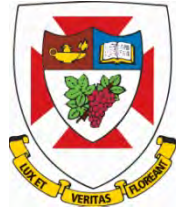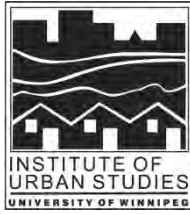# Report: Establishment of a Virtual Learning Resource Centre in the City of Winnipeg

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by the University of Winnipeg Office of the Vice-President (Academic) and the Institute of Urban Studies
Studies
1998

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The Institute of Urban Studies

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REPORT: ESTABLISHMENT OF A VIRTUAL LEARNING RESOURCE CENTRE IN THE CITY OF WINNIPEG
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The University of Winnipeg

Office of the Vice-President (Academic)

and

The Institute of Urban Studies

REPORT

Establishment of a

Virtual Learning Resource Centre

in the City of Winnipeg

PHASE I: Concept and Design/ Feasibility Study

January, 1998

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ACKNOWLEDGEMENTS

EXECUTIVE SUMMARY

The Virtual Learning Resource Centre is viewed as an electronic database which will be accessible on-line through the World Wide Web and meets the following objectives:

- To support decision making on career goals and their implementation

- To provide convenient access to information on education and training for specific career paths

- To assist education and training providers in disseminating course information to potential students

- To provide an efficient and cost effective method of maintaining education and training information

- To ensure the best possible match between students and course/institution, thereby reducing the personal and governmental costs which result from inappropriate choices.

As an electronic platform, the VLRC would provide information on educational and training courses to be entered and updated on-line, and link other products ensuring a comprehensive information service to individuals seeking a first career or career change.

The proposed design concept is based on the premise that two client groups exist which are seeking information about education and training opportunities. The first group is identified as those whom **counselling** is an important element in their search for information. This group would include high school graduates exploring new education and training opportunities, those already employed seeking to expand their knowledge and skills, those seeking a complete career change, and those that are unemployed who are seeking information on opportunities to assist them in finding meaningful employment. The second major client group consists of those seeking **specific information** on a particular education or training program. This group would consist of those clients who have a particular career path in mind and who are seeking specific information on program requirements, content, etc.

Assessment of On-line Resources

A fundamental element of the conceptual design of a Virtual Learning Resource Centre is that, where possible, it should integrate links between planning tools, local labour market information and local education/ training opportunities. To this end, it was identified that Human Resources Development Canada has developed the Labour Market Information (LMI) database which combines occupation listings based on the National Occupation Classification (NOC) and labour market information. As a result, the emphasis of the project is to develop an education and training database component that may be linked with

the LMI database.

Many training and education Internet sites were reviewed to assess existing data sources. This review revealed inconsistencies and gaps in the way data is made available and the way it is distributed. Some sites only list a series of links to information sources while others have a systematized method for displaying information.

An interactive Web database with a standardized format, incorporating course and training information, is viewed as a solution to the future development of the VLRC. It is recommended that the VLRC be developed as a data driven, dynamic Web accessible database. Dynamic databases have features which solve many problems related to database integrity and standardization. The data driven format of a dynamic database permit the generation of content-based queries, and the use of a template for data presentation. Dynamic database systems are becoming alternatives to static Internet sites.

Private Vocational Training

The implementation of a Virtual Learning Resource Centre required an assessment of all Internet sites developed by private vocational training organizations outside the larger academic institutions. Consultations revealed that some of the larger organizations that provide vocational training are already supplying information on-line, though only a few provide detailed course information. Many of the smaller organizations are not yet on-line, therefore creating a gap in the availability of information on the World Wide Web for vocational training. Many of those organizations contacted expressed interest in the VLRC and would like to participate in the future.

The proposed VLRC will have to overcome the gap in training information on the World Wide Web by developing a database that will incorporate all institutional information in a standard format.

User Access

Broad community access to the VLRC is important for ensuring the circulation of education and training information to those who need it. The proportion of home-based computers with Internet access is still small, so it is necessary that some form of public access to computers is available. Over 30 government and community organizations were consulted for input into the desirable features of the VLRC as seen from a user perspective and to assess the technical needs of various potential access points. There is significant support for the VLRC among community organizations. Many organizations showed particular interest in the career building possibilities within the system.

A number of organizations have access to stand alone computers but many still do not have Internet access. A possible solution is to strategically place computers with Internet access in key locations and with organizations that are located in areas where higher proportions of low-income and disadvantaged groups reside. This would include non-profit

service organizations, community organizations and neighbourhood resources centres. This type of initiative may depend on funding availability.

Feedback on Proposed Database

A select number of non-profit and private vocational training institutions were specifically approached for opinions on the proposed database design and to solicit recommendations to ensure the data requirements are satisfactory. Included in these recommendations were suggestions for additional features to be added to the **counselling** component of the VLRC.

Overall, there is support for the VLRC and the use of a standard template for data input into the system. Concerns were raised about the fields listed in the template and the need to ensure data integrity.

Design Parameters

The proposed design of the VLRC recommends the dynamic generation of content and interactive functionality. Data driven web sites are identified as ideally suited for delivering information that requires continual updating and modification. A three tier architectural model is considered the best data delivery system for the VLRC.

Three tier models make use of the Web and an *application server* as a middle tier between the browser and the database. The application server performs the database query and processing tasks leaving the server to deliver data displays. Three tier applications have commonly used Common Gateway Interface (CGI) based programs or a web server used in conjunction with a dedicated application server. Within this architecture, applications reside on the server and can be deployed instantaneously. Server overhead associated with running CGI processes has led to the development of application servers which communicate 'in memory' with the web server through Application Program Interfaces (API). The application server negates the need to start and stop CGI processes by either providing an optimised CGI interface to the web server or by directly interfacing to the web server API. Recent advances in three tier solutions to data delivery provide a number of viable options for building a VLRC web site.

In a dynamic data driven Web site, moving data between the database and the HTML page involves a number of processes. The browser (user) triggers a reference to a database query within the HTML page, usually an SQL command to view specific data. The Web server passes the query to the middle tier application server for processing. The application server opens a connection to the database which then executes the query, gathers the results and returns them to the application server. The application server then formats the results into HTML using predesigned templates. The composed web page is sent to the Web server and returned to the requesting browser.

These systems also support gathering data through an HTML page to update or modify a

database. The ongoing maintenance of the database can thus be performed by any validated client from any browser with an Internet connection. This integrated solution to database maintenance and browsing provides a cost effective method for the delivery and maintenance of dynamic data.

Implementation

A key consideration in the development of the VLRC as a dynamic data driven web site is the cost of initial development and deployment versus the costs of ongoing maintenance. With an initial overhead that may be greater than for a static web site, long term management and maintenance costs are substantially reduced by the data driven Web site model. Content changes are not reflected in changes to the user interface, but are changes to data. An application that allows content providers to easily update the database lowers the cost of ongoing content maintenance.

Applications that can be modified and updated through the use of a visual programming environment reduce the skill sets and ease the ongoing support for the application. Changes to the user interface and design can be made through service contracts with the application developers or an independently contracted support team.

The VLRC Data Model

A structural overview of the VLRC data model (**Figure 1** - p.54) describes the relationships between tables. At the first level all counselling, education and training programs would belong to organizations. An organization would be required to provide an address and contact information. The organization table could also contain fields for logos or URL's. The key table for the VLRC database would contain the education and training program information fields. **Figure 2** (p.55) outlines the key identified fields in the program table. The fields could be further refined and modified in Phase II of the project in consultation with the VLRC Advisory Board. The program address would functionally default to the organization address but could also be modified. Large educational organizations with a multitude of programs could provide program specific address information. The NOC table of career classifications and a table of keywords would provide the primary look up links to the program table. The HRDC LMI database could be integrated to the VLRC through the use of the common NOC table.

Skill Sets

Like any professional development effort, many skills are required to see a Web project through from concept to completion. It is important to define the team members and the roles they will play. The following is a list of roles (ordered alphabetically, not by importance) necessary for the development of the VLRC; keeping in mind that one person may fulfill several roles.

The **Application Developer** is responsible for producing the code and logic behind the

product. In the context of the VLRC project, this may include client- and server-side scripting, and HTML.

The **Database Administrator** designs the schema, implements stored procedures, and helps the Application Developer work with the database.

The **Graphic Designer** determines the look and feel, constructs the layout, generates backgrounds, and control (for example, button) artwork.

The **User Interface Designer** works closely with users and the Team Leader to build a product that is easy to understand and simple to operate.

The **Team Leader** maintains the schedule and provides the liaison with users, clients and the proposed VLRC Advisory Committee. The Team Leader makes sure that other team members have what they need to get their jobs done.

Formation of a Interim Steering Committee

The responsibility of the Interim Steering Committee will be to oversee program development and to provide recommendations for an organizational structure to manage and control the VLRC in the future. The Interim Steering Committee requires an organizational structure that incorporates groups with separate interests, such as those who will receive data from the system and those who will provide data for the system as well as groups representing specific interests and target groups. The VLRC Project Team with the assistance of the Interim Steering Committee must work to ensure that these needs are addressed at all times.

The make-up of the Steering Committee should not surpass 9 to 11 members. It is proposed that the Chair of the Committee will be the **Team Leader** of the VLRC Project Team. The remaining members include representatives from the following organizations and sectors: 1) HRDC, 2) Manitoba Education and Training, 3) City of Winnipeg Community Services, 4) The University of Winnipeg, 5) University of Manitoba, 6) Red River Community College, 7) Representative of Private Vocational Training, 8) Representative of the Non-profit Service sector, and 9) a Representative of ManCET. Additional members may be included as optional candidates for the Committee as follows: 1) Representative from the Aboriginal community who is involved with training, 2) Representative of welfare services, and 3) a Representative from the Francophone community involved with bilingual training. Representation from the Winnipeg Development Agreement can be achieved through HRDC.

Preliminary Cost Estimates

Subject to further refinements, a preliminary estimate of the costs of this project (Phase II) is as follows:

1. Administration (project coordinator, project manager)
   6 months @approx $5,000 per month

   $ 30,000

2. Database Modelling and Implementation
   6 months @4,000 $ 24,000

3. Application Developer.
   6 months @$4,000 $ 24,000

4. Web Interface Designer
   6 months @$4,000 $ 24,000

5. Administrative/Clerical Support
   6 months @$2,500 $ 15,000

6. Hardware (1 Pentium Pro Server and 2 Pentium workstations) $ 30,000

7. Software (variable) $ 0-5,000

8. Internet Access (variable, per year) $0-36,000

9. Overhead costs (supplies and expenses, etc.) $ 15,000

10. Contingency (approx. 10%) $ 18,000

11. Translation (approx. 100,000 words* $0.22 &additional expenses) $ 30,000

          Total $ 208,000 - 249,000

Ongoing Maintenance

To ensure its long term feasibility, the VLRC must be housed at an appropriate and stable organization. This consideration should play a prominent role in the selection procedure for the Phase II application development contract. It is important that the application be developed and housed at an organization that has:

- expertise in information technology
- experience in database application development
- experience with Web servers and Web site maintenance
- a long and stable history

● an understanding of and commitment to education and training

After successful deployment of the VLRC application and the completion of Phase II implementation, ongoing support will be required in the following areas:

● Providing technical support to users with both the short-term goal of assisting them with current problems and the long-term goal of improving the application to make it easier to use.

● Performing both routine content updates and periodic application upgrades. Because the application would be in use in a production environment, these should be coordinated with the system administrator to ensure as little impact as possible to any users accessing the site.

● Engaging in ongoing performance monitoring to ensure that the application is continuing to run at peak efficiency.

The continued operation of the VLRC Web site will require an ongoing administrative team. This team would be responsible for ensuring that liaison with content providers, both existing and new, will be maintained.

The Interim Steering Committee established during Phase II of the project should assume an advisory capacity to the VLRC host and administrative team over the long term. The VLRC administrative team should periodically meet with the Committee to monitor the VLRC's progress, and provide broad based input on its modification, development or refinement.

Recommendations for Phase II Implementation

The following outlines five recommendations for the implementation of Phase II of the VLRC project:

● The Virtual Learning Resource Centre be developed as a dynamic data driven Web site.

● An Interim Steering Committee be established to guide and oversee the development and implementation of the VLRC.

● The VLRC be hosted at one of the major Winnipeg universities.

● The Phase II VLRC Implementation process comprising the database design, interface design, and application development be contracted to a local company or institution in liaison with the VLRC host institution.

● Ongoing funding for the maintenance of the VLRC be provided for a five year term after which the VLRC would become self financing.

The University of Winnipeg

**Report on the
Establishment of a
Virtual Learning Resource Centre
in the City of Winnipeg**

PHASE I: Concept and Design/ Feasibility Study

1.0   INTRODUCTION

The concept of a Virtual Learning Resource Centre arose out of discussions between officials of Human Resources Development Canada (HRDC) and The University of Winnipeg, which led to the submission of a proposal to HRDC by The University of Winnipeg in September, 1996.   Funding approval under the Winnipeg Development Agreement was received in November, 1996. The proposal was aimed at establishing a Concept and Design framework for the establishment of the Virtual Learning Resource Centre, as a first step towards a detailed implementation plan.

As envisaged, the VLRC would be an electronic database, accessible on-line through the World Wide Web, having the following broad objectives:

●   To support decision making on career goals and their implementation

●   To provide convenient access to information on education and training for specific career paths

●   To assist education and training providers in disseminating course information to potential students

●   To provide an efficient and cost effective method of maintaining education and training information

●   To ensure the best possible match between students and course/institution, thereby reducing the personal and governmental costs which result from inappropriate choices.

The establishment of a Virtual Learning Resource Centre, would enable potential students to easily access timely and accurate information on public and private sector training and educational opportunities. This information currently is widely dispersed and in some cases available electronically.   Potential students are usually required to contact individual educational institutions or training providers to obtain course calendars or timetables and associated information.   Only major institutions (e.g. The University of Manitoba, The University of Winnipeg, Red River Community College) provide information electronically.

There is also a scarcity of resources which link career planning tools, local labour market information, and local education/training opportunities. As a result, in many cases, educational choices are made in ignorance of personal aptitudes or labour market realities. Recently, important steps towards remedying this have been taken at both the Federal and Provincial levels.

The Province of Manitoba (Education & Training) has a project underway to produce a compendium of course calendars (public and private) in both print and electronic form. As well, a web site is under development which will provide a listing of potential occupations as identified by the Federal Government under the National Occupation Classification system (NOC). This site also attempts to link these occupation categories with education and training providers, and represents an important first step, directly relevant to the VLRC project.

In addition, a Federal, Provincial, and private sector initiative now underway under the CanWorkNet umbrella, will ensure that a wide range of career counselling and labour market information products, relevant to Winnipeg residents, are available on the Internet.

The VLRC advances these concepts by providing an electronic platform for information on educational and training courses, co-op education opportunities, etc., to be entered and updated on-line. The database would be dynamic, ensuring users access to the most current information available. The VLRC would also link to these other products, ensuring a comprehensive information service is available to persons seeking a first career or career change.

1.1 Summary of Goals, Phase I: Concept and Design

The proposed design concept is based on the premise that there are essentially two kinds of client groups seeking information about education and training opportunities. The first group may be identified as those for whom **counselling** is an important element in their search for information to assist them in making the proper choice for their particular career, training, or retraining goals. This group might include:

- high school graduates wishing to explore a number of educational and training opportunities related to a variety of career possibilities;

- those already employed seeking to expand their knowledge and skills in order to become eligible for advancement within their organizations;

- those seeking a career change but uncertain of the range of opportunities for re-education and retraining;

- the unemployed, seeking information on education and training opportunities in order to assist them in finding meaningful paid employment.

Information designed to meet the needs of this group must be carefully structured to allow the client to undertake an exploration of the numerous career, education and training options. It must contain appropriate linkages which match the client's selection. It should be both menu-driven and/or query based, with each layer leading to further choices until the client's queries are fully answered.

The second major client group consists of those seeking **specific information** on a particular education or training program. This group would consist of those clients who have a particular career path in mind and who are seeking specific information on program requirements, program content, and the institutional providers of their program of choice. For this group, the VLRC would be a tool for searching a database in response to a specific query selected from a listing of key words or phrases, or entered in a query text input bay.

With this in mind, the following **Objectives** for the project were established and agreed upon as part of the project approval process:

Objective 1: To develop a planning framework for the establishment of a Virtual Learning Resource Centre in Winnipeg.

Objective 2: To form an Interim Steering Committee to oversee the development phase and to provide recommendations for an organizational structure to manage and control the initiative in the longer term.

Objective 3: To develop a strategy to ensure broad public access to the VLRC.

A number of activities to be undertaken in pursuit of these objectives are identified. These will be addressed in the body of the report that follows.

1.2 Identify a Project Coordinator and Research Staff

Project Coordinator: **Dr. George Tomlinson**, Vice-President (Academic), The University of Winnipeg;

Research Staff: **Christian Douchant**, Research Associate, Institute of Urban Studies (IUS), The University of Winnipeg;

Peter Tittenberger of *Extension 504* - Private Consultant with experience in Internet Publishing.

Other IUS staff, on an occasional, as-needed basis; Research Assistants hired on a casual basis for specific segments of the project.

1.3   Advisory Committee

Dr. George Tomlinson
Vice-President (Academic)
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515 Portage Avenue
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R3B 2E9

Mr. Christian Douchant
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1.4 Report

This report addresses the three objectives stated in the introduction. It begins with a general overview of existing on-line resources, including interactive Internet databases then addresses issues of community access and feedback from service providers. The final section is completely devoted to the development of the database design, including hardware and software requirements and cost estimates.

2.0   *ASSESSMENT OF CURRENT AND PLANNED ON-LINE RESOURCES*

2.1   **Review of On-line Resources**

A fundamental element in the conceptual design of the Virtual Learning Resource Centre is that, wherever possible, it should integrate links between planning tools, local labour market information and local education/training opportunities. Thus, a significant portion of the background work carried out for this project involves a review and assessment of current and planned on-line resources in these areas.

Human Resources Development Canada has developed a database which combines occupation listings and labour market information. The Labour Market Information (LMI) **[See Section 2.3]** has occupations listed according to their National Occupation Classifications (NOCs) and provides labour market information derived from Employment Insurance (EI) claims from every region of Canada. Consequentially, the emphasis of the VLRC project is to develop an education and training database component that may be linked to the LMI database.

To this end, existing online and print resources have been compiled in order to assess the existing gaps in developing an education and training database, and to consider the best way to assemble information in a form which meets the needs of various client groups. Existing Internet sites were selected based on the information they provide for occupational or career training and educational advancement. Following the *Winnipeg Development Initiative Guidelines*, only sites that are in Winnipeg or provide services for people in the city were selected – this includes international service providers of correspondence courses.

2.2   **Training and Education Web sites**

Various websites were viewed for this phase of the project. The sites varied from single institutions to a webpage providing many links to other public and private educational websites. The final selection process was based on whether the site in question had links to education or retraining courses and/or links to other sources that had information.

The first sites reviewed were from the Federal Government (Human Resources Development Canada) and the Province of Manitoba (Manitoba Education and Training). The site addresses are as follows:

1. http://www.gov.mb.ca/educate/labour/cg_home.html
2. http://www.hrdc-drh.gc.ca/hrdc/corp/stratpol/jobs/english/index.html

Other relevant sites reviewed include those developed by private and public institutions which are qualified to provide education services. These sites include universities and community colleges, including:

1. http://www.uwinnipeg.ca (The University of Winnipeg)

2. http://www.umanitoba.ca (The University of Manitoba)
3. http://www.rrcc.mb.ca (Red River Community College)
4. http://www.ustboniface.mb.ca (Collège de St. Boniface)

A survey of private sector education and training providers was carried out. Only a small number of these currently have web addresses; two good examples are:

1. http://www.herzing.edu/winnipeg/(Herzing Career College)
2. http://www.anokiiwin.com

The remaining sites viewed were either providing links to other education sources or education providers with no significant information provided on a webpage other than an address for "snail-mail" and E-mail. Included in the list are some institutions outside of Winnipeg. The list of addresses are as follows:

1. http://www.winnipeg.freenet.mb.ca/iphome/e/epw/index.html
2. http://www.cam.org/~dcohen/txt/jobs/
3. http://ele.ingenia.com/
4. http://aweto.com/jobs/
5. http://www.nacc.ca:80/college/mb-city.htm
6. http://www.cdicollege.com
7. http://www.academyol.com/
8. http://www.assiniboinec.mb.ca:80/www/manitoba.htm
9. http://www.alice.pangea.ca/universities_colleges
10. http://www.manitobanow.com/community/education.html
11. http://www.ubrandon.com

A brief review of these sites revealed inconsistencies and gaps in the way data is made available and the way it is distributed. Some sites only list a series of links to information sources while others have a systematized method for displaying information. For example, The University of Winnipeg displays course information using a standardized template for each department. Other examples include Herzing Career College and Anokiiwan Training Institute which provides training to First Nations communities.

The emphasis of the VLRC is to move towards building a database that will provide standardized, relevant information and simultaneously permit linkages to other electronic sites. From a brief review of these sites, it is evident that a new database will have to be developed for the purposes mentioned. Existing data is distributed in too many different formats, and not all institutions are providing standard set of data.

2.3   Labour Market Information - (LMI)

The Labour Market Information database is an important component in the future development of the VLRC – *http://lmi-imt/hrdc-drhc/gc.ca*. This database provides all the necessary labour market information and the NOCs occupation listings that are

fundamental for the development of the proposed site.

All occupations listed are obtained form the National Occupation Classification (NOC) which is a systematic taxonomy of occupations in the Canadian Labour Market. The NOC replaces the previous occupational classification system, the Canadian Classification and Dictionary of Occupations (CCDO). The existing classifications are closely related to the 1980 Standard Occupational Classification (SOC) of Statistics Canada.

The labour market information is collected and summarized by HRDC with data obtained from Employment Insurance (EI) claims. All offices of each local Human Resource Centre summarize claim data monthly and send the information through a Wide Area Network (WAN) to update the central database in Ottawa. Labour market information is then tabulated and redistributed to the local branches to be used by counsellors and users through the HRDC Kiosks. The data is disaggregated to allow forecasts for Canada, each province, or a major metropolitan centre. Consequentially, a complete list of occupations is available for the metropolitan region of Winnipeg with adjoining labour market information for each occupation.

Because of the standardized format of the data and the nature of information provided, it is not necessary to develop an occupation database as a component of the VLRC. The emphasis is to develop an interactive education and training database to be linked with the existing LMI database.

2.4   Examples of Interactive Databases

The following is a brief review of two interactive databases available on the web. They were investigated and evaluated for their potential as a basis for developing the education and training database for the VLRC.

The **Interactive Training Initiative** is a database listing training opportunities for the Province of Ontario - *http://207.81.58.101/training/search1.idc*. This an interactive system providing generated data through a search menu that allows the user to qualify searches in the database. The user starts from a regional map of Ontario. Once they have selected a particular region, the user can perform a query through a menu that permits the selection of key fields, which include: **Keyword Search**, Type of Training, Duration of Study, Start Date, Full or Part-time, Day or Evening Courses and Institutions.

A quick test was performed to investigate the type of data generated by the system. Once the user returned the query, a new menu was generated that listed cases it has found. In one example, course name, location, institution, fee and start date was generated in the new menu and all cases were listed underneath. From this generated menu, a course name could be selected which would provide a course description.

The database has not been fully developed since data from large university institutions has yet been entered. However, the system provides an excellent example of how an education

and training database could be designed for the VLRC.

Three features are of particular interest. The use of an interactive map allows the user to access the database quickly. Second, the use of the search engine with key fields for selection allows the user to narrow the search. Finally, the generation of a new menu for query results is highly effective at displaying results in a standard format.

The **Illinois Articulation Initiative - iTransfer** is an interactive database for the Illinois Transferable General Education Core Curriculum, which is a program that allows future college students an easier transition to complete college level courses toward an Associate or Bachelor's degree program in any participating college or university - *http://www.itransfer.org/ IAIsite/GenEDCore.qry.* This website was developed to provide students with an enhanced selection of courses to choose from. This is also another example of an interactive system that permits the user to generate data through a search engine. In the main menu, the user is given five fields or categories for selection, or the user can quickly use a **Find a course** search engine to select courses.

A quick test was performed to identify the nature of data available in the system using **Find a course** link. The user is first presented with a regional map of Illinois; once a region is selected the user is then able to select an institution; the next menu permits the user to select any course in a program or all courses available in the institutions that qualify under the program. The last menu lists all the course names and numbers, along with a title. Finally, the user can link to the course number to get a brief description.

The system operates very much like the ITI database developed by HRDC in Ontario. The site is interactive because it generates new menu screens every time a query is returned; all outputs are presented through a template. These data generating database systems have become more prominent than static Internet sites. This data driven content format is likely to be adapted for the education and training database for the VLRC.

3.0 PRIVATE VOCATIONAL TRAINING

3.1 Survey of Education and Training Providers in the Private Sector

The implementation of a Virtual Learning Resource Centre required an assessment of all Internet sites developed by private vocational training organizations outside the larger academic institutions. It was also important to determine which of these organizations are not on the Internet and to assess their views on using the Internet. For this purpose, 43 organizations listed under the Manitoba Government, *Private Vocational Schools Act* were contacted and consulted about their use of the Internet. For a list of the organizations under the Act see **Appendix I**. Many questions were asked about courses available, curriculums, certification of instructors and whether organizational curriculums are accredited by any professional body.

The consultation with private vocational trainers was undertaken to address key issues and questions that need to be considered prior to the development phase of the VLRC. These include: How many organizations are on the Internet? What type of information is available on the Internet (i.e. courses, curriculums, programs, etc)? If they are not on the Internet now, will they be in the future? What level of interest is there for the development of a VLRC? If they are not on the World Wide Web but are interested in becoming part of the VLRC, are they prepared to have another organization develop a website for them?

During the consultation process, additional questions were asked to determine interest in the VLRC and whether the Internet will play a greater part of their future marketing plans. It cannot be under-stated that participation in the VLRC by these organizations must be promoted in order to build a meaningful database in the future.

3.2 Results of Consultation

Most of the organizations responded to the consultation process (40 out of 43 - 93% response rate). Almost all were cooperative and sent back information about their organization, including courses, curriculums and program outlines. Many expressed interest in the potential Virtual Learning Resource Centre and indicated they would like to be informed in the near future about its development.

Many of the organizations contacted were not on the World Wide Web but were connected to the Internet via e-mail. Many others indicated they were in the process of developing web pages or were considering it in the near future. It should be mentioned that some organizations listed are correspondence schools from outside the province but were surveyed at their Winnipeg office, or at their out-of-province number, because they were registered under the Act and they provide relevant training vital to the Winnipeg economy.

3.3 Organizations with Websites

Only a few organizations had an official web page. These web pages provided information such as course information, curriculums and programs outlined in detail along with other pertinent information. These organizations include: Anokiiwin Training Institute, Herzing Career College, Granton Institute of Technology, Patal Vocational Preparation Schools Ltd and The Jacks Institute. Most of these organizations have offices located in Winnipeg - except the Patal Vocational Preparation Schools which is a correspondence college from Toronto, Ontario.

3.4 Organizations with Limited Internet Access

There are some national and international organizations providing education services in the city and that have branch offices in Winnipeg. Most of these branch offices do not have a local web page and instead are listed by name and address in their main corporate web page. In most cases, an e-mail address is provided for users to obtained further information.

Organizations listed in this fashion include: ICS Canadian Ltd, H&R Block of Canada, McGraw - Hill Continuing Education Centre, Success/ CompuCollege School of Business, and CDI College. Some web pages provide more information than others. For example, the national web page for CDI College listed various programs offered by their school including course requirements and fees; however, they explicitly state that curriculums vary across the country and the user has to use e-mail to contact the nearest local office. For other organizations, only an e-mail address is provided along with the local address; there is no additional information provided to the user.

3.5 Organizations with No Internet Access

The remaining organizations had either no connection to the Internet at all or had minimal access to e-mail. Many of these organizations had an interest in developing web pages in the future or were in the process of building web pages. Some indicated that they were not interested in developing a web page but showed some interest in the VLRC - this could mean they are prepared to provide the needed data for the future database. A brief profile of the type of organisations contacted include: hair stylist training schools, schools of esthetic design, truck driver training schools, schools of multimedia and technology and some more unique institutions (training in taxidermy and professional modelling).

These organizations are relatively small and may not have the resources and expertise to use the Internet. A future consideration for the proposed VLRC would be to provide the necessary expertise to the smaller organizations for placing their information in the database. At this point, the issue should be raised and should be addressed in the future.

3.6   Final Comments

The main conclusion to be drawn from this consultation is that many organizations providing vocational training in the private sector are not yet available on the World Wide Web, particularly the smaller operations. Some of the larger organizations do have detailed web pages while others simply have an e-mail address listed to their main corporate web page. Many of the organizations contacted expressed interest in the VLRC and may want to participate in the future.

4.0 USER ACCESS

4.1 Assessing User Perspective of the VLRC

In order for the Virtual Learning Resource Centre to be a useful tool for those seeking information on career-related education and training opportunities, broad public access is essential. Although public access to the Internet through home-based computers is increasing rapidly, the proportion of homes with direct access remains quite small (about 10% of homes nationally, according to one recent survey). Furthermore, home access is generally more likely to be confined mainly to those in the middle- and upper-income levels. Thus, it is important that steps be taken to ensure broad public access to the VLRC from such locations as public libraries, universities and colleges, community organizations and neighbourhood resource centres.

There are two important issues to address before developing the design concept for the VLRC. First, it is necessary to contact potential user groups for input into the desirable features of the VLRC as seen from a user perspective. (As a secondary goal to this, the need to gauge the level of interest in a resource such as the VLRC). The second issue relates to the technical needs that have to be addressed at the various points of access (the technical needs relate to hardware requirements, including Internet connectivity).

In order to address these issues, we contacted over 30 government and community organizations. These organizations are listed in **Appendix II**. The findings of this study have been incorporated in the final Proposal (**See Section 6.0**).

4.1 Special Needs and Target Groups

For those already familiar with the World Wide Web and who want direct information on occupation training, the VLRC will provide the relevant necessary information required. However, for those who live in difficult social and economic conditions in the inner city of Winnipeg, the benefits of this information may not reach them. The following is a brief outline of some social and economic disparities between Winnipeg's Inner City and the suburban areas. See **Appendix III** for social, economic and demographic data comparing the inner city with the suburban areas.

The City of Winnipeg Social Development Review Committee in association with the Institute of Urban Studies recently produced a report titled *Planning for Equity in Winnipeg* (1996) which outlines two different economic and social realities that exist between the Inner City and the suburbs of Winnipeg. Comparing the economic and social circumstances, the Inner City has a higher concentration of low income single parents and Aboriginal households than suburban areas. Rates of household, family and individual poverty along with unemployment rates are at times twice the level of suburban areas; in some Inner City neighbourhoods, the level of poverty and unemployment is three to four times higher than the average city rate. An increasing number of the households need social assistance.

There are also some key demographic characteristics in the inner city that are worth noting. There are higher proportions of children living in poverty than suburban areas; this is particularly true for children in Aboriginal families. Many new immigrants settle in the inner city compared to suburban areas. Even more important, there is an increasing Aboriginal population, many of whom live in extreme poverty and are without the skills needed to access adequate employment. Finally, the overall population in the inner city has substantially lower levels of education than the suburban areas. This is particularly true for the Aboriginal population.

This discussion reveals that there is a need for such a system proposed to be made available to those who are disadvantaged and who may not otherwise have access to the Internet. The VLRC may bring new opportunities to these individuals and those providing counselling services and may go along way to help those seeking to improve their existing circumstance. The proposed **counselling** features of the VLRC would be particularly important for such clientele, and it should incorporate elements that would serve the specific needs of the inner city.

4.2   VLRC Community Consultation

From our consultation with many community groups, there is significant support for the VLRC project. Many groups showed particular interest in the career building possibility with the system. David Weismiller, Director of Libraries with the City of Winnipeg, was quite positive about the VLRC and wanted to know how the public libraries could play a role. Gerald Mirecki, City of Winnipeg Neighbourhood Resource Centre Manager, was very positive about the VLRC and wanted to meet and further discuss its possibilities; for him, the VLRC is compatible with the City's Neighbourhood Resource Centre concept. Doug Muir of the Manitoba School Counsellors' Association is interested in the VLRC and feels it has potential. Wayne Helgason from the Social Planning Council of Winnipeg is quite interested in it from the Aboriginal perspective and feels it would likely benefit this segment of society.

Some groups inquired about certain technical features and the type of information that will be provided through the proposed VLRC. Greg Selinger of the Winnipeg Education Centre specifically asked whether the VLRC page would include employment opportunity links. Others also indicated that they wanted to know if employment opportunities would be listed. Doug Muir of the Manitoba School Counsellors' Association would like to see career development information be made available. He provided an example of the ASCA (a school counsellor's site in the USA) webpage as an example of a site with some career development information.

As to technical limitations for groups to use the proposed VLRC, some organizations have sufficient capabilities while others do not. Frank King of the Broadway Neighbourhood Centre indicated they have a satellite program with Gordon Bell High School for students in danger of dropping out; the centre has a basement computer lab with Xts and 286s. All the computers were donated from the Faculty of Medicine at the Health Sciences Centre.

Since the Health Sciences Centre has over 1600 operational computers at present, he feels it is only a matter of time before the centre acquires more advanced computers. At this time, the organization does not have any computers with Internet access.

Doug Muir of the Manitoba School Counsellors' Association indicated that most school counsellors have computers in their office, but not all of them necessarily have Internet access. Whether each counsellor office should be equipped with computers for Internet use has not yet been determined.

Rick Magnus of The Single Window project is presently developing the Aboriginal webpage with HRDC. This organization brings together federal and other levels of governments for the benefit of Aboriginal people - this is HRDC's contact with this particular community. To ensure that the VLRC addresses the concerns of the First Nations people, Mr. Magnus will be a good future contact.

Greg Selinger of the Winnipeg Education Centre revealed that they only have 5 or 6 computers available in their office, though their 130 students do have access to all computer facilities at the University of Manitoba. Almost all their computers in the Centre are Pentiums and have Internet connections and therefore should be more than adequate for immediate connection with the VLRC.

City of Winnipeg, Parks and Recreation Department

The City of Winnipeg Parks and Recreation Department is responsible for 74 community centres across Winnipeg. The City of Winnipeg essentially owns the land and facilities of each centre, but it is local community resident groups who are responsible for programming and day-to-day management of the facilities. Marlene Amell of Parks and Recreation indicated that her department is considering the future implementation of computer resources in the next five years, but these resources would be for staff and operations and not for use by the general public. Providing Internet access for these community centres would come under the responsibility of the resident community groups. However, it was acknowledged that many of these resident groups do not have the funds to setup computer facilities with Internet access. Consequentially, resident access to computer facilities at community centres is non-existent.

The City of Winnipeg is responsible for a few recreation centres located in the Inner City, which include Mangus Eliason Recreation Centre, Turtle Mountain Recreation Centre and Freight House Leisure Centre. These recreation centres are different from conventional community centres in that all programming and management is conducted by the Department of Parks and Recreation. None of the centres are equipped with computer facilities for the general public – usually staff are supplied with any PC's. There are current negotiations with HRDC to include information Kiosks at two of these recreation centres: Magnus Eliason and Turtle Mountain. Another possible community outlet is the West Broadway Community Centre which has taken its own initiative to supply computers for the neighbourhood. As for the overall situation, Gerald Mirecki of the City of Winnipeg Parks

and Recreation Department indicated that they have no computer access for the public in any of the centres - just enough for internal staff use and none of those have Internet access.

City of Winnipeg, Library Department

The Winnipeg public library system is singled out here because of an exciting proposed four to five year plan by the Library Department to upgrade all their publicly-accessed computers from text-based browsing to new computer platforms with full multi-media capability and Internet connections. The plan has been approved by the City of Winnipeg Council and is being funded as a Capital Project. However, funding will be approved in phases; therefore, funding for each year has to be approved by the Executive Policy Committee. Overall, there is wide support for the project by City Council and the project will likely be completed in the time allotted.

Presently, the **Sir William Stevenson** Library on McPhillips Street is the most up-to-date branch in terms of Internet and multi-media technology capabilities available for the general public. The four year plan involves upgrading all 20 branches to the same level of technology.

In this four year plan, the Library Department is still negotiating whether it will set up its own server at the Centennial Library Main Branch. The Library Department plans to setup T1 cable lines to about half the branches. The other half will continue to be serviced with existing City of Winnipeg cabling through Winnipeg Hydro. The Centennial Branch will have fibre optic cable setup through the services of VIDEON cable. Branch to branch cabling connections will be through T1 lines and each terminal in a branch will have a 100 Megabyte cable link to each individual branch server — this will allow their systems to acquire data 4x faster than present capabilities.

The present plan is for 100 telephone connections with Bluesky/ Muddy Waters internet services. Originally, the intent was to use the server through the City of Winnipeg; however, the City was concerned about security of their system due to the number of clients accessing the system. As a result, the Library Department may maintain their own server apart from the rest of the City of Winnipeg.

All existing mainframe computers and older PC models are to be replaced with Pentium computers with full multi-media capability. The computers will run with a Windows NT operating system. The Libraries will have a customized menu for their services (i.e., book searches from within the branch or branch to branch). However, they are considering menus with direct links to other important sites and sources such as Federal and Provincial departments. The proposed plan signifies that a key community access point will have full capability of providing powerful Internet service for the general public at no cost.

Human Resource Centres, Human Resources Development Canada

There are four Human Resources Centres in the City of Winnipeg providing employment services to the general population; these centres include Winnipeg Centre, North/East, St. Boniface and South/west. Apart from employment services, these centres have significant resources at their disposal for those seeking employment and/or training opportunities along with supportive counselling services. Computer resources provide access to word processing software for resumes and cover letters, and tutorials for reviewing interview practices. A significant amount of literature is also available for all users on similar topics. Also, the many Kiosks have various on-line services provided by HRDC, such as LMI and the Job Bank (employment opportunities).

Each Centre can become some public access points for the VLRC. It will compliment the many services that HRDC provides.

4.3   Inventory of Computer facilities for Public Access

Over a dozen organizations provided information on their existing computer inventory (**See table below**). Of those organizations with computer facilities, many do not have an Internet connection. Those that do have Internet connections, usually a single computer, or the only computer available for the clients, has access to the internet through the use of a modem. Data transfer over the Internet for all the clients in these organizations is likely slow. Among the organizations that have Internet access, only the Osborne Village Resource Centre indicated frequent usage of the Internet. The remaining organizations acknowledge that Internet use was low, either because clients lack the knowledge to operate the browser or the staff did not have sufficient time to train clients.

The computers facilities of the service organizations contacted largely consist of stand-alone PCS. A handful of organizations have a network setup for all their client computer facilities (e.g. Taking Charge! and Osborne Village Resource Centre). Funding seems to be the major barrier for these organizations to supply Internet services. Many expressed a desire to acquire Internet access or to increase their existing capacity in the future.

Many public and private schools have computer facilities with Internet services. The use of public school computer facilities may be a short-term solution to Internet access to specific target groups and the general public until other organizations can get the equipment they require. Another option for public Internet access is the City of Winnipeg public library system.

It is important to note that public and private schools have not been surveyed in the report because their adult education training is not listed under the Private Vocational Training Act and therefore they are not under the mandate of this report. However, the existing computer facilities at these institutions may be considered as a community access point for Internet facilities in the future.

		Computer facilities				Computers with Internet Connection		
Name of Organization	Target Clients	#	Type	System	Network	#	Internet Connection	Company
Employment Projects for Women Inc.	Women, single parent mothers, etc.	13	Pentiums and 486s	Win 3.1	none	none		
Youth Employment Services	Youth 16 - 24	2	Pentiums	Win 95	none	1	modem	Escape Communications
Osborne Village Resource Centre	Youth, Adults, single parents, Aboriginals, and immigrants	12	Pentiums	Win 95		1	modem	Escape Communications
Taking Charge!	Single parent mothers, Aboriginal women	17	Pentiums	Win 95	Novell	none		
Aboriginal Training and Employment Services	Aboriginals	4	486s	Win 95		none		
Andrew Street Family Centre	Single parents, youth, adults, Aboriginals	0				none		
Reaching Equality	Youth, etc	-	486s	Win 31	none	1	modem	Escape Communications
YM\YWCA Youth Now	Youth and Aboriginals	0				0		
New Directions for Children	Youth, Single Parents, Aboriginal	1	486	Win 95	Novell - linked to staff network	1	modem 28.8 bps	-
Youth Career Development Program	Youth	-	Pentiums	Win 95	-	-	Modems	-
West Broadway Community Centre	Youth, Aboriginals, single parents,	7	ATs, 386s	DOS	none	none		
Welfare Reform Family Services	Public on Social Assistance	none				none		
Open Doors	Youth	Use computers facilities of King Edward School						
Winnipeg Adult Education Centre	Young adults, Aboriginals,etc	Use computer facilities of King Edward School						

4.4 Cost Estimates for Supplying Internet Access

The public library system and some of the smaller non-profit organizations (**See Above Table**) are presently providing Internet access or will be providing access in the near future. However, other organizations do not have sufficient funding for computer facilities with Internet access. To ensure broad community access for the proposed VLRC, the purchase of computer for such organizations may have to be considered in the long-term. The purchase of computers would include a cost estimate for the services of an Internet service company. The following lists the cost estimate for one Pentium computer with standard features: Pentium 200 MHz CPU,15" SVGA Monitor, 3.22 gb HD,16 Mgs RAM and 33.6 Kbps Modem. The cost estimate for a computer are relative and based upon current listings from various retail outlets.

The Internet service connection is based upon rates as set by **Escape Communications**, which include four packages for Internet connections over existing telephone lines. Three packages provide varying monthly service rates that only support analog signals, but guarantee access with no busy signals. These packages essentially support modems with speeds of 33.6Kbps or lower. The other package provides unlimited access to their digital pool with faster access and supports modems up to 55.6Kbps. However, they only support the Rockwell Chip set and not the US Robotics; in addition, the digital pool does not guarantee immediate access without busy signals.

The following calculations were based upon charges for their 90-hour Internet service package (via analog signal), which includes a standard monthly fee of $24.95. Other monthly rates are 5 hours - $4.95 and 30 hours - $15.95. For all monthly rates, each additional hour is $1.00. The extra cost cited in the Internet Service includes a hypothetical estimate based upon 6 hours of Internet use everyday in a five day work week over a year. The estimate shown outlines the costs for all hours of use with the 30 hours priced under the monthly fee subtracted from the total service hours.

Price

Computer	$2,500.00
Optional Multi-Media (CD Rom, Sound Card)	$ 500.00
Sub-total	$3,000.00
Internet Service **	
$24.95 per month	$ 299.40
remaining service to be paid	$ 480.00
Total	**$3,779.40**

** Calculations for Internet Service over 12 month period

Internet hourly service rate $1.00

6 (hrs) * 5 (days) * 52 (weeks) = 1560 total hours

12 * 90 (30 paid by monthly fee) = 1080 paid hours

Remaining service to be paid
1560 - 1080 = $480.00 (remaining hours 480 * $1.00)

These rates for computers and Internet service are subject to change.

4.5   Potential Funding Options

Many community centres, neighbourhood resources centres, Human Resource Centres and non-profit service organizations could provide Internet access points for residents of low-income areas who may not have access to the Internet. The best possible scenario would be to supply at least one computer to organizations that provide services to disadvantaged groups or neighbourhood recreation centres. The exact number of computers needed would vary depending on the number of organizations selected as important access points and their changing technical requirements. However, providing computer facilities with Internet access could go a long way to provide inclusion of many disadvantaged groups that would not normally have the opportunity for using the Internet.

There are possible sources of funding available for some of these organizations to acquire computers with Internet access. The Community Access Program (CAP) from Industry Canada supplies computers with Internet access to rural communities in order to promote the use of the Internet for business development and growth.   The CAP has a five year mandate and whether a new program will be made available for urban communities is unknown. If the program is made available in urban centres, organizations would be required to prove that Internet access would contribute to neighbourhood economic growth. Organizations with a well-developed business plan would likely be more successful in receiving funding over other organizations.

Another possible source of funding for these organizations is HRDC. Such funding for computer acquisition would allow non-profit, training organizations to access HRDC services over the Internet. Other possible sources of funding could include the continuing Winnipeg Development Agreement (WDA) which may have financial resources for such specific purposes – i.e., providing Internet outlets for disadvantaged neighbourhoods in Winnipeg.

5.0   *FEEDBACK ON PROPOSED DATABASE*

5.1   Review of Database Requirements with Non-profit and Private Training Organizations

The following outlines suggestions and comments provided during meetings with non-profit and education services providers to obtain feedback on the development of an education database for the Virtual Learning Resource Centre. A synopsis is also provided.

When presented with the database concept certain assumptions were provided to the organizations about the database design. First, the database design would be similar to the interactive database concept reviewed in **Section 2.0** such that the database will likely generate new outputs for every query forwarded by a user into the system. Second, the data would have to be inputted by the various education and training providers in Winnipeg through the use of an dynamic template that would keep an up-to-date database via a central server. The dynamic template would be designed similar to a typical data entry screen listing various fields for the training providers to fill out.

Working with these assumptions, the organizations consulted were asked whether the overall concept was feasible and whether they would be prepared to maintain their own data via the server if the system was implemented. We requested their input on the key fields that should be included in the template as well. Finally, any input they could provide on possible requirements for the "counselling" component of the system was requested.

Youth Now - YM/YWCA
Nancy Kelly

About the Organization:

Youth Now is a program delivered through the YM/YWCA and provides counselling services for troubled youth and single mothers. Nancy Kelly indicated that roughly 80% of their clients are Aboriginals. One major focus of their program delivery is to assist individuals in obtaining their grade 12 or to obtain an equivalency by referring clients to various institutions in Winnipeg. The organization tries to make sure their clients have the basic necessary skills to re-enter the job market or begin a career. They offer Basic Skills training but nothing that is registered or recognized by Manitoba Education and Training.

Assessment of VLRC

The organization was satisfied with the concept of a centralized database and the use of template for data entry. The information presented in a standardized format was an important element. The addition of a counselling section was regarded as very important. In addition, they were satisfied with general attributes to be included in the database, which include: name of institution, location, program, cost, etc.

Overall, the idea of the project was well received. It was indicated that the system would be useful for both their clients and their counsellors.

Additional Database Requirements

The organization felt the need to include a section for those individuals seeking information for completing a high school diploma or the equivalent. They would like to see information on where to obtain a GED (Grade 12 Equivalence Diploma), Grade 12 through correspondence, or Grade 12 through Adult Continuing Education. They would like data fields indicating location of institutions, dates offered (school year) and prerequisites (entry level tests). They would also like to see an outline of potential funding sources (i.e., Aboriginals through their own Native Band, HRDC and Social Services).

Price was deemed important as well. Winnipeg School Division #1 offers GED for free, and, therefore, this type of information would allow potential clients to do comparison shopping.

Osborne Village Resource Centre
Donna Sigurdson-Moors

About the Organization:

The OVRC acts a facilitator for individuals to move from unemployment or underemployment to full employment. Their clientele consists mainly of adults between 25 -54 years of age (81%); the majority of the clients are unemployed (61%). Full computer services are provided for individuals for resume building and word processing. Internet browsing will eventually be made available. Many computer training courses and workshops are offered which have been certified by Manitoba Education and Training. OVRC also provides preparatory courses for GED and offer ESL training for immigrants. The organization is affiliated with the South Winnipeg Technical Centre, which provides some instructors for the courses offered at OVRC.

Assessment of VLRC

The overall concept of the proposed VLRC was well received. The project was viewed as a tool for both the clients and the counsellors on staff.

When asked whether their organization would be prepared to maintain their data set through the use of templates, the response was luke-warm. They would enter their course into the database but felt they did not have sufficient staff to ensure the information was also kept up-to-date.

Additional Database Requirements

OVRC expressed the need for information on ESL, GED and other adult education programs for High School equivalency. Accreditation was another important element to be included. Many organizations provide training to individuals that is not relevant or officially certified for a particular occupation. By including only those organizations that are certified will ensure that users are not obtaining irrelevant training.

They also indicated that industry provides many certified training programs for potential future employees. For example, Bristol Aerospace and the Investors Group provide on-site education for industry occupations. Most of the students are referred from an organization or by word-of-mouth. We were asked whether private industry training initiatives would be included. Many individuals would take up the opportunity simply to know that it is in fact there for them.

Taking Charge!
Rosa Walker

About the Organization:

The organization provides many client and employment driven programs for single parents, ranging from personal development to literacy and academic training. The centre provides training on-site. Individuals are assessed according to their abilities before being placed in their programs. Programs offered include GED exercises, Life Skills and Job Search strategies.

Assessment of VLRC

The overall concept of the proposed VLRC was well received. The project was viewed as a tool for both the clients and the counsellors on staff.

Additional Database Requirements

Taking Charge also expressed the need for information on GED and other adult education programs for High School equivalency. Overall, they were satisfied with the general structure of the database and felt it would very useful for them in the future.

Employment Projects for Women Inc.
Fatima Soares

About the Organization:

EPW provides employment counselling services specifically suited for women. They also focus on immigrant women employment counselling needs. Their mandate has recently changed and they will be providing services for the general public. Some training is provided at the site, such as life skills and basic computer usage but nothing that is certified.

Assessment of VLRC

The project was well received. It was viewed as a good instrument for both the counsellors and their clients.

Fatima Soares identified the Contact Database as a good source of information on existing education and training providers. This publication is maintain by the Volunteer Centre of Winnipeg on a quarterly basis.

Additional Database Requirements

Two important issues were raised. Accreditation was identified as an important feature to be included in the database. It was revealed that many individuals approach Private Training schools and obtain large financial loans to take courses and training which is not relevant. Therefore, it was important that the student know the training they were acquiring was relevant and officially recognized by the Province.

The second issue raised was to ensure that relevant market labour information be made available for the system. It was not enough that the NOCs were listed but that employment forecasts and prospects were available as well. To this end, the existing Labour Market Information (LMI) from HRDC should be linked to the proposed project.

Fatima Soares indicated it was important that the information for education and training initiatives be maintained and kept up-to-date as much as possible.

Anokiiwan Training Institute
Jay Cowan

About the Organization:

Anokiiwan is profit-driven operation which provides education and training in a cultural setting suited for Aboriginals. The programs vary from computer courses to training for construction and manufacturing.

Assessment of VLRC

The project idea was well received. The concept was good but it was not seen necessarily as a tool for the private sector. As a profit making organization, they do not necessarily want to let individuals price shop for course training on the Web. Hence, they would prefer certain attributes not be included in the database.

In addition, when asked whether they would be willing to update and maintain they own course information, there was some reluctance. The staff are involved with many projects and something of this nature would only be considered a medium priority. Hence, they could not guarantee that their information would always be updated on a monthly basis, pending the popularity of the web site. If many users were seen to be using the VLRC or they obtained many clients via the system, they may be induced to properly maintain it.

Additional Database Requirements

They had many concerns with existing NOC classifications as the basis of occupation identification. It was raised that the NOCs do not yet have sufficient classifications for more high-tech jobs and/or jobs related to the information age. They are often forced to conform their training and descriptions to NOCs.

Information for target populations, such as Aboriginals, should not be highlighted in the beginning of the VLRC site. It is an important element to include in the "counselling" portion of the site so that those seeking service catering to Aboriginal needs are aware the organizations and programs available to them. They feel that target population needs are a good feature to identify in the "counselling" section of the database.

As for attributes in the database, they believed that the instructor, price and start date should not be included. The main reason is that this information often changes over the course of time - once again reinforcing their concerns about the need to update the data files on a monthly basis. Price should also not be include for the reason mentioned above; price shopping may deter people.

They also had concerns with the user comparison of their programs with the larger institutions. User browsing may highlight the limited number of course options available at their organization compared to university institutions which may again deter potential clients

away. For this reason, they may be reluctant to participate; however, they admitted that if the system was up and running they may have no choice but to include their organization out of necessity to compete.

New Directions
(established 1885, formerly Children's Home of Winnipeg)
Digby Farris

About the Organization:

The organization provides a diverse mix of services: education and training, crisis intervention, counselling and therapy, residential care and advocacy. They deal primarily with troubled youth and single parents. The majority of the education and training programs are for life skills, developing work "habits" and other basic training. They also provide training for basic computer usage.

Assessment of the VLRC:

They feel this system would be good for their counsellors. Information on GED would be a bigger asset. Their organization will have Internet access in the near future, but only through modems. They anticipate about 6 computers in which two will have Internet access.

Additional Database Requirements:

For counselling information, they would like to see some type of interactive counselling features, such as learning basic skills or academic upgrading (e.g. basic math). They do not care for aptitude testing because often such tests do not take into consideration all cultures - such tests are too standardized.

They would like to see the "counselling" section provide services for cultural needs. Hence, subsets for aboriginals, single mothers would be a nice feature. These subsets would immediately outline services and programs which suit particular group needs.

If possible, they would like to have information on accessibility to education and training facilities. Since most of their clientele are low-income, they would like to have the necessary bus routes outlined to the various institutions in question. Also, whether the organization has barrier-free access for the physically challenged would be an important feature.

Hallcrest Career College

Addie Jason, Principal

About the Organization:

A profit-driven operation which provides education and training for the general population. They offer many programs but most are either computer or office related. They also offer training for various programs dealing with tele-marketing.

Assessment of the VLRC:

The overall assessment of the VLRC was good, though they did have specific concerns. Since the system may be controlled by a large institution, there may be a bias towards larger institutions. The bias would be in the form of a total inundation of references in the database towards the large universities and almost none to the private vocation schools. Mrs Jason added that the Universities could technically provide training for many of the occupations listed, while their own training is very specific and would only cover a few specific ones. However, they believed that this problem can be overcome as long as the information displayed is in a standard format. A listing of institutions offering training for a specific occupation should ensure that no institution is more prominent than another.

They indicated that they would not have a problem with maintaining data on the system.

Additional Database Requirements:

The organization recommended that the information displayed for each institution should be standardized. No institution should stand out more than the other. Displayed information about each institution should be in the same format.

For private vocation training, it was suggested that only institutions that are registered under the Private Vocation Training Act should in included in the database. None of the many unregistered organizations, such as high school continuing education programs, should be listed in the database.

5.2   Synopsis

Database Attributes: the non-profit organizations had no problem with the basic fields (ie., institution, address, course, price, start date, etc). They would simply like to have this information immediately available. However, it is the private sector vendors who have some difficulty with certain key fields, particularly course and program price listings. These organizations want to increase the number of potential students to ensure a healthy "bottom-line" and such a system may allow users to price shop; this could lead to a loss of potential clients. Conversely, many of the non-profit groups would like to include price in order to let their clients price shop; their clients are often in the low-income bracket.

The database outline for those seeking **"counselling"** information should have key features (if possible). Some of the ideas mentioned include interactive basic skill testing for academic abilities (e.g. math quiz), aptitude testing, and even basic life skills. These features help individuals with determining what abilities they have and what they believe they can accomplish. Also, this counselling section should offer subsets for cultural and special needs, i.e., Aboriginals, single parents, those on welfare, etc. An example would be to identify all relevant links and information for Aboriginals under one designated menu.

Information on **GED** (Grade Twelve Equivalence) or adult education for grade 12 would be beneficial. Many service groups are working with clients who want to get into the job market but cannot for the lack of a basic high school diploma.   Also, information on ESL programs would be useful for immigrant clients.

For the institutions inputting data, it was identified that only recognized and **accredited institutions** should be allowed. Too many individuals pay for course training to only discover it is irrelevant or out-dated. Hence, there should be key fields in the database identifying whether the organization is registered with the Province of Manitoba.

Some private trainers have difficulty with existing **NOC classifications**. The NOCs do not take into consideration contemporary high-tech employment which is now available. In addition, many employees, professionals and private consultants are not registered under the Employment Insurance program (i.e. private contractors), hence their job descriptions are not even classified under the NOCs. Some other source might need to be used to identify employment classifications, such as Income Tax returns which list employment category.

For updating and **maintaining** the database, most of the clients admitted that they could not guarantee continual updating of information on the system database. After an explanation of the template data entry system to be potentially used for the VLRC, there was still some reluctance to supply the information on the regular basis. The main reason being time and person hours to accomplish this task. Other fields such as instructor and start date would also create complications because they often change (sometime within weeks).

6.0 DESIGN PARAMETERS

6.1 Purpose and Objectives

The general purpose of a Virtual Learning Resource Centre is to contribute materially to the prosperity of the City of Winnipeg through a highly skilled work force.

As stated in the original proposal, and confirmed through the studies carried out as part of *Phase 1: Concept and Design*, the Virtual Learning Resource Centre would be an electronic database, accessible on-line through the World Wide Web, and meet the following objectives:

- To support decision making on career goals and their implementation

- To provide convenient access to information on education and training for specific career paths

- To assist education and training providers in disseminating course information to potential students

- To provide an efficient and cost effective method of maintaining education and training information

- To ensure the best possible match between students and course/institution, thereby reducing the personal and governmental costs which result from inappropriate choices.

The VLRC would meet these objectives by providing electronic delivery of education and training course information linked to career information (educational requirements, career opportunities, etc.). The resource would be structured so as to incorporate features which would meet the needs of the two major user groups identified in Phase I of the project, i.e., those needing broad counselling as to the range and scope of the education and training opportunities available in Winnipeg; and, those whose career goals are more clearly defined and who are seeking specific information on a particular education or training program.

The VLRC would contain a database of counselling; education and training institutions; the programs offered by them, and the types of career opportunities for which these programs seek to prepare students in their search for meaningful employment. Database information would be delivered dynamically, ensuring users access to the most current information available. In light of the needs of the two user groups, The VLRC would contain both a menu driven browsing capability, to assist those users wishing to explore options; and a search capability, enabling rapid access to specific information for those clients with specific queries. The VLRC would be constructed as a Web Site accessible through the Internet and would be linked to other tools provided by both government and the public and private education/training sector.

6.2   Outline of Design Concept for a Virtual Learning Resource Centre

6.2.1 Two Main Types of User Groups

The proposed VLRC design concept is based on the premise that there are essentially two kinds of user groups seeking information about education and training opportunities. The first group may be identified as those for whom counselling is an important element in their search for information. The VLRC would assist this group in making the proper choice for their particular career, training, or retraining goals. Information designed to meet the needs of this group would be structured to allow the user to undertake an exploration of numerous career, education and training options. The site would contain appropriate paths which match the user's selection. Menu-driven and query based options would allow the user to drill down to specific information or seek information through text based input.

The second major user group consists of those seeking specific information on a particular educational or training program. This group would consist of users who have a particular career path in mind and are seeking specific information on program requirements, program content, and the institutional providers of their program of choice. For this group, the site would offer a menu driven or query based option for accessing specific program information in the VLRC database.

Our discussions with community organizations revealed a third potential user group for the VLRC. For those engaged in counselling either of the two main user groups described above, the VLRC was seen as a valuable tool to assist counsellors to make information available to their clients.

6.2.2 Technical Background

The World Wide Web is rapidly becoming the fastest, most efficient vehicle for distributing and sharing information worldwide, to organizations, and to target audiences. The Internet currently brings vast amounts of data to user's desktops and information providers face the challenge of transforming this raw data into valuable and compelling information. Without context, the information will fail to empower user's with the knowledge they need and desire. By building context around data, users are not inundated with raw unstructured data, but can obtain specific information to satisfy their unique needs.

The design and implementation of the Virtual Learning Resource Centre offers a unique opportunity to create an integrated Web centric counselling, education and training database. The Web offers a compelling platform for the delivery of data-driven content without the access limitations imposed by traditional networked client/server models.

The Internet is evolving toward a client/server computing model along two dimensions. Content is changing from static display to dynamic generation and from read only to interactive functionality. That is, Web sites are moving to updatable data driven content

A Web centric system that allows for the rapid creation of dynamic and interactive Web applications has distinct benefits:

- Efficiency - remote authoring of content allows the database to provide rapid information delivery and maintenance. Centralising content in one database achieves increased information delivery performance

- Uniformity - with content stored in a centralised database information fields are standardised and uniform. In addition, the presentation or context is uniform, providing a unified look and feel to information delivery.

- Effectiveness - the responsibility for maintaining information falls to the owners and creators of the content. Ownership improves the accuracy of the information presented.

- Innovation - the inclusion of new media types (audio, video, images) and the ability to gather user information online.

6.3   Considerations in Developing a Data Driven Web Site

6.3.1 Technical

The full benefits of developing dynamic data driven Web sites require systems that have been optimised for the Web and Internet platforms. An integrated system of Web server, application server and database is best achieved with a system that has been designed in the first instance as Web centric. For example, architectural benefits are significantly affected by the type of language on which they are based. Languages that have emerged for Web/data applications include Java, Visual Basic, C++, and Javascript. Ideally, an application environment which utilises a Web optimised language is preferable.

The efficiency of the application server is also dependent on its interface with both the Web server and the database. Application servers which operate within a server API and directly support databases offer processing optimisation over applications that reside in CGI and provide connectivity to Open Database Connectivity (ODBC) databases through drivers. Application servers which can retain database connectivity across sessions offer enhanced performance over servers which open and close database connections with each request. Similarly, an application server must be capable of maintaining user state across a session.

An application server that provides a visual programming interface to simplify the construction of queries, and automate code generation, provides a distinct advantage in initial development time and decreased overhead costs in the short and long term. Products that integrate Web site development, Web page layout, database connectivity, and site management offer the ideal solution to building a Web based dynamic data driven site.

Because a Web application can only present data and functionality to a user via the Web browser, the capabilities of the target browsers will affect the user interface design.

A good Internet application will provide a similar experience across all browsing platforms. Because the application will be accessible to any casual user, any one of a number of browsers may request a page. Requirements for browser-specific functionality should be avoided. Functionality that can be best presented in Internet Explorer with a client-side ActiveX control, for example, would require a programmed Java applet in a Netscape browser. A Mosaic or Lynx browser , on the other hand, would need to be redirected to a static page. The VLRC site should be built with these considerations in mind and under no circumstances should a page appear to be non-functional to a specific browser.

The VLRC training and education database module should offer the flexibility to easily incorporate existing database modules developed and maintained in remote sites and in other ODBC compliant formats. The ability to access the significant material maintained and updated by HRDC through their Labour Market Initiatives and Job Futures data would provide a robust data set for the VLRC.

In summary, the proposed VLRC is a dynamic Web site for creating electronically distributed content that requires new Web enabled tools and technologies.

6.3.2 Implementation

A key consideration in the development of the VLRC as a dynamic data driven web site is the cost of initial development and deployment versus the costs of ongoing maintenance. With an initial overhead that may be greater than for a static web site, long term management and maintenance costs are substantially reduced by the data driven Web site model. Content changes are not reflected in changes to the user interface, but are changes to data. An application that allows content providers to easily update the database lowers the cost of ongoing content maintenance.

Applications that can be modified and updated through the use of a visual programming environment reduce the skill sets and ease the ongoing support for the application. Changes to the user interface and design can be made through service contracts with the application developers or an independently contracted support team.

Finally, an application environment that has a large base of local expertise is recommended. The ability to find continuing technical support for the project in the long term should play a part in the selection of the VLRC developer. Similarly, products made by vendors with long term growth and sustainability provide safeguards for system viability. The products and systems recommended later in this document bear these considerations in mind.

These underlying considerations provided the context and background of our analysis of the following web based data delivery models outlined below.

6.4   The VLRC Web Site

Static Web Site Model

```
┌──────────────┐                                    ┌──────────────┐
│              │ ──────── Internet ──────────────── │              │
│  Web Client  │                                    │  Web Server  │
│              │        Http over a TCP/IP Network  │              │
└──────────────┘                                    └──────┬───────┘
                                                           │
                                                    ┌──────┴───────┐
                                                    │     HTML     │
                                                    │   Document   │
                                                    └──────────────┘
```
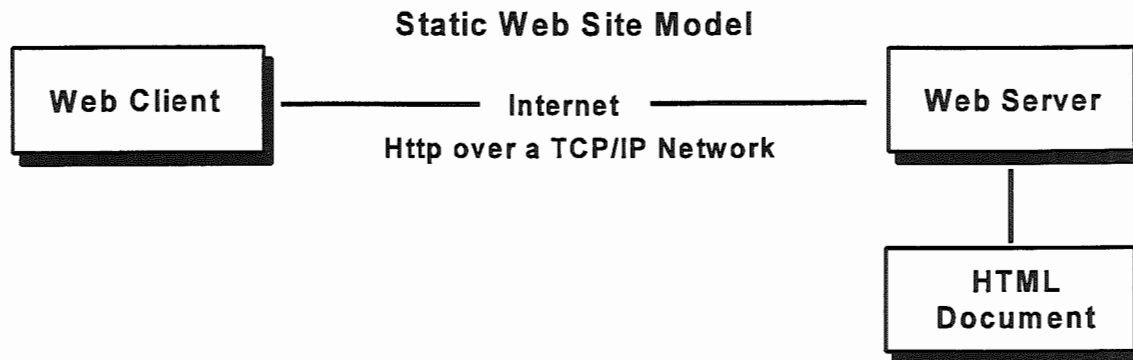
6.4.1 Static Model

Given the suitability of developing the VLRC as a dynamic data driven site a brief description of an alternative static model is offered.

An HTML document stored in a file is an example of static Web page: its content does not change unless the file is edited. For Web sites that contain information that is dynamic, maintaining such information in HTML files incurs heavy maintenance overhead.

A VLRC site could be constructed in which information was delivered in the form of static HTML Web pages. In a static site, program information is defined by template fields. This model would combine links to HTML files that were stored locally on the VLRC server and to HTML files that resided on existing institutional web sites. Links to specific program and course content would often move users off the VLRC site to an existing site which contained relevant information (RRCC, U of Wpg, etc). Since these sites would not necessarily provide links back to the VLRC browsers could quickly leave the VLRC environment. The externally maintained and located relevant education and training information would be supplemented by information contained on the VLRC server. The local files would contain training and education information currently unavailable through institutional web sites. These files would be developed and maintained by the institutions.

The design and implementation of this model would be relatively straightforward. Files would be constructed using a common template with predefined fields. Training providers could create, access and modify their files by either using a web browser with built in visual editing capabilities (Netscape Gold 3.0) or through browser based form completion. The former would require system administration overhead in administering write permissions to training providers. The latter would require a custom CGI script to be written to govern permissions and write form results to HTML pages. Using a web server with Server Side Includes (SSI) capability would allow the inclusion of VLRC headers and footers to display visual identity and navigation information.

A dedicated search engine such as Architect's Excite could be installed to index and provide text and concept based searching of the locally resident files. Extending the search to external servers and web sites entails a number of technical and content related problems.

The static model poses a distinct set of disadvantages that can be summarised as follows:

- Education and training information would reside on a number of servers
- Information would not be formatted consistently
- Users will be linked to external web sites and leave the VLRC
- Searching would only be feasible on locally resident files
- High level ongoing maintenance of static HTML files and system administration

6.4.2 Dynamic Model

The recommended model for the VLRC web site delivers data dynamically based on user input. Utilising recent developments in web database interface and access, this model sees web pages constructed in response to specific user requirements. The browser acts as the mechanism for requesting information from the web server which delivers dynamic content based on query parameters.

In this model a unique VLRC relational database would be constructed. Institutions with existing online information on education and training programs relevant to specific career opportunities, and training providers with no current online information available would both create and maintain information on their programs within this database. Standardising database information across occupations and institutions would ensure a uniform display of information. Education and training providers would not be disadvantaged by size and resources and all results would be displayed in a standardised format.

Dynamic Web Site Model

```
┌─────────────┐                            ┌─────────────┐
│             │                            │             │
│ Web Client  │────────── Internet ────────│ Web Server  │
│             │   Http over a TCP/IP Network│             │
└─────────────┘                            └─────────────┘
                                                   │
                                                   │
                                            ┌─────────────┐
                                            │ Application │
                                            │   Server    │
                                            └─────────────┘
                                                   │
                          ┌────────────────────────┤
                   ┌─────────────┐           ┌─────────────┐
                   │    HTML     │           │             │
                   │  Document   │           │  Database   │
                   │             │           │             │
                   └─────────────┘           └─────────────┘
```
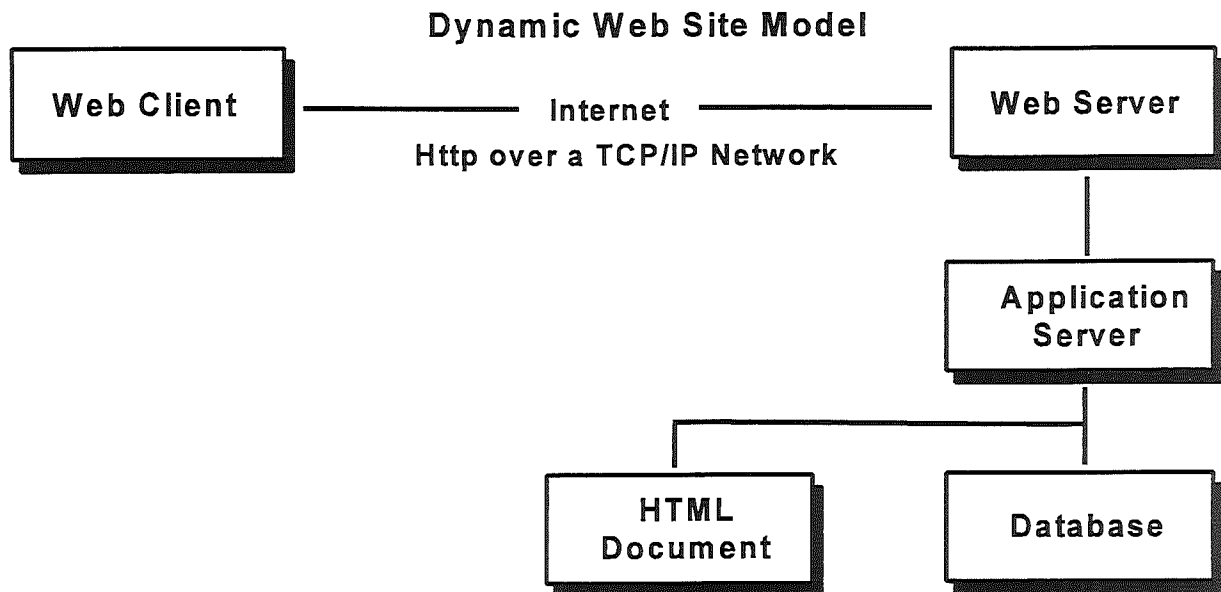
Creating a unified database to hold all education and training information based on the National Occupation Classifications (NOC) imparts the overhead of maintaining data records. This overhead is distributed among the participating institutions and organizations. Within larger institutions, database maintenance would probably be redistributed. Some private training providers identified limitations within the NOC in relating some high technology course offerings with existing occupation classifications. The database model outlined below provides a supplemental categorisation of training programs with a table of keywords.

The distinct advantages of a dynamic data driven model are the uniformity of information presentation, equality of treatment of training providers, self containment, and the ability to construct a robust interface that would access counselling, education and training information from a number of paths. Specific content would not in the first instance lead away from the VLRC site but to data delivered from the VLRC database. Within returned pages, external links could be provided to specific institutional contacts, to institutional web sites, and to forms that would allow users to request further information.

This model provides the scalability necessary for the progressive implementation of a web based database. Ongoing maintenance is less costly as the growth and modification of the database does not require modification to the user interface. Dynamic web pages respond to user requests and can gather information from them – an important consideration in the development of the counselling component of the site.

The dynamic delivery of web pages does require a sophisticated level of integrated system design. The web server, application server and database must efficiently utilise system requirements. System components which interoperate natively offer the greatest

processing speed and fewest system conflicts.

6.4.3 Software Options

Developers have made a number of systems available that address the needs of a web based dynamic data driven site.

Leading Internet vendors such as Netscape and Microsoft have integrated web servers, application servers and databases to optimise dynamic data delivery. These application development tools require a significant investment in initial programming expertise. Both, Netscape and Microsoft offer solutions that provide the capability and flexibility for the implementation of the VLRC, while offering scalability and various degrees of system migration.

Netscape offers a suite of products that includes a Web server, Netscape Enterprise Server 3.0; a native API application server, LiveWire Pro; and direct database connectivity to a bundled Informix database. The Netscape solution also supports access to any ODBC compliant database. This integrated solution is available for both Windows 95/NT and Unix operating systems. LiveWire Pro applications are written in server side Javascript, a native web language. Netscape Enterprise 3.0 includes sophisticated visual web site management and monitoring tools as well as Netscape Gold for WYSIWYG Web page design. Implementation within the Netscape framework would require a thorough knowledge of Javascript. The Netscape Enterprise 3.0 suite of products is free to educational institutions, but does not include an operating system.

Microsoft also offers an integrated suite of products for Web database connectivity. Microsoft BackOffice includes the operating system, Windows NT Server 4.0; a Web server, Microsoft Internet Information Server 3.0; and a relational database, SQL Server 6.5. Visual InterDev is Microsoft's Web application development environment and utilises Microsoft Active Server Pages as the interface between Microsoft Internet Information Server 3.0 and Microsoft SQL Server or any ODBC database. Active Server pages can be written in VisualBasic or other Visual tools and can utilise Active X controls. Internet Database Connector (IDC) and Active Server Pages provide ready access to SQL Server from IIS. This cohesiveness permits a focus on application functionality rather than communication pathways between the operating system, Web server and database. Microsoft Front Page provides integrated web page design. Microsoft does not provide a migration path to a Unix platform. The approximate academic pricing for Back Office and InterDev is $2,000.

By isolating components, developers have created development tools which provide middle tier interfaces between web servers and databases. These products provide native support for various databases or access to ODBC compliant databases through drivers. Most are optimised to run within Web server API's. These systems offer great flexibility in designing the VLRC site by combining platforms, server software, application servers and databases from various vendors.

With over 80 products available, our analysis of middleware products has focused on industry leaders ColdFusion 3.0 , NetDynamics 2.0 and Tango Enterprise 2.2. All offer development environments well suited to the VLRC site.

ColdFusion is a web/database authoring tool which allows access to databases on Windows NT and Windows 95 platforms, using any database that is ODBC compliant. ColdFusion is a script that uses HTML files to present users with a query form. The user query is sent to the database and then template files determine how the output is presented to the user. ColdFusion creates dynamic HTML pages in response to user queries by mixing HTML tags and its proprietary Database Markup Language (DBML) which dictates how the database results are displayed. An example of a ColdFusion site is www.farmjournal.com.

NetDynamics is a Web/database application builder which integrates visual development, a high performance JAVA application server, and scalable database access into an architecture optimised for Web/database access. NetDynamics runs under Windows 3.1/95/NT and various flavours of Unix. NetDynamics has been added to the Netscape AppFoundry web/database development environment and can be utilised within an all Netscape solution.

Tango is an application server (CGI or API Plug-In) which integrates Unix, WindowsNT or Macintosh Web servers with most popular ODBC compliant databases: Oracle, Sybase, SQL Server, FoxPro, Butler SQL, FileMaker and many others. Tango includes an application server and a GUI visual programming document editor used for Rapid Application development of Tango based web applications. Multiple databases can be accessed from within the same Tango document. An example of a Tango site is www.mbanx.com.

The following Table presents information on the three applications servers.

	Tango Enterprise	ColdFusion	NetDynamics
Application Server Platforms	MacOs, Windows 95/NT, AIX, SGI IRX, Solaris	Windows 95/NT	Windows 95/NT, Unix
CGI/ PlugIn	Yes, NSAPI, ISAPI, WSAPI	Yes, NSAPI, ISAPI, WSAPI	Yes, NSAPI, ISAPI, WSAPI
Native Database Support	Oracle, FileMaker Pro, Butler SQL		Oracle, Sybase, Informix
ODBC support	Yes	Yes	Yes
Visual Development	Yes	No	Yes
Language	Proprietary	Proprietary (CFML)	Java
Cost	$ 3,095.00	$ 495.00 (US)	$ 1,295.00 (US)
Application Editor Platforms	MacOs, Windows 95/NT	Windows 95/NT	Windows NT, Solaris, AIX, SGI IRIX, HP-UX

ColdFusion requires initial proprietary programming expertise while Tango and NetDynamics provide a visual programming interface for application development. NetDynamics would require Java expertise. Both ColdFusion and Tango products interface with most popular desktop database programs such as Access, Fox Pro, or FileMaker Pro. ColdFusion requires a Windows NT class server; Tango and NetDynamics interface with most Unix or Windows NT servers.

Appropriate databases for the VLRC range from high end products such as those offered by Oracle, Sybase, Informix and Microsoft SQL Server, to database products such as Paradox, FoxPro or Microsoft Access.

Bundled with the Netscape Enterprise suite of development products Informix has limited local support and expertise. Microsoft SQL Server is integrated within Microsoft Back Office and provides an enterprise level relational database. Sybase SQL Anywhere Pro, although not as robust as Sybase SQL Server, provides support for up to 150 simultaneous connections, well within the VLRC anticipated load. Academic pricing for Sybase SQL Anywhere Pro is $1250 US.

Paradox, FoxPro and Access databases provide the functionality and scale necessary for the implementation of the VLRC site with third party application servers such as Tango, ColdFusion or NetDynamics

6.5 Operating System Requirements

Developing and deploying a Web-based application is a more involved process than developing a static Web site. Additional server software is required, and the server is required to perform a wider variety of processing tasks. Both of these factors, in turn, impact hardware issues.

It is recommended that the VLRC be housed on a Pentium Pro Server computer running WindowsNT Server 4.0 as the operating system. WindowsNT Server 4.0 provides a number of networking and security features that simplify the administration of a network and Web server. Microsoft Internet Information Server 3.0 or Netscape Enterprise 3.0 is the recommended Web server. It is recommended that the Web server, application server and database reside on a computer with 128 megs of RAM and 3 gigabytes of hard disk space. Determining the amount of memory for the server is largely a question of how much traffic is expected and how database-intensive the site will be. A simplistic but true maxim is the more memory, the better. Estimated cost $15,000 - 20,000.

It is anticipated that for long term maintenance two computers for the ongoing administrative team be purchased. Two Pentium 200 class computers with 64 megs RAM and 1 gig hard drives are recommended. Estimated cost $8,000 -10,000.

6.5.1 Internet Connection

Determining the type of Internet access to employ is primarily a question of anticipated site traffic. The following table lists the various available connection types and the number of users they are designed to support.

Connection	Maximum BPS	Simultaneous Users
Frame Relay	56,000	10 -20
ISDN	128,000	10 - 50
T1	1,500,000	100 - 500
T2	45,000,000	5000+

It is recommended that the VLRC establish a T1 connection to the Internet. Costs for a T1 line through MBnet are $1,999 per month plus a one time setup fee of $300. In addition, a leased T1 line would be required at an approximate cost of $1,000 per month. Both the University of Winnipeg and the University of Manitoba have existing T1 connections to MBnet. Housing the VLRC at these institutions could provide significant ongoing savings (up to $36,000 per year - subject to negotiations with these institutions).

6.5.2 Domain Name

Before connecting a server to the Internet, it must have a domain name. Domain names, like "somewhere.com," uniquely identify each server accessible on the Internet supporting the TCP/IP Domain Name Service (DNS) protocol. Commercial domain names must be registered with the InterNIC, the organization designated by the National Science Foundation to administer the domain name registry. Canadian domain names , such as "www.vlrc.winnipeg.mb. ca" are registered through CA Domain. These domain names must include geographic identifiers.

6.5.3 Specific Solutions

Vendors and organizations bidding on the Phase II implementation may offer a unique combination of the hardware and software components outlined above. Within the stated considerations, the success and cost of the VLRC implementation relies more on the expertise and skill sets brought to the implementation and its ongoing maintenance, than any specific product.

6.6 The VLRC Data Model

As a result of our consultations with potential clients and training providers we have developed an overview of the VLRC data model. The creation a dynamic data driven web site requires a carefully modelled database which can serve both the currently defined needs and provide the scalability to respond to future needs. The model should offer the flexibility of easy modification and extensibility to new tables and fields. The VLRC Web site should also support an easy integration of databases maintained by Human Resource Development Canada. These databases contains a wealth of information relevant to users searching for specific occupational information or those pursuing counselling information on occupation streams. The common table of National Occupation Classifications offers the necessary relational integration of the VLRC and HRDC databases. Figure 1 provides a visual overview of the key elements of the proposed VLRC data model.

A structural overview of the VLRC data model (**Figure 1** - p.53) describes the relationships between tables. At the first level all counselling, education and training programs would belong to organizations. An organization would be required to provide an address and contact information. The organization table could also contain fields for logos or URL's. The key table for the VLRC database would contain the education and training program information fields. **Figure 2** (p.54) outlines the key identified fields in the program table. The fields could be further refined and modified in Phase II of the project in consultation with the VLRC Interim Steering Committee. The program address would functionally default to the organization address but could also be modified. Large educational organizations with a multitude of programs could provide program specific address information. The NOC table of career classifications and a table of keywords would provide the primary look up links to the program table. The HRDC LMI database could be

integrated to the VLRC through the use of the common NOC table.

The NOC table mirrors the table currently used by HRDC to classify occupations. A look up table of broader career categories is envisioned which would facilitate searching or drilling down to a specific   NOC.

Similarly, tables of keywords and keyword categories would facilitate user navigation to specific program information. These tables of keywords would be constructed during Phase II of the VLRC in consultation with the VLRC Interim Steering Committee. The importance of the keyword table became apparent in our community consultations with independent training providers and resource centres. The keyword table could provide links to programs that do not easily correspond to existing NOC classifications - including training in high technology fields, GED and ESL programs, and workshops and seminars provided through the counselling component of the VLRC.

Functionally the VLRC would offer three tracks (**Figure 3** - p.55) to potential users. The first track is designed for clients to add, maintain, update or delete program information. This secure path would allow validated clients to access the VLRC for ongoing implementation and maintenance of the database as envisioned in Figure 1.

A second track is provided for browsers seeking specific career information. Three options would be offered: the first would direct browsers to specific NOC education and training information through a list of NOC classifications; the second, would direct browsers to specific NOC education and training information through a text input query box; and the third, would direct browsers to specific NOC education and training information by a list of keywords. Menu driven screens would allow browsers to drill down to specific program information by occupation or keyword.

A third track would lead browsers to specific career counselling services available in the Winnipeg Area.   This data table could be constructed with fields describing various organizations, their location, services provided, contact information, and mail to or Web URL's if appropriate. Information on career development paths (GED, ESL) would also be offered. Carefully chosen career aptitude and testing programs and links to other online resource would be included.

Some existing examples of on-line aptitude tests are available on the Internet. Human Resources and Development Canada (HRDC) is presently developing their own aptitude test which is currently available for the public at:

- http://www.globalx.net/ocd/career-Prospects/index.html

Internet sites with on-line aptitude tests are also available in the United States. Some of the better examples include the West Bend Community Career Network (Career Assessment) web page.

- http://job.careernet.org/assess.htm

These features are important for those seeking counselling services. In particular, those who have not yet identified their career interests and seek some assistance to pin-point various opportunities for potential career occupations.

Another valuable feature to include in the VLRC web site is occupation information, such as annual forecasts for employment opportunities, future outlook and other pertinent information. This information is maintained in a HRDC database currently available through the Web and would be important to the potential user. To incorporate this information an arrangement should be made with HRDC to include access to this database from within the VLRC.

6.7 Proposed Approach to Phase II Implementation

6.7.1 Formation of a Interim Steering Committee

The responsibility of the Interim Steering Committee will be to oversee program development and to provide recommendations for an organizational structure to manage and control the VLRC in the future. The Interim Steering Committee requires an organizational structure that incorporates groups with separate interests; these interests include those who will receive data from the system and those who will provide data for the system. Data recipients include the general public, counselling services (non-profit organizations) and various levels of government. Conversely, academic institutions, private vocation trainers and non-profit training institutions will provide the data needed for the system. The VLRC project team with the assistance of Interim Steering Committee must work to ensure that both sets of needs are addressed at all times.

The final membership selection should ultimately stress those organizations who will be providing data for the system. It will be necessary to solicit the involvement of community groups and service providers, and their input will be valuable. However, membership should incorporate a larger proportion of organizations and institutions that provide education and training information since the database development will involve their *voluntary* input of data. Failure to provide a significant role for those organizations and institutions could result in a less than complete database.

The Manitoba Corporation of Enabling Technologies (ManCET) is a consortium of information-based organizations whose focus is on the accelerated adoption by Manitobans of the information technologies and practices. It is recommended that a representative from this organization sit on the Interim Steering Committee.

It is proposed that the Chair of the Committee will be the **Team Leader** of the VLRC Project Team. The Chair will be responsible for scheduling all meetings with the Interim Committee and for building a consensus with all members of the Committee. In this dual capacity, the

Chair would ensure that the project team is developing the system according to specifications and the Interim Steering Committee is kept up-to-date on system development. Committee decisions would receive the input of all members. The chair will have to ensure a quorum at the committee meetings. If any of the original Committee members cannot be available, the chair must ensure that a replacement from the organization in question is available to temporarily take the place of that member.

The make-up of the Steering Committee should not surpass 10 to 13 members. The proposed membership includes representatives from the following organizations and sectors: 1) HRDC, 2) Manitoba Education and Training, 3) City of Winnipeg Community Services, 4) The University of Winnipeg, 5) University of Manitoba, 6) Red River Community College, 7) Representative of Private Vocational Training, 8) Representative of the Non-profit Service sector, and 9) Representative of ManCET. Additional members may be included because they present specific interests and target groups. Three optional candidates suggested for inclusion on the Committee are as follows: 1) Representative from the Aboriginal community who is involved with training, 2) Representative of welfare services, and 3) a Representative from Francophone community involved bilingual training. Representation from the Winnipeg Development Agreement can be achieved through HRDC.

Membership from the various levels of government and the academic institutions will have to be decided by those bodies.

Some recommendations are presented for the remaining organizations. The member representing private vocational training can be from any one of the organizations listed under the Private Vocational Training Act. A good possible candidate is Adie Jason of *Hallcrest Career College* who has expressed interest in becoming involved with a committee for the VLRC. Within the Non-profit sector, there are numerous organizations that could be selected. The preferred candidate should be someone from an organization that has not acquired funding from a government organization; this could eliminate any bias. The candidate in question should belong to an organization that received funding from a non-profit organization like the United Way or through a foundation grant. A good representative would be a member of *the YM/YWCA* or *New Directions*. However, if no other potential candidate is available, then any candidate with a good understanding of the education and training needs of the general population could be suitable. A representative from *Employment Projects for Women*, Fatima Soares, would be a good candidate.

Interim Steering Committee Objectives

The mandate of the Interim Steering Committee is to oversee database and system development by incorporating the input of the various Committee members and ensuring the quality of the final product is acceptable to all those involved. The emphasis for the Committee is to ensure that the final product meets the needs and objectives as specified by Human Resources Development Canada and the Winnipeg Development Agreement.

Considering this mandate the following objectives are required:

- Establish the final database design. Determine a final template design outlining data fields to be used for the database acquisition and establish the system design parameters in cooperation with system developers.

- Provide ongoing recommendations to system developers. Develop a full liaison with software developers to ensure products meet specifications and requirements.

- Establish potential local Internet access points including any organization that may obtain a computer.

- Establish a liaison between the private and public sectors, community groups and the general public. Maintain a community profile and continue to promote the VLRC to other potential service providers for the database.

- Determine future management requirements after the system is completed. This involves establishing an organization responsible for long-term management of the system.

6.7.2 Skill Sets for VLRC Development Team

The general process of designing and developing a Web-based application is not significantly different from that for any software product. Successful implementation requires a good team that will be able to work well together throughout the project life cycle.

Like any professional development effort, many skills are required to see a Web project through from concept to completion. It is important to define the team members and the roles they will play. The following is a list of roles (ordered alphabetically, not by importance) necessary for the development of the VLRC; keeping in mind that one person may fulfill several roles.

The **Application Developer** is responsible for producing the code and logic behind the product. In the context of the VLRC project, this may include client- and server-side scripting, and HTML. There may be more than one type of developer on a project, perhaps one to create the HTML and another to add scripting. The distinction between "HTML experts" who create the HTML templates and "Programmers" who write code is becoming less distinct as the tools to create these elements improve and become easier to use.

The **Database Administrator** designs the schema, implements stored procedures, and helps the Application Developer work with the database. As the database grows, the Database Administrator monitors the performance of the database, building (or rebuilding) indexes and performing checkpoints.

The **Graphic Designer** determines the look and feel, constructs the layout, generates backgrounds, and control (for example, button) artwork. Often the Graphic Designer will have considerable input into the user interface and will have to work closely with the User Interface Designer.

In the early phase of development, the **Quality Assurance** role makes sure that product development is progressing according to the required specifications. Once the product reaches testable milestones, Quality Assurance reports bugs and other problems to the developers.

The **User Interface Designer** works closely with users and the Team Leader to build a product that is easy to understand and simple to operate. Like quality, this cannot be "added on" to a completed project and is therefore an integral part of the development process.

The **Team Leader** maintains the schedule and provides the liaison with users, clients and the proposed VLRC Advisory Committee. The Team Leader makes sure that other team members have what they need to get their jobs done.

Through the course of the application development cycle, different roles will be more prominent during each development phase. It is important to have the entire team assembled and working together from the beginning of the project to ensure that the final product represents a cohesive and unified effort.

In addition, the developer should be thoroughly familiar with the educational and training environment around which the conceptual model is built, and be the able to utilise development tools to translate the conceptual model into a working application.

6.7.3 Implementation Process

The design and implementation of the VLRC as a dynamic Web application must be guided by three fundamental considerations:

- The user interface design must seek to strike a balance between the range of browsers supported, the aesthetics of the application, and how easy the application is to use.

- An efficient database design is crucial to ensure quick client response time. A good database design requires reasonably normalised tables that do not require excessive joins to satisfy queries, enough indexes to optimise frequently performed queries without consuming excessive drive space, and the use of stored procedures for frequently performed or complex database operations.

- A database access plan specifying which HTML pages require database content can help the designer to determine which pages should be generated entirely dynamically using server-side scripting and which are static pages.

As currently envisaged, the VLRC implementation process would involve:

- Establishment of an Interim Steering Committee from representatives of counselling and public and private education and training providers and HRDC to guide the application development team.

- the construction of an appropriate database, with provision for the incorporation of additional data fields as required by future expansion demands, and the programming of the associated query system based on the conceptual model generated in Phase I of the project.

- development of a user-friendly data entry interface which would facilitate the loading and maintenance of data by individual educational institutions or training providers, in conjunction with the VLRC project manager.

- roll-out of the database product to content providers and the loading, updating and maintaining of content

- design of VLRC web site to provide context for the delivery of dynamic data driven information

6.7.4 Milestones

The development process of a Web-based application is similar to both a static Web site and a non-Internet-aware client/server application. But in addition to static, site-oriented tasks such as editing HTML or producing and integrating multimedia content, or server-side tasks such as creating the database and writing stored procedures, there is a set of development tasks unique to Web applications. This includes implementing the script code to interface with server components such as the database and in some cases implementing custom components as well.

To ensure the smooth release of a newly completed application to users, a deployment process encompassing the following phases should be employed:

- The application and all assets required to use it should be staged on the VLRC server computer and subjected to site testing. The functional behaviour of the application should be verified, some preliminary performance analysis performed, and simulated loads should be applied to test server response.

- Once the staged application has been certified acceptable, it may be released to production. This process involves allowing Internet access to content maintainers and the loading of content.

- A beta test period should be established in which a select group of users provide feedback on the application prior to its release for general use.

Security is a paramount concern throughout the deployment process. In controlling access to a site, administrators must take into account both who may and may not access the site and who may both access the site and modify its content.

The development and deployment process should take no more than six months.

6.8   Preliminary Cost Estimates

Subject to further refinements, a preliminary estimate of the costs of this project (Phase II) is as follows:

1. Administration (project coordinator, project manager)
   6 months @ approx $5,000 per month

   $ 30,000

2. Database Modelling and Implementation
   6 months @4,000 $ 24,000

3. Application Developer.
   6 months @ $4,000 $ 24,000

4. Web Interface Designer
   6 months @$4,000 $ 24,000

5. Administrative/Clerical Support
   6 months @$2,500 $ 15,000

6. Hardware (1 Pentium Pro Server and 2 Pentium workstations) $ 30,000

7. Software (variable) $ 0-5,000

8. Internet Access (variable, per year) $0-36,000

9. Overhead costs
   (supplies and expenses, etc.) $ 15,000

10. Contingency (approx. 10%) $ 18,000

11. Translation (approx. 1 00,000 words* $0.22 &additional expenses) $ 30,000

                                    Total $208,000
-249,000

It is anticipated that both the public and private sector would bid on a Request for Proposals issued for the Phase II implementation of the VLRC. These may include Universities, Colleges and private companies.

6.9 Ongoing Maintenance

To ensure its long term feasibility, the VLRC must be housed at an appropriate and stable organization. This consideration should play a prominent role in the selection procedure for the Phase II application development contract. It is important that the application be developed and housed at an organization that has:

- expertise in information technology
- experience in database application development
- experience with Web servers and Web site maintenance
- a long and stable history
- an understanding of and commitment to education and training

After successful deployment of the VLRC application and the completion of Phase II implementation, ongoing support will be required in the following areas:

- Providing technical support to users with both the short-term goal of assisting them with current problems and the long-term goal of improving the application to make it easier to use.

- Performing both routine content updates and periodic application upgrades. Because the application would be in use in a production environment, these should be coordinated with the system administrator to ensure as little impact as possible to any users accessing the site.

- Engaging in ongoing performance monitoring to ensure that the application is continuing to run at peak efficiency.

The continued operation of the VLRC Web site will require an ongoing administrative team. This team would be responsible for ensuring that liaison with content providers, both existing and new, will be maintained. Training of new content providers may be necessary. Continuing liaison with an ongoing VLRC Interim Steering Committee would provide a mechanism for input from representative constituencies. It is felt that a VLRC Manager with administrative support, could provide this service.

Technical and application support would best be achieved through the acquisition of an annual technical service contract. This contract would provide system administration, application and database maintenance and/or modification, and performance monitoring. This contract should be let by the VLRC host organization and offered in renewable terms.

Given these considerations it is recommended that the management and control of the VLRC be housed within an existing public sector educational institution. The major Winnipeg universities offer the stability, administrative experience and

technical expertise to house the VLRC for the long term.

These institutions have extensive experience in building and maintaining web sites, running web servers, and database development. As major contributors to the database, they have a vested interest in ensuring that the quality and scope of the information delivered by the VLRC is thorough and up to date.

The experience and administrative structure of the universities offer a climate to manage the VLRC on an ongoing basis, but it cannot be expected that the administrative and technical functions required to maintain the VLRC could be absorbed within existing staff compliments. Ongoing funding of the project would be required to enable the university to hire, and/or contract the maintenance functions. An additional $50,000 would be required over five years to ensure the ongoing maintenance of the VLRC prior to the implementation of a cost recovery model.

The Steering Committee established during Phase II of the project should assume an advisory capacity to the VLRC host and administrative team over the long term. The VLRC administrative team should periodically meet with the Committee to monitor the VLRC's progress, and to provide broad based input on its modification, development or refinement.

6.9.1 Recommendations for Phase II Implementation

The following outlines five recommendations for Phase II of the VLRC project:

- The Virtual Learning Resource Centre be developed as a dynamic data driven Web site.

- An Interim Steering Committee be established to guide and oversee the development and implementation of the VLRC.

- The VLRC be hosted at one of the major Winnipeg universities.

- The Phase II VLRC Implementation process comprising the database design, interface design, and application development be contracted to a local company or institution in liaison with the VLRC host institution.

- Ongoing funding for the maintenance of the VLRC be provided for a five year term after which the VLRC would become self financing.

Figure 1

VIRTUAL LEARNING
RESOURCE CENTRE
Datamodel Overview

ORGANIZATIONS

Contains information about all organizations that offer a program or programs.

ORGANIZATION ADDRESSES

Contains a single, primary address for each ORGANIZATION.

Each *ORGANIZATION* can have **none, one or many** *PROGRAMS*.

PROGRAMS

Contains detailed information about the program(s) offered by an ORGANIZATION.

PROGRAM ADDRESSES

Contains a single, primary address for each PROGRAM.

Each *PROGRAM* can be related to **none, one or many** *NOC CLASSIFICATIONS*.

Each *PROGRAM* is linked to its related HRDC career information by the use of HRDC NOC classifications.

Each *PROGRAM* can be related to **none, one or many** *KEYWORDS*.

PROGRAM - NOC RELATIONSHIPS

Contains a comprehensive listing of all NOC CLASSIFICATIONS that apply to a particular PROGRAM.

PROGRAM - KEYWORD RELATIONSHIPS

Contains a comprehensive listing of all KEYWORD CLASSIFICATIONS that apply to a particular PROGRAM.

NOC CLASSIFICATIONS

Contains a comprehensive listing of all H.R.D.C. NOC classifications. These are used to describe PROGRAMS.

Labour Market Information

Human Resources and Development Canada Career Data

KEYWORDS

Contains a listing of specifically defined keywords. These are used to describe PROGRAMS.

NOC CATEGORIES

Contains simple listing of categories used to catalogue NOC CLASSIFICATIONS. Each NOC CLASSIFICATION will belong to one of these categories.

KEYWORD CATEGORIES

Contains simple listing of categories used to catalogue KEYWORD CLASSIFICATIONS. Each KEYWORD CLASSIFICATION will belong to one of these categories.

Figure 2

VLRC Database Program Table
Preliminary Fields

Name of organization (mandatory)
Name of program (mandatory)
Description of program (mandatory)

NOC Classification (none, one or many)
NOC category (none, one or many)
Keyword (none, one or many)
Keyword Category (none, one or many)

Location of program (optional)
Date of program (optional)
Prerequisites for entry (optional)
Requirements for completion (optional)
Certificate, diploma, degree offered (optional)
Duration of program (optional)
Instructor (optional)
Cost (optional)
Organization logo (optional)
Contact for more information (optional)

FIGURE 3

Functional Overview of VLRC

```
                        ┌─────────────────┐
                        │ VLRC Main Page  │
                        │                 │
                        │ English  French │
                        └─────────────────┘
          ┌────────────────────┼────────────────────┐
┌──────────────────┐   ┌──────────────────┐   ┌──────────────────┐
│   Data Entry     │   │     Career       │   │   Counselling    │
│  by Institution  │   │   Information    │   │                  │
└──────────────────┘   └──────────────────┘   └──────────────────┘
          │                    │                    │
┌──────────────────┐  ┌──────────────────┐          │    ┌──────────────┐
│    Password      │  │ Get Information by│          ├────│  Counselling │
└──────────────────┘  └──────────────────┘          │    │   Services   │
          │        ┌────────┬────┴────┬────────┐     │    └──────────────┘
          │  ┌─────────┐ ┌─────────┐ ┌───────┐        │    ┌──────────────┐
          │  │ Keyword │ │  NOC    │ │ Query │        ├────│   Aptitude   │
          │  │   or    │ │Classif. │ └───────┘        │    │   Testing    │
          │  │ Keyword │ │   or    │                  │    └──────────────┘
          │  │Category │ │Category │                  │    ┌──────────────┐
          │  └─────────┘ └─────────┘                  ├────│     GED      │
┌──────────────────┐  ┌──────────────────┐            │    └──────────────┘
│    Program       │  │     Program      │            │    ┌──────────────┐
│    Database      │  │    Database      │            ├────│     ESL      │
└──────────────────┘  └──────────────────┘            │    └──────────────┘
                                │             ┌──────────────────┐
                      ┌──────────────────┐    │     Program      │
                      │      HRDC        │    │    Database      │
                      │    Database      │    └──────────────────┘
                      └──────────────────┘
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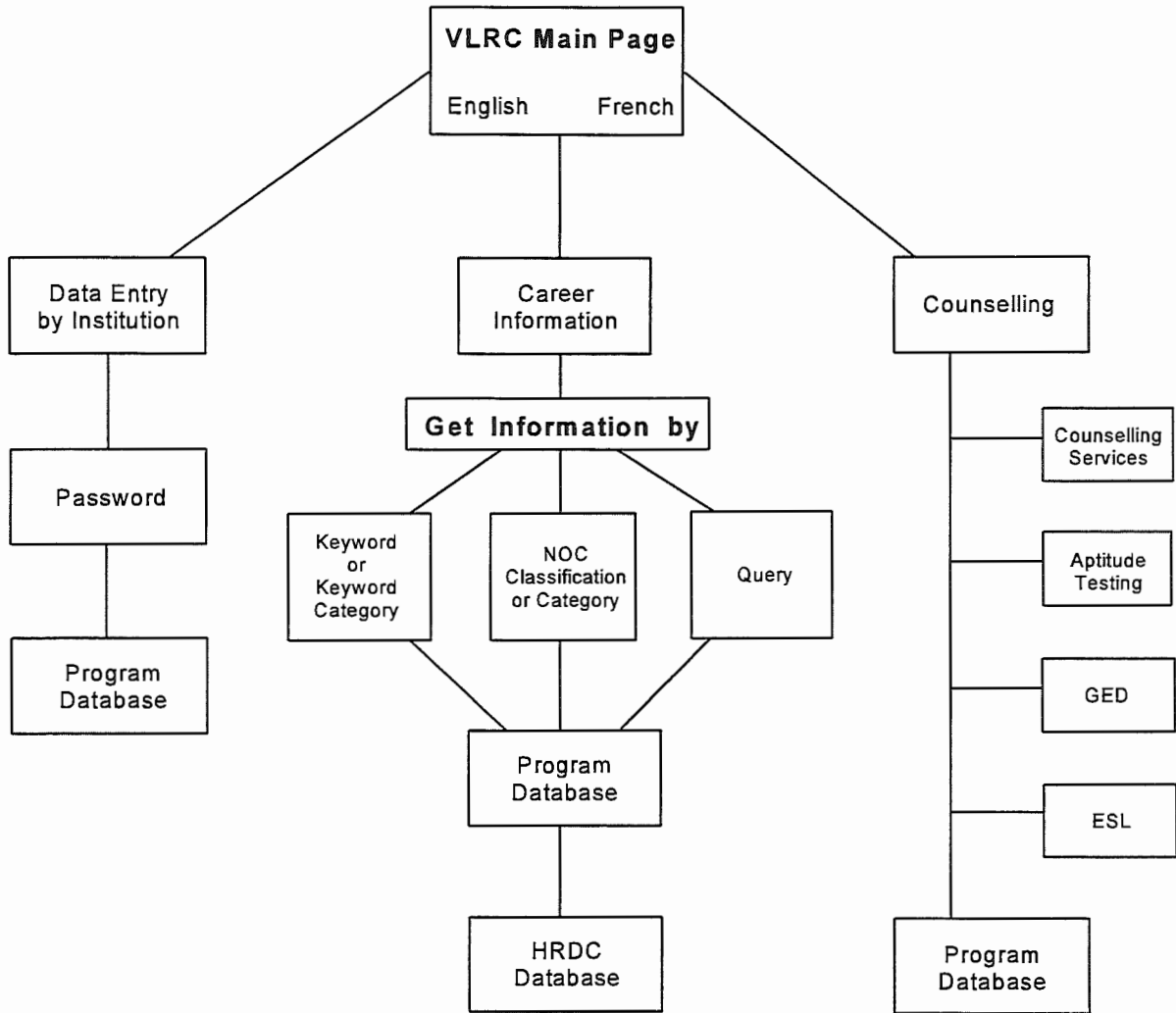
APPENDIX I

Education and Training Providers in Winnipeg

Private Training Organizations registered under the Private Vocations Training Act

Sally Campbell
Academy of Electrology
1836 Portage Avenue
Winnipeg, Manitoba
R3J 0G6

Beth Bisson
Academy of Learning - North
1109 Henderson Highway
Winnipeg, Manitoba
R2G 1L4

Ken Nelson
Academy of Learning - South
106B Scurfield Boulevard
Winnipeg, Manitoba
R3Y 1G4

Virgil Moore
Anokiiwin Training Institute
105-260 St. Mary Avenue
Winnipeg, Manitoba
R3C 0M6

Mathew Baron
Applied Multimedia Training Centres
495 Portage Avenue, Lower Level
Winnipeg, Manitoba
R3B 2E4

Admissions Officer
C.C. Manitoba Driving School
2nd Floor, 2126 Logan Avenue
Winnipeg, Manitoba
R2R 0J2

Brenda Andreone
CDI College of Business & Technology
400-393 Portage Avenue
Winnipeg, Manitoba
R3B 2H6

Terry Ledoux
Canadian College of Taxidermy
419-1st Avenue
McCreary, Manitoba
R0J 1B0

Jim Fuller
Canadian School of Floral Art
569 St. Mary's Road
Winnipeg, Manitoba
R2M 3M6

Warren Gander
Edutech Training Centres
609 Erin street
Winnipeg, Manitoba
R3G 2W1

Doreen Maunder
European School of Esthetics
241 Vaughan Street
Winnipeg, Manitoba
R3C 1T6

Ross
Fine-Art Bartending School
118 Sherbrook street
Winnipeg, Manitoba
R3C 2B4

Christopher Hope
Granton Institute of Technology
263 Adelaide Street West
Toronto, Ontario
M5H 1Y3

Trina Cameron
H & R Block Canada, Inc.
867 Portage Avenue
Winnipeg, Manitoba
R3G 0N8

Jacquie Cole
Hairstory Beauty College
650 Portage Avenue
Winnipeg, Manitoba
R3C 0G6

Jan Cruise
Hallcrest Career College
205 Skywalk Level, 400 St. Mary Avenue
Winnipeg, Manitoba
R3C 4K5

John Brandt
Herzing Career College
723 Portage Avenue
Winnipeg, Manitoba
R3G 0M8

Heikki Thoen
ICS Canadian Limited
9001 Avon Road
Montreal West, Quebec
H4X 2G9

Bev Cronchaw
Jim Penner and Company - Training Centre Inc
949 Thomas Avenue
Winnipeg, Manitoba
R2L 2C6

Colleen McGuire
McGraw-Hill continuing Education Center
300 Water Street
Whitby, Ontario
L1N 9B6

Christine Lyons
MTCM - The Massage Therapy College of
Manitoba Inc.

Misericordia Hospital, 2nd Floor - 691 Wolseley
Avenue
Winnipeg, Manitoba
R3G 1C3

Doug
Mid Ocean School of Media Arts
1588 Erin Street
Winnipeg, Manitoba
R3E 2T1

Paul McCrae
National Institute of Broadcasting
1546 St. James Street
Winnipeg, Manitoba
R3H 0L2

Melissa Campbell
Panache-Agency-Models-School
106-897 Corydon Avenue
Winnipeg, Manitoba
R3M 0W7

Pat Winram
Patal Vocational Preparation
200-220 Hespeler Avenue
Winnipeg, Manitoba
R2L 0L4

Kathy Polet
Peter Polet's Class 1 Driving School
1127 Redonda Street
Winnipeg, Manitoba
R2C 2Z2

Admissions Officer
Pollock School of Beauty
480 Portage Avenue
Winnipeg, Manitoba
R3C 0E9

Darcy Zavislak
Professional Institute of Massage Therapy Ltd.
570 Portage Avenue
Winnipeg, Manitoba
R3G 0G4

Oliver Good
Professional Transport Driver Training School
300 Oak Point Highway
Winnipeg, Manitoba
R2R 1V1

Susan Munroe
Red River School of Floral Design
668 Elizabeth Road
Winnipeg, Manitoba
R2J 1A4

Admissions Officer
Reimer Express Driver Training Institute Inc.
1214 Fife Street
Winnipeg, Manitoba
R2X 2N6

Admissions Officer
Right Choice Driver Training Inc.
985 Dugald Road
Winnipeg, Manitoba
R2J 0G9

Richard McDougall
Robertson College Inc.
696 Portage Avenue Winnipeg, Manitoba
Winnipeg, Manitoba
R3G 0M6

Ness Michaels
School of Recording Arts of Manitoba
275 Selkirk Avenue
Winnipeg, Manitoba
R2W 2L5

Lucy Laurin
Scientific Marvel School of Hairstyling &
Esthetics
269 Kennedy Street
Winnipeg Manitoba
R3C 1T2

Kevin Gamble
Security Training Academy of Manitoba
101-1 Wesley Avenue
Winnipeg, Manitoba
R3C 4C6

John Schmidt
SLA Computer Training Centre
46 Stadacona Street
Winnipeg, Manitoba
R2L 2C8

Admissions Officer
Southway Transport Training School Ltd.
1305 Dugald Road
Winnipeg, Manitoba
R2J 0H3

David MacLennan
Success/CompuCollege School of Business
2nd floor, 267 Edmonton Street
Winnipeg, Manitoba
R3C 1S2

Betty Schimke
The Jacks Institute
P.O. Box 52028 - 2 Alpine Avenue
Winnipeg, Manitoba
R3M 5P9

Bev Weeks
U & R Tax Schools
201-1345 Pembina Highway
Winnipeg, Manitoba
R3T 2B6

Randy Ellingson
Wellington College of Remedial Massage
Therapies
503-200 Main Street
Winnipeg, Manitoba
R3C 4M2

APPENDIX II

Government and Community Organizations Contacted in this Study

Employment Projects for Women Inc
Fatima Soares
Tel: 949 5300
Fax: 944 9918

Workers Compensation Board
John Strickland
Tel: 945 3420
Fax: 945 1792

Winnipeg Métis Management Board
Alvin Chartrand
Tel: 589 4327
Fax: 586 6482

Canadian Federation of University Women
Mary L. Scott
Tel: 888 2996
Fax: 888 1385

Youth Employment Service
Linda Gunning
Tel: 987 8668
Fax: 942 8262

Osborne Village Resource Centre
Dana Sigurdson Moors
Tel: 989 6503
Fax: 477 0903

Taking Charge!
Rosa Walker
(Executive Director)
Tel: 925 1103
Fax: 925 1105

Mennonite Central Committee/SEED
Winnipeg
Gary Loewen
Employment Concerns Director
Tel: 261 6381

Aboriginal Training and Employment Service of
Manitoba
Marileen McCormick
Executive Director
Tel: 989 7112
Fax: 989 7113

Osborne Village Resource Centre
Jane Steubing
Program Administrator
Tel: 989 6512
Fax: 488 4152

Community Education Development
Association (CEDA)
Tom Simms
Executive Director
Tel: 947 6940
Fax: 949 9511

City of Winnipeg Libraries Department
David Weismiller
Director of Libraries
Tel: 986 6472
Fax: 942 5671

City of Winnipeg
Parks and Recreation Department
Gerald B. Mirecki
Recreation Services Division
Tel: 986 5091
Fax: 986 4274

City of Winnipeg
Parks and Recreation Department
Dan Prokopchuk
Tel: 986 3075
Fax: 986 4274

Winnipeg School Division #1
Pauline Clark
Superintendent of Inner City Schools
Tel: 775 0231

Andrews Street Family Centre
Josie Hill
Tel: 589 1721
Fax: 589 7354

Reaching Equality
Debbie Bean
Tel: 947 1609

Youth Employment Services
Tel: 987 8660

Independent Living Resource Centre
Allan Simpson
Executive Director
Tel: 947 0194

YM\YWCA
Michael Wier
CEO
Tel: 989 4160

New Directions for Children Youth and Families
Dr. Linda Trigg
Executive Director
Tel: 786 7051

Youth Career Development Program
Manitoba Education and Training
Clayton Sandy
Tel: 945 3235
Fax: 945 0221

MERLIN
Dan Kerr
Tel: 945 3206
Fax: 945 2222

Welfare Reform, Family Services
Dan Haughey and/or Janet Harrison
Tel: 945 5795 or 945 1589
Fax: 945 0082

Open Doors (King Edward school's parent literacy program)
Margaret Banasiak
Tel: 586 8381

Manitoba School Counsellors' Association
(Vincent Massey School)
Doug Muir
Tel: 453 8023
Fax: 284 0448

North End Women Centre
Chris Tetlock
Executive Director
Tel: 589 7347
Fax: 586 9476

Magnus Eliason Recreation Centre
Neighbourhood Resource Centre
Gerald Mirecki
Tel: 986 5091
Fax: 986 4274

West Broadway Recreation Centre
Frank King
Tel: 772 9253
Fax: 786 2653

Freight House
Gerald Mirecki
Tel: 986 5091
Fax: 986 4274

Winnipeg Education Centre
Greg Selinger
Tel: 947 1674
Fax: 786 2653

Aboriginal Council of Winnipeg
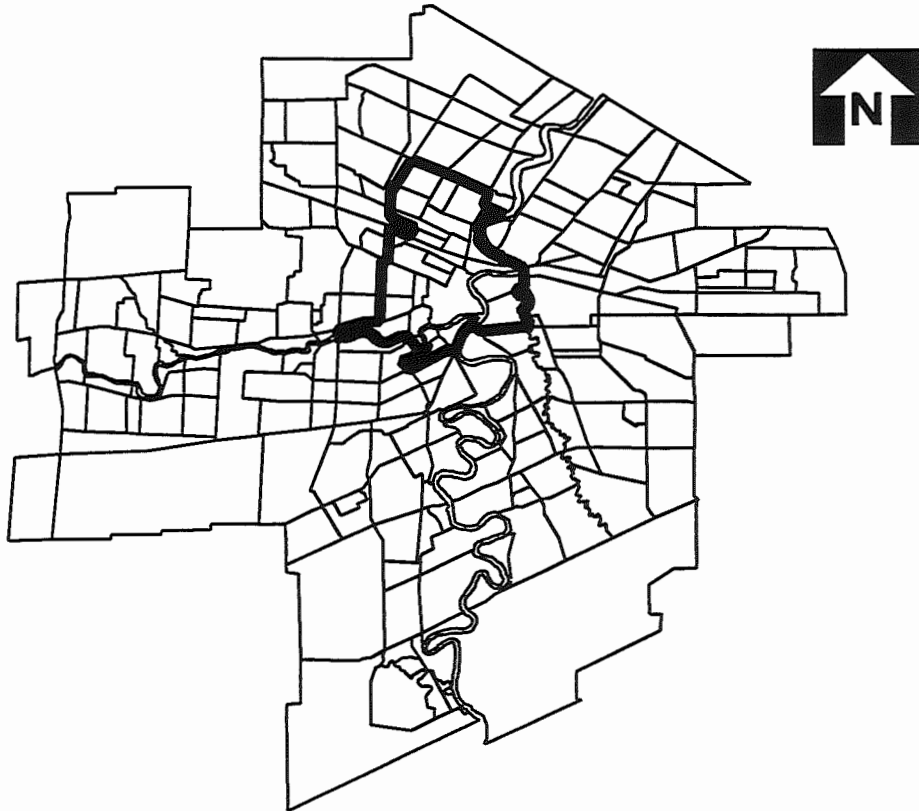181 Higgins
Mary Richards
Tel: 989 6399

Salvation Army
Emily Dalton
Tel: 946 9135

Social Planning Council of Winnipeg
Wayne Hegalson
Executive Director
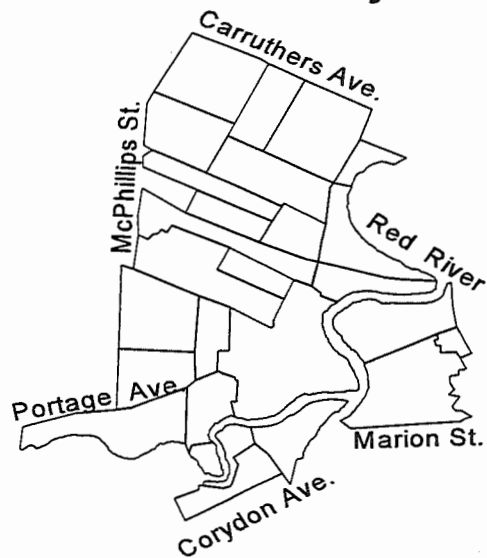Tel: 943 2561
Fax: 942 3221

Appendix III

Comparing Demographic, Social and Economic Characteristics

of Winnipeg's Inner City and Surburban areas

DEFINITION OF GEOGRAPHY

Winnipeg Neighbourhood Boundaries

Inner City

Demographic and Socio Economic Statistics for Winnipeg's Inner City and Surburban Areas.

** Suburban area is defined as the region inside the official metropolitan boundary but not including the Inner City. All data was obtained from Statistics Canda Census Metropolitan Profiles 1991 and the City of Winnipeg Neighbourhood Characterization Areas 1991.

Population count for Winnipeg in 1991 - 614,187

	Surburban	**Inner City**
Population 1991:	478, 030	165,525
Ethnic Make-up:		
Aboriginals	4.9%	16.4%
Visible Minorities	9.3%	19.0%
Remaing Population	85.8%	64.6%
Families:		
Husband-wife	79.0%	60.0%
Single Parents	14.0%	25.0%
Common-law	13.0%	7.0%
Education:		
with less than Grade 9	9.0%	20.0%
with no High School	27.0%	29.0%
Source of Income:		
Employment	78.0%	67.0%
Government Transfer	10.0%	13.0%
Other	12.0%	20.0%
Incidence of Poverty:		
Families	17.7%	37.7%
Individuals	43.0%	55.0%
Labour Force:		
Unemployment Rate 1991	7.5%	15.0%
Participation Rate 1991	70.0%	59.0%

ABORIGINALS IN WINNIPEG

- *In 1991, over 65% of Aboriginal single parents in the inner city depended on social assistance (welfare, unemployment) as a source of income compared to 38% in the non-inner city.*

- *Over 85% of Aboriginal single parents moved (or changed residences) within the 1986 to 1991 period, compared to 27% of non-Aboriginals.*

- *Over 41% of Aboriginal single parents were unemployed.*

- *In 1991, over 90% of all Aboriginal households in the inner city were renting, compared to 62% of non-Aboriginal households.*

- *Aboriginal average household incomes fall well below total average household incomes for the inner city and non-inner city.*

- *In the inner city, average household income for all households was $27,483 in 1991, compared to only $15,511 for Aboriginal households. In the non-inner city, the respective levels were $46,169 and $30,117.*