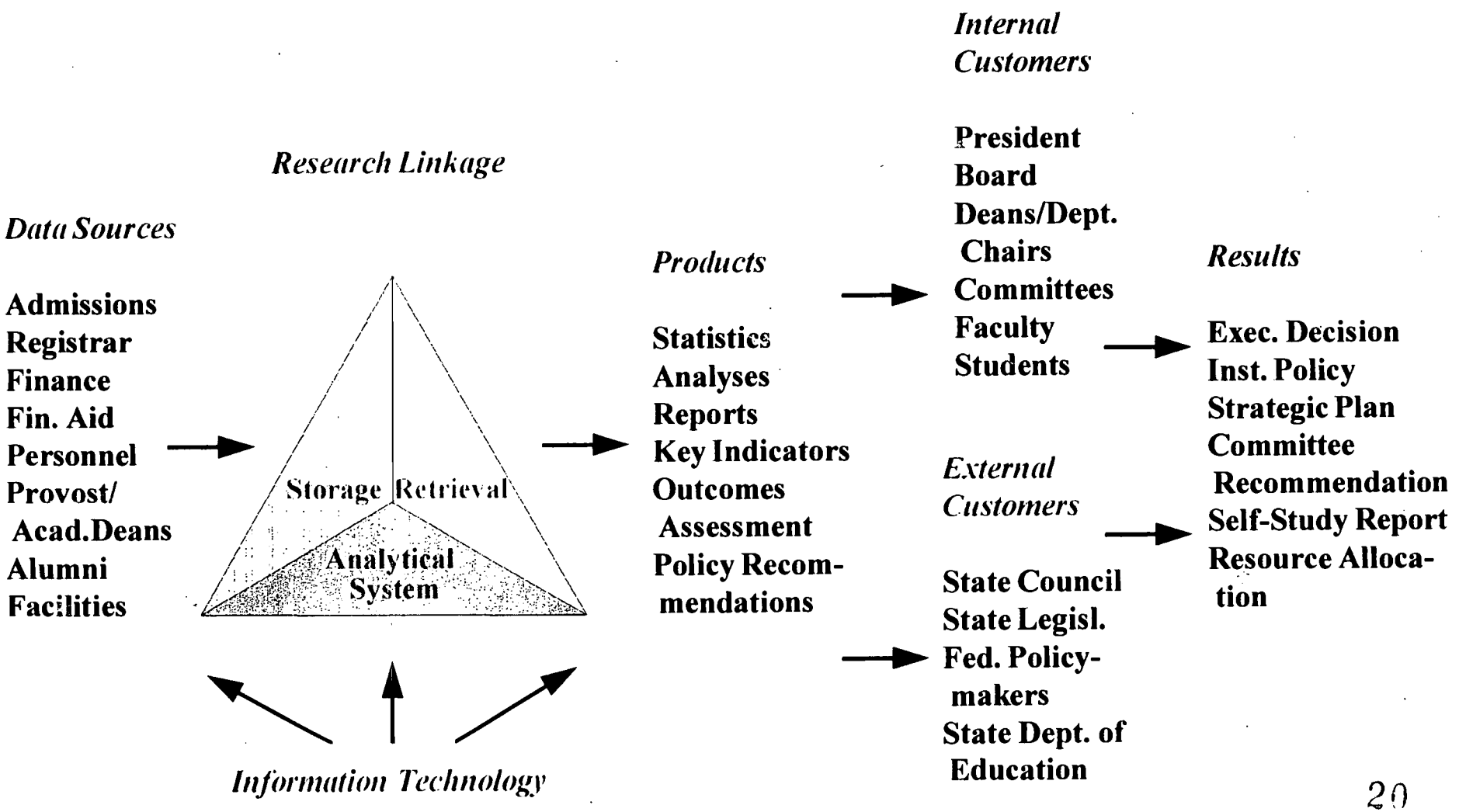


Figure 1

# Sheehan's Three-Hat Theory with Expanded Roles

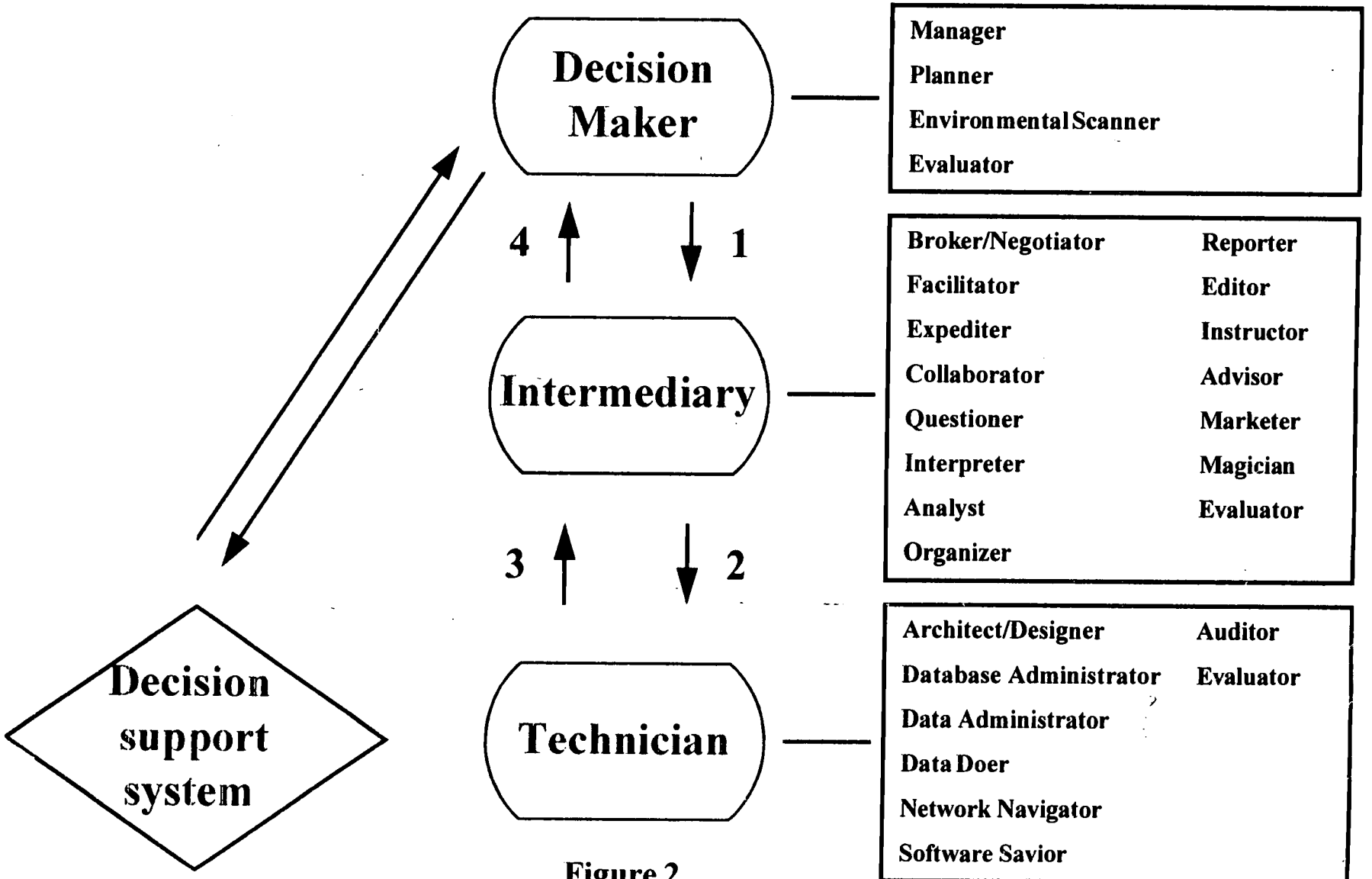


Figure 2

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