

**STRATEGIC HUMAN RESOURCES
STUDY OF THE SUPPLY CHAIN SECTOR**
FINAL REPORT | FALL 2005



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Canada

Summary Report

Introduction

The findings of the Canadian Logistics Skills Committee's national supply chain strategic human resources study present a picture of a sector in need of a vision and strategic leadership. Survey data suggests that many human resources challenges could be overcome by connecting a fragmented sector, increasing awareness of supply chain occupations, and working with educators at all levels to develop supply chain programming that addresses the sector's evolving needs.

The Strategic Human Resources Study of the Supply Chain Sector, a report funded by the Government of Canada's Sector Council Program, builds upon, and continues the work initiated by, the Lean Logistics Technology Roadmap project. It is an in-depth national research study aimed at developing a common industry vision for, and a co-operative approach to address, the current and future human resources challenges of the supply chain sector.

This study was conducted under the guidance of the Canadian Logistics Skills Committee (CLSC), a national committee comprising industry, academic and provincial-government representatives, and in partnership with Human Resources and Skills Development Canada, Industry Canada and Transport Canada.

The CLSC is mandated to assess technologies, innovations and conditions that have the greatest impact on the supply chain sector, and to develop a strategic human resources action plan for Canadian industry and academia.

A review of the major human resources challenges in the sector reveals a limited pool of skilled employees and the need to develop skill sets to cope with emerging technologies and a global marketplace. In addition, the sector must overcome a general lack of awareness and understanding of the supply chain sector and its occupations. Students, new workforce entrants and those in career transition typically do not enter the supply chain sector by design – usually by accident – simply because they do not know it exists.

In order for the sector to attract, develop and retain the talent it requires, it must compete for attention in an environment where other sectors and industries have already, or are about to, initiate awareness and recruitment campaigns to address their talent shortage.

Attraction and retention of talent, particularly knowledge workers, are vital to the sector's ability to focus on improvements to the Canadian supply chain. This is of paramount importance, as supply chain performance directly impacts the costs and effectiveness of Canadian industry and, therefore, Canadian competitiveness on a national and global scale.

Study findings are based on input from a broad representation of supply chain sector participants, including employers, employees, academia, students and associations, as well as past studies and secondary sources of information. As such,

the general approach to this study comprised both primary and secondary research components. Key data gathering activities included the following:

- Review of secondary research employing publicly available studies, articles and data;
- Interviews with Canadian Logistics Skills Committee members;
- Surveys administered to industry employers, employees, academic institutions and students;
- Focus groups and interviews with industry participants (employers and employees);
- Interviews with a selection of associations; and
- Roundtable discussions with industry and academic leaders.

The scope of topics covered ranges from general industry characteristics and trends to specific human resources challenges and practices. Key areas explored include:

- The current and future business environment of the supply chain sector;
- The impact of technology on the sector and human resources skills requirements;
- The current and future employment profile of occupations in the sector;
- The current and future skilled worker demand and supply;
- The current levels and types of supply chain training and future needs; and
- Current human resources strategies and practices.

In addition, the study investigates regional and organization size differences across various factors within the scope of the study in order to identify if any specific trends or needs are present.

Study results are summarized in the body of this report and structured around the following six modules:

- Module 1 – The Evolving Economic, Business and Regulatory Environment
- Module 2 – The Impact of Technology and other Change Drivers
- Module 3 – Employment Analysis
- Module 4 – Skill Demand and Forecast
- Module 5 – Recruitment, Training, Development & Retention
- Module 6 – Recommendations

It is intended that the findings of this study be used to create a human resources action plan for Canadian industry and academia, and provide small and medium-sized organizations with recommendations they can adopt independently.

Sector Overview

There are strong interdependencies between supply chain management and logistics management and thus it is difficult to identify precise boundaries. Furthermore, these boundaries are continuously moving to accommodate an integration of supply chain and logistics activities. Nevertheless, it is suggested that logistics is a sub-function of the supply chain. While logistics may be involved to some extent in an increasing number of supply chain activities, it will never include the complete supply chain spectrum. For example, functions such as sourcing, manufacturing, customer service and retailing involve logistics in their planning and scheduling in

order to optimize the end-to-end supply chain, but their core operations are still distinct.

For the purposes of this study, the following definition of supply chain management from the Council of Supply Chain Management Professionals is employed:

“Supply Chain Management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all Logistics Management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, Supply Chain Management integrates supply and demand management within and across companies.

Supply Chain Management is an integrating function with primary responsibility for linking major business functions and business processes within and across companies into a cohesive and high-performing business model. It includes all of the Logistics Management activities noted above, as well as manufacturing operations, and it drives coordination of processes and activities with and across marketing, sales, product design, and finance and information technology.”

An increasingly important component to the supply chain sector is the emergence of functional and process outsourcing, thus creating the need for businesses (third-party logistics providers, 3PLs) that are specialized in providing logistics services. As a result, the sector comprises two main groups – logistics/supply chain users and logistics/supply chain service providers – both of which participated in this study.

Based on the results of this study, the most common supply chain activities completed in-house focus on inventory management and customer service, including processing and fulfilling orders. Conversely, the most common outsourced activities focus on transportation of goods (i.e., outbound and inbound transportation, and freight forwarding), customs (i.e., brokerage and clearance) and, to a lesser degree, warehousing.

Industry Canada’s **Logistics – Service Industries Overview Series** (2001) report estimates the total revenue for logistics-related firms in 2001 (including, but not limited to 3PL firms) to be \$50 billion (42% of which is trucking). It is generally estimated that this accounts for approximately 60% of the supply chain sector activity within Canada, with the other 40% being conducted in-house by other organizations (e.g., within manufacturing or retailing organizations).

The annual revenue growth rate of the supply chain sector was 5.8% from 1991 to 1997, according to **Logistics and Supply Chain Management – Overview and Prospects**.

Focusing specifically on 3PLs, the gross revenue for the North American 3PL market (as per **The North American 3PL Market** report (2004)), was \$65 billion in 2002. According to the same report, the 2004 growth rate for this market was 20%, with the annual growth rate for warehousing, transportation management, air/ocean freight forwarding, and dedicated carriage (four core logistics sections) being 15% to 25%.

The supply chain sector size in terms of employment was estimated at 635,530 employees (excluding truck drivers) in 2001 according to the **2001 Census** (see table below). It is estimated that as of 2004 the supply chain labour force had grown to 701,880 employees, based on **Labour Force Survey** data from 2001 to 2004. These employees are predominantly located in Ontario, Quebec, Alberta and British Columbia.

Supply Chain Sector Employees by Occupation

Sub-function	Occupation Category	NOC Code	Sample Position Titles	Number of Supply Chain Employees
Senior Management	Managerial	0016	Senior managers: goods, production, utilities, transportation and construction	6,620
Logistics Information Systems	Managerial	0213	Computer and information systems managers	9,240
	Tactical	2233	Industrial engineering and manufacturing technologists and technicians	14,635
		2172	Database analysts and data administrators	305
		2171	Computer analysts	9,415
		2175	Web/Internet site developers	665
Warehousing	Managerial	0721	Facility operations and maintenance manager: warehouse manager	24,570
		0132	Postal and courier service manager	4,660
		1214	Supervisors, mail and message distribution occupations	8,305
	Operational	7452	Material handlers	167,355
		9617	Labourers in food, beverage and tobacco processing: material handling, packaging	65,905
		1472	Store keepers and parts clerks: e.g., parts supplier, supply clerk	37,075
		7451	Longshore workers: e.g., dock worker, ship loader operator	6,935
Transportation	Managerial	0713	Transportation managers	26,135
	Tactical	1236	Customs, ship and other brokers	5,240
		1476	Transportation route and crew schedulers	3,820
		1475	Dispatchers and radio operators	2,245
	Operational	1471	Shippers and receivers	106,365
Inventory/ Material Control	Managerial	0114	Other administrative service managers: e.g., inventory control manager, support services	13,435
		1215	Supervisors, recording, distributing and scheduling occupations	20,725
	Tactical	1474	Purchasing and inventory clerks: e.g., inventory analyst, planner	38,655
		1122	Professional occupations in business services to management: consulting	820
Purchasing	Managerial	0113	Purchasing managers	9,055
	Tactical	1225	Purchasing agents and officers	28,025
		6233	Retail and wholesale buyers	22,190
Marketing and Sales	Managerial	0611	Sales, account and marketing managers	3,135
TOTAL				635,530

Source: 2001 Census (NAICS: 11, 21, 22, 31-33, 41, 44, 45, 48, 49, 51-56, 61, 62, 71, 72, 91)

From a geographic perspective, the study found that supply chain-oriented organizations typically operate in multiple regions across the country and internationally. Only a few operate in one region alone. Within Canada, organizations most often operated in Ontario, Quebec, Alberta and British Columbia. Internationally, the most common area of operation was the U.S., followed by Europe and Asia Pacific.

Looking at how the supply chain function is incorporated within organizations, this study found that the supply chain function is generally centralized and headed by a senior manager.

Not only has the supply chain function evolved from strictly storage and transportation to an active integration with many other supply chain activities, but it is also shifting in terms of perception from being a common cost centre to playing a strategic competitive role. The nature of work in the sector is changing as the supply chain becomes more complicated and strategic, and organizations try to manage the full supply chain, rather than its individual parts.

Broad Findings

Policies and Regulations

Regulations cited by organizations as having an impact on their operations are reflective of current events and the global nature of the sector. Over 50% of respondents indicate that environmental and border-crossing requirements are currently having an impact on their business.

The most common regulatory areas having a significant impact over the last three years included:

- International regulations governing border crossing, customs, U.S. import security, and international trade;
- Provincial regulations (e.g., inter-provincial trade barriers, labour, and occupational health and safety);
- Sarbanes-Oxley (SOX);
- Environmental regulations (e.g., Kyoto Protocol);
- Food regulations (e.g., U.S. Food and Drug Administration (FDA) and Canadian Food Inspection Agency (CFIA) regulations);
- Municipal regulations; and
- Transportation regulations (e.g., hours of service, weights, material storage and dangerous goods).

Customs-Trade Partnership Against Terrorism (C-TPAT) and the North American Free Trade Agreement (NAFTA) were the most commonly cited specific regulations having an impact on the sector.

Trends

In an increasingly international market, global security, international trade, international competition and border-crossing requirements are all affecting the supply chain sector, and are expected to continue to do so over the next five years. Based on the current survey results, the most common business drivers currently

impacting supply chain operations include increasing complexity, financial/cost pressures, and increasing speed and quality expectations.

Customers and competitors are exerting enormous pressure on supply chain logistics. More specifically, the link between supplier effectiveness, supply chain performance, and customer service has become critical. Having improved manufacturing efficiency and product quality in the past, suppliers now need to improve their collaboration with retailers and customers in order to respect almost instantaneous delivery requirements. Increasing customer expectations/demands, in terms of speed and quality, place an increased focus on customer service.

Technology is clearly an important tool in a company's efforts to respond to ever-increasing customer expectations. Since technology can be costly, small and medium-sized organizations are often incapable of procuring the latest technologies required to remain competitive in their respective markets. Consequently, there has been a widespread increase in the number of third-party service providers, as well as their reliance on contemporary information system services.

Technology and the resulting information management requirements are identified as key business drivers currently impacting the supply chain function and are expected to maintain a presence in the future.

Technology

While process and production technology change has been profound, information management systems and related technology have evolved at a more rapid pace and have had a more profound impact on job design and skill requirements. As such, the technology portion of this study focuses on information technology and systems.

Based on feedback from study participants, most organizations are not prepared for the level of technological integration that will be required to compete successfully. In general, Canadian organizations lag in both investing in and implementing new technologies. While information management/technology is one of the most common activities reported as falling under the responsibility of the supply chain function, technology appears to be under-utilized. It is noted that the degree of technology use reported in this study could be understated, as a result of the use of ERPs and not stand-alone systems for specific functions.

Technology is most commonly employed for inventory and warehousing management. Looking forward, employers are considering employing technology for transportation, and customer and supplier relationship management. Not surprisingly, larger organizations have implemented more supply chain-related information systems than smaller ones. Interestingly, despite the number of organizations that indicate that technology is applied in their organization, few (<12%) indicate they currently have the requisite skills to fully employ technology.

Organizations are continually updating their technology to improve efficiency and indicate that their ability to keep pace with technological change is a challenge.

The introduction of technology is changing the nature of work for all occupational categories (i.e., managerial, operational and tactical), in terms of:

- Increased pace of work with less lead time; and
- More real-time information and increased requirement to manage this influx of information.

As a result of technological change, software application and analytical and decision-making skills are rapidly replacing traditional manual processes and abilities. It appears that many employees have been able to adapt to this evolution.

There are divergent views with respect to whether employees possess technically adaptable skills. Despite the fact that employers state their employees do not have the requisite technical skills, employees indicate that they are provided with adequate training to make full use of technology, and academic institutions indicate teaching in the areas where employers employ technology. Employers are dealing with their skill gaps in the short term by focusing on in-house and on-the-job training. In the longer term, this has implications for more pro-active technical skill development and opportunity for industry/academic institution alliances.

As a result of technology introduction, going forward it is anticipated that there will be further emphasis on the importance of instantaneous adaptation to customer requirements, information management and general management skills.

Employment Profile

It is estimated that as at 2004, there were approximately 701,880 people working in the supply chain sector within Canada (excluding truck drivers) (**2001 Census** and **Labour Force Surveys**). Overall, the employment profile is predominantly full-time, male, 36 to 45 years of age, experienced and educated. The employment population is fairly diverse, with many females, members of diversity groups (aboriginal, visible minority, disabled) and employees hired from outside of Canada.

Supply chain employees work in all geographic areas within Canada, but tend to be most concentrated in Ontario, Quebec, Alberta and British Columbia.

Occupations

The sector covers a wide variety of occupations. Results from the study indicate that, generally, employment across all sub-functions of the supply chain is expected to either remain constant or grow, with particular emphasis on warehousing operational positions and logistics information systems tactical and operational positions.

The results of the employee survey also suggest a prevalence of the following emerging positions dedicated to the supply chain sector: instructor/trainers; sales, marketing and account managers; sales representatives and coordinators; and corporate service occupations with a supply chain management focus/specialization e.g., Finance, Human Resources and Information Technology positions.

Skills and Education

Skill requirements do not vary significantly by company size or region, which suggests that supply chain employees can move between regions with some degree of ease.

Employers indicate that communications and analytical skills are a requirement for all occupation categories across all sub-functions. Other common skill requirements include technology, interpersonal and customer service skills.

The majority of employees report having the priority skill requirements identified by employers. Employees also identify another set of skills that they feel they require much more of either now or in the next five years in order to be successful in their jobs. These skills and knowledge include:

- Financial planning
- Forecasting
- Cost analysis
- Knowledge of international business practices
- Knowledge of laws and regulations
- Knowledge of logistics functions and the supply chain
- Mechanical skills
- Optimization of workflow
- Knowledge of transportation
- General management and business
- Languages

An emphasis on broader business, financial and logistics/supply chain skills and knowledge is noted.

The following emerging skill requirements were highlighted by employees and employers.

Skills/Competencies by Occupation Category

Managerial	Tactical	Operational
<ul style="list-style-type: none"> • Contract administration and management • Regulatory knowledge • Negotiation skills • Vendor relations/management • Performance measurement and quality management • Knowledge of currency markets and business implications, especially for purchasing/procurement managers • Emerging emphasis on process and change management skills • Ability to work globally (e.g., working with other cultures) 	<ul style="list-style-type: none"> • Analytical capability and process improvement (e.g., pending shortage of business analysts) • Systems applications and related knowledge • Regulatory knowledge • Planning and forecasting skill sets and process knowledge • Ability to seek out opportunities for cost savings and process improvements 	<ul style="list-style-type: none"> • Process and systems knowledge • Data collection and systems input capability • Continued manual ability • Customer relationship and communication skills/competencies • A number of operational employees indicated a concern that they are generally not receiving business and analytical/problem solving training • Also a concern that supervisory staff need ongoing supervisory training, and in large part, do not receive it • However, occupational health & safety training deemed to be very strong across most companies/organizations

Companies have generally developed skill sets internally. While there is an emerging trend to source entry-level planners, schedulers and analysts from universities and colleges, new graduates still require on-the-job training and experience.

66% of employers suggest that higher education with a logistics/supply chain management or related major is essential when considering new recruits. A comparison of employee education requirements identified by employers to the current education level of employees reveals that:

- A small proportion of supply chain managers possess an undergraduate degree, while the majority of employers require it for that level; and
- Tactical and operational employees tend to possess a higher level of education than the minimum required by employers for their levels.

A minority of employers indicated that certification was required. Employer responses suggest that certification is more desirable for managerial roles, with PLog and CITT being the most common. This is consistent with the most common certifications held by employees, with CITT being the most prevalent amongst all occupational categories (i.e., managerial, tactical and operational). Approximately 20% of surveyed employees possess a supply chain-related certification or designation. Overall, certification is viewed as an asset at the managerial and some tactical levels, and there is no apparent consensus as to a preferred certification.

Employee Engagement

Although satisfied, employees have a less-than-ideal commitment to the sector/profession. Overall, employees indicate that they are satisfied with their jobs and would recommend employment in supply chain management to others. However, the workforce does not appear to be committed to their current employers and, to a lesser extent, the supply chain sector in general. Common reasons cited for potentially leaving the sector include promotion/career growth; new opportunities, challenge or need for change; job stress and pressure; and compensation.

Demand and Supply of Supply Chain Talent

Demand for specific supply chain positions is predominantly expected to remain constant, with some growth predicted for positions in logistics information systems tactical and operational, warehousing operational, customer service tactical and transportation operational.

There was an overall increased reliance on knowledge-based positions (e.g., technical logistics knowledge, information technology knowledge, supply chain specialists) and customer service positions (sales, customer service, client management). Manager-level positions were commonly cited as difficult roles to fill (e.g., functional managers, general managers, project managers, etc.), with supervisor and analyst roles also identified as a challenge. Examples of specific jobs identified as difficult to fill include:

- Inventory (e.g., inventory analysts, planners, managers);
- Purchasing (e.g., purchasers, contractors, buyers);
- Logistics and supply chain specialists (e.g., supply chain and logistics analysts, planners and engineers); and
- Warehousing and operations (warehouse supervisors, managers, general warehousing and operational personnel).

Positions are typically filled from within the current sector-wide pool of supply chain employees, either through internal development and promotion or through the acquisition of supply chain employees from other organizations.

Employees leaving the workforce due to retirement do not appear to be an eminent challenge, as the most common age category for study participants was 36 to 45 years of age, with only 5% of the study participants being over the age of 55. However, a large number of employees indicate that they would consider leaving the supply chain sector, indicating that demand as a result of sector retention is a potential risk.

Other sources of supply chain talent currently being accessed include immigrants, who constituted approximately 20% of the Canadian workforce in May 2001 (**The Changing Profile of Canada's Labour Force (2001 Census: Analysis Series)**), and new graduates, of which over 90% of supply chain-related program graduates find employment in the field after graduation.

With stable and growing workforce demand, there is a need to attract new people to the supply chain sector, either new workforce entrants or experienced employees from other sectors or countries. The main efforts in this regard will focus around attraction, as academic institutions indicate that they have capacity in their supply chain-related courses and have difficulty attracting students to this area of study, the proportion of immigrants in the workforce is growing, and the Canadian employment participation rate is expected to increase in 2005 and 2006 (according to Conference Board of Canada's **Economic Forecast – Canadian Outlook (Spring 2005)**). The challenge will be to compete for attention in an environment where other sectors and industries have already, or are about to, initiate awareness and recruitment campaigns to address their talent shortage.

Sector Growth

The annual revenue growth rate of the supply chain sector was 5.8% from 1991 to 1997 (according to **Logistics and Supply Chain Management – Overview and Prospects**).

Growth in the supply chain sector is often the result of:

- Increasing strategic importance of the supply chain within organizations, driven by globalization of markets and a focus on cost reduction.
- Growth across industry segments that employ supply chain management either in-house or through the use of 3PLs.

Sectors experiencing economic growth (e.g., resource-based sectors such as oil and gas) will have a commensurate need for managerial leadership and tactical specialists in supply chain-related roles to lead and execute the increased logistical requirements to meet increasing demand.

In the end, the growth rate of other industries, especially logistics-intensive industries, drives growth rates for the supply chain sector. 3PL growth is also a reflection of the increasing sophistication of supply chain needs, as organizations employ and leverage experts.

Overall, the supply chain sector workforce is expected to grow annually by approximately 1.7% as a result of new job creation. Additional supply chain sector employees will also be required to fill existing positions that are predicted to become vacant as a result of retirements and turnover.

Based on the current sector population, the total annual demand for employees to fill new jobs, as well as anticipated vacancies resulting from retirements and turnover, is estimated to be approximately 86,330 employees annually, or 12.3% over the next three to five years.

While the overall growth rate is not dissimilar to the anticipated Canadian growth rate of 2% for 2006 (according to Conference Board of Canada's **Economic Forecast – Canadian Outlook (Spring 2005)**), what is different is the overall mix in type and nature of the roles and skills expected to be required. There is an increasing reliance on knowledge workers with business and technological skills, in combination with general supply chain knowledge and, in some cases, very specific knowledge/experience (e.g., freight forwarding, procurement). Specifically, it is anticipated that there will be increased demand for:

- Strategic business managers who can work at the executive table and lead and represent an increasingly important business function with a broad understanding of both the entire supply chain and business;

- Supply chain specialists, including planners and analysts, who can help run increasingly complex and strategic supply chains, through the use of new technologies, information management and understanding of all supply chain components, in order to meet increasing customer demands and cost pressures;
- Logistics information systems positions (e.g., systems and data); and
- Supply chain-specific customer/client-focused positions (e.g., in sales, account management and client management).

In order to meet future demand for skilled labour, the supply chain sector will need to broaden its workforce supply beyond the existing sector and invest in awareness and education initiatives.

Education and Training

Employers indicate that technical development courses are essential for supply chain personnel to stay current. The most common means of employee development are on-the-job training and external courses. For the most part, employees indicate that they are satisfied with the training they have received and that it has met their needs.

Generally, effective training investments, greater than the Canadian average, are made across the sector; however, investment in smaller organizations is less than optimal. The most common forms of support provided to employees are tuition reimbursement, time off for external courses and the provision of in-house training. Work/study programs for supply chain employees are not widely used; however, all types are employed to some degree.

Internal training tends to be focused on technical supply chain and logistics development, interpersonal and people management skills (e.g., supervisory skills, team building, negotiations, leadership and coaching) and health and safety.

Colleges were more likely to offer dedicated logistics or supply chain management programs than the universities, and universities were more likely to offer a logistics or SCM specialization within another program. Industry alliances are a common mechanism to develop curriculum or work programs, and are less common for research activities.

There are mixed views from industry as to the usefulness of certification and specialized educational programs. While there are several courses and programs related to logistics and supply chain management being offered, approximately half of employer respondents indicate that technical training courses that meet the needs of supply chain personnel are difficult to find, and 40% indicate that professional development courses are difficult to find. Just under half of surveyed employers indicate that recent graduates of supply chain programs have the required skills to meet job requirements.

Despite employers indicating that finding required skills is a challenge, academic institutions indicate that they are offering content related to employers' main skill requirements. Perhaps the discrepancy is a reflection of the content within these areas that is being delivered (e.g., applicability, up-to-date, relevant tools, etc.) and the extent to which employers are aware of the educational programs that are available.

The majority of academic institutions indicate that demand for logistics courses appears to be increasing. All surveyed academic institutions reported that they had sufficient capacity to meet demand. The most common challenge faced by academic institutions in meeting increased demand is hiring sufficient qualified instructors.

Both employers and associations had mixed opinions as to the need for, and value of, a standardized national certification program for the sector. Some association programs that focus on a specialized technical area of the supply chain have recently been revised to include a general overview of logistics/supply chain management. While it is desirable for sector employees to have a basic understanding of most supply chain functions, there is also a need for specialized technical disciplines.

In summary, while there appears to be no shortage of sources of skill, education, and professional development opportunities, they are fragmented and not optimally aligned. There is agreement that there are a myriad to choose from, with no clarity as to the criteria to consider in selecting the most appropriate combination of formal education and professional development or certification. Employees and academic institutions are collectively of the view that they respectively have and are producing the core skills required by employers, while employers are not convinced that the content of some curricula addresses immediate and longer-term sector needs. There is also a concern that academic institutions may be under-funded and lacking qualified instructors to meet emerging demand.

Human Resources

Interview and survey results from industry participants indicate the following to be the main human resources issues facing the supply chain sector:

- Attraction;
- Education and training;
- Keeping pace with technology; and
- Succession and career planning.

Lack of a career path and succession planning are the most commonly cited human resources challenges, and there is an increasing need for succession and career planning. In terms of career progression, employers typically develop from within or hire experienced employees from other organizations. Most college graduates start employment at the tactical level, and university graduates at the supervisory/managerial level. The majority of positions held by employees, either with current or former employers, were in the supply chain field and, typically, operational and tactical employees hold an individual position for one to five years with their current organization.

Average base salary rates, as reported by employees, are comparable with other indicators of base salary compensation, considering related statistical error, and are good indicators of base salary compensation value across the broader supply chain sector. Only roughly a quarter of employers indicated that competitive total compensation is currently a challenge. While some salary differentials are observed between genders, they may be explained in the context of education, overall workforce composition, experience and job tenure.

Keeping pace with technology and the related challenges of information management is a common employer challenge. In contrast, employees indicate they receive adequate training to allow them to use technology. Continuous technological change contributes to human resources challenges (e.g., change management, job redesign, new skill requirements).

Attraction and Retention

Given that attraction is one of the most common human resources challenges being faced, and is expected to persist as such over the next five years, it is not surprising that employers also indicate encountering a variety of recruitment issues. The most

common recruitment issue facing employers is finding employees with the skills required. This may be compounded by other common challenges, which include competition for resources, and lack of awareness of/interest in the supply chain sector.

Similar challenges are faced by organizations regardless of size, with organizations identifying 'finding employees with the skills required' as the most significant challenge. Manager and supervisor positions are commonly cited as difficult roles to fill, particularly employees with general managerial skills.

There is an urgent need to attract new qualified resources, as the current internal growth and development strategy is no longer providing a sufficient pool of qualified resources. Attraction to the supply chain sector is a function of interesting work, opportunity to solve problems, opportunities for learning and growth, diversity of tasks, and the role of the supply chain in an organization or industry.

Retention is anticipated by employers to be one of the main human resources issues, especially given that employees within the sector appear ready to explore new opportunities both inside and outside of the supply chain. The supply chain employee population is predominantly between the ages of 26 and 55. The risk of losing knowledge and experience as a result of retirement is not necessarily a pressing human resources challenge; however, strategies to develop the next set of leaders and to ensure a transfer of knowledge and experience are receiving more attention. The few employers making use of retention strategies are most commonly providing a career path and flexible work schedules.

Recommendations

Recommendations for consideration are structured according to the following five categories:

- Sector governance;
- Training and development/education;
- Marketing the sector and the "profession";
- Policy implications for governments; and
- Human resources processes and practices, both for sector-wide application and for small and medium-sized organizations.

The first four categories comprise sector-wide recommendations that address issues of common concern. The last category, Human Resources Processes and Practices, contains recommendations that apply across the sector and others that may be of particular interest to small and medium-sized organizations. While many of the large organizations consulted during the course of this study have defined human resources strategies and programs (and, in some cases, demonstrate best practices), this is generally not the case for small and medium-sized organizations. Accordingly, recommendations that address the specific needs of these organizations have been developed.

Sector Governance

1. Given the fact that the supply chain sector is rapidly becoming strategically important to most organizations across all industry sectors, and that it is a highly fragmented and disparate sector, it is recommended that a nationally focused integrating mechanism or sectoral forum be created. This integrating mechanism could take the form of a human resources sector council.

The council must be unbiased and provide for full stakeholder access, and be national in scope, industry-driven and market-focused. Governance composition would ideally include representatives from all key stakeholders and provide for regional participation.

Its initial mandate would be to articulate and implement a broad-based human resources strategy, including a national awareness campaign, for the national sector taking into account the needs of small, medium-sized and large Canadian organizations.

This initiative will likely require government funding to initially capitalize and commence operations. With strategic and tactical success realized in the first one to two years, a combination of government funding and employer membership (and supporting fees) would be used to finance ongoing operations over the mid to long term.

There is also an opportunity to expand the council's mandate in the future beyond human resources, taking on a broad secretariat function, forum for sectoral learning and growth, representation and leadership on issues and initiatives of common interest.

The risks associated with not acting upon this recommendation are simply continued strategic fragmentation, less-than-optimal integration of stakeholder interests (e.g., across private- and public-sector employers, educational institutions, professional associations, unions, shareholders and governments), and further diminished market awareness on the part of future workforce participants as competing industries aggressively promote their brand and employment opportunities. Accordingly, many of the subsequent recommendations are contingent on the establishment of a sector council.

2. As highlighted in this report, the supply chain is being significantly impacted by a dynamic regulatory environment in Canada and internationally. Accordingly, there is a need for more meaningful government/industry collaboration to ensure that government practically understands industry needs and that industry can be in a position to proactively stay abreast of anticipated and current regulatory developments. Government and industry relationships may also lead to the development or strengthening of public/private partnerships to further advance the sector.
3. There is also a need for ongoing collection and monitoring of labour market information for the supply chain sector in order to identify and understand changes, impacts and sector trends. This information may be employed to establish priorities for such items as the recognition of foreign credentials, development of essential skills, the creation of occupational standards and career awareness activities. This information will be essential for the supply chain sector to develop strategies to compete with other sectors that are increasingly taking a more proactive and aggressive approach to promote career opportunities and to attract similar talent and skill sets that are of interest to the supply chain sector.

Training and Development/Education

4. Again, assuming the creation of a sector council to integrate and promote a multi-stakeholder human resources strategy, it is recommended that this council initiate an effort to clarify and communicate educational and certification options within the sector. To facilitate this, it is recommended that a national integrating entity, possibly the sector council, create an informational repository of post-secondary academic programs and industry association certifications, and implement an enabling marketing strategy to provide web-based access and promotion to all of interest. Accessibility should be maximized by offering information in multiple languages and ensuring both urban and rural access.
5. Given the nature of supply chain management, and the growing complexity of the sector, there will be continued demand for specialist training and development in supply chain specializations (e.g., purchasing, customs). In order to minimize the fragmentation that many diverse offerings within a sector create, it is recommended that associations collaborate or partner to some degree to consolidate and deliver a common foundation upon which to build a specialization. Further, and as is the case between most universities and with some professional associations (e.g., CICA), that reciprocal arrangements and cross-recognition of certification standards and common bodies of knowledge be developed. This will serve to simplify the current array of fragmented and varying degrees of duplicative offerings and standards in the eyes of prospective applicants and candidates, and begin to create a common supply chain training and development “platform” for professional certification and recognition.
6. Assuming implementation of Recommendation #1, it is recommended that more effective coordination between post-secondary academic institutions and industry be encouraged and facilitated to determine, update and validate course/program content. While some localized best practices were noted, industry is not convinced that post-secondary programs are addressing content needs as well as they could. There is a need for industry or research group(s) to identify anticipated sector changes (e.g., international/globalization) and to have a forum or mechanism for feeding this information back to the appropriate stakeholders for incorporation into educational curriculum design.
7. Building on Recommendation #2, and supporting the delivery of Recommendations 4 to 6, there is an opportunity to develop or leverage stronger partnerships within the sector across various types of stakeholders (e.g., industry, associations, academia, governments). In this regard, there should be additional interaction and collaboration with academic institutions, for instance:
 - o Technology service providers and academic institutions need to collaborate to ensure adequate and timely education/training of emerging technology skill requirements;
 - o As noted earlier, colleges and universities (in the context of creating an integrated and common “professional platform”) need to collaborate to more effectively cross-reference and recognize credits and standard offerings for those employees and students who may need to be geographically mobile;
 - o Academic institutions should work with industry to increase the availability of work/field placements for students and to increase initial employment opportunities in the supply chain sector;
 - o Programs should be developed to address curriculum development and develop instructors; and
 - o Creative public/private partnerships should be employed to leverage and share existing practices and knowledge (e.g., between large-scale government institutions and industry).

It should be noted that some current best-practice partnerships have already been formed and may serve as potential models or success stories to encourage others (e.g., the Laurier Institute and its respective industry relationships). In order for these relationships and partnerships to develop, some or all stakeholders (e.g., industry, associations and government) need to promote the concept and provide incentive for this to happen. In addition, since education is governed provincially, there may be a role for the sector council to liaise with provinces in this regard to promote a much-needed national approach.

8. Building on a select number of best-practice examples, it is also recommended that those post-secondary institutions (in collaboration with industry) that envision themselves as emerging centres of expertise/excellence in local, regional or national marketplaces appoint functional or departmental heads and expand their proactive liaison with industry.
9. In the interest of developing a broader supply chain managerial cadre and addressing the current demand for strategic and managerial skills, more advanced professional/managerial training should be made available that will develop skills such as information management, change management, strategy development and relationship management.

Marketing the Sector and the "Profession"

10. In order to address current attraction challenges and the low awareness levels of the supply chain sector and its career opportunities, there is a need to better educate and promote the sector in target marketplace segments, with particular emphasis on those making career and education decisions (e.g., students and those interested in changing careers). Delivering this type of promotion to attract new talent will require national infrastructure, perspective, coordination and funding. Again this is another potential area of responsibility or role for a sector council. Some specific areas of focus for inclusion under this initiative include:
 - o Clarifying and communicating the definition of the supply chain sector, as well as its sub-functions and occupations.
 - o Stimulating stronger awareness and, more importantly, demand for education within the business community.
 - o Marketing potential career paths and longer-term career opportunities within the sector. Articulated career paths will support a number of human resources programs: for example, recruitment (prospective candidates and workforce entrants will see that the supply chain sector offers more than just a job and that a career is possible), learning and development (to identify gaps to be addressed through training), and succession planning.
 - o Working with career advisors and influencers, such as Career Services within universities and colleges, high school guidance counselors, associations (e.g., Canada Career Consortium, Canadian Association of Career Advisors (College and University)) and HRSDC career centres.
 - o Engaging alumni of post-secondary supply chain-related programs and association certification programs to promote employment opportunities and to encourage employers to develop field placements/work study programs and entry-level job opportunities.
 - o Increasing the focus on awareness activities directed at high school students to influence decisions related to post-secondary career and education. These awareness initiatives should include the use of interactive on-line tools aimed to engage youth.
 - o Building on the current practice at some locations, whereby intermediate-level students, in grade 8 or 9, are provided an opportunity to experience a week at a college or university during which they are exposed to potential areas of study and career options.

11. It is noted that the general lack of knowledge and understanding of the supply chain sector goes beyond students and career changers. It is suggested that a broader awareness and education campaign targeting, and in partnership with, specific stakeholders (e.g., Industry Canada, Regional Economic Development sections of local Chambers of Commerce) would be beneficial to increase appreciation for the diversity and complexity of the supply chain and its significance, not only as a business imperative but for its impact in effectively delivering on social and quality-of-life responsibilities (e.g., disaster-relief projects). While the initial focus of a sector council may be on human resources-related initiatives that are directed at attracting, retaining and developing talent, a broader mandate is also appropriate.

Policy Implications for Governments

12. With international hiring becoming more important, there are implications for government immigration policy and the recognition of foreign credentials. In this regard, there may be a role for government in facilitating the mobility of employees for Canadian companies operating internationally. Government assistance would serve to facilitate the competitive growth aspirations of Canadian companies.
13. With the exception of a few examples (e.g., Ivey School of Business, HEC, Van Horne Institute), industry/education alliances for the purposes of applied management research are not prevalent. Government promotion of research funding programs and mechanisms needs to be enhanced. One possibility would see increased involvement and collaboration from academia, Industry Canada, municipal and provincial governments and a sector council to create a Canadian Research Centre with regional centres of expertise (e.g., in Halifax, Montreal, Toronto, Calgary and Vancouver). Such focus would serve to enhance “thought leadership” and contribute to building a stronger employment brand in the marketplace. This Canadian Centre could also create alliances with other supply chain research centres, such as the Georgia Institute of Technology (U.S.), to provide research that capitalizes on the unique attributes of supply chain management in Canada and in conjunction with our most significant trading partners/parties.
14. Given the scope, complexity and cost of strategic investments in such things as recruitment/staffing, IT systems development and international marketing, many small and medium-sized businesses are challenged to identify and implement contemporary practices and related management protocols. As such, government advisory entities need to be more effectively identified and promoted in the marketplace as a source of information for such things as talent sourcing (recruitment) in foreign markets, small-business technology tool-kits, and export and financing advice.

Human Resources Processes and Practices

Sector-wide Recommendations

15. It is recommended to develop supply chain-specific occupational standards (e.g., tasks and skill sets) that will then set the standard for the development of educational curriculums applicable to the needs of supply chain occupations. National Occupation Classification (NOC) codes should be reviewed to eliminate those that are no longer valid and add new ones based on new and emerging supply chain jobs (e.g., logistics managers, supply chain analysts, marketing and sales specialists, and trainers). A sector council would be a good source of subject-matter expertise to assist with this review.
16. Given that sector organizations are at different stages of human resources strategy sophistication as a result of their maturity, business strategy and model, their ability to execute human resources solutions varies, despite the fact that the human resources challenges they encounter may be similar. To facilitate the development of better human resources practices across the sector, it is recommended that “best-practice information sharing” mechanisms be created. For example, a sector council could gather and promote, through its website, best-practice human resources processes, practices and tools. Having access to human resources best practices or services for the supply chain sector would be of particular benefit to small and medium-sized organizations.
17. With a sector council as a catalyst (Recommendation #1), it would be ideal if an industry-sponsored mentoring program could be established in target geographic locales with a primary focus on advising and guiding the career interests of younger top-talent employees typically working in small or medium-sized organizations. An effective source of mentors could be retired supply chain professionals wanting to remain connected to the sector on a part-time basis. Program success would also be contingent upon company- or organization-specific commitment to provide employees with the time to participate in such meetings.
18. Based on the findings and observations presented in Module 5, it is recommended that all organizations examine their compensation policies, practices and processes to ensure that the principles of internal equity and pay equity are supported, and that compliance risks are mitigated. Further, and in the context of the growing strategic importance of supply chain management, and the fact that there is a relatively limited supply of both tactical and managerial competence, organizations in target geographical labour markets should conduct an annual market pricing review of internal/external total compensation practices and possibly consider supplemental base salary premiums for “near and dear” skill sets. This will serve to enhance retention and minimize the risk of losing supply chain professionals to competing interests for simply compensatory reasons.

Recommendations of Particular Interest to Small and Medium-sized Organizations

19. The findings of the study suggest that a more strategic approach to managing human resources in the sector is required. With the growth of the sector and the emerging focus on the supply chain function as a source of competitive advantage, it is increasingly important that individual organizations take a longer-term and more thoughtful approach to developing and deploying their current workforce and attracting new talent. The strategic nature and scope of an organization’s human resources strategy sets the context for the design, implementation and management of its enabling human resources policies, practices and systems, especially those that are deemed to be strategic and

proactive. It is recommended that organizations articulate a clear vision for people and organizational effectiveness and implement an enabling human resources strategy in the context of the organization's business strategy and economic foundation.

20. As noted in the findings section of Module 5, an emerging trend and opportunity for the sector is the growing number of new sector-specific occupations. Of primary importance in this regard is the emerging number of marketing, sales, account management, human resources specialists and trainers that are exclusively focused on the supply chain. This emerging trend provides employees with opportunities to expand their career beyond operational and tactical roles. Accordingly, it is recommended that organizations consider implementing more formalized human resources programs, such as job rotation, secondments and defined developmental projects, to create broader career opportunities for employees on the one hand, and to create greater breadth of knowledge and resource deployment flexibility on the other hand.
21. Consistent with identified best practices, it is recommended that, where practical, organizations implement a defined talent management program to identify critical supply chain positions and related high-potential employees, and then implement specific developmental programs to further expand the cadre of operational, tactical or managerial resource pools. In addition to being part of an effective succession and human resources planning strategy, this type of initiative will also serve to enhance organizational retention capability.
22. Organizational economics permitting, defined career paths, including skill and competency profiles, should be developed for operational and tactical employees. In this regard, existing best practices from academic, professional and employer organizations could be leveraged and shared.
23. In response to interest expressed by operational employees and given the increased emphasis on quality and customer satisfaction, organizations should consider developing education or information sessions for operational employees that will augment their understanding of the economics of the business and their role in this context. This would enhance employee engagement and, ultimately, performance by providing them with a line-of-sight and understanding of the broader supply chain.
24. Manager and supervisor positions are commonly cited as difficult roles to fill, supported by the fact that general managerial skills were identified as a current and future demand. Given this, and the need for 'career planning', 'opportunities' and 'succession planning', the development of managerial and supervisory skills should be a focus in order to provide employees with these opportunities and to fill future leadership roles.
25. In an effort to address a potential gap in leadership skills, organizations should consider a leadership development program in concert with succession planning efforts. A leadership development program regularly identifies and develops leaders and leadership competencies. Development programs should provide support, resources, information and learning opportunities that will systematically target and improve desired performance and behaviours. Typical program components include internal and external training programs, informal internal training (e.g., lunch and learns), mentorship, job rotations, stretch assignments, communications, information management and diversity management programs.
26. In addition to providing training to ensure that technology is used effectively and appropriately, organizations should ensure that a comprehensive change management program designed to support employees through technological change is in place. A comprehensive program typically includes a readiness

assessment of the target population to ensure that training, ongoing communications and technical support address the key areas of concern to support transition. Further it is recommended that organizations conduct a follow-up assessment to gauge the extent to which the technology is being employed effectively and as envisioned.

Implementation Considerations

There are two main areas for action to take these findings and recommendations forward:

- A. The governance and infrastructure for addressing these findings and moving forward with the recommendations. There is a need to establish a sector council and clarify its role and governance model, and assuming business case funding, strategic and tactical priorities.

In recognition that strategic leadership is a key success factor in addressing the human resources challenges facing the sector, industry roundtables demonstrated overwhelming support for creation of a sector council.

- B. Roll-out:
- Create a strategy to roll out and promote these findings and recommendations across the sector, starting with organizations participating in this study.
 - Develop appropriate communication and change management strategies to move this broad agenda forward.
 - Host a sector-wide symposium once the governance and infrastructural business model have been determined and established.
 - As part of a defined financial/funding strategy, develop appropriate business cases to secure funding and move the agenda forward.

Conclusion

The recommendations provided in this report essentially focus on the collective needs of an emerging and strategically important, but fragmented, sector in the Canadian economy and the micro-economic needs and opportunities that individual organizations can capitalize on to improve their related human resources practices and ultimately, their competitive position.

Fundamentally, however, strategic sector-wide progress (and enabling governance and infrastructure) will be the catalyst for both macro- and micro-economic development. The opportunity to make this progress happen will ultimately depend on the ability and commitment of key stakeholders to collaborate with each other and elevate and address the broader interests of the sector.

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