The 1967 investigation to examine and assess the Hamline University library's role in Hamline's educational program and to identify directions for its contributions to this program in the future are summarized in this study. The results of this study showed that the Hamline University was not meeting the information needs of the faculty and students. Based on the prediction that informational material will continue to increase in amount and diversity and that user needs will follow the same trend, it was apparent that, if the library continued to operate in the traditional mode, its contribution to the educational program would become progressively less significant. Thus, it was recommended that the library increase both services and resources by adding a switching center service. This service would establish a detailed specification of user information requirements and attempt to satisfy these requirements either through the collection at the Hamline University Library or by tapping the collections and services available at other information centers. With these arrangements the library could provide information support for all aspects of the educational program. The workability of the switching center system was demonstrated. (Author/IV)
A FEASIBILITY STUDY FOR ESTABLISHING
AN INFORMATION SWITCHING CENTER
AT HAMLINE UNIVERSITY

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Submitted as Annual Report
under NSF Grant GN-786

Hamline University,
St. Paul, Minnesota 55101

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A Feasibility Study for Establishing An Information Switching Center at Hamline University

I. Introduction

A. Background of Previous Descriptive Analysis

In 1967 The Hamline University Library under the sponsorship of the National Science Foundation initiated a study to examine and assess its role in Hamline's educational program and to identify directions for its contributions to this program in the future. In order to provide a complete picture, the study undertook to describe in some detail (1) the library operations and functions including personnel requirements and processing and service costs, (2) the information requirements of the members of the faculty and student body, and (3) the other libraries and information centers used by the Hamline faculty and students. The methods and results of this initial investigation are summarized here.¹

The description of the library was accomplished through (1) structured interviews with key personnel in each of the library's major departments: Acquisitions, Cataloging, Serials, Circulation, and Reference, (2) direct observation of book ordering and processing procedures, and (3) tabulation and analysis of library records. Information obtained from these three sources led to a detailed specification of the steps involved in acquiring, processing, storing and circulating books and periodicals, and a general characterization by academic area of the material held in the collection.

In order to establish a general understanding of user information requirements, open-ended interviews were conducted with a large percentage of the faculty and a number of students representing each academic department of the college. Specifically, these interviews were focused on describing the major activities of the faculty and students which required information support and the ways in which these requirements were satisfied. For the faculty members, these activities included teaching, administrative and committee work, and personal/professional endeavors; for students they included term papers, independent study projects, and general outside reading assignment.

Sources of information (libraries and information centers) remote from the Hamline campus were described through interviews with head librarians and by obtaining pamphlets and other documentation on services and materials. These descriptions were aimed at identifying collection strengths and weaknesses and in delineating the services offered and the procedures and costs associated with obtaining each service.

In general, the results of this study showed that the Hamline library, operating in a traditional mode, was not adequately meeting the information needs of the faculty and students. Through the interviews with the users, it was determined that many of their needs for materials and services were being satisfied by means other than the Hamline library. Both faculty and students found it necessary to go to other libraries to search for and obtain the materials they needed to support the performance of their academic tasks. It was also apparent that if the library continued to operate in the traditional mode, its contribution to the educational program
would become progressively less significant. This conclusion was based on
the prediction that the generation of informational material will continue
to increase in both amount and diversity and that user needs will follow
this trend. With a limited budget, and the requirement to process and store
all materials acquired, the library will necessarily fall further and fur-
ther behind in its attempts to make relevant material available.

Based on these findings, it was recommended that the library undertake
to increase both services and resources by adding a switching center service.
This service would first work to establish a detailed specification of
user information requirements and second, attempt to satisfy these require-
ments either through the collection at the Hamline library or by tapping
the collections and services available at other information centers.
External information resources include other college and university libra-
ries, government information centers, civic and social agencies, industrial
organizations, and professional societies. Switching center personnel would
develop methods for assessing user requirements and would set up procedures
and working agreements for obtaining materials and services from other infor-
mation facilities. Having these arrangements established through the lib-
rary should be more efficient than having each individual user make his
own arrangements. In concept, the library would be in a position to pro-
vide information support for all aspects of the educational program thus
freeing the faculty and students from the tasks of searching for and ob-
taining informational materials from sources remote from the Hamline campus.

The major aspects of the switching center service include:
- Information specialists on the library staff would function as
  a support organization, diagnosing needs of users on a continu-
ing basis and locating appropriate sources for satisfying those
  needs.
Information specialists would become more directly and actively involved in the educational process, working out explicit procedures by which to interact with faculty and students to provide support for their activities.

Formal arrangements would be set up with external sources of informational materials and services corresponding to categories of identified user needs.

Internally, the center would be geared to process large numbers of information requests, obtain relevant material, disseminate materials to users within specified time frames, obtain feedback from users on adequacy of the material, monitor new demands, and be aware of new materials as they become available.

Figure 1 provides an overview of the proposed system. First, main categories of users are identified and their information-related tasks defined. The information requirements associated with each task are identified and analyzed to derive a responsive set of information services. The materials required are obtained through the switching center either from the library or from relevant external resources. Information specialists on the switching center staff perform additional services on requested materials as needed (e.g., abstracting, data compilations, etc.). The materials are then made available via the library or delivered directly to the user who in either case evaluates their usefulness to his task. This evaluative feedback serves to modify the services provided by the system.

B. Purpose of Current Feasibility Test

The purpose of the present study was to test the feasibility of establishing a switching center service as part of the Hamline University library. The areas of feasibility to be explored included:
- The ability to provide a sufficiently detailed statement of user information requirements to serve as a basis for designing information services.

- The ability to set up cooperative arrangements with a sufficient number of external resources having materials and services relevant to the needs of the system.

- The ability to identify and establish system internal processing procedures required to fulfill different kinds of user requirements.

The results of the feasibility study will serve as a basic input to the proposed development and implementation of an information system for Hamline University.

C. Approach to Feasibility Test

One major focus of the feasibility study was the detailed specification of services to be performed by the switching center system. The approach taken was to derive these service requirements directly from the information needs associated with the major course-related tasks performed by the faculty and students. Task models were developed for five selected courses in which categories of information need (e.g., current awareness) were delineated for each major task (e.g., selection of topics to be included in the course). From these information needs, sets of service characteristics were developed. It was felt that tying the services directly to the users' tasks would enable the system to be more efficient in providing direct support and would facilitate evaluation of system products. The efficiency would result from the fact that each service or each set of materials provided to the user would be provided for a specific
Figure 1
Overview of Switching Center
CONCEPT OF OPERATIONS

- User Evaluation of System Products
- Delivery of System Products to Users
- Operations performed on Materials
- External Information Resources
- Library Collection (Specification of what should be held)
- Information Switching Center
- User Information Requirements (content and process)
- Materials and services needed to satisfy requirements

User Tasks
purpose -- the accomplishment of a specific task. Thus, the services included in the system would be specifically useful, not simply of general value. From an evaluation standpoint, each service could be examined in terms of its contribution to the task being performed. It was not expected that the task analytic approach would result in the identification of many new information services; however, it was anticipated that it would provide (1) a basis for determining user demand levels for each service and time constraints on the provision of services, (2) a set of guidelines for efficiently organizing the provision of these services from the standpoint of system internal operations.

A second major focus involved the development of a content structure to aid in organizing the subject areas treated in each course and to facilitate access to the materials included in these subject areas. This content structure was derived from a subject analysis which was designed specifically to reflect the professor's organization of the course content and the terminology he used in referring to the subject matter. This structured orientation to the content should be of value to professors and students in organizing study and in specifying topics for projects and papers.

The third major focus was the characterization of potentially relevant external information resources. This was accomplished through the use of a survey questionnaire mailed to other college and university libraries, industrial organizations, civic agencies, public libraries, and government information centers. The major areas addressed in the questionnaire
included: (1) the collection strengths and weaknesses, (2) the materials and services available, (3) the procedures required to make use of these services, (4) the average turn-around time associated with each service, and (5) the cost for the use of each service. The results of this survey were used to construct an external resource characterization file.

The fourth major area was the specification of the internal system tools and procedures. To provide a clearer definition of what was specifically required, the switching center was operated in an experimental mode; initial development of policies, procedures, and tools proceeded concurrently with the actual determination of real information requirements and the attempts on the part of the system personnel to provide services using the resources of the Hamline collection or other information sources. One of the principal functions of the system personnel during the experimental operation was to translate the content structure derived from the course and the professor's terminology into the organization and terminology used by external information sources.

D. Major Findings and Recommendations

Feasibility of the switching center concept was demonstrated by the following results:

- User needs could be adequately structured to provide a basis for the identification and provision of information services by the system. For each task or activity involved in the teaching process, the information requirements needed could be delineated and the services required to provide the needed information could be specified by means of the task analytic approach.
Content structures developed for some courses proved useful to both the professor and the students in understanding the content and specifying study topics.

Of the 195 external information sources identified as relevant to user interest areas, 87% offer services which have potential uses. The major areas of available services included: photoduplication, preparation of bibliographies, circulation of acquisition lists, interlibrary loan, selective dissemination, translation, and referrals.

As a result of the experimental operation, a number of system tasks were identified and a set of preliminary procedures and tools were developed for the internal operations of the switching center.

Based on these results, it is recommended that the switching center be further developed, evaluated, and implemented at Hamline University. This will involve the operation of the system in a pilot mode with a limited number of users, the generalization of pilot system results to the entire population of users, and the large scale implementation of the system.

E. Organization of the Report

The remainder of this report is divided into 4 major sections. The first two sections describe the methods used and the tools developed to describe user information requirements and the external resources which potentially match these requirements. The third section deals with how the system uses these and other tools in its internal operation and in its provision of services. The fourth section presents the conclusions drawn from the results of the feasibility study.
II. User Information Requirements

A. Introduction

To design an information system which is responsive to the needs of its users requires a complete and detailed specification of (1) the kinds of informational materials and services required by the users and (2) the level of demand and the time constraints associated with each service. One of the major aspects of this study was to examine the feasibility of developing such a description.

At a small liberal arts college the principal function of the professor is teaching and the main activity of the student is attending classes and preparing assignments. Thus, the academic course can be considered as the primary generator of information requirements for the professor in terms of preparing, teaching, and evaluating the course and for the students in terms of outside reading and report preparation. The initial step in the structuring of requirements, therefore, was the development of descriptive models of the teaching-related tasks performed by a selected group of professors. The process of preparing for and conducting a college course could be analyzed into component sub-tasks; and for each task identified, it was possible to determine the kinds of information materials and types of services which would aid in its performance.

Paralleling this effort was the development of user-specific content structures for some of the selected courses. Subject analyses and
structured lists of subject headings were developed to reflect the professors' content perspective, organization, and use of terminology. Further expansion of these tools is planned on the basis of feedback from student experiences with them.

Since student information needs are primarily dictated by the course structure and the professor's expectations of tasks to be accomplished and level of content knowledge to be achieved by the student, student information requirements were identified by discussions with the professor, through observation of the students' tasks as they occurred during the course, and by interviews with selected students following course completion.

B. Selection of Pilot Users

Five faculty members were included in the feasibility test. There were several considerations involved in the selection of the participants and the courses to be supported. These include:

- The professors selected should be interested and motivated. The development of a task analysis and a content analysis requires many hours of hard work for each participant. Success is based on two major factors: (1) the participants' belief that the initial time investment will have a valuable pay-off and (2) the participants' awareness of their need for improved information service.

- The courses selected should be in dynamically changing content areas, present a variety of teaching approaches, and represent different levels of student backgrounds. It was important to choose courses that would maximize the variability of service requirements encountered.

- The topics treated in the courses should be in content areas where information resources can be identified and where efficient service arrangements can be worked out.
The courses selected were (1) Economic Issues and Institutions, (2) The Age of Revolution, (3) Racial and Cultural Minorities, (4) Cell Structure and Function, and (5) Organismic Form and Function. The economics course is offered every term and is primarily for underclassmen. The history course is offered annually primarily for majors. The sociology course also offered annually is open to all students and attracts a very diverse student group. The two biology courses are completely new and being taught for the first time as part of major curriculum revision by that department.

C. Development of Task Analyses

Through a series of interviews, each professor was asked to describe in as much detail as possible the general concept and purpose of the course and the steps he performed to prepare and teach the course. The discussion conducted at the first meeting was general and for the most part unsystematic. From the results of this discussion, first approximation task models were developed which provided a framework for the second round of interviews, etc. At each successive stage new and more detailed model representations were developed and in turn discussed and revised. The end result was a detailed description of the tasks required in the teaching process, the guidelines or considerations involved with each task, and the types of information required to aid in the performance of each task (examples in Appendix A).

Two basic teaching models were identified: the first was based on
the lecture approach to teaching, the second stressed the teaching of processes through student participation. In actual practice elements of each model are likely to be found in any given course. The second approach required a significant amount of interaction between the professor and the students and significantly more information for all than the lecture approach. For the lecture-oriented approach most of the tasks requiring information support were concentrated in the course preparation phase. The major tasks identified include: specifying course objectives, selecting topics to be included in the course, choosing textbooks and supplementary reading, and preparing material for presentation. Many of the information requirements for these tasks can be anticipated in advance. For the process-oriented approach, many of the information-related tasks occur during the conduct of the course and their requirements cannot be anticipated in advance. These include perform laboratory problems (or experiments), and select, develop, interpret, and report on topics. Providing information support to tasks performed during the course requires quick response information services.

It may be helpful at this point to look at an example of a task and see how it can be elaborated to the point of specifying the combinations of system personnel and procedures to perform a specified service in response to a specific information requirement. Figure 2 shows one section of a task model. The model indicates that for the Topic Selection task, Professor A is guided by two major considerations (criteria) and has two primary areas of information requirements. From these stated requirements, a set of information services can be derived and the steps required by the system to perform these services can be specified. The final stage
Figure 2

Racial and Cultural Minorities Course
Task Category: Course Preparation

Criteria:

Topic should treat basic concepts, theories, and studies concerning prejudice and discrimination
Topics should be current and socially pervasive

Tasks:

Task 2
Select topic to be included in the course

Information Requirements:

Awareness of current events in prejudice/discrimination, etc.
Current awareness of events, people, attitudes, studies, programs, legislation

Information Services:

From external information source file, select source that performs current awareness services in this area. Request search, disseminate results to user.
Scan newspapers, magazines, journal tables of contents, abstracts, etc. and complete list of citations.
Disseminate results

Steps Required to Perform Service

Identify places where specific materials may be obtained.
Request documents or reprints.
Disseminate results.

Configurations for Performing Steps:

Clerks, resource files, materials received file, order forms, accounting forms, procedures for ordering, recording, and disseminating
Information specialist, key word selection procedure, search strategy
Clerks, resource files, materials received file, order forms, accounting forms, procedures for ordering, recording, and disseminating

Historical context of current issues
Retrospective search service in requested area for historical perspective
in the modeling is the determination of the personnel and procedures best suited to the performance of each step. Theoretically, all materials and services provided can be directly tied to one of the tasks being performed by the professor.

D. Tasks, Criteria, and Information Requirements

1. Course Preparation Tasks

The principal tasks in the course preparation and their relationships to each other are shown in Figure 3. The first task is the specification of objectives for the course, i.e., the determination of the professor's goals for the effect of the course on the student. Three general goals were identified: (1) acquisition of content knowledge, (2) development of skills in methods and techniques, and (3) establishment of appropriate attitudes toward the general subject field. Each professor in the interview sample was concerned with achieving all three goals to some degree; in all cases, however, one of the three goals was emphasized. Three professors were primarily concerned with instructing the students in the methods of the field, one with increasing the students' grasp of the content, and one with development of educated attitudes. For those courses where the emphasis was placed on methods, a substantial amount of student involvement and participation was required (i.e., learning by doing). In the courses where attitude development and content acquisition were of primary concern, the lecture method was the principal means of instruction. Only one of the five professors identified areas of information needed to help in the specification of course objectives (see Table 2). In general, this task involved the development of the professors' philosophical
Figure 3
Course Preparation Tasks and Their Interrelationships

1 Specify objectives for the course

2 Select topics to be included in the course

3 Select text and supplementary reading

4 Determine depth of coverage of each topic included in the course

5 Prepare materials for course presentation

6 Select specific supplementary reading
orientation towards the course and the subject matter of the field.

The second task in the course preparation phase concerns the selection of topics to be included in the course. Table 1 lists the criteria used by each professor in topic selection. These criteria specify the characteristics which a topic should have to be considered for inclusion in the course. Some examples of such criteria are:

- Topics should treat basic concepts and theories.
- Topics should be current.
- Topics should be broad in scope and have wide influence.
- Topics should provide tools/methods for making generalizations from specific experiences.
- Topics should be characterized as multidimensional, having several branches and subtopics.

The information requirements associated with topic selection are shown in Table 2. These information requirements can be classified in 3 general categories: (1) information concerning student background, level of sophistication and interest, (2) information on department curriculum at Hamline and at other universities teaching similar subjects, and (3) information characterizing the topic areas in the field. Some examples of the third category include: currency, maturity and sphere of influence of each topic considered, theoretical and historical context, underlying relationships in the subject field, and basic issues and problems.

The third task in course preparation is the selection of a textbook and the supplementary reading materials for students. Some of the professors considered this to be two separate tasks with the Supplementary Reading Selection task occurring later in the course preparation.
<table>
<thead>
<tr>
<th>Subject</th>
<th>Select Topics to be Included in the Course</th>
<th>Select Textbooks and Supplementary Reading Sources</th>
<th>Determine Depth of Coverage for Each Topic</th>
<th>Prepare Material for Course</th>
</tr>
</thead>
</table>
| Sociology | - Topics should treat basic concepts, theories and studies concerning prejudice and discrimination     | - Recency of publication  
- Facility of style  
- Comprehensiveness of coverage  
- Organization of text: major topics should be treated one at a time; all topics should be treated in each chapter  
- Supplementary material should compensate for text content weaknesses  
- Supplementary material should emphasize recent and critical issues  
- Supplementary material should provide good coverage of a narrow topic | - Currency and urgency of topic  
- Pervasiveness of topic | - Audio-visual aids should be used where possible  
- Level of topic presentation should match student level of sophistication  
- Guidelines for scanning, abstracting, extracting, summarizing information |
| Economics | - Topics should be well developed, mature issues  
- Topics should be current  
- Topics should be broad in scope, should have wide influence on economic picture | - Materials should provide adequate coverage of the topic  
- of the level of sophistication appropriate to student characteristics | - Pervasiveness of issue/topic | - Guidelines for scanning, abstracting, extracting, summarizing information |
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<tr>
<th>Subject</th>
<th>Select Topics to be Included in the Course</th>
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<th>Prepare Material for Course</th>
</tr>
</thead>
</table>
| Biology 15 | - Topics should emphasize cell function rather than cell structure  
- Topics should emphasize general concepts and principles of living things  
- Topics should provide tools/methods for making generalizations from specific experiences | - Text should emphasize cell biology from experimental point of view  
- Text should integrate lab and lecture sections of the course  
- Text should supply minimum of basic concepts and terminology | - Current state of subject matter in rapidly evolving areas should be presented to student  
- Audio-visual aids should be used when possible | |
| Biology 16 | - Topics should emphasize plant and animal structure and function at the organismic level  
- Topics should include application of materials to content areas  
- Laboratory topics should be broad enough to allow students to work at different levels depending on their ability | - Text organization should be comparable with course  
- Text should include both plants and animals  
- Supplementary materials should give good coverage to single topics | - Lecture materials and laboratory exercises should be integrated | |
<p>| History | - Topics should be characterized as multidimensional, having several branches and sub-topics | - Material complexity should match with student level of competence | - Audio-visual aids should be used when possible | |</p>
<table>
<thead>
<tr>
<th>Subject</th>
<th>Specify Objectives for the Course</th>
<th>Select Topics to be Included in the Course</th>
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<td>Most often cited studies in each major topic area</td>
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<td>Characteristics of topics: currency, maturity, sphere of influence</td>
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<td>Subject</td>
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<td>Biology</td>
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<td>Biology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Methods for teaching research tools in Biology</td>
</tr>
<tr>
<td>Subject</td>
<td>Specify Objectives for the Course</td>
<td>Select Topics to be Included in the Course</td>
<td>Select Textbook and Supplementary Sources</td>
<td>Determine Depth of Coverage for Each Topic</td>
<td>Prepare Materials for Course</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------------------------------------------------------------</td>
<td>-------------------------------------------</td>
<td>------------------------------------------</td>
<td>-------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Biology 16</td>
<td>- Description of courses in Biology of Organisms being taught at other universities&lt;br&gt;- Student background&lt;br&gt;- Materials included in textbooks&lt;br&gt;- Adaptive problems which organisms are faced with&lt;br&gt;- Relationships between structures, functions, and environments</td>
<td>- Information on published textbooks&lt;br&gt;- Information on available single topic monographs</td>
<td></td>
<td>. Texts and general reference books covering content areas included in the course&lt;br&gt;. General background materials in topic areas where the professor has limited knowledge&lt;br&gt;. Methods for teaching research tools in Biology&lt;br&gt;. Methods for teaching use of literature search tools&lt;br&gt;. Original papers which are specific to the equipment and techniques to be used in the laboratory</td>
<td></td>
</tr>
<tr>
<td>Subject</td>
<td>Specify Objectives for the Course</td>
<td>Select Topics to be Included in the Course</td>
<td>Select Textbook and Supplementary Sources</td>
<td>Determine Depth of Coverage for Each Topic</td>
<td>Prepare Materials for Course</td>
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<td>------------------------------------------</td>
<td>------------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>History</td>
<td></td>
<td>Characteristics of information support materials</td>
<td>Level of sophistication of available material</td>
<td>Student characteristics</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td>. Accessibility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>. Depth of coverage</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>. Currency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>. Diversity of themes/perspectives</td>
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</tr>
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<td></td>
<td></td>
<td>. Amount</td>
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</tbody>
</table>
Figure 3). The criteria associated with text selection (Table 1) include material organization, recency of publication, topic coverage, and level of sophistication relative to student competence. The major information requirement identified by all 5 professors as relevant to the performance of this task was the need for descriptive material and critical reviews covering the content and level of treatment of textbooks currently available in their respective subject areas (Table 2). For selection of supplementary reading assignments, descriptive information on single topic monographs and articles was required.

The fourth task is the determination of the depth of coverage for each topic selected for inclusion in the course. Only two of the five professors considered this as a separate task. The basic considerations influencing decisions as to depth of coverage were the currency, urgency, and pervasiveness of the topics (Table 1). For each topic considered, information was needed regarding (1) the availability of materials on the topic and (2) the depth at which the topic was treated in the literature (Table 2).

The fifth and final task identified was the preparation of materials to be presented in the course. There are a number of processes involved in preparing a set of lectures, discussions, or laboratory problems (or experiments). Materials must be selected, read/scanned, summarized, abstracted or extracted, and integrated into a coherent presentation. The major consideration involves the establishment of guidelines for how to most effectively process and utilize the relevant material selected for review (Table 1). Additionally, most of the professors indicated a concern for making use of audio/visual aids where applicable or useful.
The material preparation task generates the major portion of the information requirements. In preparing lecture materials, the professor needs a variety of information on the specific topics to be presented. He needs texts and general reference books, selected articles from the professional literature, audio/visual material, answers to factual questions, and materials on teaching methods (e.g., methods for teaching the use of literature search tools -- see Table 2 for a detailed list).

2. Course Participation Tasks

The information related tasks which occur during the course conduct are, for the most part performed by students. These tasks are related to the accomplishment of class reading assignments, supplementary reading, laboratory problems and experiments, class participation, and term projects and papers. A variety of combinations of these tasks may be required in different classes; not all of them will be present in every class. An example of all the tasks combined into a single course is shown in Figure 4.

The first task, acquisition of basic principles, is usually supported by the lecture, the textbook, and provision of required materials on reserve in the library. An enterprising student however may well develop interest in identifying and locating relevant material beyond that required by the instructor.

The different types of student project tasks provide a variety of information requirements. Criteria for topic selection and topic refinement by students are similar to those identified by faculty in their course topic selection tasks (Table 1) with two additions: (1) the topic be
Task 1
Acquisition of Basic Principles

A. Attend class and read assignments

B. Take course examinations

Task 2
Topic Selection

A. Select general topic for class presentation

B. Select general topic for laboratory project

C. Select general topic area for term paper

Task 3
Topic Refinement

A. Narrow and refine topic

B. Plan laboratory project

C. Narrow and refine term paper topic

Task 4
Topic Development

A. Develop topic for class presentation

B. Conduct laboratory experiment

C. Develop specific topic

Task 5
Output

A. Give class presentation

B. Write laboratory report

C. Write term paper
specific enough for the student to develop and handle within the constraints of time and background, (2) some information or raw data on the finalized topic be available or obtainable. In applying these latter criteria the student will usually consult with either or both the professor and the information specialist. The information needed to support the topic selection tasks usually takes the form of general works and review articles.

The next set of tasks, topic development and output, places the greatest information requirement on the switching center system. Depending on the objective of the assignment the service needed may range from minimal guidance in bibliographic searching to extensive searching and provision of material by the information specialist. One particular requirement for certain student projects is the preparation of visual aids in the form of graphics, illustrations, slides, transparencies, or films.

3. Summary

For each of the major tasks identified in course preparation, conduct, and participation, it was possible to delineate categories of informational support. The initial tasks in course preparation which deal with selection processes require information on the characteristics of topics and materials: how current they are, how broad they are, how well developed they are, and how effectively they are organized and presented. The task involving the preparation of materials for course presentation requires the provision of content and methodological information (primary sources) in the topic areas to be presented. Thus, descriptions characterizing the topics are needed first followed by information in the topic areas themselves.
The information-related tasks occurring during course preparation are reading assignments, laboratory problems, class presentations and term projects and papers. The information needed to support these tasks ranges from factual textbook type material to primary source material and includes non-print as well as print material.

The completed task analyses and related information requirements are used by information specialists on the library staff as a structure for providing responsive services. As services are provided, they are evaluated by the professor and students. The task analyses may be updated by the information specialists as new information and service requirements occur. Frequent interaction between the information specialist and the professor and students is required to insure an adequate flow of information requests, feedback, and the provision of satisfactory services.

E. Content Characterization

A content structure was desired to characterize the subject of each course in the experimental sample and to provide system continuity in the event of system personnel change. The tools used in this characterization include: (1) a detailed subject analysis, (2) a structured list of subject headings, and (3) a modified uniterm index system. The subject analysis is constructed to reflect the professor's concept of a given course, the topic areas emphasized, and the relationships perceived. The structured list of subject headings derived from the subject analysis serves to reflect the terminology used by the professor. The third tool, the uniterm index provides a system for classifying the documents obtained in each subject area.
1. Subject Analysis

The subject analysis is developed through a series of in-depth interviews between an information specialist and the professor. The first step in these interviews is the determination of the topics and subtopics included in the course and the areas emphasized. This step is facilitated by the use of materials which the professor has prepared on topic presentations for the course such as (1) course outline or syllabus, (2) reading lists, and (3) tables of contents of textbooks. Through a series of discussions the information specialist and the professor develop a detailed description of each topic. These descriptions reflect the professor's perspective on each topic, the depth of detail with which each will be treated in the course, the way in which the professor relates the topic areas to each other, and the terminology which the professor uses in conjunction with each topic area.

In the case of the history course it was decided to relate the professor's description of the topics to the general subject field as a whole. This was accomplished through a general review of the literature in the subject field focusing on topics included, topics emphasized, and topic relationships established. The results of this review, together with the professor's description, were used to construct a rough classification of the subject, including all the major topics. This preliminary classification attempted to emphasize the topics which the professor emphasized and to relate the topics as he related them. The classification was presented to the professor in a tree diagram or outline form (see Figure 5, Part I) for review and modification. Several sessions between the information specialist and the professor were required to generate a subject
Figure 5
Development of Content Characterization

Part I. Sample Subject Analysis of Business Enterprises

Tree Diagram

Business Enterprises

- Organization of resources for production
  - Proprietorship
  - Partnership
  - Corporation

- Issues of market power
  - Public utility and administrative commissions
  - Enforced workable competition

Characteristics of corporations
- Capital stock
- Giant corporations
  - Internal growth
  - External growth
  - Conglomerates

Ownership
- Control
- Significance

Outline

1. Business enterprises
   A. Organization of resources for production
      1. Proprietorship
      2. Partnership
      3. Corporation
         a. Characteristics of corporations
         b. Capital stock
         c. Giant corporations
            (1) Internal growth
            (2) External growth
            (3) Conglomerates
            (4) Ownership
            (5) Control
            (6) Significance
   B. Issues of market power
      1. Public utilities and administrative commissions
      2. Enforced workable competition
analysis which the professor felt was representative of his course and the
literature in the field. Further modifications to this analysis will be
required after experience with it in the course.

The basic functions of the generated subject analysis include:

- The definition and documentation of topic and terminology relationships which were previously only in the mind of the professor.
- The provision of a framework for interpreting the information requests put to the system as a result of the course.
- The provision of a framework to help the student see each concept in context.
- The provision of a basis for developing the structured list of subject headings.

2. Structured List of Subject Headings

The development of a structured list of subject headings from the completed subject analysis is a mechanical operation. Essentially, this list is an alphabetical arrangement of all the terms used in the classification schedule. After each term is a description which relates it to the original schedule. The function of the list is to guide the student in examining a term to see its various interrelationships to other terms in the field; i.e., it shows those terms which are broader, those which are related on the same level, and those which are narrower or subordinate.

The procedures followed in developing the structured list of subject headings are shown in Figure 5, Part II, Steps 1-4. The first step involves the development of a set of 3 X 5 cards; each card carrying a term used in the subject analyses. The next step (Step 2) is to enter on each term card the terms which are immediately superordinate (under Term -- BT) to the term, those which are related on the same level, and those which are narrower or subordinate.
Part II. Development of Structured List of Subject Headings

Step 1: A note card is made for each term used in the classification schedule from beginning to end.

- Enforced workable competition

Step 2: The immediate surroundings of each term are recorded with B.T., R.T., and N.T. notations.

**Business enterprises**
- Organization of resources for production
- Issues of market power

**Capital stock**
- Characteristics of corporations
- Capital stock
- Giant corporations

**Corporation**
- B.T. corporation
- R.T. characteristics of corporations
- Giant corporations

**Partnership**
**Proprietorship**

**Organization of resources for production**

**Business enterprise**

*BT - Broader Term  RT - Related Term  NT - Narrower Term*
Step 3: The cards are arranged in alphabetical order.

Significance of giant corps.

Control of giant corporations
Conglomerates
Characteristics of corporations
Capital stock
Business enterprises

Step 4: Cards are added for synonyms, near-synonyms, and terms commonly used in the literature which the professor either omits or to which he ascribes other than the commonly used meaning.

Control of giant corporations
Conglomerates
Characteristics of corporations
Capital stock
Capitalistic enterprises see: business enterprises
Business enterprises
Administrative commissioners use: public utilities and administrative commissions
(Related Term -- RT), and those which are immediately subordinate (Narrower Term -- NT). Once this procedure is completed for every term card, the cards are arranged in alphabetical order (Step 3). The final step is to add cards for synonyms, near synonyms, and related terms (Step 4). The cards developed in this step carry "see" and "use" instructions.

When the structured list of subject headings is completed in card form it is transferred to standard 8 1/2" X 11" sheets of paper (see Appendix B for sample).

Copies of the structured list of subject headings are made available for use in the professor's office, in the information specialist's office, or in some cases given to each student.

3. Uniterm System

The third basic tool derived from the user-oriented subject analysis is a method of minimal indexing and record keeping. After it is decided a document should be retained for subsequent usage, it is indexed with all relevant terms from the subject heading list. The document identification number is recorded on a uniterm card for each of those descriptions and the document filed in a course file by identification number.

As with other uniterm systems there is a card for each term. Document numbers are recorded on the cards of the terms to which they apply in the column which corresponds to the last digit of the document identification number. See Figure 6. When performing a retrieval operation, the numbers on the cards are compared for each of the terms in the query. The system is different from the standard uniterm system in that subject
**Figure 6**

Uniterm System

Search Topic: Large Corporations in the U.S.

<table>
<thead>
<tr>
<th>Corporations</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<th>5</th>
<th>6</th>
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<th>8</th>
<th>9</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>182</td>
<td></td>
<td></td>
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<td>27</td>
<td></td>
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<table>
<thead>
<tr>
<th>Conglomerates</th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<th>4</th>
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<td>15</td>
<td>6</td>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. Uses of Tools

In concept, the content structuring tools discussed in this section are of value to three groups: the professors, the students, and the information specialists. The professor uses the subject analysis to formulate and revise the structure for the course and to relate the various sections of the course. For the student and the information specialist, the subject analysis provides an overview of the course, showing the interrelationships of the topics included and their relative importance.

The second tool, the structured list of subject headings, aids the student in narrowing and defining a topic of interest and in discovering other closely related topics.

The third tool, the uniterm index, is useful to professors, students, and information specialists in determining what materials on a given topic have already been acquired and retained in the system.

System continuity can be provided by the content characterization tools described where they are applicable. In instances where they are not developed, course outlines, syllabi, and tapes of information specialist interviews of faculty can be used as substitutes.
III. External Resources

A. Introduction

Major functions of the information switching center are (1) to identify information resource centers external to Hamline University having materials and services which match the information requirements of Hamline users, and (2) to set us working arrangements with those resource centers which are willing to cooperate. This section of the report describes the survey of external resources and the results obtained from the survey.

B. Identification and Survey of External Resources

Information facilities which appeared to have materials and services matching the topic areas covered in the courses included in the pilot sample were identified through standard directories of information sources. These directories included descriptions of the subject areas in which the library specializes and the types of services it offers. In addition, a list of local information facilities was obtained. Altogether 195 facilities were identified. These facilities include: college and university libraries, civic organizations and research institutes, government agencies and information centers, public libraries, and industrial and commercial organizations.

Each of the 195 facilities was asked to respond to a one-page questionnaire. This questionnaire was designed to obtain information in the following major areas:
The content characteristics of the collection: General subject areas collected in depth and special collections held.

The services which are offered to other libraries: Specific services offered relative to its collection.

The procedures required to make use of each service: Special forms and procedures to be used.

The cost associated with each service.

The turn around time associated with each request for service.

If a response was not received within two weeks of mailing the original questionnaire a follow-up questionnaire form was mailed. Of the 195 facilities surveyed, 170 (87%) responded to the questionnaire.

C. Survey Results

The results of the survey are shown in Table 3. Of the 170 respondents, 70% offered at least one service. The principal services identified were photoduplication (69 facilities), sale of microfilm copies (26 facilities), preparation of bibliographies (42 facilities), list of acquisitions (48 facilities), and interlibrary loan of books and other materials (80 facilities). Services offered with less frequency were selective dissemination, translation, and referrals. The turn around time for obtaining these various services ranged from 1 day to 2 weeks.

The average cost for photoduplication was 12 cents a page; for microfilm, 6 cents a frame. Some of the libraries offering these services required cash in advance. Prepared bibliographies and lists of acquisitions were generally treated as library publications; some of these were offered free, others had established costs from one to five dollars. Sixty-five of the 80 facilities offering interlibrary loan services used
<table>
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<tr>
<th>Services</th>
<th>Colleges and Universities</th>
<th>Civic Organizations and Research Institutes</th>
<th>Government Agencies</th>
<th>Public Libraries</th>
<th>Industrial and Commercial Organizations</th>
<th>Other</th>
</tr>
</thead>
<tbody>
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<td>Xeroxing or copying</td>
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<td>11</td>
<td>6</td>
<td>7</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Sale of Microfilm</td>
<td>14</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Preparation of bibliographies</td>
<td>17</td>
<td>8</td>
<td>11</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Lists of acquisitions</td>
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<td>12</td>
<td>11</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
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<td>Interlibrary loan</td>
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<td>9</td>
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<tr>
<td>Mailing lists</td>
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<td>14</td>
<td>16</td>
<td>1</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
the Standard American Library Association format. Requests for other services in most cases were required in written form, however, no standard format was specified.

A Resource Characterization card file was developed from the survey results. Each card in this file carries a description of one information facility. Figure 7 provides an example of the card format. The file can be used by the information specialists as an aid to selecting the most probable resource to fill a specific request. As new resources are identified they will be added to the file.

D. Other Sources of Local Support

Locally the Hamline University library is participating in a cooperative network with six other small liberal arts college libraries. The current plans of the network call for making materials in each collection quickly available to all faculty and students of the participating institutions. A regular pick up and delivery service among the seven college libraries is currently operating. In addition, a union list of periodicals is under preparation. Longer range plans call for coordinating purchases, developing a centralized storage collection of little used materials and establishing a single technical processing center for all participating libraries. Additionally, the Hill Reference Library in St. Paul, Minnesota is currently considering a proposal to provide switching center services to local colleges. This would be of significant value to the Hamline switching center in that many requests for materials could be funneled through the Hill Library.
### Figure 7
Resource Characterization Card

#### Side 1

<table>
<thead>
<tr>
<th>Service</th>
<th>Yes/No</th>
<th>Time</th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>Interlibrary Loan</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Pictures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microfilms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Books</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Translations</td>
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<tr>
<td>Bibliographic Search</td>
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<td>Prepared Bibliographies</td>
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<tr>
<td>Microform for Fee</td>
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<td>Referral</td>
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<td></td>
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</tr>
<tr>
<td>Index</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Citation Index</td>
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#### Side 2

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<td>Microform for Fee</td>
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<td>Referral</td>
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<tr>
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<tr>
<td>Citation Index</td>
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</tr>
<tr>
<td>Publication List</td>
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</tbody>
</table>

III-5
IV. System Operations and Services

A. Introduction

Theoretically the function of the switching center system is to work as an intermediary between the faculty and students and the information resources available for meeting their requirements. The user task analyses and content characterizations should provide the basis for determining the services to be provided, and the Resource Characterization File should be the principal guide to selecting and tapping relevant sources of information. To insure an efficient linking between the user and the materials, system tasks must be specified and procedures and forms must be developed.

This section of the report describes the results of a limited operation of the system on an experimental basis. The primary functions of this experimental operation were (1) to delineate the information service characterizations and the personnel tasks associated with the provision of the services, (2) to document the procedures associated with these tasks, and (3) to obtain evaluative feedback on the provision of services.

B. Experimental Operation

During the experimental operation of the system full information support was provided to two of the five courses in the pilot sample and partial support was provided to a third course. Support for the remaining two courses is underway in the spring term of 1970. The experimental system was staffed with two information specialists. Their principal functions included:
- The development and documentation of procedures for working with system users to better define their information requirements.
- The development and documentation of internal procedures and forms for providing services to the user.
- The development and documentation of procedures for ing materials from external sources of information.
- The design of forms to obtain feedback from the user as to the adequacy of the material provided by the system.

A substantial portion of the information specialists' time during the experimental operation was devoted to record-keeping tasks. As a means for documenting procedures, information specialists maintained detailed daily diaries.

1. Information Specialist and User Interaction

To establish an adequate flow of information requests, services, and user feedback, between 30 and 40 information specialist/professor contacts were required during the time period in which the course was prepared and taught. Some of these contacts involved extensive face-to-face discussions of specific topic areas and information requests, some were shorter sessions either in person or by telephone concerning a single question or request, some involved the delivery of materials, and some concerned the determination of the adequacy of materials and services provided. Additionally, information specialists attended class sessions to further their understanding of the subject matter and to better comprehend the professor's objectives, teaching methods, and the real problems which develop. Being in the class sessions helps the specialists establish contact with the students taking the course and provides an opportunity for the class members to raise questions and problems about information gathering for general discussion.
a. Information requests - During the early stages of support for course preparation activities, the principal contact with the professor took the form of extensive face-to-face interviewing. This allowed the information specialist (1) to become familiar with the specific topics of interest to the professor and their relative priorities, (2) to develop and modify the content characterization tools, (3) to receive, discuss and refine specific information requests, and (4) to obtain feedback on the specific support provided.

Throughout the sessions, the task analysis was used as a basic structuring tool. Each time a specific request was made by the professor, he was asked to describe the basis of his request (i.e., what use he planned to make of the information). In this way, each request was related to a task in the teaching model. If the request related to a task not included in the model, the model was revised accordingly. Each information specialist kept a notebook describing the specific request associated with each information requirement and each task.

Five general types of information requests were received from the professors being supported. These include (1) literature searches (retrospective, current awareness), (2) location of specific citations, (3) acquisition of material from a specific organization, (4) answers to factual questions, and (5) compilation of extracted material on a given topic. The categories of materials specified in these requests were original articles or books, review articles, bibliographies, abstracts, tables of extracted materials, compilations of fact, and various types of audio/visual materials.
Student requests for information generally resulted from course project tasks. Several of the students used the information specialist to help them define their topics and identify and locate materials relevant to their projects. Support took the form of literature searches, verification of specific citations, and delivery of potentially useful items. Many of the materials provided to the professor for course preparation were used by the students in developing their topics and producing their course projects.

b. Evaluative feedback - In the early stages of experimental system operation, the supported professors were asked to describe either verbally or in written form their evaluation of each service provided. This procedure was not particularly effective; first, because there was usually a time lapse between the review or use of specific material and the discussion focused on the evaluation of the material and second, because the evaluative response requested by the information specialist was not sufficiently structured. As a result a Material Evaluation Form was developed (see Figure 8). This form was attached to each piece of material delivered to the professor by the system. The first section of the form is filled out by the information specialist. This section states the topic covered and the task for which the material was provided. The second section of the form requires the professor to indicate whether the material was useful and the task(s) for which it actually was used. If the material was not useful, the form provides a section for indicating the reason. The information obtained from these forms allows the information specialist to adjust the services to better meet the requirements. It shows whether the material was useful for the originally specified task
Figure 8
Material Evaluation Form

To __________________________ Date ______________ Code No. __________________

For Topic or Subtopic ________________________________________________________

For Task ________________________________________________________________

<table>
<thead>
<tr>
<th>Topic Selection</th>
<th>Text Selection</th>
<th>Preparation for Lecture</th>
<th>Preparation for Lab</th>
<th>Selection of Supplementary Reading Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Assigned Reading Lectures</td>
</tr>
<tr>
<td>Specifi cally Useful</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generally Useful</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Useful</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If not useful:     ___ too general     ___ too sophisticated     ___ irrelevant     ___ too old
                     ___ too specific     ___ too elementary     ___ redundant     ___ other (specify)

Useful for:     ___ another course (please specify) ________________________________
                     ___ another topic (please specify) ________________________________
                     ___ I would like to have a copy _________________________________
                     ___ Put ___ copies on reserve _________________________________
                     ___ Other: ________________________________________________________
or for some other task(s) and it points out those characteristics of the material which made it unusable for the course. A similar form has been developed to obtain evaluative information from students.

2. System Internal Forms and Procedures

A set of internal processing forms was developed to document the steps, the cost and the time associated with filling each type of information request. The form designed to characterize a topic search request (Figure 9) includes information about:

- The user task or tasks which are to be supported by the request and the principal user of the resulting material (professor; student).

- The general description of the topic and the key words selected for initiating the search.

- The search strategy employed for identifying relevant items and places for obtaining these items.

- The general requirements specified by the user: time limits, bibliographic form, physical form (xerox, microfilm, etc.).

- The data for evaluation of the search (e.g., time required, number of items identified, percentage of order filled).

Three other request forms are included in the set: (1) location of a specific citation, (2) acquisition of information from a specified organization, and (3) answers to factual questions. These forms vary in minor ways from the form described above (see Appendix B). Each information request form is accompanied by a series of citation cards (Figure 10), each carrying a reference identified in response to the request. Both the information request forms and the citation cards were designed as data collection devices as well as system processing aids. When the system becomes operational, some of the categories of documentation will be omitted.
1. Requestor's Name

2. Course

3. Activity:
   - topic selection
   - supplementary reading selection
   - lecture supplement

4. Principal user:
   - professor
   - student

5. Request received
   - search initiated
   - search completed

6. Topic description

7. Key words selected for search

8. Search strategy:
   A. Identify items
   B. Identify resources

9. Time limits set by requestor

10. Bibliographic form desired by requestor:
    - full text
    - abstract
    - other

11. Physical form desired by requestor:
    - micro
    - xerox
    - original
    - other

12. Statistics for evaluation:
    - time required to identify relevant items
    - time required to identify best resource
    - number of items ordered
    - number of resources used

Percentage of order filled:
- less than 1 week
- 1 week
- 3 weeks
- 2 weeks
- 1 month
- unfilled
The information recorded on each request form covered the steps taken by system personnel to locate and obtain information relevant to the request. If the obtained information is not in the form desired by the professor, information specialists have to perform the additional steps associated with appropriately modifying the material. One example of this is the compilation of extracted material on a specific topic. Documentation of these tasks is included in the daily diaries.

Through an analysis of the data recorded on the request forms and in the diaries of the information specialists, a large number of tasks associated with the experimental system operation were identified. These tasks fall into five major categories:

- Identifying, finding, scanning, and selecting material relevant to each request.
- Locating, ordering, retrieving, delivering, and returning materials.
Preparing products for distribution to the professor/student.

- Developing files of materials for the course (e.g., theory file, laboratory file, etc.).

- Keeping system records and data collection forms.

The specific tasks included in each of the above categories are shown in Table 4. Although most of these tasks were performed by information specialists during the experimental operation, many of them are clerical in nature. In one instance the professor developed and maintained the file of materials. Table 4 provides a general allocation of tasks between clerical and professional functions. Based on experience in the pre-system library operation at Hamline, a great deal of each of the professional tasks in the second category in Table 4 can be performed satisfactorily by clerical personnel under specialist training and supervision.

The following description provides an example of the sequence of internal processing steps required to fill a request. In this example, the professor has provided the system with a description of the general topic area. The product he desires is a compilation of extracts on this topic.

Step 1: A topic search request form is filled out indicating the teaching task associated with the request, the primary user of the material, the general description of the topic, and the characteristics of the product desired by the professor.

Step 2: Some general articles are read on the topic to help the information specialist provide better definition of the topic.

Step 3: A general search strategy is developed and pertinent bibliographic tools selected for use.

Step 4: Relevant key words/descriptors from the selected bibliographic tools are identified.

Step 5: A literature search is performed using relevant abstracting journals, bibliographies, tables of contents, etc. (This may be performed at the Hamline library or at another information facility.)
<table>
<thead>
<tr>
<th>Task Category</th>
<th>Professional Tasks</th>
<th>Clerical Tasks</th>
</tr>
</thead>
</table>
| Interaction with users        | - Meetings with professors and students to establish information requirements and to obtain evaluative feedback  
- Attend classes for purposes of subject structuring  
- Structuring and organizing professors file | - Delivering materials to users                  |
| Identifying, finding scanning, and selecting materials | - Reading articles to understand request  
- Retrospective literature search  
  - at Hamline  
  - at other local libraries  
- Current awareness scanning on a regular basis  
- Review materials for relevance and level of sophistication  
- Review new books  
- Identify books and journals to be purchased for the library  
- Identify supplementary materials to be put on reserve | |
| Locating, ordering, retrieving, and returning materials | - Verify references  
- Check location of journals, books, visual aids  
  - Check card catalog, shelf list, etc.  
  - Check resource characterization file  
- Find addresses  
- Order materials  
  - Form or letter  
  - Telephone  
- Retrieve and return materials  
  - Book store  
  - Stacks  
  - Acquisitions or cataloging office  
  - Departmental libraries  
  - Other local libraries | |
Table 4 (Cont.)

<table>
<thead>
<tr>
<th>Task Category</th>
<th>Professional Tasks</th>
<th>Clerical Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product preparation</td>
<td>. Extracting</td>
<td>. Sorting materials received</td>
</tr>
<tr>
<td></td>
<td>. Abstracting</td>
<td>. Typing excerpts, abstracts, summaries</td>
</tr>
<tr>
<td></td>
<td>. Summarizing</td>
<td>. Xeroxing</td>
</tr>
<tr>
<td></td>
<td>. Compiling</td>
<td>. Collating, trimming, and stapling</td>
</tr>
<tr>
<td>File preparation</td>
<td>. Assemble articles into organized topics</td>
<td>. Maintain and update uniterm card file</td>
</tr>
<tr>
<td></td>
<td>. Develop and update files</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Assign terms to materials</td>
<td></td>
</tr>
<tr>
<td>Record keeping and data collection</td>
<td>. Develop record-keeping forms</td>
<td>. Add to citation cards information on ordering, receiving, and disseminating material</td>
</tr>
<tr>
<td></td>
<td>- Modify task charts</td>
<td>. Fill out data collection forms for system evaluation</td>
</tr>
<tr>
<td></td>
<td>- Develop subject characterizations and uniterm file</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Fill out information request forms and citation cards</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Organizing and reviewing card file</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Fill out data collection forms for system evaluation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Record discussions with professors and students</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Keep a daily diary</td>
<td></td>
</tr>
</tbody>
</table>

IV-11
Step 6: A citation card is filled out for each article, book, etc. identified as possibly relevant.

Step 7: The Hamline library is checked for articles and books identified as relevant to the topic. (If a book or article is not in the Hamline library and is judged to be of definite use, the information specialist will recommend that the library acquire it for the general collection.)

Step 8: The resource characterization file is checked for potential external sources.

Step 9: Bibliographic tools, such as the National Union Catalog, Union List of Serials, etc., are searched for specific location of books and articles.

Step 10: Books (ILL) and articles are ordered. (Pick them up or have them sent.)

Step 11: Received materials are reviewed/scanned for relevance. Unusable materials are returned or discarded.

Step 12: If selected articles or books need to be returned, a copy of relevant material is made and collated.

Step 13: Relevant sections from books and articles may be extracted and compiled.

Step 14: A final draft of material to be delivered to the professor is typed. An additional copy for retention by the information specialist is made.

Step 15: A material evaluation sheet is attached and the material is delivered to the professor.

3. Experimental System Results

In support of the three courses, the staff of the switching center have ordered from external sources or obtained from the Hamline library 527 articles and pamphlets and have recommended that the Hamline library acquire 25 books and 13 journals for its permanent collection. In some cases the material received was free in other cases there were page charges for copying. Support was also obtained through interlibrary loan of books from local college libraries (members of the cooperative
program). Approximately 20% of the materials obtained by the switching center in response to user information requirements came from the Hamline collection.

From the materials collected, a number of files organized by major subject headings were created for each course (laboratory file, theory file, etc.). Many of the materials included in these files were first used by the professor for course preparation and later used by the students for outside reading, oral report preparation, laboratory project work, and term paper writing. Additionally, a materials file was developed and located in the library. The items in this file proved extremely useful to several students in developing their term projects. In some instances assigned and optional readings were placed on reserve at the library circulation desk. This was usually done when multiple copies were needed to permit all students to use the material in a given time frame.

During the experimental operation, data were obtained on material costs, search time, number of resources tapped, and turn around time for these resources (a breakdown of this information is shown in Appendix B). The average cost of the materials obtained was 90 cents per item. The search time required to identify a relevant document ranged from 2 minutes to 2 hours with an average time of 20 minutes. Overall 25 resources in addition to the Hamline library were used in support of three courses. For local resources such as the University of Minnesota, materials were obtained within one or two days; the time required by other resources such as government agencies and civic organizations ranged from 1 week to 5 months with an average time of 4 weeks. When outside resources in the Twin Cities were used every effort was made to perform off-site
tasks with system personnel and minimize the time material was unavailable to the institution's clientele. The exception to this was the use of member libraries of the cooperative organization, CLIC, which libraries have special procedures established to handle outside requests.

At the present time little objective data concerning the usefulness of the materials has been collected as the document evaluation forms were not in use during the major portion of the experimental operation. Subjectively, however, each of the professors has indicated that most of the material obtained for their support had been useful to them or to their students. In addition, the professors felt that the system saved them time and provided them with more material than they would have obtained on their own. It is planned to institute a measurement system to assess effectiveness of those courses supported during the fall of 1970.
V. Summary and Conclusions

The purpose of this study was to demonstrate the feasibility of adding a switching center service to the Hamline University library. The three major areas of concern were (1) to describe user information requirements in sufficient detail to specify system services, (2) to set up cooperative arrangements with other information facilities, and (3) to examine and delineate the internal system processing procedures required to link the user with the sources of relevant information. A number of tools were developed during this effort. These include:

- Descriptive models of the course preparation and course conduct activities of the five professors selected for the pilot sample.

- Subject characterizations of the courses based on the professor's perspective, the areas he emphasizes, the topic relationships he establishes, and the terminology he uses.

- Forms for collecting usage data from the professors and students supported.

- An external resource characterization card file describing the collections, services, procedures, costs, and response time associated with each resource identified.

- Information request forms and citation cards used for internal processing and data collecting concerning the system operation.

- Modified uniterm indexes for filing materials obtained by the system.

The development of descriptive teaching task models and subject characterizations served as a means for organizing the professor's ideas and activities relative to the course, as a structure for the provision of responsive information services by the system and as an aid to the information specialist in specifying and filling specific requests. As experimental system operations continue and services are provided, it is hoped
that a generalizable pattern of user tasks -- information requirements -- information services will be established. Such a pattern will provide a useful input for the determination of level of demand, frequency of demand, and time constraints associated with each service. The material evaluation forms attached to each item disseminated or filed will provide valuable guidance concerning the adequacy of each service and the ways in which it should be modified.

The resource characterization card file contains the results of a survey of information sources identified as having material relevant to the users' information needs. Approximately 120 resources are included in this file. Each of these resources provides services in one or more of the following areas: photoduplication, preparation of bibliographies, listing of acquisitions, interlibrary loan, selective dissemination, translation, and referrals. In addition to services, information costs, procedures, and response time are recorded for each resource. This file provides a means of identifying, comparing, and selecting resources to be used in filling service requests.

The information request forms and the citation cards have served two major functions in system documentation. First, they provide a record of each request and the materials obtained in response to that request. Second, they provide evaluative information on procedures followed, time required, and costs incurred.

The uniterm indexes were intended to serve as a quick means of characterizing and filing the materials received by the system. It was thought this indexing method would require a minimum amount of labor and materials,
provide flexibility in the number of terms combined to perform a search, and allow for easy updating. In fact the development and use of the unis-term indexing system has been very time consuming and of limited use. Observation and evaluation of its use and applicability are continuing to determine whether it should be discontinued.

The system tools provide a basic structure for the continued development and expansion of the experimental system. They serve as a basis for documenting (1) the information requirements of each user of the system (task models and content characterization), (2) the external resources identified and their degree of usefulness, (3) the forms and procedures required to describe the system's operating tasks and to provide responsive information services, and (4) the types of personnel needed to perform each system task. This documentation will insure the system's survivability independent of changes in operating personnel. A new information specialist can quickly adapt to the system. He can study the task models to understand the nature of the professors' tasks to be supported, the content characterizations to understand the perspectives and topical emphases that the professor imposes on the content of the course, and the course files, compiled bibliographies, reserve lists, and card catalog to assess the amount of information support already on hand. In addition, the history of use of various external resource centers will be retained to evaluate their relative effectiveness in fulfilling various service demands. For further continuity major faculty task modelling and topic definition interviews are being recorded for use by the information specialists.

The documentation of the system provides a basis for growth and change. As content areas develop, emphases shift, and a responsive faculty member
correspondingly shifts the emphases of his course coverage. Faculty turnover also brings about different perspectives on general content and the subject areas to be emphasized. These differences in perspective and depth of coverage require revision of the content characterization tools. These tools, therefore, are continually growing, dynamic, and responsive to change.

The progress made during this study has demonstrated the workability of the switching center system. At the present time, however, it is impossible to make an objective quantitative evaluation in terms of cost and effectiveness. First, little objective information is available on the usefulness of the system to the users. Subjective reports from the professors and students supported have indicated that the system has saved time and has provided more useful information than they might have obtained on their own. It is interesting to note that some students continue to obtain their own information and do not use either the developed files or the information specialists for assistance. During the next phase of experimental system operation, data will be obtained regarding (1) the direct usefulness of the material provided by the system and (2) the impact of the system services on the course-related tasks performed by professors and students. Second, true system operating costs are not readily available. During the experimental operation, information specialists are required to perform a number of functions which would not be included in fully developed operational systems. They perform all tasks (professional and clerical) associated with the provision of services, they serve as data collectors, and they develop and document system operating procedures. Measurement techniques and tools are currently being
developed to separate the time and cost associated with each of these functions. It is planned to obtain objective cost information for each type of service performed and to evaluate each service in terms of its impact on the users and the educational program.
Critera

Tasks

Task 1
Specify objectives for the course
- Content goals
- Process goals
- Attitudinal change

Task 2
Select general topics to be included in the course

Topics should emphasize cell function rather than cell structure
Topics should emphasize general concepts and principles of living from specific organisms
Topics should emphasize general tools and making concept of living from specific organisms

Information
Requirements

Curriculum development discussions of Biology faculty
Student background

Information
Service

Service
Characteristics
Topics should provide tools/methods for making generalizations from specific experience.

Text should emphasize cell Biology from experimental point of view.

Should integrate lab and lecture portions of course of course.

Supply minimum of basic concepts and terminology.

Course Preparation

Task 3
Select textbook and supplementary sources

Information on recent publications

Compilation of tables of contents of recent publication and characterization of depth and nature of content coverage

Circulation of choice magazine and publisher book ads

Determin coverage topic

Recent publications to be covered

Select textbook and supplementary sources

Information on recent publications

Compilation of tables of contents of recent publication and characterization of depth and nature of content coverage

Circulation of choice magazine and publisher book ads

Determin coverage topic

Recent publications to be covered
Current state of subject matter should be presented to students in rapidly evolving areas. Audiovisual should be used when possible.

Methods for teaching general concepts of living organisms.

Methods for teaching research tools in Biology.

Methods for teaching use of literature sources in Biology.

Select specific topics and prepare materials (exercises) for course conduct.

Professional literature for assignment to students.

Journal reprints.

Review articles.
Audiovisual aids should be used when possible.

Specific topics for course materials should be assigned to students.

Cell structure.

Cell function.

Growth media recipes.

Student ability.

Film loops and accomplishment topics.

Preparation of information selects for each experiment.

Content materials for the course on selected topics.

Student ability.

Film loops and accomplishment topics.

Preparation of information selects for each experiment.

Specific topics for course materials should be assigned to students.

Cell structure.

Cell function.

Growth media recipes.

Student ability.

Film loops and accomplishment topics.

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Cell structure.

Cell function.

Growth media recipes.

Student ability.

Film loops and accomplishment topics.

Preparation of information selects for each experiment.

Specific topics for course materials should be assigned to students.
Task 7
Student performs lab exercise

Task 8
Students and professor discuss outcomes of lab exercise

Water sample

Instructions in lab manual
Information packages containing relevant journal materials
Chapter references in the textbook

Student topic depend
Task 9
Student select topic for independent work

Task 10
Student develops technical plan

Task 11
Student performs independent study task in laboratory

Water sample
General literature

Background information on topic area to be explored

Guidance from Dr. Downing

Information on methods and techniques

Information on procedures
APPENDIX A

COURSE CHARACTERIZATION

Teaching Task Models

A sample Subject Characterization

Task 11
Student performs independent study task in laboratory

Task 12
Student interprets results of independent study

Information on procedures

Previous findings obtained with the organism under study

Guidance from Dr. Downing

ERIc
Laboratory topics should be broad enough to allow students to work at different levels depending on their ability.

Topics should emphasize structure and function at the organismic level.
- Plants
- Animals
- Micro-organisms

Topics should include application of methods to content areas.

Task 1
Specify objectives for the course
- Content goals
- Process goals
- Attitudinal change

Task 2
Select general topics to be included in the course

Information Requirements
- Descriptions of courses in Biology of Organisms being taught at other universities
- Background of students taking the course
- Materials included in textbooks
- Adaptive problems which organisms are faced with
- Relationship between functions

Information Services

Service Characteristics
Course Preparation

Text organization should be compatible with course

Text should include both plants and animals

Supplementary materials should give good coverage of single topics

Task 3
Selection of textbooks and supplementary sources

Information on available single topic monographs

Information on published textbooks

Relationships between structures, functions, and environments

Compilation of tables of contents of recent publications and characterization of depth and nature of content coverage

Lists of materials being used by other universities offering a course in Biology of Organisms

Circulation of Choice Magazine and publisher book ads
Lecture materials and laboratory exercises should be integrated

Task 4
Select specific topic and prepare materials for course conduct

- Texts and general reference books in course subject areas
- Methods of teaching students to use literature search tools
- General background materials in topic areas where the professor has limited information
- Original papers which are specific to equipment and techniques to be used in the laboratory

BIOLOGY OF ORGANISMS
Methods for teaching research tools in Biology

Task 1
Lecture

Task 2
Student papers individually or in groups

Location of references included in the text and supplementary reading sources
Information on how to use literature search tools in Biolog;
Articles and references in selected topics
Task 2
Student papers individually or in groups

Task 3
Performance of laboratory exercises

Information on how to use literature search tools in Biology

Articles and reports in selected topic areas

Instructions from professor

Information on application of technique

Research literature relating to specific problems being examined in the laboratory
Topics should be characterized as multi-dimensional, having several branches and subtopics.

Task 1
Specify objectives for course
- Content goals
- Process goals
- Attitudinal goals

Task 2
Select initial topic/place to start the course

Characteristics of information support material
- Accessibility
- Depth of coverage
- Currency
- Diversity of themes/perspectives
- Amount

Reference Service
Task 3
Present lecture on boundaries of course topics, issues, perspectives

Task 4
Select specific topics for individualized instruction

- Availability of adequate information sources
- Match with student expressed interest

- Student backgrounds, level of sophistication
- Student range of interests

Characteristics of materials:
- Volume
- Depth
- Level of sophistication

Reference Service
History

Task 5a
Present lectures which elaborate topics of interest to students

Task 5b
Professor makes available selected materials (or indicates availability of) to students in areas of interest

Task 6
Student begins reading materials in general topic area

Availability of materials to students

Collection circulation

Match between student level of competence and level of material complexity

Task 7
Selection of specific topic to be pursued by student; accorded through student-teacher discussion

Student characteristics

Availability of materials to students

Collection circulation

HISTORY
Task 7: Selection of specific topic to be pursued by student; accomplished through student/professor discussions.

Available material

Reference service

Task 8a: Professor presents lectures to serve as models of how to develop a topic. Demonstration of how reconstructionist historian works.

Materials relevant to central theme: Possible perspectives to be pursued. Contextual information, etc.

Task 8b: Students develop their own topics.

Reference and circulation

Task 9: Preparation of papers by students.
Task 9
Preparation of papers by students

Task 10
Presentation of papers by student to the class for comment and discussion
Criteria

Tasks

Task 1
Specify objectives for the course
- Content goals
- Process goals
- Attitudinal change

Information
Requirements

Student Characteristics
- White middle class socio-economic background
- Lack of exposure to non-white dominated subcultures

Cultural context of the existing society

Basic sociological principles and concepts

Information
Services

Service
Characteristics
Topic should treat basic concepts, theories, and studies concerning prejudice and discrimination. Selected topics should be current and socially pervasive.

Task 2
Select topics to be included in the course.

Awareness of current events in prejudice/discrimination, etc.

Current awareness of events, people, attitudes, studies, programs, legislation.

Retrospective search service in requested areas for historical perspective.

Historical context of current issues.

Compilation contents of areas.
Selection of text should be guided by recency of publication, facility of style, and comprehensiveness of coverage.

Text should be organized to treat major topics one at a time having all topics treated in each chapter.

Supplementary material should compensate for text content weaknesses and emphasize recent and critical issues. Material should provide good coverage of a narrow topic.

Task 3
Select text and supplementary sources

Recent publications in selected topic areas

Compilation of tables of contents of recent publications in selected topic areas

Depth of content coverage, level of treatment of topics in available materials

Characterization of available materials re: depth and scope of coverage per topic area

Allocate based on vasivene area

Available of covers per topic

Identific character available resource

SOCIOL G
Allocate time to topics based on judged pervasiveness of topic area

Currency and urgency of topics to students

Guiderules for abstraction/ extraction of information content and characteristics
  - Level of detail/abstraction
  - Level of sophistication

Audio visual should be where possible

Task 4

Determine depth of coverage to be afforded each topic area

Availability and depth of coverage of material per topic

Student characteristics
  - Amount of information held about prejudice and related phenomena

Specific content material related to topics, sub-topics, etc.

Identification and characterization of available information resources

Historical context of current issues

Task 5

Prepare material for course

Specific content material related to topics, sub-topics, etc.

Provision of required content in prescribed forms (e.g., full text, abstracts, summaries, tapes, films, etc.)
Select materials that provide adequate coverage of the topic at a level of sophistication appropriate to student characteristics.

Task 5
Prepare materials for course

Task 6
Select specific supplementary reading assignments for each topic

Historical context
Current issues

Audio visual aids
Students attitudinal make-up and level of sophistication

Information of local groups who are active in reducing social tension

Most often cited articles in each content area:
What are the classical studies

Directory of local activities

Level of sophistication of available documents covering topic

Level of sophistication of students

Provide an assessment of scope and complexity of available materials about each specific topic
Select materials that provide adequate coverage of the topic at a level of sophistication appropriate to student characteristics

Task 6

Select specific supplementary reading assignments for each topic

Level of sophistication of documents

A specific topic

Present lecture
Criteria

Tasks

Task 1
Specify objectives for course
- content goals
- process goals
- attitudinal goals

Task 2
Select main topics/ issues to be included in the course

Information
Requirements

Information
Services

Service Characteristics

- Select topics that are well developed, mature issues
- Select topics that are current in U.S., international economics
- Select topics that are broad in scope, have wide influence on economic picture

Student characteristics
- No background in economics - Freshman and Sophomores

Student expressions of interest in topics

Theoretical issues covered in economics 21 and 22
that are well
ature issues
that are cur-
international
that are broad
ve wide in-
omic picture

Theoretical
issues
covered in
economics
21 and 22

Topic characteristics
. currency
. maturity
. sphere of
fluence
. Issue identi-
fication
. Topic develop-
ment monitoring-
current aware-
ness service

Task 3
Select text and supplementary sources

Recent publications in selected topic areas

Compilation of tables of contents of recent publica-
tions in selected topic areas

Task 4
Determine depth of coverage for each topic

Availability and depth of coverage of information per topic/issue

Identification and characterization of available information resources

Pervasiveness of issue/topic

ECONOMIC
Economics

Pervasiveness of issue/topic

Task 4
Determine depth of coverage for each topic

Availability and depth of coverage of information per topic/issue

Identification and characterization of available information resources

Guidelines for abstraction/extraction of information content and characteristics
  . Level of detail/abstraction
  . Level of sophistication

Task 5
Prepare lecture notes

Specific content material related to topics, subtopics, etc.

Provision of required information content in prescribed forms (e.g., full text, abstracts, summaries, etc.)

Select adequate topics for each chapter

Select relevance of available documentation

Level of sophistication of available documentation

Assessment of complexity of available materials about each specific topic

ECONOMICS
Select materials that provide adequate coverage of the topic at a level of sophistication appropriate to student characteristics

Task 6
Select specific supplementary reading assignments for each topic

Level of sophistication of available documents covering topic

Level of sophistication of students

Assessment of scope and complexity of available materials about each specific topic

Present lecture
Sociology Schedule

I. Bases of social differentiation
   A. religion
   B. race
      1. biological theory of race
      2. sociological theory of race
      3. psychological theory of race
      4. administrative theory of race
      5. religious theory of race
   C. wealth
   D. social class
      1. European estate system
   E. caste
      1. India
      2. U.S. South
   F. geographic origin

II. Kinds of majority-minority interaction
   A. majority attitudes
      1. prejudice
         a. extremism
         b. bigotry
      2. mixed
      3. tolerance
   B. majority actions
      1. assimilation
         a. mode of interaction
            (1) equalitarian
         b. majority policy
            (1) number of groups involved
               (a) unilateral assimilation (acculturation)
                  - Americanization
                  - Anglo conformity
                  - Europeanization
(b) bilateral assimilation (integration)*
(c) multilateral assimilation
   - melting pot
(2) degree of freedom involved
   (a) permitted assimilation
   (b) forced assimilation
   (c) egal protection of minorities*

2. discrimination
   a. mode of interaction
      (1) colonial
      (2) imperial
      (3) segregation
         (a) apartheid
      (4) reservation
      (5) quasi-segregation
   b. majority policy
      (1) pluralism
      (2) subjugation
      (3) population transfer (direct, indirect)*
         (a) immigration, quotas
         (b) emigration, encouraged
         (c) forced migration
      (4) extermination
         (a) genocido
         (b) pogroms

III. Causes of prejudice and discrimination

A. group conflict
   1. immigration
   2. political conflict
   3. economic conflict
      (a) Jim Crow*
      (b) Marxist theory of prejudice*
   4. religious conflict
   5. social tension
B. violence
C. frustration
   1. scapegoating
   2. targeting
   3. displacement of hostility
D. Freudian theory
E. cultural factors
   1. functional prejudices
   2. traditional prejudices
   3. stereotypes
   4. social distance
   5. consciousness of kind/dislike the unlike
   6. principle of cumulation
      (a) vicious circle
      (b) beneficial cycle
      (c) self-fulfilling prophecy
   7. racial beliefs

IV. Consequences of prejudice and discrimination
   A. on minority groups
      1. individuals
         a. biological
            (1) life chances
            (2) health
         b. social
            (1) marriage
            (2) legal rights
            (3) education
            (4) employment
            (5) housing*
            (6) religious-cults
         c. psychological
            (1) universal*
               (a) mental rigidity*
            (2) attitude toward felt prejudice
               (a) acceptance
                  - authoritarianism
                  - dogmatism
- acquiescence
- anomia
- quilt*

(b) avoidance (functional alternatives)*
- migration
- "passing"*
- ethnocentrism
  - Zionism
  - Black Nationalism

(c) aggression (hostility)
- humor
- boycott
- violence
- aggressive meekness
- chauvinism
- misanthropy
- displacement of hostility
  - scapegoating
  - projection
- reciprocal prejudice (Boerphobia)
- withdrawal of etiquette
- ostentatious display*
- non-violent resistance
  - sit-ins
  - freedom rides
  - marches

2. families
   a. sex-role variations

3. large groups

B. majority group members
1. individual
   a. psychological
      (1) prejudiced personality type
   b. social
      (1) chauvinism*

2. groups
V. Reducing prejudice and discrimination

A. changing people

1. conscious
   a. education
      (1) formal
      (2) informal
   b. legislation
   c. confrontation
   d. contention*
   e. exhortation
   f. negotiation
   g. psychotherapy
      (1) group
      (2) individual
   h. political action

2. conscious and unconscious
   a. assimilation

3. unconscious
   a. race relations cycle*

B. changing situations

VI. Role of minorities in U.S. national life

A. economic
   1. black capitalism

B. religious

C. political-legal
   1. organizations
      a. CORE
      b. NAACP
      c. ACLU

D. cultural-intellectual
Structured List of Subject Headings

acculturation
see: assimilation, unilateral

actions, majority
B.T. majority - minority interaction, kinds of
R.T. attitudes, majority
N.T. assimilation
discrimination

Americanization
B.T. assimilation, unilateral
R.T. Anglo conformity
Europeanization

Anglo conformity
B.T. assimilation, unilateral
R.T. Americanization
Europeanization

apartheid
B.T. segregation

assimilation
B.T. actions, majority
R.T. discrimination
N.T. interaction, mode of (in assimilation)
policy, majority (in assimilation)

assimilation, bilateral
B.T. groups involved, number of
R.T. assimilation, unilateral
assimilation, multilateral

assimilation, forced
B.T. freedom involved, degree of
R.T. assimilation, permitted
protection of minorities, legal

assimilation, multilateral
B.T. groups involved, number of
R.T. assimilation, unilateral
assimilation, bilateral
N.T. melting pot

assimilation, permitted
B.T. freedom involved, degree of
R.T. assimilation, forced
N.T. protection of minorities, legal

assimilation, unilateral
B.T. groups involved, number of
R.T. assimilation, bilateral
assimilation, multilateral
N.T. Americanization
Anglo conformity
Europeanization

attitudes, majority
B.T. majority-minority interaction, kinds of
R.T. actions, majority
N.T. prejudice
tolerance

attitudes, mixed
B.T. attitudes, majority
R.T. prejudice
tolerance

bigotry
B.T. prejudice
R.T. extremism

bilateral assimilation
use: assimilation bilateral

colonial
B.T. interaction, mode of (in discrimination)
R.T. imperial
seggregation
reservation
quasi-segregation

degree of freedom involved
use: freedom involved, degree of

direct population transfer
use: population transfer
discrimination
B.T. actions, majority
R.T. assimilation
N.T. interaction, mode of (in discrimination)
   policy, majority (in discrimination)

emigration, encouraged
B.T. population transfer
R.T. immigration quotas
migration, forced

encouraged emigration
use: emigration, encouraged

equalitarian
B.T. interaction, mode of (in assimilation)

Europeanization
B.T. assimilation, unilateral
R.T. Americanization
   Anglo conformity

extermination
B.T. policy, majority (in discrimination)
R.T. pluralism
   subjugation
   population transfer
N.T. genocide
   pogroms

extremism
B.T. prejudice
R.T. bigotry

forced assimilation
use: assimilation, forced

forced migration
use: migration, forced

freedom involved, degree of
B.T. policy, majority (in assimilation)
R.T. groups involved, number of
N.T. assimilation, permitted
   assimilation, forced
   protection of minorities, legal

genocide
B.T. extermination
R.T. pogroms

groups involved, number of
B.T. policy, majority (in assimilation)
R.T. freedom involved, degree of
N.T. assimilation, unilateral
   assimilation, bilateral
   assimilation, multilateral

immigration quotas
B.T. population transfer
R.T. emigration, encouraged
   migration, forced

imperial
B.T. interaction, mode of (in discrimination)
R.T. colonial
   segregation
   reservation
   quasi-segregation

indirect population transfer
see: population transfer

integration
see: assimilation, bilateral

interaction, mode of (in assimilation)
B.T. assimilation
R.T. policy, majority (in assimilation)
N.T. equalitarian

interaction, mode of (in discrimination)
B.T. discrimination
R.T. policy, majority (in discrimination)
N.T. colonial
   imperial
   segregation
   reservation
   quasi-segregation
<table>
<thead>
<tr>
<th>Concepts</th>
<th>Examples</th>
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<td><strong>kinds of majority-minority interaction</strong></td>
<td>use: majority-minority interaction, kinds of</td>
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<td><strong>legal protection of minorities</strong></td>
<td>use: protection of minorities, legal</td>
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<td><strong>majority actions</strong></td>
<td>use: actions, majority</td>
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<td><strong>majority attitudes</strong></td>
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<td><strong>majority-minority interactions</strong></td>
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<td>R.T. social differentiation, bases of prejudice and discrimination, causes of prejudice and discrimination, consequences prejudice and discrimination, reduction of role of minorities in U.S. national life</td>
<td>N.T. attitudes, majority actions, majority</td>
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<td><strong>majority policy</strong></td>
<td>use: policy, majority</td>
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<td><strong>melting pot</strong></td>
<td>B.T. assimilation, multilateral</td>
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<td>use: attitudes, mixed</td>
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<td>R.T. subjugation</td>
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<td>population transfer</td>
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<td>R.T. interaction, mode of (in discrimination)</td>
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prejudice
B.T. attitudes, majority
R.T. attitudes, mixed
N.T. extremism
bigotry

protection of minorities, legal
B.T. freedom of involved, degree of
R.T. assimilation, permitted assimilation, forced

quasi-segregation
B.T. interaction, mode of (in discrimination)
R.T. colonial imperial
segregation reservation

reservation
B.T. interaction, mode of (in discrimination)
R.T. colonial imperial
segregation quasi-segregation

segregation
B.T. interaction, mode of (in discrimination)
R.T. colonial imperial
reservation quasi-segregation
N.T. apartheid

subjugation
B.T. policy, majority (in discrimination)
R.T. pluralism population transfer extermination

tolerance
B.T. attitudes, majority
R.T. prejudice attitudes, mixed

unilateral assimilation
use: assimilation, unilateral

unilateral
1. Requestor's Name

2. Course

3. Activity:
   - topic selection
   - supplementary reading selection
   - lecture supplement
   text material
   selection preparation
   student other(____)

4. Principal user:
   - professor
   - student
   topic selection

5. Request received
   - search initiated
   - search completed

6. Topic description

7. Key words selected for search

8. Search strategy:
   A. Identify items

9. Time limits set by requestor

10. Bibliographic form desired by requestor:
    - full text
    - abstract
    - other (_____)

11. Physical form desired by requestor:
    - micro
    - xerox
    - original
    - other
    - book
    - journal article
    - manuscript
    - gov rept
    - map
    - picture
    - film or slide
    - other

12. Statistics for evaluation:
    - time required to identify relevant items
    - time required to identify best resource
    - number of items ordered
    - number of resources used

Percentage of order filled:
    - less than 1 week
    - 3 weeks
    - 1 month
    - unfilled
FORM B
DOCUMENT REQUEST
CITATION INPUT

1. Requestor's name______________________________

2. Course______________________________

3. Activity:
   ___ topic selection  ___ text selection  ___ material preparation
   ___ supplementary  ___ student topic  ___ lecture supplement
   ___ reading selection  ___ selection

4. Principal user:
   ___ professor  ___ student

5. Request received:  Search initiated:  Search Completed:
   ___ mo ___ day ___ yr  ___ mo ___ day ___ yr  ___ mo ___ day ___ yr

6. Search strategy for identifying resources
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________
   ____________________________________________________________

7. Time limits set by requestor______________________________

8. Physical form desired:
   ___ micro  ___ xerox  ___ original  ___ other (______)

9. Statistics for evaluation:
   ___ time required to identify best resource
   ___ number of items requested
   ___ number of items ordered
   ___ number of resources used
   percentage of orders filled:
      ___ less than 1 week
      ___ 1 week
      ___ 2 weeks
      ___ 3 weeks
      ___ 1 month
      ___ unfilled
FORM C
DOCUMENT REQUEST
ORGANIZATION/PERS0N INPUT

1. Requestor's name________________________________________

2. Course______________________________________________

3. Activity:
   - topic selection
   - supplementary
   - reading selection
   - text selection
   - student topic
   - selection
   - material preparation
   - lecture supplement

4. Principal user: professor____ student____

5. Request received: _______ Search initiated: _______ Search completed: _______
   mo  day  yr     mo  day  yr     mo  day  yr

6. Topic limitations_______________________________________

7. Search strategy (person):
   Identify resources_____________________________________

8. Bibliographic form desired by requestor:
   ______ full text ______ abstract ______ extract ______ summary ______ other

9. Physical form desired by requestor:
   ______ micro ______ xerox ______ original ______ other
   ______ book ______ journal article ______ manuscript ______ govrpt ______ other
   ______ map ______ picture ______ film or slide ______ other

10. Statistics for evaluation:
    Persons:
        ______ time required to identify items
        ______ time required to identify resources
        ______ number of items ordered
        ______ number of resources used

    Organizations:
        ______ number of items received
        ______ frequency of items received
        ______ time lag between publication and receipt

percentage of order filled:
   ______ less than 1 week
   ______ 1 week ______ 2 weeks
   ______ 3 weeks ______ 1 month ______ unfilled
FORM D
DOCUMENT REQUEST
FACT RETRIEVAL

REQUEST NUMBER______

1. Requestor's Name__________________________________________

2. Course____________________________________________________

3. Activity:
   ____ topic selection   ____ text selection   ____ material
   supplementary   student topic   preparation
   ____ reading selection   ____ selection   lecture
   ____ selection   ____ supplement

4. Principal user:
   ____ professor   ____ student

5. Request received: Search initiated: Search completed:
   mo  day  yr   mo  day  yr   mo  day  yr

6. Question asked
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

7. Search strategy (bibliographic tools and indexes used ) _____________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

8. Answer to question
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

   Where found ______________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

9. Time limits set by requestor ________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

10. Statistics for evaluation:
    ____ time required to identify relevant item
    ____ number of items ordered
    ____ number of resources used
    ____ time required to obtain them