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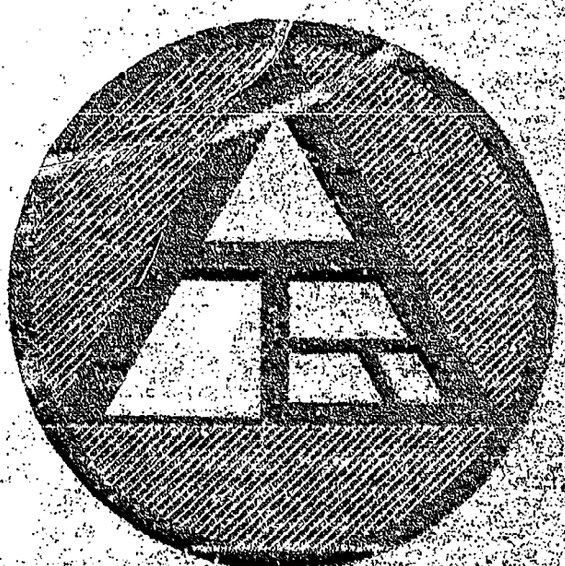
ABSTRACT

The aim of the Automated Retrieval Information System to Track and Optimize the Training and Learning Environment (ARISTOTLE) project is to develop a computer-based training model to link program standards, tests, resources, curriculum, and operational and student placement procedures of the Canada Manpower Centers, the Ministry of Colleges and Universities, and the Training Centers. The proposed computer retrieval system will store student records and provide information on the job market and academic requirements to assist in trainee counseling. The system has the capability to map a course of study to fit individual student goals and store follow-up information on program graduates. Once implemented, the model will be evaluated, modified, and disseminated so that Project ARISTOTLE will be available to any training center with computer access. The project's organizational chart, Gantt chart, and general operations model are included along with plans for evaluation, and the budget. (KC)

PROJECT
ARISTOTLE



SUBMISSION

1st January 1976

TRAINING IMPROVEMENT PLAN

SUBMISSION FORM

Training Improvement Plan (TIP)

Date - 1 January 1975
Province - Ontario

1.0 Biographical Data

1.1 Project Title:

PROJECT ARISTOTLE

Automated Retrieval Information System to Track and Optimize the Training and Learning Environment.

1.2 Submitted By:

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1.3 Initiated By:

Humber College of Applied Arts and Technology,
Lakeshore Campus,
Mr. William E. Sinnett,
Program Development Coordinator.

UNDER THE AUSPICES OF THE

Manpower Training Branch,
Mr. Walter F. Davy,
Director.

2.0 Abstract

The project title - 'Automated Retrieval Information System to Track and Optimize the Training and Learning Environment' summarizes the aims and objectives of this project.

2.1 'Automated Retrieval Information System...' emphasises the concept of an integrated network of computerized data systems to support the efficacious management of a Training Centre.

The development of innovative delivery systems for training has created the problem of trainee 'tracking' and the solution is to create an efficient information processing system.

The major thrust of the project is to 'optimize' 'training' and 'learning' through a computer managed approach.

2.2 The goal of ARISTOTLE is to design, develop, implement, evaluate and disseminate a MODEL for a computer managed system. The activities included in the system encompass: trainee diagnosis and counselling, course placement, training and learning, career mobility and job placement. The computer managed network would integrate all available data and subsystems within the domain of overlapping activities carried on by the Canada Manpower Centers, the Ministry of Colleges and Universities and the Training Centres.

The System developed will have a built-in capability to facilitate local adaptation in any Training Centre having access to a computer.

2.2.1 The product of ARISTOTLE will be composed of the following subsystems - note that this is a conceptualization rather than a distinct set of chronological phases or subprojects.

Subsystem I - Input and retrieval of information regarding student history - records - attendance - performance and achievement.

Reports will be generated on student contract or commitment - accruement of credits and rates of progress according to common standards as well as forecasting of completion date.

Other functions included are the scheduling of resources to provide optimal student programs - test procedures and the issuing of transcripts and certificates within a highly flexible delivery-system environment.

2.2.2 Subsystem II - A diagnostic and course placement subsystem to generate student profiles of aptitude.

Other pertinent information on student pre-entry skills and knowledges as well as strengths and weaknesses will be generated to assist Training Centre staff to effectively manage the training and learning environment.

Career planning and selection in relation to job family data according to CCDO will be part of the model. The concept of generic skills and the identification of job related academic requisites will form another subsystem in this diagnostic-counselling area.

2.2.3 Subsystem III - The banking of learning objectives and test items built upon an hierarchical framework will be integrated with all available learning resources banks. The machine readable catalogue - DACUM chart system and the modules already developed will form elements of Subsystem III. The generation of technical-vocational curricula along with appropriate mediation for the development of CMITP and CMTP requirements are central to this system.

The data generated will be integrated with Subsystem II to provide for effective and efficient decisions at the Training Centres.

2.2.4 Subsystem IV - This evaluation and integrating subsystem will pull together the elements of the network outlined in Subsystems I, II and III. The emphasis here is upon job market requirements and placement-followup of the student-trainees.

This subsystem also includes the integration of a Program Planning Budgeting System (PPBS) to provide accounting and cost effectiveness data.

3.0 The Problem

The goals pursued by our Society include the provision of opportunities for individuals to achieve economic stability and personal growth. Training and Education are regarded as means of achieving these goals.

Training is here defined as a conscious, purposeful effort to reduce the discrepency between the range of skills and knowledges required to perform in a particular vocational or occupational field and the range of skills and knowledges already possessed by a potentially employable individual.

The mission of the Training Centre, in our view, is to provide the individual with that portion of skill and knowledge which he lacks in order to become a viable candidate for employment in a particular field.

On the one hand we must have information regarding the aptitude and present level of achievement of the individual while on the other hand we must have information regarding the requirements of the vocational and job fields. The effectiveness of the Training which is intended to fill this gap depends heavily upon the information available about the individual and the occupational requirements.

To optimize training, information on these two areas must be available, relevant, immediate, updated and interpretable. The training process itself must be highly flexible in order to cope with a changing, broad set of occupational fields as well as with a heterogeneous group of trainees.

The problem is essentially the need for relevant information to make appropriate decisions.

4.0 Objectives

Given the resources (both human and technological) project ARISTOTLE will do the following:

4.1 Design, develop, implement, evaluate and disseminate a MODEL for an integrated computer-based information data system to link: CMC, MCU and CAAT program standards, tests, resource materials, curriculum, operational and student placement procedures with the functioning of a Training Centre. The project's output must meet the objectives of the users.

4.2 Locate, analyse, select and /or modify existing subsystems which will support the development of project ARISTOTLE.

4.3 Collect, analyse and synthesize,evaluative, historical and statistical data to support research and development aspects of project ARISTOTLE.

5.0 Relationship to Other Developmental Activities

A number of information, data processing and computer managed instructional systems already exist in North America. To the best of our knowledge no attempt has been made in Canada to build an integrated network of subsystems which would optimize the training-learning environment.

Project ARISTOTLE'S model would raise the 'state of the art' to the point where Provincial and National networks will become feasible.

6.0 Relationship to On-Going Programs

The project will be conducted in an operating Training Centre which has a demonstratable history of innovation and proven record of accomplishment.

The active participation of other Centres and agencies will be sought in order to ensure the relevancy, transferability and usefulness of the outcomes.

7.0 Project Design and Components

A Systems Approach characterizes all aspects of the project.

7.1 In General

Goals and Objectives will be clarified

Note - the real goal of ARISTOTLE is to meet the goals and objectives of the users.

Parameters and constraints must be identified and quantified.

A model using LOGOS language (Language for Optimizing Graphically Ordered Systems) will be generated and simulations run on paper. It may be possible to mathematize this model and run it on a computer.

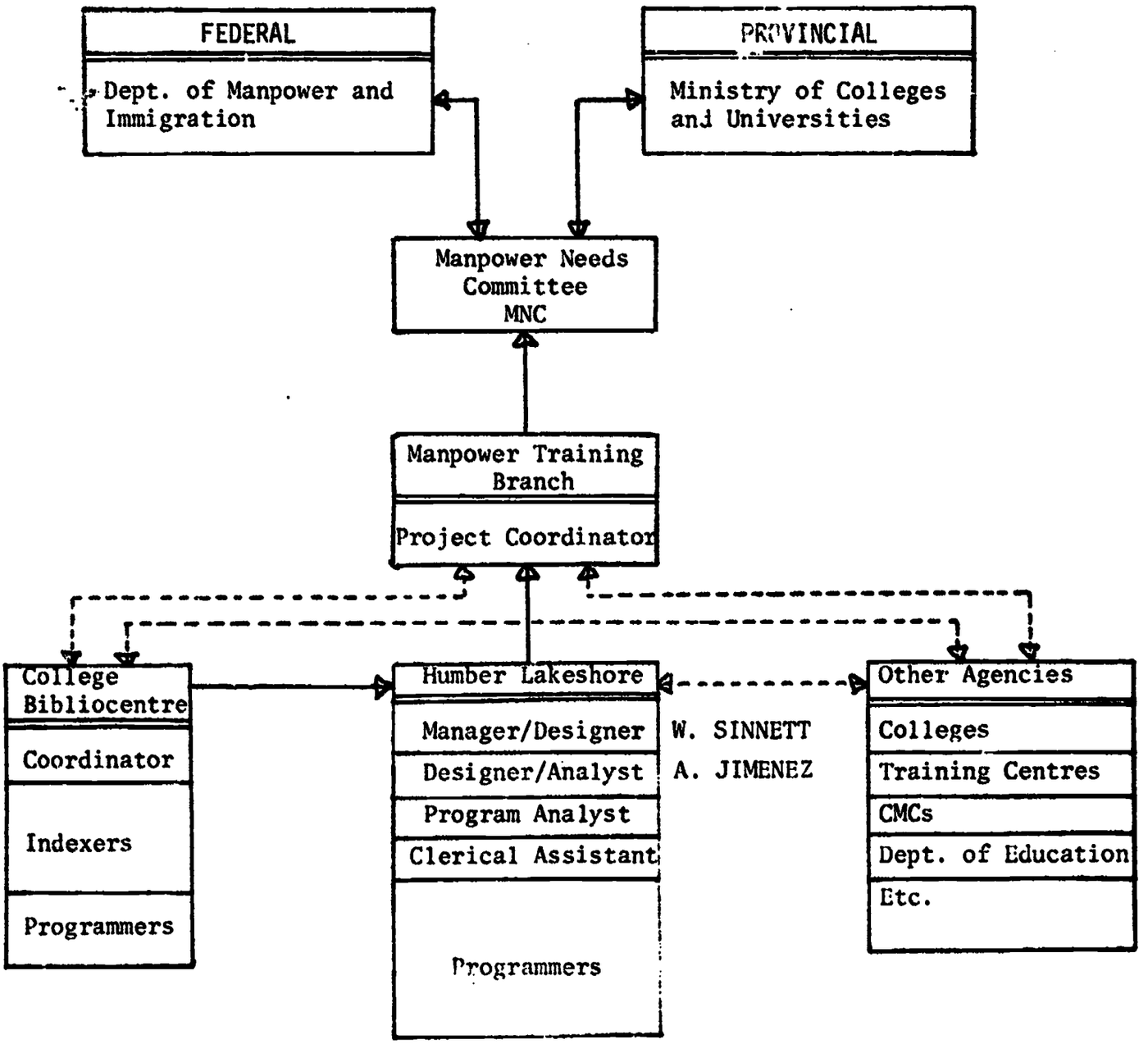
Elements which can be or already are computerized will be designed, developed or adapted. As universal an approach as possible will be taken.

Tryouts at various phases of development and integration will be conducted in on-going Training Centres along with user training and orientation.

Implementation, evaluation, dissemination and modification will follow.

The project will be coordinated through the Manpower Training Branch. Humber Lakeshore and the Bibliocentre will be contracted to carry out various aspects of the design and development work as well as other colleges and agencies.

7.2 Administrative Organization



GANTT CHART: PROJECT ARISTOTLE

1975 MONTHS

FUNCTIONS/ACTIVITIES	01	02	03	04	05	06	07	08	09	10	11	12
1.0 Perform anasynthesis CMC, MTB, CB, CAATS	✓	✓										
2.0 Write Brief Proposal	✓	✓										
3.0 Develop Model												
3.1 System I - Student Tracking	✓	✓										
3.2 System II - Diagnostic-Placement	✓	✓										
3.3 System III - Banking	✓	✓										
3.4 System IV - Evaluation & Career Planning	✓	✓										
4.0 Consult Users	✓	✓										
5.0 Consult Experts	✓	✓	✓	✓								
6.0 Consult Other Training Centres	✓	✓	✓	✓								
7.0 Simulate Model			✓	✓								
8.0 Develop Specs - SS. I & II			✓	✓								
9.0 Assign Programming Tasks			✓	✓								
10.0 Supervise Programming			✓	✓	✓							
11.0 Determine Logistics			✓	✓	✓	✓						
12.0 Design Forms, Cards, Etc.			✓	✓	✓	✓						
13.0 Rent/Purchase Hardware/Software			✓	✓	✓	✓						
14.0 Simulate/Debug Subsystems I & II							✓	✓				
15.0 Train Users for Subsystems I & II							✓	✓				
16.0 Install Subsystems I & II							✓	✓	✓			
17.0 Debug Subsystems I & II								✓	✓	✓		
18.0 Operationalize Subsystems I & II									✓	✓	✓	✓
19.0 Prepare & Submit Report SS. I & II											✓	✓
20.0 Evaluate SS. I & II											✓	✓
21.0 Prepare To Disseminate SS. I & II											✓	✓

GANTT CHART: PROJECT ARISTOTLE

1976

MONTHS

	01	02	03	04	05	06	07	08	09	10	11	12
22.0 Maintain/Monitor Systems	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
23.0 Develop Specs for SS. III & IV	✓	✓	✓									
24.0 Consult Users	✓	✓	✓									
25.0 Consult Experts	✓	✓	✓									
26.0 Consult Training Centres	✓	✓	✓									
27.0 Simulate Model	✓	✓	✓									
28.0 Assign Prog. Tasks				✓	✓	✓						
29.0 Supervise Programming				✓	✓	✓	✓					
30.0 Determine Logistics				✓	✓	✓	✓					
31.0 Rent/Purchase Hardware/Software				✓	✓	✓	✓	✓				
32.0 Simulate/Debug SS. III & IV								✓	✓			
33.0 Train Users for SS. III & IV								✓	✓	✓		
34.0 Install SS. III & IV										✓	✓	
35.0 Debug SS. III & IV										✓	✓	✓
36.0 Operationalize SS. III & IV											✓	✓

GANTT CHART: PROJECT ARISTOTLE

1977

	MONTHS											
	01	02	03	04	05	06	07	08	09	10	11	12
37.0 Evaluate SS. III & IV	✓	✓										
38.0 Prepare & Submit Report SS. III & IV	✓	✓										
39.0 Prepare to Disseminate SS. III & IV			✓	✓								
40.0 Integrate All Systems				✓	✓							
41.0 Prepare Report Integrated System					✓	✓						
42.0 Submit Final Report					✓	✓						
43.0 Disseminate All Systems					✓	✓	→	→				

7.4 Evaluation

7.4.1 Formative Evaluation

The planning model (using LOGOS) with its detailed description of every step of the process and every output of the system will ensure that feedback constantly monitors and adjusts the System according to the stated specifications.

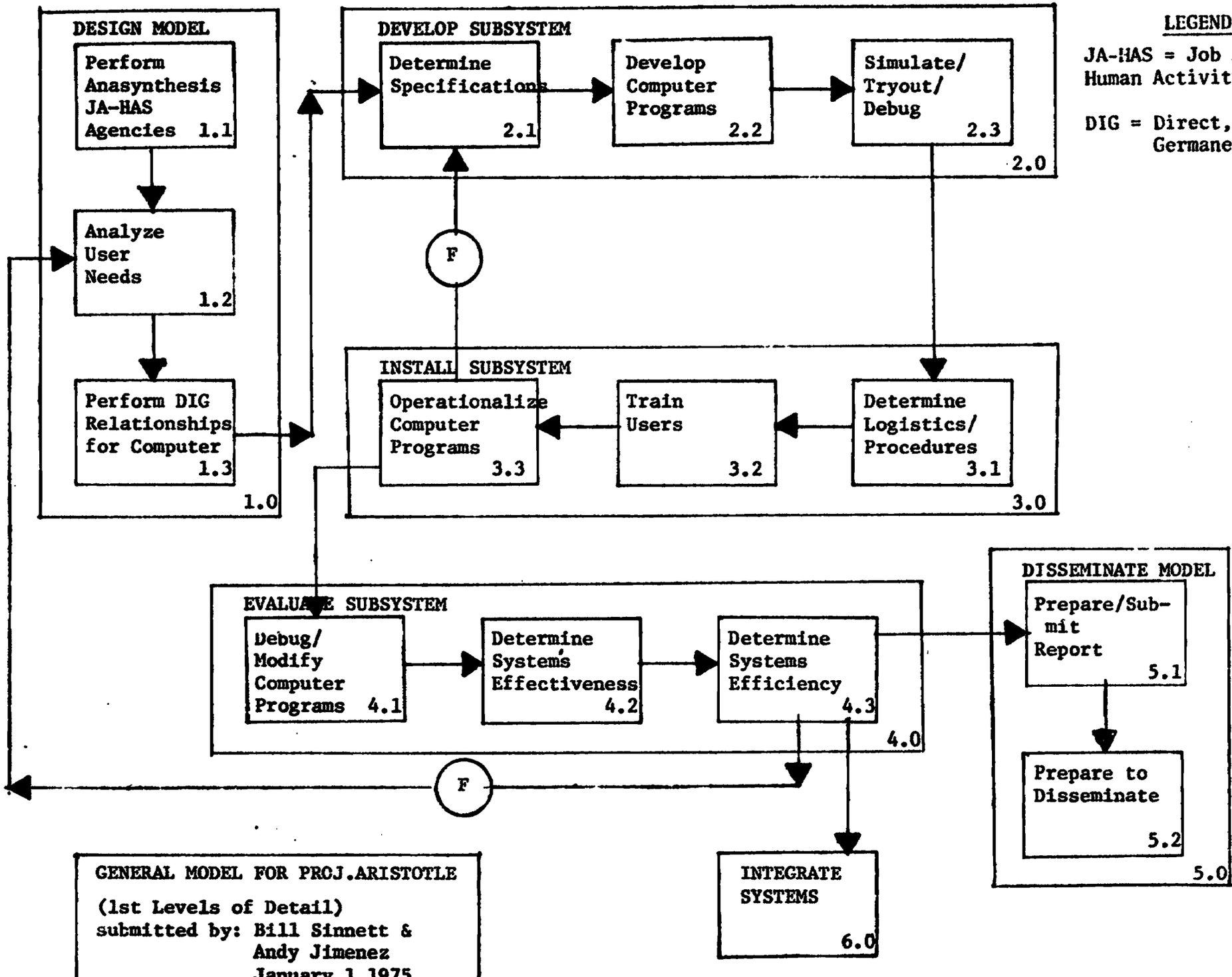
Standards of performance with respect to ARISTOTLE will be specified to the highest level of detail possible to enable the project staff to make decisions at critical points in the work flow.

7.4.2 Summative Evaluation

The Monitoring Committee will be provided with detailed progress reports and details of any changes that are made as the work progresses.

Since the objectives of the project are to meet the needs of the users an evaluation survey will be conducted at the completion of the work to determine the degree of fit between the services provided through the System and the requirements of the users.

7.0



GENERAL MODEL FOR PROJ.ARISTOTLE

(1st Levels of Detail)

submitted by: Bill Sinnett & Andy Jimenez

January 1 ,1975

8.0 The major burden of the design and development of the project will fall on Humber Lakeshore.

Key personnel will be the Project Manager/Designer and the Systems Designer/Analyst.

8.1 Mr. William E. Sinnett (Manager/Designer)
Coordinator of Program Development for Humber Lakeshore

Education - - Grade 13, Ontario
- Graduate of Canadian Services College, Royal Roads, Victoria, B.C.
- General B.A., Queen's University
- Permanent Ontario High School Teaching Certificate
- Presently completing last half of M Ed. program at OISE - Dept. of Curriculum.

Professional Experience (14 years in Education)

- 4 years teaching Secondary School Science, Math.
- 5 years instructor in Manpower Retraining Program - Science, Math., History
- 1 year Science Supervisor in Retraining and Apprenticeship Division, Humber
- 1 1/2 year Assistant Chairman of Academic Studies - Retraining and Apprenticeship Division, Humber
- 2 1/2 years Program Development Coordinator (Educational Development Officer) for Humber Lakeshore.

8.2 Mr. Andres E. Jimenez (Designer/Analyst)

Education - - Grade 12, Phillipines
- General B.A., University of Santo Tomas
- M.A. in Philosophy at University of Detroit
- M Ed. in Instructional Technology - Wayne State
- Presently completing thesis stage of PhD
  OISE - Dept. of Computer Applications

Professional Experience (5 1/2 years in Education)

- 2 years teaching Post Secondary Philosophy
- 2 years Educational Development Officer, Canadore College - Retraining and Post Secondary
- 1 1/2 years Team member of 'Learner at the Centre Project' - Canadore College - Funded by Ministry of Colleges and Universities.

9.0 Facilities

Office space will be provided at Humber Lakeshore to serve as a Project Centre.

An on line terminal will be needed at the Project Centre during all developmental stages.

Computer facilities will be rented or accessed through the CAATS, OISE or NRC.

The Training Centre which comprises Humber Lakeshore has appropriate delivery systems and a student body of approximately 2000 with a variety of some 30 programs to use as an on-going model.

10.0 Utilization

10.1 Ultimate Users

The chief users will be counsellors, instructors and administrators at Training Centres.

The CMC counsellors and MTB coordinators will also be using the information generated through the ARISTOTLE model to make decisions.

10.2 Use of Projects Results

As outlined in the objectives and work plan the data which is generated will assist those in the training and learning environment to make optimal decisions for the best use of limited resources.

10.3 Dissemination

A dissemination model is presently being developed in the CAAT system. The progress of this model and its implementation will be closely monitored.

With the cooperation of the appropriate senior committees, Training Centres will be approached and an assessment made of the possibility of implementing the ARISTOTLE model. The dissemination model just mentioned will be used to carry out this disseminating process.

The entire project will be open for inspection and input on a controlled basis. The successful implementation of the model will be based upon cooperation and input from a number of Training Centres and involved agencies.

11.0 BUDGET FOR PROJECT ARISTOTLE

EXPENSES:	(Jan. 1/75-Mar. 31/75) FISCAL 1975	(April 1/75-Mar. 31/76) FISCAL 1976	(April 1/76-Mar. 31/77) FISCAL 1977	(April 1/77-June 30/77) FISCAL 1978	TOTAL COSTS
SALARIES: *Project Manager/System Designer	$ 6,657	$ 26,628	$ 29,290	$ 8,055	$ 70,630
*System Designer/Analyst	4,900	19,600	21,560	5,929	51,989
*Program Analyst	4,250	17,000	18,700	5,143	45,093
*Programmers - 1	3,250	13,000	14,300	3,933	34,483
*Programmers - 2	3,250	13,000	14,300	3,933	34,483
*Programmers - 3 (Part-Time)	5,000	5,000	12,000		22,000
Indexing - Bibliocentre	11,000	11,000			22,000
*Clerical Assistance	2,000	8,000	8,800	2,420	21,220
Design Consultants	0	3,500	3,500	0	7,000
Computer Consultants	0	2,400	2,400	1,400	6,200
Computer Services	0	7,500	15,000	5,000	27,500
*Fringe Benefits @ 9 1/2 %	2,784	9,712	11,300	2,794	26,590
Hardware Rental @ 1.100./M					
Regular -		1,100	2,700	5,500	9,300
Bibliocentre -		2,200	1,700		3,900
Printing & Micro-Recording					
Regular -	1,000	5,000	5,000	2,512	13,512
Bibliocentre -		9,200			9,200
Office Supplies	150	600	600	150	1,500
Travel & Conferences	1,000	5,000	4,000	500	10,500
Telephone, Mail	300	1,200	1,200	300	3,000
Total Costs	$ 45,541	$ 160,640	$ 166,350	$ 47,569	$ 420,100
Cash Flows:					
Regular Project	$ 29,541	$ 133,240	$ 164,650	$ 47,569	$ 375,000
Bibliocentre Project	$ 16,000	$ 27,400	$ 1,700	$ 0	$ 45,100

12.0 Comments

No two Training Centres operate in exactly the same way nor do they have access to the same computer facilities.

To overcome this problem the Model produced through Project ARISTOTLE will be general, flexible and as open-ended as possible.

The possibility of new data bases, techniques, sub-systems and requirements is quite distinct. The entire approach to this network of computer managed information will have to be flexible.

This proposal must, by the very nature of the project to be undertaken, be fairly general and open to modification and adjustment. Since the ultimate objective of the model produced is to meet the needs of the users and thus to provide greater opportunity for Canadians to improve their economic stability and personal growth - then the actual model with all of its allowences for flexibility cannot be described until the research is undertaken.

Although no System can hope to be 'all things to all people' it is hoped that the assembling, managing, analysis and synthesis of data which the computer does so well can become a valuable asset for those who must make critical decisions regarding human and physical resources. The intent of the project is not, however, to shift priorities into the collection of data at the expense of service to the individual.