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Conceptual Framework for an Optimal Labour Market Information System: Final Report

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Conceptual Framework for an Optimal Labour Market Information System

Final Report

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EXECUTIVE SUMMARY

The importance of labour market information (LMI) to the efficient functioning of product and input markets has increased with the expanding globalization of economic activity. Markets transcend national boundaries and operate continuously. High-quality, easily accessible LMI is a fundamental feature of a well-oiled competitive labour market, and LMI can improve both short- and long-term matches of labour supply and demand to ensure that individuals build and renew the skill sets required in the dynamic marketplace. This study provides the framework for an optimal labour market information system. By optimal we mean best given the available resources. Our aim is to provide a practical model for Human Resource and Social Development Canada (HRSDC) as it improves and refines its LMI activities in the real world of public policy with limited budgets.

Canada is widely recognized as a world leader in LMI development and delivery. Many features of an optimal LMI system already exist in Canada. Indeed, many principles were initially developed by Canadians and have been assimilated in other countries. Nonetheless, dramatic and rapid changes in markets suggest that occasional reviews of LMI are beneficial to keep in step with the changing information requirements and methodologies. Periodic reviews may identify new gaps emerging from change, and suggest changes so that LMI systems remain useful and relevant to job seekers, employers, and public policy makers.

This study also examines the critical need for governmental intervention to build and maintain an optimal LMI system. Theory suggests that markets themselves might generate information sufficient for effective decisions, but the complexities of the market make it nearly impossible for all or even the most relevant information to be generated and made available through normal market transactions. Government must play a major role to ensure there is a public LMI system, which produces reliable and relevant information, and that LMI is disseminated in user friendly ways to increase the likelihood of improving the efficiency of

markets. In addition to assembling relevant data, public agencies have a key role in transforming facts about economic activity into useful labour market intelligence.

Among the major issues and findings covered in this report are the following:

- LMI has positive effects on labour market adjustments for business and individuals.
- Nearly all industrialized countries recognize the need for government intervention in developing and disseminating LMI. The governmental role arises from theory, social policy, and the benefits of efficient market operations and transactions. Several studies reviewed for this report make a strong case for the governmental role, reinforcing HRSDC's case to further enhance LMI development and delivery.
- The complexities of the labour market necessarily require large-scale activities and partnerships to develop and operate an optimal LMI system. Collaboration among government ministries, agencies, and private sector entities is probably necessary to building a robust LMI system.
- The range of potential users of LMI encompasses nearly all individuals, businesses, and educational institutions. Reviewing the range of users and their needs is an important aspect of building, revising, and operating an optimal LMI system.
- Intermediaries including counsellors, career facilitators, front line employment office staff, and others should be considered an integral part of a comprehensive LMI system.
- Labour market analysts are of critical importance in an optimal LMI system.
- Seven fundamental features of an optimal LMI system are described and detailed in this report:
    1) Governance and cost effectiveness.
    2) Timely, accurate, and relevant data.
    3) Analysis and interpretation add value to data.
    4) Labour market analysts are integral to an optimal LMI system.
    5) Information must be easily accessible.
    6) Intermediaries should be regarded as part of an LMI system.
    7) Job seekers, businesses, and institutions public and private are likely to make many labour market related choices and decisions over their lifetime—an optimal LMI system should educate users to increase the impact of labour market intelligence.
- Effective governance should be part of the system design and not an afterthought.
- Data sets in an optimal LMI system must be viewed along several dimensions, including
    - time period of the data;
    - geographical detail—the appropriate and feasible level of geographical detail must be defined;

- measurement criteria and methodology—appropriate units of measurement and methodologies need to be selected;
- classification—data need to be categorized and classified to facilitate data development, presentation, comparisons, and interrelationships; and
- other data related features:
  - timeliness;
  - accuracy;
  - links and crosswalks among data sets;
  - data standards to ensure consistency, reliability, and valid comparisons.

- Data sets included in an LMI system can be organized in several ways. For purposes of this study, detailed data elements of an optimal LMI system are categorized in six groupings:
  1) Core labour force and market data.
  2) Demand data (labour, skill sets, etc.).
  3) Occupational supply.
  4) Occupational characteristics.
  5) Education and Training information.
  6) Crosswalks and links that interrelate different data sets, such as industry, occupation, and educational program information.
- Dissemination of LMI requires multiple approaches, but clearly computer Internet or World-wide-web (Web) based delivery is the primary means of providing information to many end consumers. However, it is crucial to an optimal LMI system that we consider how consumers can access the Internet, particularly those who may not have access at home. For example a public LMI system should ensure that libraries, one-stop employment centres, community and faith based organizations, and other appropriate entities be encouraged to offer access to LMI as well as counselling and career development support.
- Web sites should adhere to quality standards, and three sets of standards are identified in the report including
  - FLMM *Career and Labour Market Information Service Delivery Guidelines,*
  - FLMM *LMI Product Guidelines*, and
  - the Association for Computer-Based Systems of Career Information (ACSCI) standards for career information delivery.
- Suggestions for HRSDC consideration to further enhance and refine LMI activities include:
  - Strengthen collaborative efforts among ministries and agencies, perhaps through an expanded role of the FLMM.

- A Web-based one-stop portal for LMI across ministries and geographies may be beneficial. The system would provide easy access to national data and some sub-national data across Canada and also provide easy access to specific Ministry, Province, and local Web sites.
- Greater use of occupational staffing patterns, particularly at sub-national levels to help identify occupational sill needs.
- Canada might consider a partnership with the U.S. to keep the Canadian National Occupational Classification (NOC) and US occupational coding (O*NET) sytems up to date while sharing costs and information.

Our study supports the importance of LMI for the efficient operation of labour markets and the need for government intervention. The lists of data elements and delivery strategies presented in the report are intended to assist Canada in achieving an optimal LMI system. They provide a comprehensive, but not all-inclusive menu. They may guide future work by HRSDC, but should be modified and adjusted according to specific HRSDC needs. Our work is a starting point for setting priorities for future Canadian investments in LMI.

1 INTRODUCTION: THE CONCEPTS OF LMI AND AN LMI SYSTEM

This report presents an overview of features essential to an optimal labour market information (LMI) system. The exposition includes descriptions and examples of a wide range of features and data sets which may be included. Our use of the term optimal reflects the practical limitations of financial resources for LMI development when aspiring to an ideal system. Economic choices must be made between alternatives available for system development given available resources, and an optimal system results from the best choices. Key components of an optimal LMI system include: the types of data, quality standards for data, level of detail, analytic enhancement of data, and information dissemination strategies and mechanisms. Equally important when considering an LMI system are the roles of analysts and intermediaries. These professionals are an essential part of an optimal system. Ultimately, LMI consumers and their needs drive the design of the system. This report examines all of these players and components of an optimal system, and is intended to provide Human Resources and Social Development Canada (HRSDC) with a model as it looks toward future enhancements of LMI development and delivery. Our exposition reveals some areas where additional coordination and system enhancements could add value to the Canadian LMI system, which is widely regarded as one of the best in the world.

Since the global economy and related labour markets are in a continuous state of flux, no LMI system can ever be truly ideal. Any information system is likely to need occasional adjustment to keep up with changing market arrangements and needs of economic agents. For example, information on skill requirements is of growing interest, and as skill, knowledge, and ability sets change more rapidly, new ways of sensing such changes and disseminating the information to the public may be needed. It may no longer suffice to update skill information every 5 or 10 years, but rather an intelligence or scanning system may be useful, if not necessary, to at least identify changing needs and economic conditions in a more timely manner.

This project does not offer a critique of the current Canadian LMI system; there are several recent high-quality studies that provide such background. Many of those studies are referenced in this report. Our aim is to outline an optimal model to complement the guidance provided by earlier related studies. This should be useful information as HRSDC officials set priorities to further enhance LMI development and delivery in concert with other federal departments. Horizontal governance and collaboration (OGDs and other levels of government) are fundamental to an optimal LMI system since many departments and agencies develop, deliver, and use labour market information.

Recognition of the value of an LMI system has grown over the last 30 years as economies have become more complex and transcend national boundaries. The labour market is a complex and dynamic series of flows reflecting requirements of the buyers of labour services (employers) and the sellers of labour services (individuals). These processes and the nature of the players in the marketplace are covered under the umbrella of labour economics, which is defined by Ehrenberg and Smith (1994) as being "primarily concerned with behaviour of employers and employees in response to the general incentives of wages, prices, profits, and non-pecuniary aspects of the employment relationship, such as working conditions. These incentives serve to motivate and limit individual choice." Underlying this broad definition is the fundamental requirement for information to help businesses, individuals, educational institutions, and other actors in the marketplace make effective decisions in the labour market. High-quality, detailed information on labour market participants, flows, and needs has become more essential in a global economy, which is characterized by a rapid pace of technological advances that lead to continuous changes in skill requirements and work processes, and wherein the production of goods and services may be outsourced to other countries.

In theory, we might expect the marketplace to generate sufficient information for labour market choices and decisions. As noted by Yavitz, Morse, and Dutka (1973), "an economy based on private property and individual choice, with a minimum intervention on the part of government, theoretically generates a body of information, in the form of prices of inputs and outputs that provides individuals with the basis for rational action." In the short term, the market

provides some information on the immediate demand needs in the form of job openings information, but such information covers only one aspect of the labour market. Yavitz, Morse, and Dutka make an important distinction about labour market that is still relevant today. They suggest the following dichotomy:

- The concept of *Job market* refers to the more immediate demand/supply matching transaction between employers and job seekers, i.e., employers filling their current job needs and individuals seeking and accepting job offers. This is an important aspect but does not define the larger set of labour market transactions and flows;
- The term *Labour Market* refers to the "entire set of interlinked institutions and processes that determine the flows of job opportunities and manpower [labour supply] in both the short and the long run." [Yavitz, Morse, and Dutka 1973]

The job market, in this view, is an important subset of the larger labour market, and the approach taken in this study is to address the larger concept. Yavitz, Morse, and Dutka (1973) and several more recent studies argue that the marketplace and private sector are unlikely to provide for general use LMI that is consistent, reliable, and comparable across a whole nation. Consequently, government should play a role in building the foundation for an LMI system. It is within this larger context that the theoretical basis for an LMI system, and the rationale and role for government intervention in producing and disseminating labour market information will be examined in Chapter 2. That chapter also will consider assessments of the value of LMI. Measuring the impact of LMI is very difficult, because so many factors are involved in job search, career planning, economic development, education program offerings, and business decision making. Ultimately, the fundamental question concerns the value added to the system by having information on the skill needs of business and the talent capacity of the workforce generally available to facilitate job matches. While there are no exhaustive, comprehensive studies of the value and impact of LMI, there are some focused studies on the value of LMI for specific uses, such as job search, and some of these studies will be cited.

In Chapter 3, we consider some of the primary customers and uses of LMI. This overview will help identify where LMI may be useful in addressing certain issues and decisions, what type of information might be useful, what assistance might be needed, and how such information might be accessed and presented.

Since our interest lies with information that measures the components and flows of the larger labour market, it is important to establish a working definition of LMI that goes beyond the short-term labour market. There is no single definition of LMI generally used and accepted by economists or participants in the marketplace. There are however, many different definitions that provide reasonably broad or partially complete characterizations of LMI, including the following from the International Labour Organization (ILO), that we will use as our working definition:

- The ILO defines LMI as "any information concerning the size and composition of the labour market or any part of the labour market, the way it or any part of it functions, its problems, the opportunities which may be available to it, and the employment-related intentions or aspirations of those who are part of it." (Thuy et al. 2001, p. 57)
- Employment policy administrations in some regions, such as Northern Ireland, use the phrase "labour market intelligence" rather than labour market information to convey the idea that information has been analyzed and reduced to essential facts relevant for decision making (Lantra 2005). The report uses the initialism LMI to refer to both information and intelligence about the labour market.
- Work futures. British Columbia, without fully defining LMI, adds additional perspective to a possible definition: "The traditional definition of LMI refers to descriptive and statistical information about occupations, wage rates, unemployment rates, employment outlooks, education and training, and economic trends and conditions. However, as LMI is becoming more essential to career development, its definition has expanded. LMI now refers to any information that is used for labour market–related planning and decision making. This is an important change because it recognizes that LMI is part of the career planning process. As work and life become more intertwined, information about how the labour market works should be part of every stage of career planning." (HRSDC: BC/Yukon 2006)
- In the United States, the Workforce Information Council uses the term *workforce information* to encompass both labour market and workforce information and provides the following general definition: The workforce information system "provides information on labour market trends and conditions, job outlook and wages, skill requirements of jobs, and a wide variety of other information that helps customers make decisions about their businesses, careers, training, and job search."

Using these varied but related views of LMI, we will employ the following working definition for this study:

> *Labour market information includes any quantitative or qualitative information and intelligence on the labour market that can assist labour market agents in*

making informed plans, choices, and decisions related to business requirements, career planning and preparation, education and training offerings, job search, hiring, and governmental policy and workforce investment strategies.

This definition is intentionally broad and should be understood to include the following features of LMI.

- Information/intelligence on
    - Labour market conditions;
    - Demand and supply trends and requirements;
    - Composition and characteristics of labour supply;
    - Projections of future demand and supply;
    - Market and job opportunities, and problems;
    - Education and training services and resources; and
    - Other related information supporting labour-market related decisions
- Interpretation and analysis of the data for various customer needs such as:
    - Narrative analyses of trends over time
    - Narrative comparisons between geographies, industries, occupations
    - Narrative analysis tailored for specific applications
    - Graphical presentations of information

These features are elaborated in Chapter 4, which includes both raw data and analytic enhancements of these data.

The notion of LMI is perhaps best depicted by providing additional detail on the types of information elements that fit under the definition of LMI. As an illustration of the types of data that would be included in an optimal LMI system, we draw the following from the U.S. Workforce Information Council report:

- **Labour market conditions** data provide information on the overall structure and condition of the labour market, including its demographic composition, trends in employment and unemployment, labour turnover information, and information on labour force dynamics—the movement of people into and out of the labour force.
- **Industry data** organize employment, wages, and other information by the type of production processes used. Industry data also include information on job creation and destruction and the life cycle of business establishments.

- **Occupational data** organize employment, wages, and other information by the type of work performed and identifies the skill requirements and other occupational characteristics of workers and jobs.
- **Labour market projections** examine labour force, industry, and occupational trends, and provide a picture of future employment and job openings based on assumptions about economic growth.
- **Business establishment lists** provide information about individual business establishments, such as name and address, industry, employment, and payroll. These lists also provide the sampling universe for business surveys.
- **Labour market dynamics** information examines the flows of workers into and out of employment, and the creation, expansion, contraction, and disappearance of businesses, and factors related to these dynamic changes.
- **Current job vacancies** information identifies job openings for which employers are actively seeking workers.
- **Data on employment and unemployment** include information on the employment, earnings, and other items for individual workers, information on individual job seekers contained in resume or applicant files, as well as program information on individuals in workforce training or other programs.
- **Education and training resources information** identifies education and training institutions, programs and courses, information on access to and the quality of these training sources, and information on financial assistance.

An enumeration of critical data elements is provided in Chapter 5 of this report.

As stated above, the purpose of this study is to conceptualize an optimal LMI system, and while data is a necessary element of an LMI system, it is not sufficient to ensure an optimal system. In its most basic sense we will consider an LMI system as consisting of the following essential features:

- Data elements, analytic enhancements, information, and intelligence.
- Delivery and dissemination systems and products.
- User support including labour market analysts, intermediaries such as counsellors, human resource specialists and consultants, business associations, economic development personnel, teachers and others; tools; and resources to assist customers in the effective use of information in making informed labour-market related plans and decisions.

While many users can benefit from simple access to the data, for most users it is important that there are products tailored or customized to their needs. The complexity of the

labour market and even the very existence of large amounts of labour market data can make it confusing for a user to navigate through the various data sets and sources to answer specific labour-market questions and needs. Dissemination and user support is discussed in Chapter 6 of this report.

Finally, in Chapter 7, an initial mapping of an optimal LMI system is presented. We also offer some suggestions on how features in the Canadian system compare with those of an optimal system for use by HRSDC to identify areas to explore for further investments in LMI development and delivery. A more exhaustive review and comparison should be the subject of another study or a compilation of findings from existing studies and reports commissioned by HRSDC, other departments and ministries, and the Forum of Labour Market Ministers.

2 THEORETICAL AND PRACTICAL RATIONALE FOR LMI

Theoretical and Practical Rationale for LMI: Summary

Labour market information is a fundamental requirement for efficient labour markets. Due to its nature as a public good there is an under production of LMI, government investment in LMI is essential. We examine previous studies about the role of LMI in labour market operation. The main topics covered include:

- A fundamental assumption of competitive labour markets is access to LMI.
- High-quality LMI improves labour market efficiency.
- LMI has characteristics of a public good—in particular, that use by one agent does not diminish its value and access for another. This reduces incentives for private production of many types of LMI and argues strongly for governmental investment in LMI.
- Globalization increases the importance of efficient labour markets for a nation to effectively compete in the international marketplace.
- Labour market information needs mirror the flows of the labour market that define the types of information to be considered in an LMI system.
- The complexities of the labour market necessarily require large-scale activities and partnerships to develop and operate an optimal LMI system.
- Previous studies cited in this report document:
    - Lack of access to quality LMI creates inefficiencies in job search and matching, and in longer term career planning and preparation
    - LMI has positive effects on labour market adjustments for business and individuals by improving the speed and quality of matches
    - Individual counseling may reduce unemployment duration with the implication that LMI used in conjunction with counseling is important to serving many clients
    - All studies reviewed for this report concluded that computer assisted programs that deliver LMI have positive effects on career planning and choice
- Nearly all industrialized countries recognize the need for government intervention in developing and disseminating LMI. The governmental role arises from theory, the demands of social policy, and public requirements for efficient labour market operation. Several specific examples are cited in this chapter.

Examining the theoretical and practical rationale for a government role in LMI helps frame the scope of an optimal LMI system. An effective system involves many partnerships, both explicit and implicit, between public and private entities. Much of the data that forms the core of an LMI system must be collected from private businesses and households, usually on a voluntary basis. Private business establishments and organizations may collect labour market–related information on skill needs and wages in their particular sphere of activity. Proprietary and nonprofit organizations may develop customized LMI applications to address individual needs better than standardized releases through public channels. Nonetheless, an optimal public LMI system can serve an array of needs. It requires significant government investment and involvement for a number of reasons.

"Many of the central theories and principles in economics are based on assumptions about perfect information," notes Nobel prize winning economist Joseph Stiglitz (2003, 2004) of Columbia University. A fundamental economic assumption for competitive labour markets is access to perfect information. While reality does not meet the standard of perfection, either in terms of information quality or access, striving toward the best possible labour market information and effective and efficient means of delivering it is crucial to the smooth operation of labour markets and related product markets. Without such information the competitive labour market is severely hindered and likely to be somewhat inefficient with respect to the labour exchange function of the market, longer-term career preparation, upgrading skills to meet changing needs of the workplace, and business workforce decisions.

A governmental role in LMI has been accepted and pursued in most developed industrialized countries. Public provision of LMI can be rationalized since it has characteristics of a public good, and a type of market failure can result in its under production. Use of LMI by one economic agent does not diminish its value for another. This feature of nonexclusion in consumption reduces incentives for private production and leads to an undersupply of LMI. Therefore, public investment in LMI could improve labour market performance through a better matching of skills and employment opportunities. Improved matches can yield spillover

benefits, namely economic growth. With an increase in the speed and quality of job matches, output increases, the economy expands, and additional job opportunities emerge.

Governments have adopted many different approaches to LMI development and delivery ranging from highly structured centralized approaches to looser decentralized systems. Some systems feature formal interagency governmental partnerships, and formal public-private sector partnerships. LMI collection and delivery in Canada and the United States have characteristics of both centralized and decentralized systems with information developed and disseminated at the national, province, and local levels.

To help set priorities and identify potential partnerships in building and maintaining an optimal LMI system, we examine the rationale for governmental investments in development and delivery of LMI. However, before we look at the governmental roles, it is valuable to examine basic components and flows in the labour market that an LMI system must be designed to capture.

High-quality LMI improves labour market efficiency. As noted, access to "perfect information" is a fundamental feature of a competitive market. Perfect information is a goal that would yield faster job matches, improved quality of job matches, and consequently increased economic activity yielding secondary employment gains from economic growth. LMI supports speedy employment for the job ready, human capital investment decisions when skills do not satisfy labour demand, employer recruitment to fill job openings, and planning by education and training institutions.

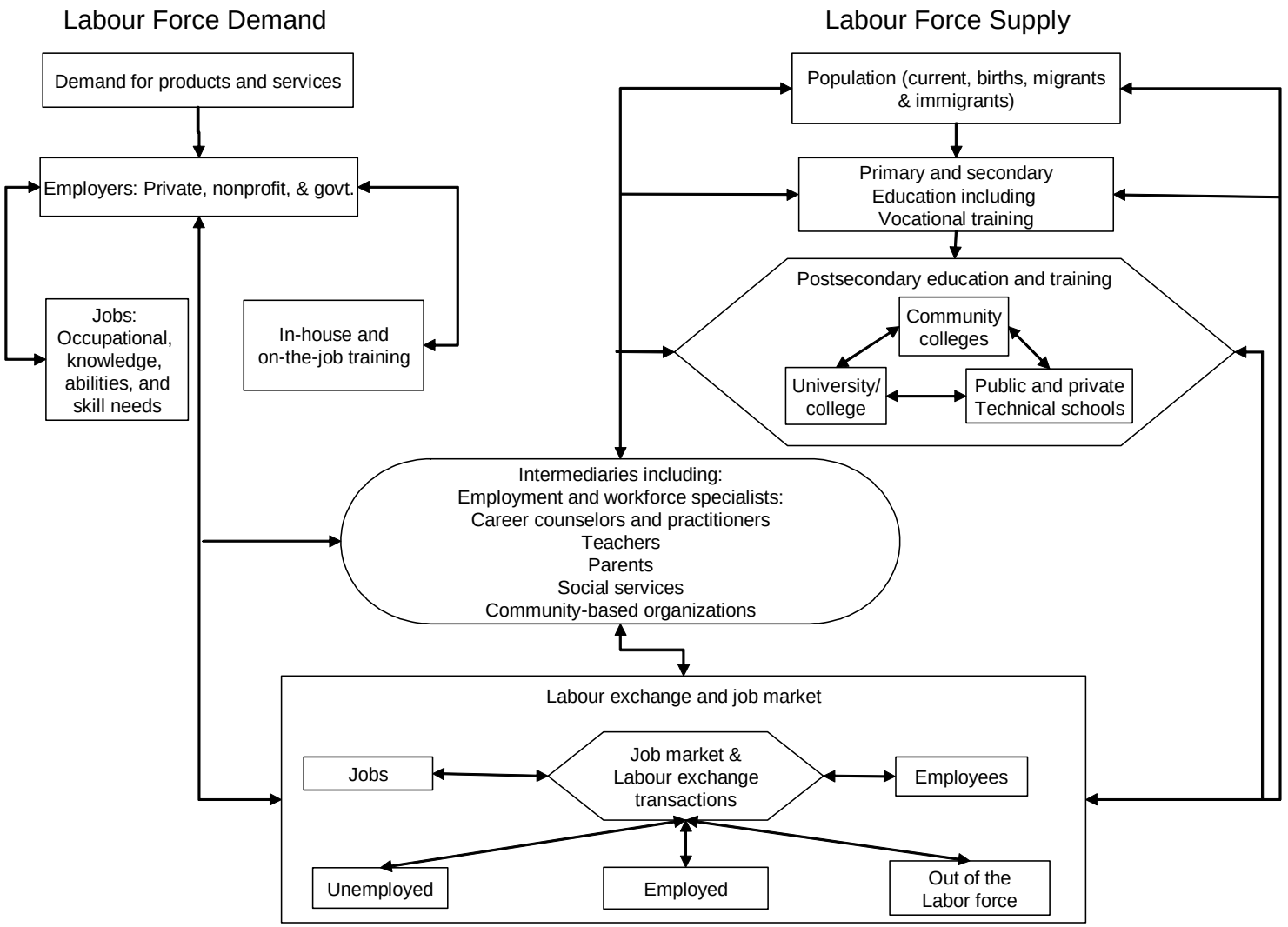
Globalization has increased the importance of efficient domestic labour markets to assure international competitiveness of Canadian businesses. Canadian immigration policy would benefit from timely high-quality LMI to inform decisions for targeted occupations.

Labour Market Features and Flows

The simple labour market model presented as a flow chart in Figure 2.1 is a variant of a model suggested by Yavitz, Morse, and Dutka (1973). It provides a snapshot of the labour market at a point in time. The left-hand side of the flow chart represents employer labour demand. The top box on the left side of the flow chart represents the demand for products and services that in turn drives business activity and labour demand by employers (second box). Job openings, the occupational mix of industry and business, and skill requirements are derived from demands for various types of products and services. Demands for labour services are influenced by the nature of production and service processes and technology, and availability of capital equipment. Employers may provide on-the-job and in-house training to upgrade the skills of employees.

The type of information that can measure labour demand is not reflected in Figure 2.1 but is implicit. Information on industry employment, occupational staffing patterns, employer skill requirements (such as those in Canada's National Occupational Classification and essential skills project), and the distribution of employment by occupation across industries provide a picture of the labour demand side. Projections of future employment by industry and occupation provide information for medium- and long-term planning.

Moving down the demand side of the flow chart, employers may recruit and hire new employees through intermediaries (the oval image in the middle of the chart) or directly through the public labour exchange (as pictured in the large box at the bottom of the page). Employers also recruit through networks, word of mouth, and other methods, but for purposes of this discussion we focus on the more formal recruitment. Within the labour exchange arena, we see the matching activities between job opportunities and prospective employees. Generally the outcomes can lead to hires (the employed), or movement into and out of employment or the labour force. Providing both buyers and sellers of labour services with easy access to LMI facilitates efficient matching of labour services with job skill requirements. The labour exchange activity also can provide a source of labour market information through data on job openings, resumes for job seekers, and other information that could become part of a formal LMI system.


Labour Force Demand
Labour Force Supply
Demand for products and services
Employers: Private, nonprofit, & govt.
Jobs: Occupational, knowledge, abilities, and skill needs
In-house and on-the-job training
Population (current, births, migrants & immigrants)
Primary and secondary Education including Vocational training
Postsecondary education and training
Community colleges
University/ college
Public and private Technical schools
Intermediaries including:
Employment and workforce specialists:
Career counselors and practitioners
Teachers
Parents
Social services
Community-based organizations
Labour exchange and job market
Jobs
Job market & Labour exchange transactions
Employees
Unemployed
Employed
Out of the Labor force

For example, it is possible that data mining of job openings could lead to a system for monitoring changing occupational and skill requirements, well before formal data collection programs might pick up such changes or new trends.

The labour supply side of the market is illustrated on the right-hand side of the figure. Moving down from the top, we have the overall population that will expand or contract based on internal migration, immigration of foreigners, emigration of citizens, births and deaths. Most members of the population have or will move through the educational system at some point. However, at any point in time, people may move from the overall population into the labour exchange process, either directly or through intermediaries (see the flows from the left- and right-hand sides of the population box). Similarly, individuals may move from secondary education directly into the labour market (or through intermediaries) or on to higher education, and from there to the labour market (or remain outside of the labour force).

Of course, at any point, persons may move in or out of employment while remaining in the labour market, and they may move in or out of the labour force. An optimal labour market information system must measure stocks and flows of available labour services. While not shown in the figure, implicitly the chart highlights the importance of information to help smooth the flows thereby avoiding periods of excessive unemployment or labour shortage. For example, schools that provide skill training, whether, basic, core, or specific, will support marketplace efficiency if they train individuals in skills demanded by employers in the market. As noted earlier, this is why it is important that an LMI system develops demand information and makes such information available to the public. Similarly it is important that information on education and training opportunities linked to occupational and skill needs be available for individuals to effectively plan their educational and training investments.

Given the complexities of the marketplace, as summarized in Figure 2.1, it is clear that collecting, managing, analyzing, and disseminating LMI is a large scale undertaking. It is, however, a necessary task for the efficient and effective operation of the labour market.

Governmental Role and Intervention

Understanding the theoretical and practical basis for an optimal LMI system is important to our consideration of the government's role in LMI, and we take up this topic next. Subsequently we will examine the case for governmental intervention to ensure the availability of LMI. The efficiency of the labour market in no small part depends upon reliable information exchange between the buyers of services and skills (employers) and the sellers (individuals). Yavitz, Mores, and Dutka (1973), suggest from a theoretical view that LMI is analogous to a form of intellectual capital, similar to the skills, abilities, and aptitudes that an individual builds through investments in education and training. Yavitz, et al. argue that both the direct investments and the "indirect opportunity costs of job search by the job seeker enable a worker to come closer to matching his skills and aptitudes to that employment that will offer him the highest return." However, as Yavitz, et al. note, the distribution or amount of LMI (a form of intellectual capital) is not necessarily optimal, and such imperfections mean certain groups or the entire labour force may not acquire the necessary information for an optimal matching of their skills to employer needs. This inefficiency impacts not only on the immediate labour exchange/job match aspect of the market, but also effects longer-term career planning and preparation in which individuals must make decisions to invest both time and money in building skills, for example, the cost to an individual investing four or five years to earn an engineering degree from a university.

The economic basis for information presented by Yavitz, Morse, and Dutka (1973) argue not only for LMI as a fundamental component of the labour market, but also that such information needs to be available to all individuals, businesses, education, and other participants in the marketplace. As noted in the introduction, while there are no definitive studies on the impact of LMI, there are a number of studies that support the value of LMI, some of which are highlighted below.

The value of a well-honed LMI system is highlighted in the report *The Role of LMI for Adjustment: International Comparisons*, by Center for the Study of Living Standards for

Industry Canada (2005). This study reviews several experimental and nonexperimental evaluations or reviews of LMI and summarized the results as follows:

- "Well-organized LMI can reduce job search costs for firms and workers and help workers reallocate among different employers and industry. By facilitating the reallocation of labour in the direction of basic market forces, LMI can enhance productivity, competitiveness, and economic growth, while also reducing social inequality." This argument identifies LMI as a crucial element for optimal Labour market performance. Even without direct evidence of impact, the summary of existent studies is consistent with a logic model concept, in which information on the key needs of the market, e.g., skills, knowledge, abilities, job openings, wage rates, etc. can facilitate a more efficient market. Clearly it is in line with a key premise of a free market economy in which access to perfect information is both a fundamental and necessary aspect of the market.
- "LMI is crucial in managing transitions from one level of education to another and transitions between education and working life." This finding is important to the role of LMI in assisting individuals in career preparation and advancement. It is consistent with the principle of *lifelong learning*, building and enhancing our skill set to keep pace with changing skills and evolving employer requirements in the job market.
- "This evaluation of LMI finds that the provision of LMI positively affects the outcomes of labour market adjustments." This reinforces the importance of LMI at a time when adjustments at the business, educational, and individual levels are the norm because of the dynamic global market and the rapid advancement of technology and its impact on skill requirements.
- "LMI is much more cost-effective than many other labour market interventions." This finding certainly does not suggest that other interventions be dismissed or lessened, but rather that LMI can play a major role in the full tool-kit of interventions. Also, LMI addresses the needs of many individuals and businesses that do not necessarily need other interventions, so it is a universal service.
- "Unlike spot market transactions, labour market transactions involve negotiations, contracting, and exchange, with the exchange continuing over time in the context of ongoing employment relationships." LMI measures these flows and transactions and provides a dynamic contextual resource that reflects these flows. It is not a one-time resource for consumers, but one that they may use many times in business and career decisionmaking.
- "Incomplete information on both sides involves the existence of information asymmetries, making it difficult for both sides to find the appropriate matches . . . This incomplete information results in high transaction costs. Both firms and workers have to make a sunk investment before they find each other." This finding supports not only the value of immediate job opening information to facilitate matches between business and job seekers, but it also is crucial to longer-term planning in which individuals may have to invest in months and years of training to prepare for market needs.

- "Suboptimal matching can result in negative externalities, such as increasing the incidence of layoffs and thereby raising the costs of social security systems [or unemployment insurance systems]. Providing information to all market participants can reduce transaction costs and further mitigate the negative externalities." This finding further supports the potential value of LMI in reducing public sector costs to the extent that some individuals may require fewer services or financial support through the effective use of LMI.

A significant study commissioned by HRSDC (2005), *Summative Evaluation of HRSDC Labour Market Information Products and Services*, investigated how Employment Insurance Recipients are affected by HRSDC LMI products and examined the impact of individual counselling on unemployed individuals. The study found:

- Individual counseling reduced unemployment duration in the short run, and there was some evidence that LMI might reduce the duration of unemployment. We would add that for counsellors to be effective, they need easily accessible LMI to work with their customers, so the potential value of LMI rests in its direct use by some individuals and almost certainly by counsellors.
- While the study could not conclusively address the impact of LMI products and services on job search duration, the authors did infer that, from the fact that the period of unemployment was reduced (see previous bullet), it was reasonable to presume that the job search period was reduced.
- Findings suggested that users of LMI products conduct more intense job searches—while this finding was not definitive, it appears consistent with other findings from the study. Though this is not a measure of the direct impact of LMI, we would argue that services that promote more intense job searches (or career planning) can only be for the good in the complex labour market, and that this supports the case of LMI.
- The study concluded that LMI users "were significantly more likely to use all other job search methods compared to non-users." Once again, while not providing direct information on the impact of LMI, this finding reinforces the case for LMI.
- Assisted use of LMI appeared to have positive effects on the job search process.

Yet another study, carried out for the Forum of Labour Market Ministers, *The Impact of LMI on the Career Decision-Making Process*, provides further backing for LMI. This study reviewed several other studies and concluded the following:

- All of the studies reviewed indicated that the use of computer-assisted programs (LMI or career information delivery systems) had positive effects on career choice and decision making.

- Several studies indicated a significant impact of LMI when delivered along with advice from counsellors.
- More and better information has a positive impact on successfully finding a job and on obtaining a higher salary.

While many of these points focus on the relationship of employers and individuals, all of them are equally relevant to all labour market participants. As an example, educational institutions must have good information on the current and anticipated demand requirements of business establishments if an appropriate mix of programs and courses with relevant curriculum is to be offered. As shown in the earlier schematic of the labour market flows, all individuals go through a formal educational process that builds basic skills (such as traditional literacy and numeracy skills), and many, if not most, are likely to receive training in essential or specific skills related to fields of work. The more focused those training programs are on building marketplace skills, such as programs offered in vocational or technical institutions, professional programs, etc., the more important it is that such programs have access to reliable information on marketplace needs.

If education and training institutions do not address marketplace skills, market inefficiencies may be compounded as individuals invest time in money in skills that do not provide necessary or relevant training, and their employment choices may be suboptimal as a result. On the demand side, employer needs may go unmet, or be inadequately met, creating inefficiencies and unnecessary costs in the provision of products and services. Ultimately, such inefficiencies can create significant imbalances that can impact on the competitiveness of firms in a global economy and on immigration needs and policy.

Nearly all industrialized countries have recognized that there is a need for government intervention in developing and providing labour market information. The government role arises from a theoretical basis, social policy concerns, efficient market operations, and practical operational considerations. Proprietary firms play a major role in LMI development and delivery, but as discussed below, it is unlikely that a single firm or combination of business

establishments would operate any full-scale nationwide LMI system. Reasons for government intervention by operating an LMI system include the following:

- There is a need for equal access to labour market information by all participants. Equal access addresses the interest in an efficient labour market in which information on market needs and supply availability is widely disseminated and accessible to optimize matching of buyers and sellers.
- Equal access addresses concerns with social inequality in at least two ways: first, it allows groups who may not fully participate in the marketplace or take advantage of their abilities and skills to be aware of opportunities and the required preparation; secondly, a competitive marketplace may well depend more and more on subgroups in the economy to participate in all aspects of the market, particularly as other groups reach a threshold in labour force participation. It is well known that much of the growth in employment in some nations including Canada and the United States has been due to rising participation rates in women, but those levels are not likely to rise enough in the future to sustain similar economic growth.
- Given the argument that equal access to LMI should be a fundamental aspect of a well-functioning labour market, then LMI is viewed in large part as a public good. It is difficult to measure the value of LMI in both monetary cost and future or downstream impacts. Adequate LMI provision improves market performance and yields spillover benefits such as economic growth, the value, price, and cost of which are impossible to reliably measure. This makes it unlikely that a full LMI system would be provided through proprietary firms or market optimizing behavior. The private sector is very likely to develop and supply LMI in particular niches but not cover a nationwide system.
- Related to the previous bullet point, the cost of developing and maintaining a national LMI system that includes, national, regional, and local information is large, but once collected it would be difficult for any private company to keep control of the information and receive compensation/profit. This nonexclusion in consumption reduces incentives for private production and would likely lead to or continue and undersupply of or inequitable access to LMI, without significant government intervention.
- Yavitz, Morse, and Dutka (1973) suggest that, “once collected, the value of this information [LMI] can best be reaped by the widest possible dissemination.” This is a key point from a market standpoint. While a proprietary firm rightly would desire to maximize profits from selling LMI, such an approach would not likely optimize use of the information to improve efficiencies in the overall labour market. Government intervention can maximize the value of the data relative to costs by ensuring that the use of the information is optimized, and thus optimizing the positive impact on labour market flows.
- Another case for governmental intervention is the importance of LMI at the macro level. To this point we have focused on the use of LMI at the micro level, which is certainly of primary concern. However, there are many labour market measures that have major impacts on national policy decisions, allocation of funding, legislative acts, government

interventions in marketplace, and immigration policy and operation, etc. The government has a vested interest in developing and producing such information and is unlikely to depend upon incomplete, nonstandardized information from other public and proprietary sources.

- A report from the Office for National Statistics, United Kingdom (2002) reinforces the case for government intervention: "[t]he area of labour market policy has become increasingly involved. Labour market statistics underlie a raft of different needs, including macroeconomic policy, employment and welfare policies and employment relations policies. And there is a subnational dimension too, not least in relation to the statistical needs of the devolved administrations." The report emphasizes that reliable LMI must address a fitness for purpose, that requires information to meet standards of:
    - Accessibility and timeliness.
    - Accuracy and precision.
    - Coherence—consistency—linking across agencies; agreement on terms and measures.
    - Comparability (over time and areas).
    - Relevance.

These criteria, when viewed from a nationwide system, require significant investment in surveys, collection and use of administrative data, and capability to use new methods such as data mining to collect information nationally and at different geographical levels.

Goldfarb and Adams (1993) provide an excellent summary of the case:

> No industrialized economy, however, depends solely on private markets for LMI. It is costly to produce information on labour demand and supply in markets that are widely separated by geography and skill. Market failures arise due to the public good nature of much of this information. Once produced, it can be difficult to maintain proprietary rights to its use, which discourages its very production. Lack of consistency in concepts and definitions used and methods of collection by private producers can impede comparability of data. Inequities may arise from rationing access to LMI to those with the ability to pay.

The need for and importance of government intervention has been well established, but each of the points that justify government intervention has significant implications for the design and operation of an LMI system. They are suggestive of some of the types of data to be included in the system; the argument for equal access must take on an important role in the design of any dissemination system; and the criteria of equal access and optimizing the use of information

builds the case for the need for intermediaries that can help individuals more effectively use LMI. Wide dissemination of the information, which the Internet can facilitate, also suggests that partnerships among agencies and proprietary concerns to deliver information should be considered, since a single governmental agency may not be in the best position to serve or even effectively reach all audiences. In the next chapter, we develop further background for an optimal LMI system by examining some of the primary participants in the labour market and how labour market information may assist in the labour market planning and decision making.

3 USERS AND USES OF LABOUR MARKET INFORMATION

Users and Uses of Labour Market Information: Summary

Labour market information needs are largely demand driven. This chapter explores the implications for an optimal LMI system including:

- User requirements are important in defining most features of an LMI system.
- The role and information needs of intermediaries are crucial in defining an optimal LMI system since intermediaries assist individuals, businesses, schools, and others in the use and interpretation of LMI.
- Among the users and needs considered in the chapter are:
  - Government officials who make major policy, program design and operation, and funding decisions—LMI is a crucial input to informed decisions at the national, province, and local levels.
  - Individuals can make better decisions for both short- and longer-term labour market transitions, planning, and preparation.
  - An optimal LMI system ideally should help individuals manage their career planning and development over their lifetimes.
  - Frontline staff working with individuals and businesses require a wide range of LMI and need to work with clients in many different contexts. The chapter includes an example of a system designed to support frontline staff, the Frontline Decision Support System (FDSS).
  - Counselors and career facilitators are indispensable in the delivery, use, and interpretation of LMI through their work with customers.
  - LMI must support the needs of business establishments for recruiting, improved work processes and services, expansion and location planning, and employee skill development.
  - Education and training institutions require LMI to determine program offerings, curriculum design, and career services to students, in addition to other needs.

In our view, an optimal LMI system is demand driven, that is, it is driven by the wide range of possible user needs. An optimal system is designed to support effective decision making by participants in the labour market despite financial constraints due to a lack of public funding to support LMI. There are a large number of different players in the labour market

presenting a diverse set of needs. User requirements should play a key role in defining many of the features and elements of an LMI system. In this chapter we briefly review some of the key LMI customer communities and how labour market information may address their labour market related requirements. One important note, it is crucial that any LMI system take into account the needs of intermediaries and consider the role of intermediaries as part of the overall design of the system, regardless of the environment of these intermediary services, e.g., in public employment offices, private employment services, counseling services in educational and training institutions, economic development planning, human resource specialists and consultants, etc. While the Internet has dramatically increased our ability to organize and provide information to customers, for many individuals at some point of their career planning or job search experiences they will need assistance from counsellors and career facilitators. The LMI system products and tools must not only take into account how to best provide information to intermediaries but recognize that such persons and the services they provide are fundamental to an optimal LMI system.

The table below provides examples of LMI customers and some of their basic needs that can be supported by LMI, followed by a discussion of the needs of a wider range of consumers. As noted, the preceding table provides only a very small sample of LMI users. Basically, LMI may potentially serve all members of society over their lifetimes, particularly as they are engaged in the labour market. We will focus on the following customer groups and provide brief descriptions of some of their LMI requirements.

Examples of Selected Customers and Some of Their Information Needs

User group	Activities/decisions supported by LMI	Examples of LMI responsive to needs
Individuals		
Workers	Upgrade skills to advance in current employment Seeking employment in other fields or firms.	Skill requirements, occupational projections, job openings, staffing patterns, information on education and training programs
Students and other planning or preparing for careers	Identify growth occupations and skill needs. Identify what education or training is required for different occupational fields What is the long-term outlook? Potential for advancement and earnings prospects.	Occupational projections; wage information, distribution of occupations within and across industry sectors, detailed occupational characteristics including skills information; links between education programs and occupations.
Intermediaries including Employment specialists, counsellors, teachers, human resource specialists	Job openings, training requirements, assessment tools	Job openings information, detailed occupational characteristics; decisions support and career information systems, wage information, projections, unemployment and labour force statistics
Government officials	Policy and legislation formulation, funding decisions, program design, measuring economic environment	Unemployment and labour force statistics, industry employment over time, occupational estimates and projections, supply data, etc.
Business	Upgrading skills of workers, recruitment, relocation decisions, business expansion	Education and training programs linked to occupations and skills data Resume services and job postings Area industry mix Unemployment and Labour Force data Potential supply

- Government officials including
    - National, regional, and local executive department staff
    - Legislators
    - Human resource and workforce development policy and program planners
    - National, regional and local human resource agency development staff
    - Economic development planners
- Individuals engaged in labour market transitions including
    - Work transition
    - Workers upgrading skills
    - Career planning and preparation

    - Relocation (immigrants and migrants)
- Intermediaries including
    - Employment and workforce specialists working with persons in labour market transition (frontline staff)
    - Career counsellors and practitioners
    - Teaching and career education
    - Parents
    - Social services
    - Community-based and other private or public service organization staff
- Business establishments and organizations
- Education and training system and institutions
- Researchers and evaluators

There are other users of LMI, and the types listed above may be broken down into more specific subsets of customers, but these categories of users define most of the key actors in the labour market. The extent to which labour market information can support a more efficient labour market will rest in no small part with the degree to which it can meet some of the more important labour market–related decision-making needs of these users. Below, we briefly discuss each type of user and look at some of their key needs and the types of information that may address the decisions they make.

Government officials. Labour market information plays a major role in some of the more important decisions made in the economy. For example, at the broadest level, data on unemployment rates may lead to policy or program changes, since these data are one of the major signals of the health of the economy. Unemployment rates and employment growth may trigger changes in tax rates and structures, investment decisions, and fiscal or monetary policy. But many other labour market measures are key to governmental decisions

Executive Department leaders and legislators make funding decisions on various labour market intervention strategies, new or revised laws, regulations, and policies regarding government interventions in human resource development and employment transition and preparation. Changes in overall unemployment, employment trends, and more detailed

information on demographic and income characteristics of the labour force, those out of the labour force, the employed, and the unemployed may justify increases or decreases in human resource development budgets.

Ministries responsible for human resource, education, social, and skill development may use LMI to propose new programs or changes to existing programs that support and enhance human resource development to meet changing business requirements. For example, as the industry and occupation mix of employment changes, the skill, ability, and knowledge requirements demanded by employers also change. This information can lead to new program strategies and designs. Examination of labour force participation rates may help planners identify focused programs to reach out to populations with lower participation rates—this is critical not only to improve the prospects of these individuals, but it directly supports business needs and enables the overall economy to continue to grow. Similarly, information on what occupations are difficult to fill may serve as input for immigration policy and strategies. Agency staff responsible for implementation of programs may use the information to market services to different populations in Provinces or local communities, based on local labour market conditions, characteristics, and trends that may be different from the national picture. Local information on the labour market such as occupational and industry employment estimates, unemployment rates, wage information, etc. are important for effective program implementation locally.

Similarly, economic development planners depend on labour market information, among other types of information, to assist employers in economic development within a community or in relocation. Economic development depends on quality LMI on the occupational composition of industries, the industry mix of an area, the product and service relationships among different industries, and other key labour market measures. In short such information is crucial to understanding the demand requirements of business, the supply available in an area, and the capability of education and training institutions to support economic development by offering training to meet changing skill needs.

Individuals engaged in labour market transitions. This covers several groups of LMI users including those seeking immediate work and others planning investments in education and training for career development. Our focus will be on 1) work transition/job seekers, 2) upgrading skills, 3) career planning and preparation, and 4) relocation decisions. Many of the same types of information and career facilitation services are useful to individuals within any of these categories. Indeed, LMI must address the needs of individuals as life-long learners, since nearly everyone during their careers will make multiple decisions over time relating to enhancement of skills for advancement, job change, etc. The level of detail and way in which the information is used may vary. For example, a beginning high school student just starting her career exploration may benefit from fairly broad-based information on the occupations and learning about the educational requirements and universities and training institutions that may prepare an individual for particular fields of work. On the other hand, a working person may return to school to upgrade skills or transition to another job—this requires more detailed information and tools that allow the individual to compare their current skill set to the skill set he or she is interested in obtaining or upgrading.

Ideally an optimal LMI system would offer or encourage individuals to build their career and work planning skills and provide career counselling and facilitation personnel and other services so that they can effectively manage their career planning and preparation over a lifetime. An optimal LMI system should foster a career management approach by individuals through the design of products that facilitate career management and provide tools that help individuals and intermediaries to learn how to apply information their career management needs.

Work transition is an important aspect of the market supported by quality LMI. The HRDC report *Labour Market Information 2003 Users National Survey* (2003) provides a useful definition of work transition to include individuals who are

- moving from unemployment/home to work,
- changing occupation or field of work,
- seeking job advancement, and/or
- transitioning from school to work

To a degree all of these users require similar information because of the immediate or near-term interest in job search or skill enhancing investment. This is the immediate labour exchange function of the marketplace in which businesses and potential workers seek one another. Common LMI needs for most users include job openings and announcements, job requirements, wages, terms of employment, skills, knowledge, and ability requirements; and for those who are changing occupations or building new skills, information on available training and education programs. The LMI system plays a role through government-supported job banks in public places like workforce development offices, public libraries, and school counseling services. The information is also typically available 24/7 through the Internet.

The specific types of LMI used may vary depending on the circumstances of the labour market participants. For example, a person who is unemployed because of a plant shutdown in a declining industry might benefit from information that identifies other industries that employ people in the same occupation or occupations requiring similar skills. Also, LMI may identify opportunities in related occupational areas with or without additional training. To address this need, an LMI system must provide capabilities for workers to match their existing skill sets to those of another occupational field to identify what additional training, if any, may be necessary or beneficial for their transitions. If additional training is needed, then information on training programs and locations will help the individual prepare for the transition. To answer such a need, either the individual or intermediary must have information on occupational staffing patterns, the distribution occupations across industries, occupational and industry projections, and information on the skill requirements of occupations. This information needs to be organized in such a way that the user can easily navigate through a linked set of information summarizing raw and analytically enhanced LMI data.

Similarly, individuals looking to advance within an occupational field or upgrade their skills, or who are considering a move to another field of work or transitioning from school to work, will benefit not only from immediate job openings information but also by having access to occupational characteristics including essential/core skills, specific skills, knowledge, and

ability requirements, short- and long-term employment outlook, and education and training requirements. This information may help individuals to focus their choices on realistic opportunities and/or identify how to prepare for such transitions. For immediate job transition, the same information can be invaluable in writing resumes, preparing for job interviews, and even in evaluating job postings.

When applying for services at public workforce development centers, job seekers normally register by providing significant amounts of personal and labour market experience background information. If the application includes a claim for unemployment compensation, the jobseeker can supply additional information that can be linked to LMI to better serve the individual. A pilot test was undertaken to return to job seekers useful guidance based on the labour market experience of other recent registrants in Georgia Career Centers (Eberts and O'Leary 2002). A text box on the next page summarizes the methodology called the Frontline Decision Support System (FDSS).

Career planning and preparation. Nearly all of the various data sets included in an LMI system are relevant to supporting career planning and preparation. These include information about occupational characteristics including skill requirements, work activities, knowledge, abilities, software skill requirements, tools and equipment requirements, the outlook for job growth, and likely earnings. Information about education and training programs that prepare individuals for the required skills and the institutions that offer such instruction are necessary to support effective career planning. Information that helps individuals understand how the economy is changing, including knowledge about growing and declining industries, can help individuals plan for careers with good long-term prospects.

Long-term career planning serves at least three important functions that may facilitate an individual's future success in the marketplace: 1) it may help an individual select a career path and the appropriate education path to prepare for that field of work; 2) it may help some individuals better understand the relationships between education and training and the workplace; and 3) if introduced in the educational system through counsellors, career

A Frontline Decision Support System for Georgia Career Centers

The Workforce Investment Act (WIA) of 1998 emphasized the integration and coordination of employment services. Central to achieving this aim was the federal requirement that local areas receiving WIA funds establish one-stop centers where providers of various employment services within a local labour market are assembled in one location. A major challenge facing staff in these centers is the large volume of customers resulting from relaxed program eligibility rules. Nonetheless, resources for assessment and counseling are limited.

To help frontline staff in one-stop centers quickly assess customer needs and properly target services, the U.S. Department of Labor funded development of a Frontline Decision Support System (FDSS). The FDSS was pilot tested in Georgia Career Centers during the spring of 2002.

FDSS is comprised of two main parts: 1) the systematic job search module, and 2) the service referral module. The systematic job search module is a means to undertake a structured search of vacancy listings. The module provides frontline staff a summary of job seeker characteristics, and based on this information FDSS also gives guidance about prospects for returning to a job like the prior one; an assessment of likely reemployment earnings; a list of occupations related to the prior one with related wage and job demand information about these occupations; and screening for job vacancy listings by region, occupation, and earnings requirements. The service referral module identifies the sequence of activities that most often leads to successful employment for clients with similar background characteristics.

For additional information about FDSS see Randall W. Eberts and Christopher J. O'Leary 2002. "A Frontline Decision Support System for Georgia Career Centers" Kalamazoo, MI: W.E. Upjohn Institute Working Paper 02-84 (July). http://www.upjohn.org/publications/wp/02-84.pdf

practitioners, and teachers, it may help individuals build lifelong career development skills that will benefit them as they navigate through the dynamic marketplace.

A key aspect of information for career planning is that it be presented in the context of a career planning process with "seamless" linkages between various data that allow the individual to easily navigate the system. Fortunately, career information delivery systems (CIDS) may be the most developed LMI delivery systems available. These systems, established and refined over

the last 30 years, many through private-public partnerships, help to integrate both theory and data into a career planning process. There are several public and proprietary CIDS in the market, including Bridges (over 14,500 schools and institutions are licensed to use Bridges in Canada and the United States, according to the company Web site), COIN, InfoCareers, and ACT Discover. Well-developed career information standards have been prepared by the Association for Computer-Based Systems of Career Information (ACSCI), and encouraging and fostering the use of fully developed CIDS that meet these standards may be beneficial in the long run in smoothing flows in the labour market through a population that becomes well versed in career education and planning.

Relocation decisions benefit from quality labour market information on job opportunities, along with other economic measures such as cost of living, and housing availability and affordability, can be invaluable for relocation decisions, both for migrants within a country and potential immigrants from other countries who may fill unmet labour demands. Information on prospective employment growth, unemployment information, as well as specific occupational openings information and detailed occupational characteristics data, may help individuals make decisions about whether or not to relocate. Information on education and training resources that may help them expand or enhance their skill sets may also be of value before they make such a major decision.

Intermediaries. There are many intermediaries who assist individuals and businesses in labour market related planning, decisions, and transitions. We focus on six broad groups of intermediaries, each of which is briefly considered below.

1) **Employment and workforce specialists.** These are frontline staff working in employment, workforce, or human development offices, directly serving the public. They need information to recruit businesses, help link job seekers and business, identify training needs of clients, offer counseling services, provide work related assessments to help individuals locate work opportunities and training relevant to their background and interests, and support area economic development and employment needs. Frontline personnel require information on immediate job openings, detailed occupational characteristics, assessment instruments, information on past and projected industry and occupational trends, etc. One potential area for future work that might be considered is the

development of information support systems that organize information for frontline staff through integrated processes. The pilot work done by the Upjohn Institute on Frontline Decision Support (FDSS) (Eberts and O'Leary 2002) supported job seeker counselling. Similar decision support systems based on LMI could be developed to produce customized reports and information for other agents in the labour market, including employers, educational institutions, and workforce development agencies.

2) **Career counsellors and practitioners.** These professionals may operate in many different environments, including public and private organizations offering employment and human resource development services, schools, business establishments, and community-based organizations. The importance of counsellors cannot be overestimated. Even with the most sophisticated information systems, many users will need or benefit from staff-assisted services. Counsellors benefit from easy access to well-organized and effectively presented LMI because they may be able to serve more individuals by helping them to learn how to use information and manage their careers. One area of significant potential, one in which Canada is a leader, is the introduction of career development in schools through the use of CIDS and career education instruction by counsellors and integrated into the classroom.

3) **Teachers.** Teachers are, of course, direct participants in the labour market in the sense that they prepare individuals for core and specific skills they may need for gainful employment. In the context of this paper, we look at teachers as potential intermediaries in the delivery and use of labour market information. Introducing career development concepts in the classroom and demonstrating relationships between what is being learned in the classroom and the world of work and the student's future ability to succeed in the marketplace can help individuals throughout their working lives as they transition and progress through a series of employment opportunities.

4) **Parents.** Parents serve as a major influence on many youth, yet it is likely that many parents, in spite of their work experience, know little about the marketplace and future opportunities. Designing simple LMI products that may help parents better understand labour market operations and trends may help some parents work with their children and the school system in planning and preparing for careers. It is not likely that an LMI system can reach out and impact on all or even most parents, but an effective career education process as part of an LMI system may touch some parents with relatively little additional cost.

5) **Social services.** Many clients of employment and workforce development offices will require social services such as child care, health care, transportation, etc. While most social service front-line staff need not be experts in LMI, understanding the basic structure of the marketplace, the types of businesses and occupations, and the employment outlook may help them as they work to provide a package of support services to job seekers and persons in the human resource development system.

6) **Community-based and other private or public service organization staff.** Many people may be more comfortable working with community, faith-based, and other local organizations rather than with staff in governmental offices. Such local organizations provide many important functions, including

- access to the Internet and other computer-based LMI delivery systems,
- some level of staff assistance through career practitioners, and
- encouragement to seek further assistance through available government services.

Community-based organizations may have well-established connections with employers and educational institutions, but not all may be well versed in the workings of the labour market. Outreach by the LMI system to educate such organizations in the availability, access, and use of information may have a significant multiplier effect in reaching more individuals that need labour market–related assistance.

Business establishments and organizations. Businesses make major decisions about recruitment and hiring, work processes, products and services to be provided, location, expansion, wages and compensation, and training and upgrading of employee skills. For example, an employer looking to expand its business may be interested in existing supply, future supply, and the capability of the education and training system to prepare individuals for some of the skills needed for new positions. Employers may want multiple ways to recruit individuals, so the availability of a public job bank with organized posting structures and resume services may complement other recruitment approaches. A business considering location in an area will require a wealth of information on the existing and projected labour market, employment, and unemployment trends.

Education and training system and institutions. Ideally LMI should play a major role in the education and training system in several respects including

- program offerings,
- curriculum, and
- access to career information and career education.

Career, vocational, technical, professional schools, and higher education programs designed to prepare individuals for employment, such as engineering programs, should be driven

in part by the current and future skill needs of the marketplace. Labour market information on the changing occupational and industry mix, when linked to core/essential skills, literacy, numeracy, specific technical skills required in a field of work, can help training institutions to change the mix of program offerings to reflect market needs. This is a difficult process because of fixed costs in equipment, facilities, instructors, etc., so changes may be incremental and gradual. It is important, however, that training reflect market needs for the labour market to flow smoothly and for areas and nations to remain competitive in the global marketplace. Detailed information on skills should serve as important input to curriculum design, helping to establish the educational competencies, subject matter, and outcomes for a specific course. Finally, education and training institutions can serve as the primary mechanism to educate the youth population in career planning and preparation and in skills that will help them navigate the labour market in the future.

Researchers and evaluators. These are prime users of LMI. For example, studies evaluating the effectiveness of employment programs must control for labour market conditions using LMI data to yield estimates that can be compared across time periods and geographic regions. Studies about how the labour market is operating, how well specific employment programs are working, and evaluations of alternatives to existing interventions all require LMI data. The results of such research may serve as input to government officials, including legislators and executive staff engaged in policy design, program refinement, budget allocation, and program management. Researchers may not need tailored LMI delivery systems, but they do require easy access to the full range of LMI.

As noted, there are other users and applications that can benefit from LMI. However, the key constituencies help define the needs that must be met by an optimal LMI system, within the constraints of financing, statistical reliability, and personal privacy. The next chapters take up a discussion of some key features of an optimal LMI system including data sets and dissemination strategies.

4 FEATURES OF AN OPTIMAL LMI SYSTEM

Features of an Optimal LMI System: Summary

No single set of data requirements or delivery approaches characterizes an optimal LMI system. However, as summarized in this chapter, there are key features that should be considered in designing and implementing an optimal LMI system. These include:

- Translating quantitative labour demand and supply information into easily used qualitative labour market guidance.
- Seven fundamental features of an optimal LMI system:
  1) governance and cost-effectiveness;
  2) timely, accurate and relevant data;
  3) analysis and interpretation of data;
  4) labour market analysts;
  5) information must be easily accessible to users through a variety of outlets;
  6) intermediaries; and
  7) education and guides for effectively using LMI.
- The importance of effective governance cannot be overstated—many different public and private organizations are likely to be involved formally and informally in developing and delivering LMI. Governance is instrumental to a systematic approach to LMI and must be a fundamental strategy and not an afterthought.
- Data sets included in the system must be considered against several dimensions, most significantly: time period, geographical detail, measurement criteria and methods, classification of data, timeliness, accuracy, interrelationships of data sets, and establishment of data standards. Multiple data development approaches need to be considered in an optimal system, including the use of informal data. Each factor is discussed in the chapter.
- Human expertise in LMI is often overlooked. Informed labour market analysts are the lynchpin of an optimal system and are important in developing LMI, interpreting and analyzing information, providing qualitative information and serving as intelligence "agents," providing user support.
- Flexible, easily accessible delivery systems should focus not on the number of products but on how an integrated set of LMI products and services can most effectively be offered to users.
- An optimal LMI system can help intermediaries to better serve more individuals by providing tailored, easily useable products and services for counselors and other intermediaries.
- Use of LMI should be part of a life long learning process, particularly as individuals, businesses, and schools operate in a dynamic global economy. It is important for consumers to build their knowledge and skills in how to use LMI to help more effectively participate in the labour market.

There are core elements in an optimal LMI system. Canada has a world-class LMI system, and nearly all of the features covered in this chapter are present in the Canadian system. However, at the margin there may be differences of degree in the detail of data, the ease of access, the level of analytical information, user support, and other aspects that may suggest future enhancements to the Canadian system. Examining the key features of an optimal LMI system may help identify where changes may be useful and to prioritize future efforts to enhance the LMI system within budget constraints.

An optimal LMI system relates quantitative labour demand and supply and presents qualitative analyses of supply/demand (Frugoli 1983) and other labour market relationships and trends. In addition, an optimal system must provide for easy access to the information and provide support in using the information, to the extent possible. The Center for Study of Living Standards in their report prepared for Industry Canada (2005, first draft) identified four important factors of an optimal LMI system: 1) wide accessibility; 2) timely, accurate, and relevant data; 3) flexible delivery models, and 4) cost-effectiveness. We expand upon those essential components and identify the following basic features of an optimal LMI system:

- effective governance and cost-effectiveness;
- elements and features of the LMI database—timely, accurate, and relevant data;
- interpretation and analysis of data;
- informed labour market analysts;
- flexible and easily accessible delivery systems and dissemination of the information;
- availability of intermediaries to assist users.; and
- education for users in appropriate and effective acquisition and application of the information.

This chapter considers each of these core features of an LMI, system and the two subsequent chapters cover the data elements and information dissemination in greater detail.

Effective Governance and Cost Effectiveness

While effective governance is important to any large-scale governmental activity, it is particularly crucial for a nationwide labour market information system. This paper does not cover governance in great detail since Canada has undertaken several studies related to governance of the LMI system and established the Forum of Labour Market Ministers (FLMM) LMI Working Group to facilitate interdepartmental cooperation and coordination of LMI. However, because governance and management is so critical to an optimal LMI system, a few notes and comments are in order that address some of the complexities of effective governance.

Labor market information derives from a number of different sources, including surveys, administrative data, and private sector sources. As is the case in Canada, LMI is often developed and used by many different governmental agencies, and responsibilities may be decentralized among national, province, and local areas. To provide useful information and convenient access to citizens, business, education, and policymakers, many different public and proprietary parties often handle the dissemination of LMI.

A decentralized and shared approach to a nationwide LMI system can be a very effective means of building an optimal LMI system; indeed, it may be a necessary reality given the complexity of the labour market. However, this very aspect argues for a shared approach to governance for many reasons. A systematic approach to a nationwide LMI system should be a fundamental strategy rather than an afterthought to:

- Conceptualize and plan a "complete" LMI system with shared responsibilities and funding—ministries and agencies working together can develop a more comprehensive approach to LMI than each department going on its own. Also, a joint effort may help the ministries justify an overall budget request for LMI-related efforts.
- Standardization—consistency and standardization of data elements, classification systems, and methodologies is necessary to provide comparable information among different geographies.
- Minimize duplication—without a proactive partnership, there is great potential for duplication of effort in development, analysis, and dissemination of information. Not only is this cost-ineffective, it can lead to confusion among users of information.

- Provide optimal coverage—the converse of duplication; a joint effort in planning an LMI system can help develop a comprehensive framework for an LMI system and set priorities for those features that can be funded and developed.
- Effectively use limited resources and funding for LMI—this follows from the above factors; minimizing duplicative efforts and optimizing the range of the system by directly involving interested ministries can lead to more effective use of funds and help in justifying funding for LMI.
- Promote the importance of LMI to:
    - Governmental policy makers and how to effectively use LMI in policy and program design and, through its use in policy and operational capacities, make the case to parliament and the administration for appropriate funding of the LMI system.
    - The public, businesses, education, and intermediaries as a resource for more effective job, education, workplace, and economic development planning and decisions making.
- Effectively disseminate information to all citizens, businesses, education, governmental officials and other users. This is the level at which users may be overwhelmed or unable to easily navigate through LMI resources if each ministry "goes it alone." Thinking through dissemination in a decentralized system allows for flexibility and innovation across agencies and provinces, while at the same time providing a means for individuals to easily move within or across different sites.
- Efficiently use intermediaries, including labour market analysts, counsellors, career facilitators to support customers' use of labour market information. Many users will require some degree of support from counsellors and career facilitators. A coordinated approach to the LMI system will assist such intermediaries to better use resources in supporting their customer needs.

The FLMM vision statement on LMI clearly recognizes the importance of a coordinated and cooperative system: "*Federal, provincial and territorial governments will work together to create a more coherent, relevant individualized, accessible and coordinated approach to the development and delivery of LMI at the local, provincial/territorial and national levels*" <http://www.flmm-lmi.org/english/vision.asp>. Implementation of this principle is difficult. The Canadian and U.S. approaches are similar in this regard. Canada operates through the FLMM, while parallel action in the United States takes place through the Workforce Information Council. Such forums and councils can be of great value in coordinating LMI efforts—but it is important that they are proactive and have some responsibility and authority to guide future efforts.

Ideally even in a decentralized system, a single LMI budget would be desirable. The authors recognize that this is difficult and may not be possible given existing government budget limitations. However, without adequate coordination of shared responsibilities, some information gaps exist, and duplication of effort is likely to occur. Even if a single unified LMI budget cannot be presented, it is important that a budget be coordinated among federal agencies and departments to set priorities for system features and to justify budget requests to support essential system elements. Such an approach will also minimize duplication of effort and support more comprehensive coverage of the LMI system with respect to data components, features, and access for customers.

Data Features of an Optimal LMI System

The data sets included in the LMI system are the heart of the system. They define the types of and degree to which labour market–related planning, questions, and issues can potentially be addressed. While adequate data alone are not sufficient to ensure an optimal LMI system, they are necessary for an optimal system. The data contents of the system define both the breadth and constraints of issues and information that can be analyzed and delivered to various customer communities. There are a number of significant issues and features common to nearly all of the data that comprise the heart of an LMI system. These are considered below. The next chapter will enumerate the specific data elements that form the nucleus of an optimal LMI system.

The most critical issues that must be considered in collecting and compiling labour market data are

- time period coverage,
- geographical coverage and detail,
- measurement criteria and methods,
- classification of data, and
- other data-related issues, in addition to the above primary factors that relate to every data element in the LMI system there are additional considerations, including
    - timeliness;

- accuracy;
- crosswalks/link: (the system must include tools to link or crosswalk data from different sources);
- establishment of data standards; and
- the employment of multiple data development approaches in building LMI data bases, including the use of qualitative data.

Each of these factors is discussed in brief below. The important point in each case is that in building an optimal LMI system it is important that these issues must be considered for each and every data element in the system, or in some instances across data sets. It is not possible to have perfect information for many reasons, not the least of which is the cost of collecting and compiling data, so in determining the appropriate and feasible level for which a measure can be developed, each of these factors must come into play.

Time period. The time period will vary among data reflecting different spans of time. For example, national employment estimates by industry may be available by month or year, as they are in Canada. Some data may be available by week; for example, in the United States the number of initial unemployment claims. Other data may be available on a quarterly basis or even on a daily basis (such as job openings). Estimates or projections may reflect different periods of time, such as 5- or 10-year occupational projections. It is important that an LMI system consider what time period is appropriate for the various data sets, what time periods will meet user needs, the costs of developing the information, and the collection and statistical methods employed to collect the data. For any number of reasons it will not be realistic to meet all of the user demands; users may demand real-time information or annual projections of occupational needs that is not possible. Thus, determining both an appropriate and feasible time-period coverage becomes a balancing act between availability of funds and identifying what span of time can best be measured and used.

Geographical coverage and detail. Another key consideration for each data element is the geographical level for which the estimates or characteristics are developed, i.e., for the nation, province, or subprovince, including major metropolitan areas or other jurisdictions. For example, in the United State, unemployment rates are developed for the nation, each state, every

county, and most metropolitan areas, cities, and larger towns. It may not be possible or even desirable to break out data for smaller areas. Costs, confidentiality issues, and collection methods must be taken into account. However, it is important to consider what geographical level of analysis is desirable for a particular data item in building or adjusting an LMI system. National occupational estimates and projections are valuable for national policy and measurement of trends over time, but are not sufficient for use at a province or major metropolitan area level. On the other hand, information regarding knowledge, skill, and abilities associated with each occupation (for example in NOC) may not need to be developed below the national level.

Measurement criteria and methods. Determining what are the appropriate measures for supply and demand related data, the level of detail, and the methods for developing measures is one of the more complex issues facing policy makers in building an optimal LMI system to meet a country's labour market needs. Most of the key data elements have been identified over time and are considered in the next chapter. However, how to best develop estimates, how to use a mix of quantitative and qualitative information, and what level of detail for a measurement is appropriate are key considerations in developing or "tweaking" an LMI system. For example, are employment estimates best developed through administrative data, a survey of business establishments, through household surveys, or some combination of these methods. Are two sets of estimates better than one for different applications?

Such issues are not trivial; they are fundamental and complex and can have significant ramifications on measurement of the health of the economy or use by business, job seekers, students, and others. In the United States during the period 2001–2004, determining the "best" measure of employment rose to the level of national policy and debate when for a period of time employment estimates from the Current Population Survey (a household survey) appeared to show greater employment growth than the estimates from the Current Employment Survey (CES), which typically is used to measure employment trends. The debate on the best method transcended technical issues and rose to national political debate with the Secretary of Treasury arguing that the household survey was a better method, and the Commissioner of the BLS

strongly advocating the use of the CES as the appropriate measure for overall employment growth. While the existence of two different measures caused considerable discussion, the two sets also provide different types of information. The CES sample design arguably provides a better overall measure of employment change, but the CPS estimates provide employment estimates with demographic detail not available from the CPS. This situation is analogous to Canada's LFS and SEPH programs. The key point of this example is that determining how to best measure a particular aspect of the labour market is one of the most important decisions to be made and must be considered for each data set in the LMI system.

Another key measurement consideration is the level of detail of the data. Questions arise such as, what level of industry employment estimates are needed? The types of applications and questions to be addressed are important considerations in deciding the detail, but other factors come into play. For instance, the level of detail also may vary at different geographical levels because of cost, methodological reasons, or confidentiality concerns. Other issues under measurement deal with the definition of the phenomenon to be measured. For example, to track activity in the education and training components of labour supply, should we separately measure program applicants, entrants, and completers?

Classification of Data. The grouping or classification of data is a fundamental feature of any LMI system. In most developed LMI systems there are classification systems for industries, occupations, and education programs.

In Canada, classification systems for each of these are well developed. Canada, the United States, and Mexico categorize industries using the North American Industry Classification (NAICS). The National Occupational Classification (NOC) system defines and organizes occupations and provides valuable information on the main duties and employment requirements. Education programs are organized by the Classification of Instructional Programs (CIP) Canada 2000. An important characteristic of such classification systems is a hierarchical structure that allows for various aggregations of any data collected or disseminated using the classification structure. It may be possible to develop detailed industry employment estimates at

a national level, but depending on the size of subnational areas such as provinces or large metropolitan areas, data may need to be aggregated to provide accurate and reliable information. A hierarchical classification system allows for such aggregation, as needed.

Classification systems provide a meaningful way to organize data collection programs, develop measures and estimates, and disseminate information to customers. In building an optimal system, it may be useful to consider whether any other groupings or classification systems are useful in addition to the three primary items noted above. In today's dynamic and global economy, there is much discussion of developing information on specific skill or knowledge requirements and not limiting analysis to existing occupational categories; indeed, some economists have argued that occupational categories are not as useful as in the past, and we need to look at flexible bundles of skills, knowledge, abilities, etc. Canada has gone beyond traditional classification to get a better grasp on skill requirements by identifying nine essential skills, which in turn are used in preparing occupational profiles. While the essential skills are related to occupations, they also serve as a means for organizing information by essential skill requirements, providing a flexible and dynamic way of taking a different look at the market needs.

Other data-related issues. There are several other data-related factors to consider in an optimal LMI system, each of which is discussed below.

- **Timeliness**. The timeliness of the data is an ongoing concern since, not unexpectedly, users typically demand "real-time" data, or policy makers may criticize the data as not being current. Each data element in the system should be examined in terms of what is timely and realistic for a particular information item. To measure the health of the economy, it may be very important that monthly employment estimates be available within a few days of the time period that is measured. On the other hand, long-range occupational projections might be revised every two to four years—one should not expect projections to be revised annually or monthly. This is an extreme example to make the point, which is that timeliness relates very much to the type and use of a measure. In many instances, it may be important to educate the users of the information on why data may or may not need to be "real-time."
- **Accuracy.** While accuracy seems obvious, what constitutes accuracy or the need for accuracy can vary significantly among data items. Measuring unemployment rates may

require a greater degree of statistical accuracy than measuring occupational employment. Unemployment rates not only measure market behavior, they have a significant impact on the overall economy—consumer confidence, money market investment decisions, or public funding levels may change or be made based on unemployment rates. Occupational estimates are important for career planning and curriculum development, but probably do not require the same degree of accuracy as unemployment estimates; it would be cost prohibitive to try to develop the same level of accuracy. Similarly, occupational estimates are likely to be more accurate than the estimate of any specific skill requirement. It may well suffice to know that a certain set of skills may be associated with different occupations without knowing how many jobs in that occupational field actually require the skill.

- **Crosswalks/links.** Crosswalks among various data elements are important to the analysis and dissemination of useful information. For example, any LMI system should allow a user to examine information about a particular industry (classified by the NAICS), to analyze information about an occupation (NOC) within that industry, and then to see which programs (CIP Canada 2000) might train for the skills associated with that occupation. An optimal system must include relationships among these various data sets and maintain such crosswalks and links as classification systems are revised.
- **Data standards.** Any system should have data standards, particularly for core measures in the system including industry and occupational estimates and projections. Statistical standards should be developed and followed for any survey-based information included in the system. However, other types of standards need to be considered in an optimal system. For example, consistency in the way supply estimates are developed may require a standard definition of what constitutes supply. This is not a statistical standard, but it is equally important to ensure that the measure always represents the same population. The system should be consistent in the sources of information used; for example, if there are two different sets of employment estimates, the system should consistently use the same set to measure employment change over time.
- **Multiple data development approaches including qualitative data.** While data standards are important, any LMI system must use multiple methods for developing and compiling data in the system. Typically, LMI is developed using survey and administrative data, and such approaches are likely to continue for many core measures. However, qualitative information developed by analysts may play an important role both in the formal and "informal" data included in the system. As an example, local analysts may be able to provide more real-time information on market changes in a local area than the formal data sets. If new businesses plan to move into an area the analyst may be able to develop informal information on the likely occupational and skill needs that will be required. These data may not formally be included in the data base but may help economic development specialists, educators, and others work with the businesses to locate and develop labour supply to meet the businesses needs. Such information might also be included in the formal system in various analyses and narrative presentations without necessarily revising the core estimates that may need to adhere to certain data standards.

Of growing interest is the potential of data mining as a means to complement traditional methods for developing LMI. One possible use of data mining is to extract data from job banks on the skill requirements, such as from Service Canada's Job Bank. Ideally, partnerships with proprietary job banks would allow data mining covering a larger share of openings across the marketplace that might help identify changing skill requirements months or even years before they are recognized using traditional data collection techniques.

Interpretation and Analysis of the Data for Various Customer Needs

An important feature of any LMI system is quality, reliable analysis of the information. The analysis can take on many forms depending on the particular application or there may be generic analyses of trends and comparisons. Examples of types of analyses include the following:

- Narrative analyses of trends over time. A typical analysis describes changes over time, not only what the changes are but what the causes and implication may be. For example, describing the change in industry composition of an economy could focus on the changing shares of employment each industry has, how quickly such changes have occurred and what is expected to happen in the future, what factors are causing the shifts in the industry mix, and what the supply/demand implications are. While presentation of data in tables is of course invaluable for many users, the data alone do not necessarily describe the existing phenomenon that requires analysis of several different data sets and an understanding of the interrelationships. Clearly most users are not in a position nor equipped to undertake such analyses. Data products must provide such analyses and intelligence to meet user needs.
- Narrative comparisons between geographies, industries, occupations. Comparative analysis is a typical form of converting data to intelligence. Such comparisons can be made across many different dimensions. For example, comparing the industry mix in a subnational region to the nation can provide telling information for future policy, business, or job search. But as noted above, analysis does not simply describe the difference but would suggest reasons for these differences and what the implications are; for example, demand for certain skills may be quite different in one area than they are on average across the nation.
- Narrative analysis tailored to different applications. Analyses often are tailored for a particular audience or product. For example, in the United States, the *Occupational Outlook Handbook* is written primarily to help individuals explore career or work options, or more specifically, to provide "nationally recognized source of career

information, designed to provide valuable assistance to individuals making decisions about their future work lives." <http://www.bls.gov/oco/home.htm> The analysis presents relatively little in the way of numbers, but presents easily readable analysis for topics such as the nature of work, working conditions, training requirements, employment, and outlook earnings.

- Graphical presentations of information. Often accompanied with some narrative analysis, graphical representations of the data are another important means of translating data to intelligence. A graphic depiction of time trends, comparisons, composition, etc. often help the even better understand some of the events and implications, sometimes with only minimal narrative analysis.

These are only a few broad-based examples of analyses and interpretation. There are a variety of different levels of aggregation for examining LMI data. Information can be grouped geographically such as by local, regional, or national areas, or by industry sector. Analyses based on different aggregations can be used to support public and private labour market policies. Intelligence based on LMI can also support strategies for learning and education policies. The key point is that LMI products and services must include analyses that have been undertaken by experienced analysts for the information to be useful to consumers, and that such analyses need to be undertaken at different levels and from different perspectives to serve different needs. For example, simply looking at national unemployment trends would say little about unemployment in a province or major metropolitan level. This leads to our next fundamental component of an LMI system, experienced and well trained analysts at different geographical levels.

Informed Labour Market Analysts

Often overlooked in an LMI system is the value of labour market analysts because so much of the focus is on the data and delivery components of the system. Analysts are key to an optimal LMI system at the national, regional, and local levels. As funding is constrained there may be a temptation to not fund local labour market analyst positions, and this could severely handicap the effectiveness of the LMI system. Analysts are critical players in the system for a number of reasons, including

- supporting data development and compilation,
- interpreting and analyzing the data,

- serving as a source of qualitative information and part of an intelligence gathering system, and
- providing user support.

National analysts are important to provide interpretations and synthesis of information for policy determination, input to legislation, and information analyses that can impact on major business and stock investment decisions. Regional analysts typically will provide input to province planning and decision making and highlight different (or similar) trends across the nation and provinces that can inform strategies and policies that address economic needs and conditions of the province, which may be different from those of the nation. Local analysts are instrumental in supporting data development, either directly or indirectly. Analysts may be responsible for surveys or compilation of administrative data, or the development of projections that are part of the core LMI system. Analysts also may develop local data beyond the national and province requirements that reflect local conditions and needs. Local analysts are key to the interpretation of subnational labour market events and trends and can help provide context in which to use the formal statistics for local decision making. Most importantly, analysts at all levels prepare narrative analysis and presentations that are used on Web sites and other LMI products that provide meaning to the numbers which is more useful to users than raw numbers.

Of growing importance, we believe, is the value of local analysts who can provide qualitative interpretations of data that may reflect recent developments or changes that are not reflected in formal statistics. For example, long-term occupational projections are invaluable for career planning, development of curriculum, and workforce development programs. However, since such projections may not be revised for several years, they may not reflect significant changes that occur in the meantime. The local analyst is the lynchpin of a decentralized LMI system, providing key insights and analysis that directly supports the overall LMI system and customers.

Flexible and Easily Accessible Delivery Systems and Dissemination of the Information

An optimal LMI system must provide easily accessible and useful products and resources to the wide range of customers and build awareness of these resources. It is important that the

LMI system be marketed as a resource to assist business, education, job seekers, youth, and others in planning and making labour market–related decisions. Clearly the Internet has become the primary means of disseminating LMI, but it is important that other products be available for populations that may not have routine access to the Internet. An optimal system must consider different means of providing access to LMI, such as encouraging community-based organizations, libraries, and other sites to provide Internet access to LMI Web sites.

Generally an optimal LMI system should provide products and resources through both computerized systems and hard-copy publications. However, the emphasis should not be on the number of products but on how an integrated set of LMI products and services can most effectively and efficiently be offered to customers. One of the challenges in a decentralized system that delivers different products among provinces and national ministries is whether it would be useful to link sites to make it easier for users to navigate within and among sites. Chapter 6 provides a more detailed discussion of dissemination-related issues.

Availability of Intermediaries to Assist Users

The Internet has provided a powerful tool to disseminate LMI to a wider range of users, providing for many populations easier access and applications tailored to their needs. Not surprisingly, given the cost-effectiveness of Internet delivery, greater emphasis has been placed on self-service systems. A review of the literature on the career decision-making process concludes that all of the studies reviewed show computer-assisted career systems have a positive effect on career planning (Savard, et al. 2005). However, this finding does not diminish the need for intermediaries. The very complexity of the labour market and the increased pace of changes in labour market skill requirements suggests an increased need for counsellors, career facilitators, and integration of career development into the educational process. Indeed the review by Savard et al. notes that "other studies demonstrated a significant increase in the impact of LMI when it was combined with advice from a counselor, and that the use of a computerized system combined with counselor intervention "can increase the level of certainty about a career decision." The *Summative Evaluation of HRSDC Labour Market Information Products and Services* (HRSDC 2005) notes that "evidence indicated assisted HRSDC LMI had more

beneficial effects on the job search process," and that "women, older clients, those with high school education and blue-collar workers were more likely to seek assistance."

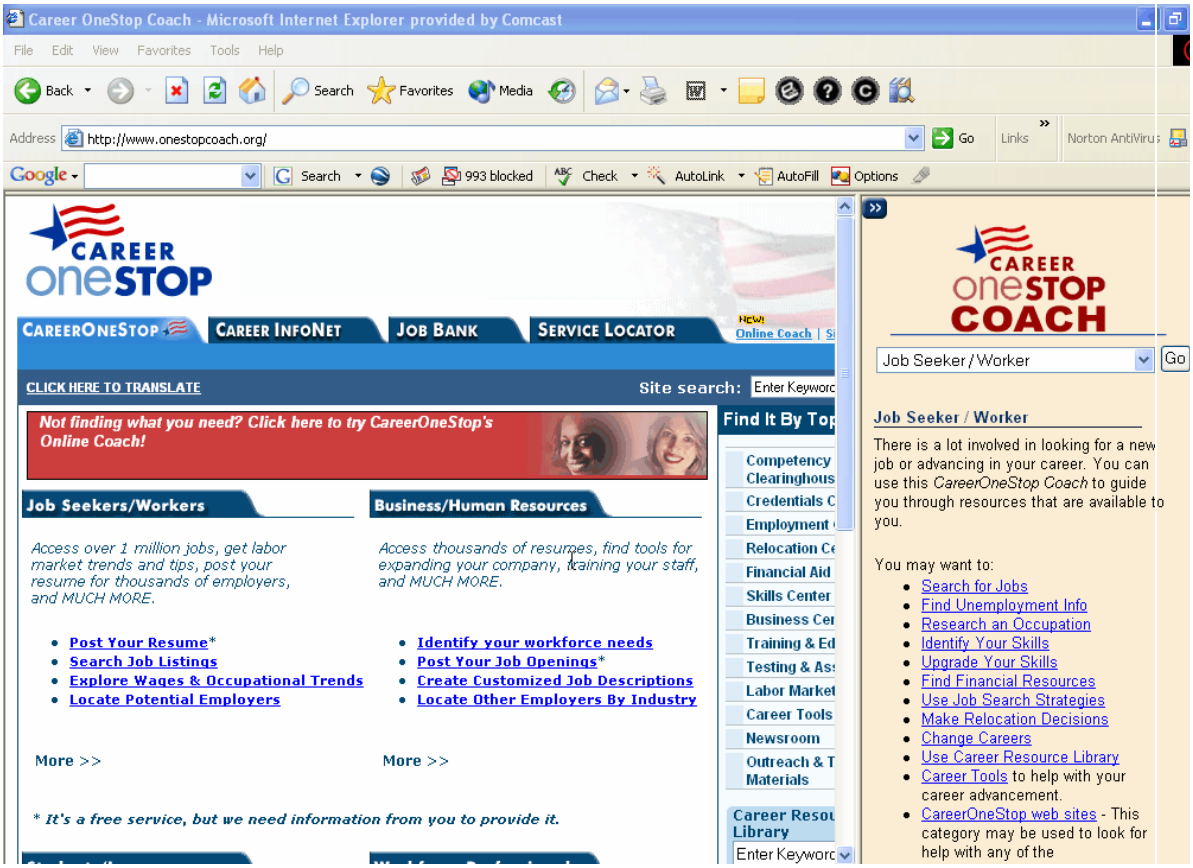
Counsellors, local workforce staff, and career facilitators should be viewed as a fundamental part of an optimal LMI system assisting in career planning, immediate job search, and career transition. Well-designed computer-based information delivery systems combined with assisted service can be important to many clients seeking labour market services. In fact, optimal LMI systems may help counsellors serve more individuals by providing easily accessible and tailored information and allowing intermediaries to help clients better use information in their career planning and job search.

Educate and Guide Users in Appropriate Application of the Information to Their Needs

An optimal LMI system also needs to market and provide tools to help customers better utilize information, with or without assistance from intermediaries. One long-term approach is to integrate career planning into the educational system. Just as lifelong learning is quickly becoming the norm for many participants in the labour market, career planning and decision-making are life-long processes and teaching career decision-making skills may help individuals throughout their lifetimes as they make major decisions on education, training, and job choices. Public and private organizations in Canada have undertaken several initiatives to educate the public on career planning, including:

- "Maps out the life/work competencies Canadians need to proactively manage their career building process, from kindergarten to adulthood." (http://206.191.51.163/blueprint/whatis.cfm) "The Blueprint is for career practitioners and facilitators, educators and trainers, career resource developers, human resources specialists, administrators, career resources purchasers, researchers—in fact, it is for anyone involved in any way in helping connect youth and adults to the futures they want." HRSDC is one of the partners in this initiative that provides one means of integrating labour market information into schools and other settings, as one aspect of the career planning process.
- The Real Game Series, which introduces career planning through a game approach with various versions designed for population from the third grade through high school (http://www.realgame.com/canada.cfm)

Well-designed applications tailored for specific user needs also provide a means of educating users in the process of using LMI. One example is the Job Futures site operated by Service Canada, which provides easy access to key information for career planning as well as a simple "Know yourself quiz." Another promising approach that may help users navigate through sites that may contain vast amounts of useful information is development of Web "online coaches." The online coaches allow a user to respond to a series of questions or options that then move the user through the system. See the example below, or to fully explore an online coach,



visit the site http://www.onestopcoach.org/.

Providing assistance and educating customers on how to best use labour market information is an important feature of an optimal system. The key is that users not only receive

assistance for their immediate needs but learn to use the information in the context of their particular needs that will help them in the future as well.

5 THE DATA FOUNDATION FOR AN OPTIMAL LMI SYSTEM

Data Foundation for an Optimal LMI System: Summary

This chapter presents a detailed table outlining databases for consideration in building an optimal LMI system. Data sets are organized by six categories, which are not necessarily mutually exclusive but do provide a meaningful way of grouping information elements:

1) core labour force and market data,
2) demand data,
3) occupational supply,
4) occupational characteristics,
5) education and training information, and
6) crosswalks and linkages across different data sets.

Each data element is examined along the dimensions of time period, geographical detail, measurement criteria, and classification. The detail of the data will vary for many different reasons including user requirements, costs of developing data, and methodological considerations.

As noted in Chapter 3, data make up the foundation of any LMI system. The earlier discussion introduced some general aspects that need to be considered for each variable in an LMI data complex, including 1) time-period coverage, 2) geographical detail, 3) measurement criteria and methods, and 4) classification of data. A number of other issues include timeliness, accuracy, links across data sets, the need for data development and quality standards, and the use of varied approaches to collecting data. All of these factors are important because they impact on the comparability of data (over both time and geographical areas), relevance to various user needs, coherence and consistency (agreement on terms and measures), and of course the reliability or accuracy of the information.

In this chapter, key variables in an optimal LMI system are introduced in the following table. The left-hand column provides general categories of variables including 1) Core labour force and market data; 2) Demand data; 3) Occupational supply; 4) Occupational characteristics; 5) Education and training information; and 6) Crosswalks. These groupings provide a useful structure for organizing and discussing data bases in an LMI system, but they should not be viewed as mutually exclusive. For example, some of the variables included under Core labour force and market data clearly fit under supply or demand categories, but as listed in the table, they tend to reflect more aggregate data that are used in macro applications.

The second column details various data elements that are key to an optimal LMI system. Other types of economic indicators, such as price indices, may be important and valuable in making decisions related to the labour market but are not included in this table. However, such data might well be considered in delivering other economic data in concert with LMI. The third column suggests geographical coverage or detail of the data at the nation (N), province (P) or subprovince (SP) level. The geographical level is important, particularly for the relevance of information for different users. For example, labour market monitoring and planning for a large metropolitan area would require industry employment estimates (and projections) for the area; national data would not necessarily suffice for local analysis, though they would be useful as a point of comparison to see how an area or province may differ (or be similar to) the nation as a whole. The fourth column suggests frequency of the information or time-period coverage. Some data, such as job openings, are daily (or in an automated Job Bank, may be “real-time”).

The last column of the table provides a very brief summary of some of the uses and background on the data. One important consideration in examining uses is recognizing that detail of the information is likely to vary for a number of reasons. Frequency/time period, geographical detail, and measurement detail (such as greater occupational, demographic or industry detail) are interrelated, and the combined impact of these factors will largely determine the realistic level of detail that might be possible. For example, it may be possible to develop detailed national data on the labour force monthly (such as from the Canadian Labour Force Survey), but monthly data at the province level may be more aggregated and may only be

available annually or possibly only every five years (when the Canadian census is taken). Such limitations are due to the cost of developing data, survey and sampling issues, statistical validity, and confidentiality. It is not unusual for consumers to desire or expect more detailed data, but in some cases it simply is not possible to develop greater detail and may not even be necessary or desirable. Education of users in the use of data and the type of analyses provided by the LMI system, as well as the availability of labour market analysts, all are important considerations in assisting users to effectively understand the strengths, limitations, and value of the data.

While the table highlights individual data sets, ultimately an LMI system must provide effective analysis of the data in narrative and graphic form. National, provincial, and local labour market analysis is critical to an optimal labour market intelligence system. Also, tools must be available to link various data sets so that the information is used in context and not simply as separate data items. The last item in the above table is the category of classification systems and crosswalks. Classification systems help ensure comparability and consistency by grouping like information and through a hierarchical structure allowing the data to be presented at different levels of aggregation. Equally important are crosswalks or other links/connections between various data. The importance of such linkage tools cannot be overemphasized. They should be transparent to users (except perhaps researches or may benefit from using detailed crosswalks) but are fundamental to the LMI system, particularly in disseminating information. But maintenance of crosswalks between data sets is as important as the compilation of the data and should not be ignored as a fundamental activity for building and updating data components of an LMI system.

Data Bases in an Optimal LMI System

Data category	Data element	Coverage, national (N), province (P) and subprovince (SP)	Time period or frequency annual (A) month (M) quarter (Q)	Uses and Notes/Sources
Core labour force and market data				Core labour force and market data also reflect supply and demand but are categorized separately as measures that track overall labour market trends.
	Population/demographics		A	All of these data are useful for monitoring the health of the labour market and labour market and economic trends. Data are invaluable for national and province analysis and if possible for at least larger labour market areas. Note that detailed characteristics data may only be available at the national level, more aggregated breakouts at the province level, and total estimates at the area level, subject to cost and sample size. Ideally monthly population data would be valuable at the national, province, and subprovince level (at least for large areas), but annual or possibly quarterly data are more realistic.
	Population estimates	N, P, SP	A, Q, M	
	Employment		M	
	Labour force part.	N, P, SP	M	
	Unemployment estimates and rates	N, P, SP	M	
	Summary labour force char.	N, P, SP	A, M	
	Detailed labour force characteristics	N,P, SP	A, M	
	Insured unemployed	N, P	W, M, A	If insured unemployed are tracked as part of a UI insurance system, these data provide a means for tracking unemployment on a weekly basis.
Demand				
	Job openings	N, P, large SP areas	Daily	Direct service of job seekers and employers. Also potential measure of occupational demand. Public and private job banks.
	Job vacancies		M or quarterly	Measure current and short-term demand.
	Labour costs	N, P, large SP	A , Q	Labour costs are an important component of demand, and while definitions may vary generally, labour costs can be viewed as the sum of wages and other costs for employees that are incurred by the employer. Labour costs are useful to business and economic development planning, particularly if data are available across areas.
	Occupational employment estimates	N, P, large SP areas		
	Summary	N, P, SP	update every 2-5 years	Aggregated NOC level data
	Detailed	N, P	update every 2-5 years	Detailed NOC level data
	Occupational employment projections: Long term–10 years	N, P, major SP	update every 2-5 years	Information is key for job seekers, career decision making, & business planning. Detailed for national and province with aggregated for larger metropolitan areas.
	Occupation projections short-term–5 years or less	N, P, major SP	Every two years	Short term projections are desirable and may be useful for career preparation, particularly for short-term programs to meet market needs. Long-term projections may provide this need if they include estimates of annual change and are updated relatively frequently, such as every 2-3 years.
	Industry employment estimates	N, P, major SP	Monthly	Industry employment estimates are key for business, education, and career planning and also provide the foundation for occupational estimates and projections.
	Industry employment projections	N,P, major SP	Every 2-5 years	
	Industry staffing patterns	N, P	Every 2-5 years	The staffing pattern for an industry and the distribution of an occupation across and industry are key information for career planning, workforce development, economic development, demand and supply estimates, etc. Direct use of this information by counsellors, career practitioners and others can help address economic declines and growth.
	Occupational distribution across industries	N, P	Every 2-5 years	

Data category	Data element	Coverage, national (N), province (P) and subprovince (SP)	Time period or frequency annual (A) month (M) quarter (Q)	Uses and Notes/Sources
	Mass layoff data	N, P, SP	Monthly or quarterly	Data help identify industries with significant layoffs, identify causes and extent of worker dislocation, and the demographic characteristics of workers who are laid off. Information can assist local workforce personnel in provide support and assistance to workers. Information can also be used in analysis of potentially available labour supply. Some data might not be published but could be used internally for local employment services.
	Business births and deaths	N, P, major SP	Montly, quarterly or annual	Measuring business start-ups and closures provides insight to the dynamic flows in the business market and are important for business, economic development, and policy decisions.
	Number of business establishments and size	N,P, major SP	Annual	Data are key for internal use, but some data may not be published for confidentiality purposes. To the extent information on the number of firms by industry can be published it is useful for nearly all users.
	Industry average earnings	N, P, SP	A, M	Useful for tracking wage/earnings changes across industries.
	Occupational wages	N, P, major SP	Every two years	Among the most important pieces of information for career planning and job search.
Occupational Supply				
	Occupational employment	N, P, SP		See above
	Unemployment by occupation	N, P	M, A	Unemployment by occupation at least for aggregated NOC categories at the national level provides a useful measure for determining changes in the marketplace. Data might also be used in develop broad estimates of occupational supply.
	Enrollees and completers of education and training programs	N, P, SP	A	A key piece of information in measuring current, potential, and future supply.
	New entrants to labour force	N, P	A	These data are important for macro-analysis. Such information would be useful for estimating supply, but it may be difficult to develop such information beyond the national or large regional level using surveys such as the LFS (Canada) or CPS (US). Administrative data might be one source of such information.
	Occupational transfers	N,P	A	Very difficult to measure using any survey information, other than at a broad NOC level.
	Geographic migration	N, P, SP	A	Survey data are useful for tracking movements at the national level; sub national information most likely would depend on administrative data.
	Labour force separations	N, P	A	Data at national and province level may be possible using the Survey of Labour and Income Dynamics and administrative data.
	Primary activity of persons out of LF		A	Help tap potential LF participants to address supply shortages.
	Educational outcomes	N, P, SP	Annual or periodic	Information on whether completers of post secondary and other education programs obtain jobs in fields related to their studies is an important. Canada national graduate survey that was carried out about every five years in the past was an exceptional resource, though it didn't provide immediate information, it provided useful insights on outcomes. Some of this data is used directly in Canadian systems such as Job Futures. The information is useful in measuring supply and providing guidance for career planning and decision making.

Data category	Data element	Coverage, national (N), province (P) and subprovince (SP)	Time period or frequency annual (A) month (M) quarter (Q)	Uses and Notes/Sources
	Estimates of supply	N,P,SP		Estimates of potential supply may be of value for scenario testing, i.e., what might supply be given certain levels of training in different occupations. Complete estimates of supply are difficult to prepare. They involve adding employment estimates, educational completers, persons outside of the labour force, etc. The difficulty is trying to ascertain supply estimates at an occupational level with some degree of accuracy so that they can be meaningfully compared to the demand estimates.
Occupational Characteristics				
	Tasks	National level data is appropriate for all of these.	If possible ongoing monitoring through data mining occasional analyses of occupations, etc. should be employed. It is costly to update these data using traditional surveys. Formal updates might occur every 5-10 years, with ongoing updates using non traditional methods.	Canada has very advanced information in many of these categories through the NOC, the essential skills project, and other activities. The categories noted here are based on the U.S. O*NET system.
	Tools and technology			
	Knowledge			
	Skills including essential skills			
	Abilities			
	Work activities			
	Work content			
	Education & training requirements			
	Interests			
	Work styles			
	Narrative descriptions of occupations			
	Licensing and certification requirements	National and sub-national if licenses vary among geographies	Update as changes in licensing requirements occur	Licensing or certification requirements should be available for all occupations as applicable–detailed licensing data need not be stored in the system if links can be established to sites that have the licensing or regulatory requirements.
Education and training information				
	Education and training institutions	N, P, SP	A	Key information for all education, career planning, and decision making.
	Ed. and training programs	N, P, SP	A	
	Program descriptions	N, P, SP	A	
	Course descriptions	N, P, SP	A	
	Educational attainment of adults	N, P, SP	Census years	
	Financial assistance sources, particularly public sources for education or employment training programs.	N, P, SP	A	Note: Financial assistance services information does not fit under the definition of LMI, however such information is important as part of an overall career planning system and as such is included in this view of an optimal LMI system. While it is unrealistic to include all sources of financial assistance, large public sources might be considered as part of an LMI data base. Any public sources that pay for employment training would be useful since they may encourage training and may impact positively on supply/demand matches.
Classification systems & crosswalks				
	Industry	Crosswalks need only be developed at the national	Crosswalks must be updated when significant changes occur in any	Crosswalks link industries, occupations, education programs, and skills–they become a key means of providing seamless navigation and data in Web applications and other
	Occupation			
	Education program			

Data category	Data element	Coverage, national (N), province (P) and subprovince (SP)	Time period or frequency annual (A) month (M) quarter (Q)	Uses and Notes/Sources
	Military classifications	level	classification system	LMI products.
	Skill to occupation crosswalks			

6 DISSEMINATION OF LMI

Dissemination of Labour Market Information: Summary

This chapter reviews various ways to disseminate LMI. Our conclusion includes the following findings:

- Web-based systems are likely to be the major means of disseminating LMI, but it is important to consider how access to such systems can be expanded to consumers who may not have easy access to the Internet, for example through libraries, one-stop centers, and community- or faith-based organizations.
- Three Web-based delivery system types are identified and discussed in the chapter, each of which is valuable in an optimal LMI system:
  1) Clearinghouse/data repositories—typically such a system provides easy access to specific types of data without necessarily organizing information for specific uses.
  2) Customized and tailored applications—generally such Web sites are designed for a specific application or related applications, such as career information delivery systems, economic development systems, or front line decisions support systems. Such systems must include logical processes and connections to navigate through the information in the context of specific user needs.
  3) Multiple applications—such Web sites may be designed to meet the needs of several different consumers and include a variety of tailored paths through the system. The Service Canada LMI site is shown as a good example of this approach.
- Sites should be designed to meet established standards. Three sets of Internet delivery standards are provided as examples in the chapter:
  1) The FLMM *Career and Labour Market Information Service Delivery Guidelines* (FLMM 2003)
  2) The FLMM *LMI Product Guidelines* (FLMM 2002)
  3) The Association of Computer-Based Systems of Career Information (ACSCI) standards for career information delivery
- Hard-copy reports remain an important way of reaching users through schools, employment centres, and newspapers. Hard-copy products should be designed to complement Internet-based and other computerized systems.
- The chapter includes a generic model of an LMI delivery system that is intended as a guide when considering an optimal LMI system.

High-quality databases necessarily are the foundation for an LMI system; however, ultimately the value of an LMI system rests on the design of the system, ease of access, quality of analysis, and relevance of the format and presentation to the consumer's needs.

In this chapter we examine some of the major issues related to the delivery of labour market information. As noted in Chapter 4, it is important that the system provides access through multiple means, including computerized and hard-copy products. However, rather than focusing on producing more products, it is more important to consider an integrated or linked set of products to minimize cost and also to reduce confusion by users on what services to use (or even to locate). Because computerized systems, including both on-site and Internet-based systems, can provide more flexible access and customized services, an optimal LMI system must consider how to make these computer-based applications available to customers who may not have easy access. For example, working through community-based organizations, nonprofit groups, libraries, schools, etc., products and services can be advertised and made available.

Below we discuss issues related to computerized and other products. One key issue is that rather than too little information being available, users may be overwhelmed by the large amount and varied information within a single system and the preponderance of different systems available. The LMI system must consider how to integrate data within a system and to link systems to make it easier for any customer to navigate through the large amount of information available. It is unrealistic and limiting to consider the LMI system as a large centralized database with a single port of access by customers. Such an approach may limit the range of information available, the scope and level of analyses, the geographical detail, and the use of qualitative data. However, we argue strongly that an optimal system would benefit from a central one-stop portal that directly provides easily accessible information, that links consumers to subnational sites that may have more detailed data and analyses, and encourages sharing of information across areas.

Web-based and other computerized delivery. We can categorize Web-based LMI sites and applications along the following lines:

- **Clearinghouse/data repositories.** Such sites may function very much like a library in that they are not tailored for a specific use, but rather provide relatively easy access to the resources (data bases) that are catalogued by the type of information, such as employment, earnings, and unemployment. Such sites are fundamental to an optimal system. If you need certain types of information for research, policy making, tracking

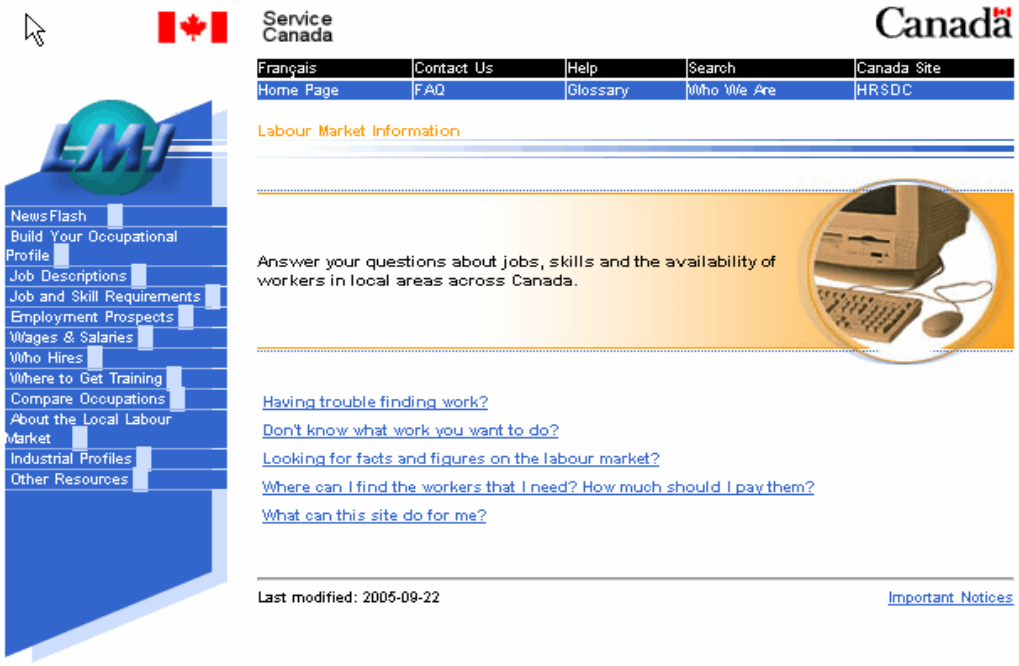
trends in the economy, etc., these sites are the mainstay of the system. There are many users who need certain types of information and specific data sets that are not tailored for a specific use, such as for career planning, and simply need direct access to the information, such as national and industry employment trends for the last five years in the provinces and nationally. Examples of such sites include

- The CANSIM Web site operated by Statistics Canada: http://cansim2.statcan.ca/cgi-win/cnsmcgi.exe?CANSIMFile=CII/CII_1_E.HTM&RootDir=CII/
- For the United States, the Bureau of Labor Statistics Web site: <www.bls.gov>.

Clearinghouse sites may include features directed at certain audiences, but their principal purpose is to provide access to a broad range of economic and labour market data, analysis, and other products and services.

- **Customized/tailored applications.** These sites typically are designed for a specific purpose, such as career planning, job search, or economic development. For many customers, these are the sites that are likely to be most beneficial in meeting their specific needs because the information is organized along a decision or planning making logic model (at least in a well developed system). Examples of such sites include
  - The HRSDC Career Planning site: http://www.hrsdc.gc.ca/en/gateways/individuals/cluster/cp.shtml, and in particular the Job Futures site: http://jobfutures.ca/en/home.shtml
  - Many proprietary or nonprofit career information delivery systems including, Choices, operated by Bridges Transitions Inc., and DISCOVER.
  - Canada's public Job Bank: http://www.jobbank.gc.ca/Intro_en.asp.

  It is important that customized applications include not only the data or information but logical processes to navigate the system. For example, a system intended to help a job seeker locate a job and/or training ideally would include not only specific job openings information, but also would allow the consumer to explore what types of skills are typically required for jobs in the related occupational area; what, if any, licensing requirements are there; and what training may be available in the area for skills that the job seeker may need to obtain or enhance. The delivery system should provide multiple and logical paths to explore information for a given application or set of needs.
- **Multiple applications.** These sites are similar to the customized sites but may be directed at several different types of users and applications. Examples include
  - The Service Canada LMI site (see exibit below), which is a multipurpose site that allows users to easily access key LMI at the national, province, and subprovince levels for a variety of uses.



- America's Career Information Network (ACINET) in the United States, which is intended to assist in job search, career planning and decision making, business decisions, and human resource and workforce development specialists.

Customized single and multiple use Web sites must be carefully designed to effectively and appropriately assist users. Poorly designed Web sites can at best be frustrating and at worst provide misinformation that may lead to poor decision making. Just as standards are fundamental for data integrity in an LMI system, it is important that delivery systems maintain high standards for reliability and accuracy.

The issue of Web site standards has been the subject of extensive open deliberation. Several good sets of standards have been enunciated to guide delivery of information. Three of these follow.

1) The Career and Labour Market Information Service Delivery Guidelines released by the Forum of Labour Market Ministers. These standards are intended to improve the quality of information services, provide consistency of information delivery across Canada,

promote services to meet client information needs, and improve awareness of information products and services. The guidelines cover six major topics (FLMM 2003):

1) Service delivery environment
2) Funding
3) Determining target group needs
4) Delivery Methods
5) Staffing
6) Marketing and Communication.

These broad-based standards are important for developing or revising the overall framework for information products, services, and delivery. Each is crucial in planning and implementing information products. More specific standards on products have also been developed by FLMM. These are highlighted below.

2) The Labour Market Information Product Guidelines from the Forum of Labour Market Ministers. These guidelines provide "voluntary standards for LMI product development and dissemination enabling consumers to make better informed decisions..." (FLMM 2002). The guidelines promote reliable, quality products designed to meet consumer needs. The guidelines are organized around a 10 elements or sections of generic, internet based, and specific product standards, outlined in the table below.

Generic and Internet Elements:	**Product-Based Elements**:
Privacy and ethical practices	Program and service information
Accuracy, completeness, and timeliness	Jobs and recruiting information
Information relevance to user needs	Career planning information
Accessibility	Educational and training information
Internet delivery for LMI product Web site	Labour market profile information

These topics are in turn further refined through more specific guidelines under each element along with compliance measures, providing a very practical means to ensure compatible, reliable, and consistent products.

3) A third, highly detailed set of standards are available for career development and planning. These have been prepared by the Association of Computer-Based Systems for Career Information (ACSCI). These standards cover four areas as summarized in the table below from the ACSCI Web site:

Four Levels of Standards

Level	Description	Application of Standards
First	Core standards	All providers of information products and services for career development, irrespective of the tool, audience, or delivery mode.
Second	Component standards	Specific process components (assessment, search/sort, and career planning and management) or content components (occupational, industry, education and training, financial aid and job search information) that advance career development.
Third	Component integration standards**Error! Bookmark not defined.**	Multicomponent career information products and services in which components are interrelated.
Fourth	Comprehensive system standards	Career information delivery systems that provide integrated career development processes linked to work-related and educational information for multiple audiences. Comprehensive systems are accountable to the public and provide user support and training.

These detailed ACSCI standards can be found at: www.acsci.org. While these standards are designed for career information delivery, many of the principles may be adapted for other delivery systems. The standards are very detailed and can be used in conjuction with the two sets of standards prepared by FLMM to further refine product development and delivery.

Hard Copy and Video Based Products

Publications, brochures, newsletters, and reports still serve as important means for providing information to customers. Such products can easily be delivered through schools, in employment centers, and other settings to provide basic information to customers. These products are particularly useful in providing information on overall economic trends and conditions, major developments in the labour market, and information on focused topics. They tend not be as useful as computerized systems for a full job search, career planning, simply because they do not have the flexibility of computerized systems to provide tailored expert

system or logic model approach to a decision-making process. But hard-copy reports can be instrumental in introducing key concepts and making users aware of other resources and where they can access computer-based systems. To a great degree, hard-copy products should be designed to complement more detailed information and processes available in computerized applications and build awareness of those resources.

Not surprisingly, videos are a growing tool used in career decision making, as more individuals have access to increased bandwidth. We highly recommend that career videos be made available at different sites (along with Internet systems) and videos be included in career decision-making products. For example Job Futures includes videos. Videos are best presented in the context of other quantitative and narrative information about the occupation and for many users provide a more realistic introduction and feel for the occupation.

Mapping a Generic LMI Dissemination System

A graphic depiction of a generic LMI system is provided next to consider some of the key decisions that should be considered in designing, developing, implementing, and maintaining and LMI dissemination system. The generic model is not intended to cover specific agency responsibilities but should help identify points at which responsibilities must be established. We now walk through the generic system to explore some of the features and operational implications. To facilitate the discussion, each element of the flow chart is numbered, and our walk-through will reference the number of each object.

Beginning with (1), conceptually there must be an LMI database. In our generic optimal system we recommend a centralized database that may include major national data sets, some province data, and even some subprovincial information. This centralized database would be linked to data maintained at other sites, as referenced in box (2). The key implication is that the ministry (such as HRDC) or collaborative set of ministries operating the LMI system need to coordinate and collabourate in building an LMI delivery system, and either centralize or develop methods for sharing the information among agencies, regardless of where the data are stored.

This can have very specific implications to file design standards to facilitate such exchanges of data.

We emphasize that this is not a black-box approach to LMI—this is neither desirable nor feasible, as noted earlier. However, a single portal that provides direct access to key elements of the LMI system facilitates access and comparisons across areas, while fostering use of province and local Web sites as sources for more detailed data and localized analysis and interpretation, which would be unrealistic to maintain in a single site. Service Canada's LMI site, to some degree, provides and example of such an approach to LMI dissemination.

Box (3) on the left-hand side depicts basic hard-copy-type reports that may be distributed through the Web (shown by the connection to [4]), directly to users (connection to [7]), or through intermediaries (connection to [6]). Hard-copy materials typically would be monthly, quarterly, or annual publications, brochures, etc. A good practice is to make all hard-copy items available through the Web as well. A second useful practice is to use hard-copy materials to advertise Web and other services.

Item (4) is a graphic convenience simply to depict that data from different sources may be used to deliver information through the Web (boxes 5a–5e). As noted, it is important that federal, provincial, and local officials collabourate in this part of the enterprise. Box 5a highlights a tailored system, in this case a Career Information Delivery System, noting Job Futures as an example. Other examples might be a system designed for economic development. Box 5b is a variant of 5a—it includes access designed for different users. For example, ACINET (U.S. system) organizes information and processes to use the information for individuals (job seekers, career planning), business, and education and training in a single site. Such systems can become very complex and confusing unless carefully designed, but great efficiencies can be gained by organizing information and access into such multipurpose sites. If well designed, they are attractive and useful to customers who can visit a single site to meet many of their needs, or then be linked to other related sites. A multipurpose site can serve as a one-stop site that either

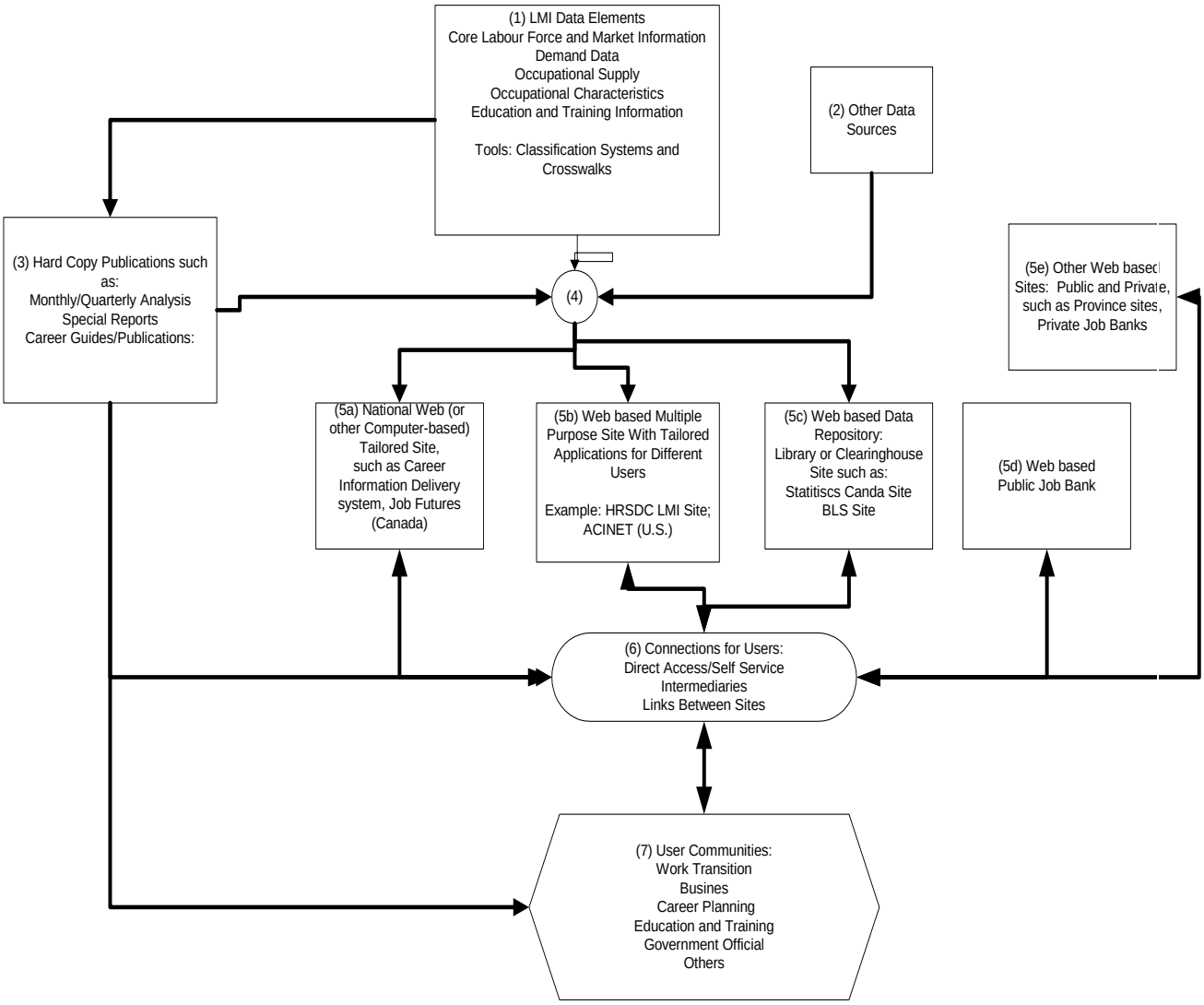
directly answers the user needs, or where additional information is required, provides easy links to other appropriate sites.

Box 5c in the flow chart represents the most basic but critically important type of site: a large data repository site that provides direct access to many data elements without necessarily providing specific applications or processes for using the information. Statistics Canada and the BLS site are examples (each also includes some specific application, but generally they are intended to provide easy access to various data sets, regardless of the intended use). For example, if a person wants to look at industry employment trends for the last 20 years, he or she will not want to track such information down in a CIDS or multipurpose site, but may simply want to go to a site that has detailed industry data.

Public job banks (5d) are another component of an optimal LMI system. Here the data generally come directly from employers (or through public employment service listings), or resume-based information input by individuals. While the data are not primarily derived from the central data base (1), some data from the central data base may be included to help individuals prepare resumes or employers to develop job announcements (this track is not shown in the graphic).

Other Web sites (5e) deliver LMI. Most notably in a decentralized system, public agents in regions and local areas may operate their own Web sites. Proprietary and nonprofit organizations may offer sites tailored for different uses, such as private job banks or CIDS. While clearly there may be limitations to the degree to which public and private partnerships can be established, it is important that a dissemination system take into account these various services. If CIDS cover much of the educational system, these might be viewed as a primary means of getting LMI to users, though for purposes of equal access there still might be some public delivery of tailored career information.

LMI Dissemination



Item (6) in our chart is a simplified way of showing how the information from the Web sites reaches the users. Information may flow directly to users (7) or through intermediaries. Intermediaries as noted earlier are critical in the LMI system in that they may serve as a means to

- provide access to Web services for individuals who do not have easy access, such as community- and faith-based organizations, libraries, and schools; and
- provide assisted services, from which many users will benefit, particularly when using materials for the first time or just beginning a career development or job search process.

Finally, box 6 is also used to indicate that the various Web sites, as appropriate, should be linked, allowing users to move among relevant sites. In building such links, the easiest links obviously are to simply link to the home page or a main page of the target site. Ideally, links at a more detailed level are desirable, if feasible. For example, if a person were exploring a particular occupation on Job Seeks and wanted to continue his or her search on the same occupation on the British Columbia site, an optimal system would connect him or her at the occupational level. While more difficult, such linkages should at least be considered when designing or revamping an LMI delivery system. If practical and cost-effective, links at this level can significantly improve navigation among sites.

As emphasized, the generic model presented above does not serve as a final operational system, but it does provide a guide to highlight major points to be considered in building an optimal delivery process. While the databases provide the foundation for the system, ultimately the success of the system, given quality-relevant data, will rest on the design, ease of access, quality of analysis, and relevance of the format and presentation to the decisions that the user faces.

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