Exploring Trends in Sourcing Software Development – A Global and BC Perspective

by

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Abstract

Both internal and external sourcing have always been a mechanism for companies to augment their staff. Perhaps surprisingly, the approaches have similarities in their benefits and their challenges, especially when sourcing talent outside of country.

This project considers “to what extent does the BC Technology sector approach augmenting software development talent through sourcing and how does it align with current global trends?” This exploratory project looked first globally and then locally. A literature review provided insight into academic direction, theories and models of global outsourcing that have evolved during the last twenty-five years. The website review and industry related articles illuminated the current state of outsourcing and future trends.

Finally, the project utilized a survey to explore trends within British Columbia; whether sourcing was being utilized and the models being used.

As a result, new areas of study and opportunities for businesses to leverage sourcing have been exposed and discussed.

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Acknowledgement

Thank you to the staff at the BC Tech Association for providing valuable access to their database of British Columbia technology companies, and to all of the companies that completed the survey that contributed to this paper.

Introduction

In 2016, the BC Technology Association released the TechTalent Report, where it was predicted that by 2021, the Technology sector in BC would have 30,500 open positions. British Columbia is challenged not only by its expected needs purely from the growing industry, but also because it is susceptible to talent being recruited into companies in Seattle and California's Silicon Valley (BC Technology Association, 2016).

In order to remain an economically vibrant industry, a multi-tier approach to building the talent pool is required. In its report, the Vancouver Economic Commission (VEC) made a number of recommendations that were designed to improve recruitment of technology specialists (Vancouver Economic Commission (VEC), 2017).

The recommendations from the VEC Report do not identify sourcing as a viable talent strategy for the sector. This gap creates an interesting line of inquiry about whether the option of sourcing skills is a viable mechanism to contribute to addressing the problem of the talent gap.

This project explores how British Columbia based technology companies currently utilize sourcing as part of their talent augmentation strategy for software development staff and compares it to global trends.

Project Research

In order to complete the project, several steps were taken. First, sixty-five papers were reviewed. These articles were selected as indicators of the breadth of study regarding outsourcing. Among those papers, several literature reviews were included, which provided insight into even greater bodies of work. Within that mix, twenty of the papers were published

earlier than 2013 to help guide historical context. Because the focus of the project is to explore current trends, the remaining forty-five articles were published in the last five years. Reviewing these papers not only provided insight into the evolution of academic thinking in this area, but also where the greater focus appears to be within the industry as a whole.

Second, an environmental scan was conducted of eighty-one companies who engaged in providing outsourcing services. The purpose of this scan was to better understand the types of services that are being marketed to potential clients, the size of the companies offering the services and how they are positioning themselves in the market space. This market evaluation provides a strong basis for forecasting trends in the outsourcing industry.

Finally, to better understand the British Columbia context, a survey was conducted that focused on the extent that companies are sourcing software development. The survey was sent to 334 companies who were identified as headquartered in British Columbia and who had product lines that had a software component or were managed through a software platform. Of those 334 companies, there were seventeen responses. As a result, additional information about the sector was gained and opportunities for further research have been identified.

Sourcing Talent

BusinessDictionary.com describes outsourcing as contracting out non-core activities (Outsourcing Definition, n.d.). Conversely, the same website describes insourcing as bringing those skills back into the organization (Insourcing Definition, n.d.). In reality, both insourcing and outsourcing refer to obtaining goods or services to augment current capabilities, with the key difference is whether the source is internal or external to a company.

During the course of this project, it has become clear that while the line between the two are sometimes clear-cut, often there are nuances that blur the lines between the two. For example, there are a variety of subsidiary, partnership and employment relationships that straddle the two definitions. Consider a dedicated team of developers who are hired, approved and managed by a client who are paid by a company solely contracted to that client. While there are some contractual issues that are more "outsourcing" than "insourcing", many of the characteristics would be better defined as insourcing.

As such, for the purpose of this project, the term "sourcing" refers to obtaining services from a source outside of a company's primary office.

Theory

It is important to understand the different motivations for a company to choose to engage in sourcing activities, because these motivations will influence the type of models that the company will ultimately choose. The external conditions, internal capabilities and corporate strategy are all factors in the decision making process.

From a corporate strategy theoretical perspective, the consideration of external conditions is an obvious place to begin to understand the motivations for choosing to source talent. External conditions include general environment, industry environment and competitive landscape. The general environment includes political, economic, demographic, technological, global and physical considerations (Hitt, Ireland, & Hoskisson, 2017). Political considerations could include the level of support through policy and taxation that a country is providing to a company that would encourage or dissuade them from increasing their permanent employees. Economic considerations could include the rate of inflation, interest rates and the strength of

currency. Demographic considerations would include the size and capabilities of the available talent pool. Issues such as available affordable housing would influence the available pool because less people would be able to live in the area.

Technological considerations would focus on ways that the existing talent pool can be augmented through technology as well as the availability of technology that would potentially make sourcing a viable option (i.e.: remote computer sharing).

The global environment is also an important consideration. The stability of foreign governments, policies regarding intellectual property and relationship between local and foreign governments are factors that would encourage or discourage companies from considering sourcing out of country.

The industry environment is also important to consider. Porter's five forces analysis include threat of new entrants, threat of established rivals, threat of substitute products, bargaining power of suppliers and buyers (Hitt, Ireland, & Hoskisson, 2017).The threat of new competition through new entrants or substitute products may influence a company's decision to source some work to speed up the development process. One model that takes that strategy to the extreme is the "Follow-the-Sun" model of development, where development centres throughout the world hand off their progress to another development centre at the end of their shift, thereby having 24 hour development (Kroll, da Silva, Bernardo, Audy, & Prikladnicki, 2014). For example, development centres could be in Brazil, Philippines and Ukraine.

Bargaining power of suppliers will influence whether there are greater costs to be gained by sourcing. Local suppliers may be very expensive relative to hiring employees or in

relation to offshore counterparts. Similarly, the bargaining power of customers may influence the optimal price for the product, and as a result require cost minimization to be competitive.

The organization's own internal capabilities become a component in determining whether to source. New technologies may require expertise not available in-house or the expertise may not be core to the business and may make sense to offload.

Finally, the corporate strategy has a large influence on insourcing decisions. Depending on the market space and strategic approach that they may choose to take, an organization may be more or less influenced to source their work. For example, a company that has a strategy of focusing on low cost, high volume products may see benefit in keeping costs low through sourcing work to lower cost countries. Conversely, a company whose strategy is to provide a highly responsive product for their customers may choose to keep their resources locally accessible to meet that demand.

There are several theories that examine decision making regarding sourcing. For example, Dunning's Eclectic paradigm suggests that the decision to outsource could be viewed through the lens of whether external factors make outsourcing a more cost effective solution than insourcing. This theory incorporates three factors that contribute to the decision; ownership advantage, internationalization advantages and location advantages (Dunning, 1988).

This paradigm has had its critics in recent years (Gerbl, McIvor, Loane, & Humphreys, 2015), suggesting that the indirect costs associated with outsourcing such as communication delays, misunderstandings and quality issues create unincorporated outsourcing costs. It does,

however provide a framework that reflects a cost driven organization's motivations for outsourcing.

The Transaction Cost Theory (TCT) provides some level of structure around the intangibles that appear to limit Dunning. This theory suggests that the decision to outsource or insource is based on governance. To explain, with outsourcing a decision would be based on marketing governance and insourcing would be based on hierarchical governance. The decision either way is built upon the costs of doing either, including human factors such as bounded rationality and opportunism, and environmental factors such as uncertainty, frequency and asset specificity (Mwai, Kiplang'at, & Gichoya, 2014).

Steensma and Corley (2001) discusses the Transaction Cost Theory, as well as two other Firm Boundaries perspectives; options and resource. The Options perspective views the decision to outsource through the threat of commercial failure. A company that is in a start-up phase my wish to outsource to keep their contractual risks minimal and flexible, whereas a company that views itself in a stronger position may choose to insource to maintain control of more aspects of the development (Steensma & Corley, 2001).

The Resource perspective views the decision through the opportunity perspective. In this case, the opportunity for growth may prompt a decision to outsource. A company that chooses to look at their organization through these strategic lenses would be exploring opportunities to reduce long term costs such as office space, and permanent employees, in particular for the activities that are expected to ebb and flow to market demand. To them, sourcing becomes an option that provides the flexibility that they would prize highly (Steensma & Corley, 2001).

A business that engages in strategic planning by looking at their core competencies may find that outsourcing is a mechanism to focus on their strengths and to utilize resources from elsewhere to accomplish non-core activities. This approach frames the decision to outsource based on whether a competency is considered core or create value (Hitt, Ireland, & Hoskisson, 2017).

Consider a company who sells magazines online. Their focus is selling magazines, but they need a platform to move their market online. To make up for their lacking technological know-how, their three different options would be developing the technology independently, acquire a company with the technology or enter into a technology sourcing agreement (Lambe & Spekman, 1997). Choosing to outsource the development of that platform enables the company to focus on their area of expertise; selling magazines. .

Sourcing Models

Once a company has made the strategic decision to augment their talent pool, the model that is chosen can be any combination of a number of factors.

Traditional models of sourcing include moving an entire function to another location. A typical example of this would be moving the manufacturing of a clothing line to China. In this case, the specifications (pattern, materials, and quality) are defined by the client, but the employees, equipment, sewing methodology and location are defined by the vendor or remote office. This sort of “black box” model is successful in some instances, however it does not easily transfer to more complex knowledge oriented activities.

As sourcing has become more prevalent as a business strategy, it is also apparent that it requires a more nuanced approach, as seen by the plethora of models that exist. With that in

mind, the factors that make up sourcing models will be discussed. These factors include type of activity, location, business relationship between the two parties, working relationship between the two parties and vendor employee status.

As we describe the different components of models, the term client will refer to the company head office, and vendor will refer to the entity (vendor, office, individual) who performs the work.

Type of Activity

In order to best understand the factors that affect the different types of activities, they have been divided into three different categories; task-based, project-based or function-based. Task-based activities contain clearly defined expectations. The workers involved in these activities are not required to have insight into the upstream or downstream parts of the process. An example of this could be processing accounts receivable payments. The A/R clerk does not need to know about the product, the sales process or the warranty specifications to do their job. Within software development, task-based activities could include performing quality assurance testing based on clearly defined criteria, where the testers are not required to understand what the code is for, but only whether it meets the specifications. Gerbl et al discusses that typically highly standardized processes hold low uncertainty requirements and are therefore easier to source remotely (Gerbl, McIvor, Loane, & Humphreys, 2015).

Project-based sourcing describes the vendor completing a client defined project. In these instances, there is an expectation of greater interactions and dialogs that would be required to complete the project. Within software development, the vendor could be tasked with creating an app. It could also include the configuration of an enterprise-wide system (i.e.:

SAP). This type of sourcing can also include a distributed development model, where part of the team is local and the other part of the team is sourced (Filho, Pinheiro, & Alburquerque, 2017).

Function-based sourcing involves the vendor taking over a functional unit of an organization. Examples of this include customer support call centres, software development centres and IT support centres. This is also known as Business Process Outsourcing (BPO) (Gerbl, McIvor, Loane, & Humphreys, 2015).

As the level of activities increase, not only does the level of complexity increase, but also the need for strong communication with the client. Additionally, the amount of knowledge transfer that is required for successful engagements increases. Gerbl, McIvor, Loane, & Humphreys (2015) describe the value of considering the level of requirements clarity and the level of knowledge transfer required when considering which model to utilize.

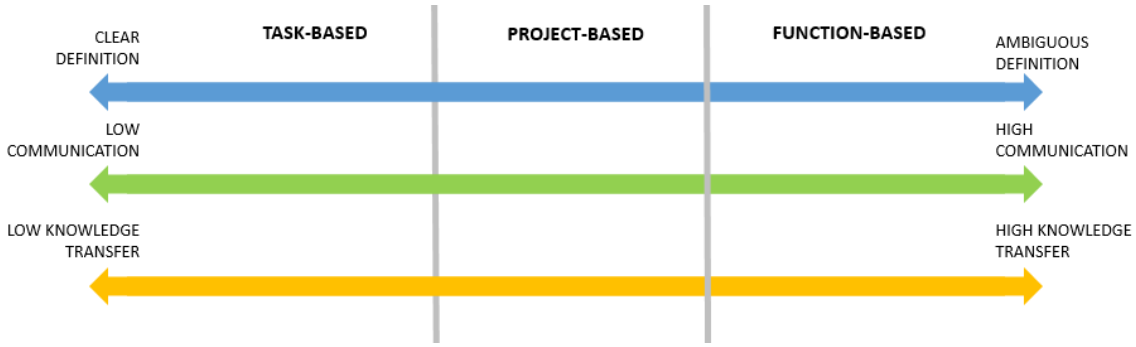

Figure 1: Activity Level Factors for Sourcing

Location

Location is an important consideration for building an appropriate sourcing model. These include local, onshore, nearshore and offshore.

Local sourcing describes activities that are performed within the same geographic region. For example, contracting a janitor to clean the office is a form of local outsourcing.

The same occurs when a consultant or contractor is procured to assist with a software development project. Relatedly, onshoring (or domestic sourcing (Manning, Larsen, & Bharati, 2015)) refers to procuring resources within the same country. For example, utilizing a consulting firm based in another province would be considered onshoring. Both of these location options provide maximum benefit from a cultural alignment and proximity perspective. There is a high expectation that the two parties can communicate effectively, that there is alignment of social norms and the education expectations are consistent. Additionally, the parties are more likely to have workday alignment so that they may have real-time interactions (Gerbl, McIvor, Loane, & Humphreys, 2015).

Nearshore describes sourcing performed within countries geographically and culturally similar to Western countries, including regions like Eastern Europe and Latin America. As such, countries such as Ireland, Spain, Portugal and eastern European countries such as Poland, Ukraine, Hungary and Bulgaria are commonly used for nearshoring services, especially within Western Europe. Within North America, Mexico, Costa Rica and Brazil are popular nearshoring destinations. Commonly, there is an expectation that communication will be strong because of common language and social norms. The proximity to the client means that there is an expected period of overlap in the work day to have real-time conversations (Gerbl, McIvor, Loane, & Humphreys, 2015).

Conversely, offshore sourcing is defined as services performed in Asia (including the Indian subcontinent) and Africa. These locations are considered more culturally disparate from western countries. As well, the time zone differential means that there are less periods of overlap for real-time communication. Cost savings become a primary motivator for offshore sourcing decisions (Gerbl, McIvor, Loane, & Humphreys, 2015).

Distance (from the perspective of time zones), language and cultural compatibility are three key variables in the definition for location. It is important to consider that location based designations are relative to the individual company. For example, India may be considered an offshore location by a company in Canada, but a nearshore location by a company in the United Arab Emirates. Schuster and Copeland (2008) discuss grouping countries based on their cultural alignment, which further contributes to this idea of relativity.

As a factor of location definition, language is an important one. Countries that have a large number of English speakers are going to be considered easier to communicate with than countries that are less likely to learn English, for example. It could be argued that because India has English as one of its official languages, language compatibility may not be an issue. The fact that the location has minimal workday overlap and there is a high cultural differential would still keep it as an offshore location relative to Canada.

Cultural alignment is a key factor in the determination of type of location. Hofstede's Cultural theory utilizes the framework of five cultural dimensions that provide a framework for considering cultural alignment. Power distance refers to the level of hierarchy. For example, Iceland has a low power distance (everyone knows the Prime Minister), whereas North Korea has a high power distance. This becomes a challenge in business when there are differences in "chain of command". A manager might become offended by being approached by a team member, for example. Uncertainty avoidance refers to the level of comfort in a culture with ambiguity. The level of individualism and collectivism in a culture are seen in behaviours of teamwork. Masculinity and femininity refer to the attitudes regarding equality between the genders (Hofstede, 2001).

Each of these dimensions will influence the behaviours and success of a sourcing interaction. For example, Bagchia, Kirsa, Udoa, & Cerveny (2015) describe in their findings that quality was impacted when there were differences in uncertainty avoidance and individualism/collectivism between the two.

Finally, cost is a factor in determining the location for sourcing. Local vendors are likely to charge as much or more than individuals employed with the client. Rates for work reduce substantially as the work moves more offshore. This must be considered within the larger context however, as work rates are not the full picture of costs with offshore locations. Indirect costs stemming from cultural and communication issues may increase the overall cost through quality and time (Gerbl, McIvor, Loane, & Humphreys, 2015).

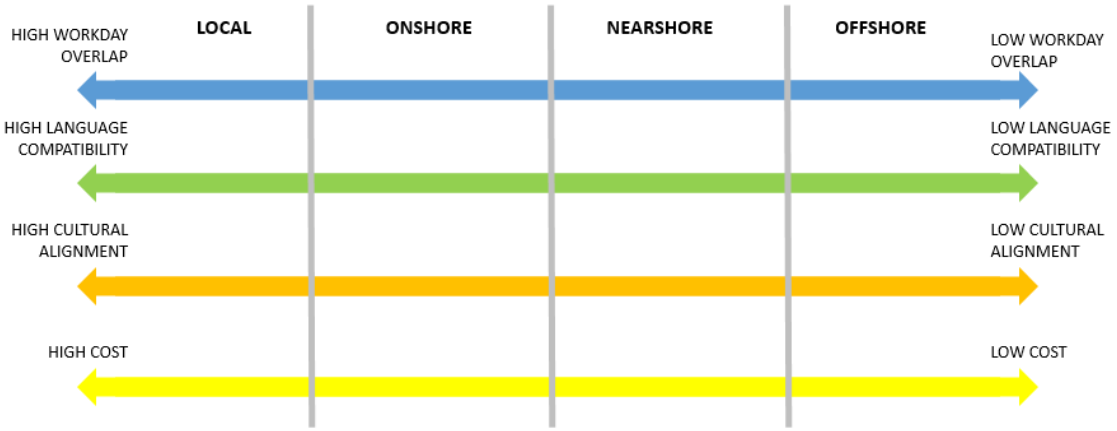

Figure 2: Location-based Factors for Sourcing

Business Relationship

The business relationship between the client and the vendor factor into the sourcing model. These relationships can be outsourced, insourced, or some level of partnership between the companies. These relationships are not always so straightforward. For example, one company may be a subsidiary of another. Although they are related under the same corporate

umbrella, they may be legally distinct. Alternatively, a vendor may have an exclusive relationship with the client, and as such their resources are completely dedicated to the client.

Factors that influence the definition of business relationship include the legal relationship with the client and the level of sole commitment to the client. The legal relationship refers to how legally bound the client and vendor are to each other, where the commitment of the vendor to the client refers to the level of exclusivity. As these factors become more legally bound and more exclusive, they become closer to becoming defined as insourcing. For example, some companies offer "staff augmentation" services, where they hire and house individuals within their organization. (see

Appendix 1: Global Website Scan – List of Companies, 3,9,12,20,26,33,36,37, 39, 40, 46, 48, 49, 52, 56, 71) The client is involved in the selection and interview processes, however the individuals remain employees of the vendors although they are sole-sourced to the client. While not legally employees of the client, the relationship of those individuals very much of an employee/employer model.

Figure 3: Business Relationship Factors in Sourcing

Working Relationship

Outsourcing models are also defined by the type of working relationship that the client and vendor have established between each other. These can be defined by integration and engagement factors.

Integration factor refers to the extent that the vendor's team is integrated with the client's team. For example a low integration relationship is a vendor who has a separate team and project manager. A higher integration relationship may have a client-based project manager leading a vendor team.

Engagement factor refers to the level of engagement that the vendor's team has with the client's team. A low engagement relationship example involves a vendor who communicates to the client through a relationship manager or project manager, but the project team remains anonymous to the client. Conversely, a high engagement relationship involves the vendor's project team communicating freely with the client teams.

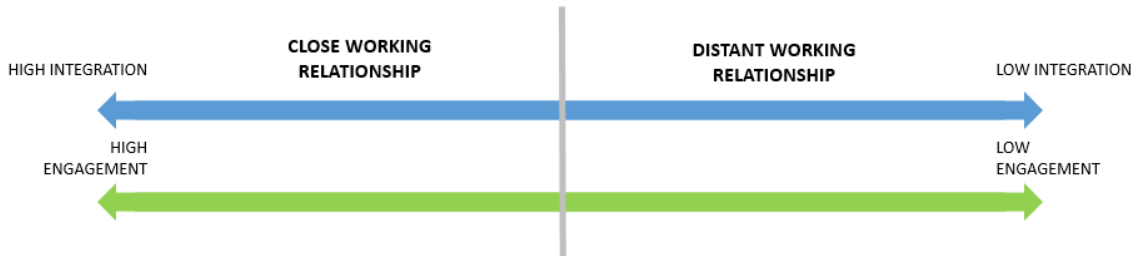

Figure 4: Working Relationship Factors in Sourcing

Vendor Employees

Finally, it is important to recognize that the vendor status is also a contributor to the sourcing model, importantly whether the vendor is an individual or a company.

When the vendor is an individual who engages with the client as a freelancer, there are different considerations that must be made. For example, a client would want to ensure they understand considerations within employment law, especially if they are engaging with someone from another country with different laws (Graham, Hjorth, & Lehdonvirta, 2017).

Comparatively, the vendor can be a company that employs individuals for the work. With the growing awareness of "sweat shops" and holding clients accountable for the conditions maintained by the vendors, this also becomes a consideration in the outsourcing model developed.

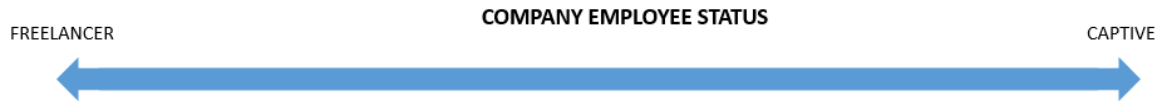

Figure 5: Employee Status Factors in Sourcing

Global Trends in Outsourcing

Outsourcing has moved through several phases since it became a viable strategy for organizations. The first big push regarding outsourcing focused on manufacturing. This wave was made possible through greater openness with countries within Asia, and was primarily driven by the low cost of production.

While outsourcing actually began in 1979 when American Express outsourced the accounts receivables functions to Tata Consultancy Services (TCS) (Agrawal, Goswami, & Chatterjee, 2010), the second wave of outsourcing became apparent in the early 1990s when countries such as India engaged in economic liberalization, essentially becoming more open to outside corporations entering their economy (O'Neill, 2011). In addition, technology and an ever-widening umbrella of regular Internet access brought forward greater opportunity to leverage countries with large educated populations, such as India and China. Early initiatives

included the development of the Software Technology Parks of India (STPI) Corporation, which bypassed the nationally controlled infrastructure through expansion of satellite link capabilities (Shelke, 2012).

Similarly, other countries experienced opportunities with the democratization of economic structures. In Eastern Europe, the dismantling of the USSR created the space for countries such as Ukraine and Belarus to engage in outsourcing supply activities. Changes to Chinese policy, especially with regards to technology had a similar effect. During this transformation of economies and the explosion of available talent, the popularity of outsourcing also surged, with the promise of moving service processes such as call centres, financial transactions and information technology to cheaper locations (Hill & Hult, 2018).

Literature Review

The purpose of the literature review was to gain a further understanding of the direction of the academic focus that has occurred regarding sourcing. Overall sixty-seven articles were reviewed for the project. Of those, twenty-two were written prior to 2013, while the remaining forty-five were written later than 2012. The intent was to observe the evolution of the field of outsourcing.

Early Literature

The literature from the period of the second wave of outsourcing focuses on early building blocks of understanding regarding knowledge based outsourcing. Liang, Wang, Xue and Cui (2016) identify twelve themes that emerged from an intensive literature review between 1992 and 2013. These themes include (in order of chronological appearance) Information Technology Outsourcing (ITO) motivations, ITO decisions, ITO risks,

Applicability to transaction cost theory, Client/vendor relationship, Vendor's perspective, Psychological and formal contracts, Application Service Platforms (ASP), Business Process Outsourcing (BPO), Open sourcing, Offshoring and Multi-sourcing (Liang, Wang, Xue, & Cui, 2016).

This body of work clearly demonstrates the evolution of perspective through academic papers. The initial papers focus on motivation, risks and most frequently decision making frameworks that drive the decision to choose an outsourcing strategy. Subsequently, the majority of the papers focus on the client-vendor relationship, which indicates that questions were being asked about the success of outsourcing as a strategy. It is only in the early 2000s that academic papers begin to focus on vendor perspectives (Liang, Wang, Xue, & Cui, 2016).

As the 2000s continued, new approaches and models for outsourcing are discussed, representing both changing outsourcing relationships and evolving technologies. These new models include ASP models, Business Process Outsourcing (BPO), open sourcing and multi-sourcing. In the later part of 2008, a considerable number of articles introduced a second wave of considerations for offshoring, including costs, cultural distance, innovation, knowledge transfer and boundary spanning (Liang, Wang, Xue, & Cui, 2016).

These early papers contribute to the narrative that initial outsourcing approaches were not always successful, and required expertise to become successful. In 2005, the International Association of Outsourcing Professionals (IAOP) was established to define and support the work of outsourcing professionals. Subsequently, the IAOP designation was developed for individuals to demonstrate their expertise in the field, and create a framework for successful outsourcing models (International Association of Outsourcing Providers, n.d.).

Original outsourcing models were heavily represented by development teams segregated from the client and managed by a project manager. The perspective appeared to be "all or nothing" – move all of the service department to an outsourcing model or not at all. Case studies such as referenced by Boden, Nett & Wulf (2010), Albertoni, Elia, Massini & Piscitello (2017) and Moe, Smite, Hanssen & Barney (2014) speak of failed attempts that appear to be driven by communication issues, cultural differences, power gaps and incongruent expectations

New technology in the latter 2000s and early 2010s such as social media, messaging technology, VPN and improved Internet connections continued to influence perception of the viability of outsourcing (Bailey, Leonardi, & Barley, 2012).

Further to the conclusions of Liang et al, the twenty-two early articles reviewed for this project demonstrate a focus on better understanding how to make outsourcing a working model. These articles focus less on new models, and more on better understanding and improving existing ones.

Category	**# Articles**	**Content**	
Team Dynamics	7	Virtual teams, team interdependencies, trust, media, attribution, social exchanges, informal communication,	(Shachaf & Hara, 2007); (Boden, Nett, & Wulf, 2010); (Maynard, Mathieu, Rapp, & Gilson, 2012); (Brandes, Dharwadkar, & Wheatley, 2004); (Bailey, Leonardi, & Barley, 2012); (Goo & Huang, 2008); (Jarvenpaa, Shaw, & Staples, 2004)
Knowledge Sharing	3	Knowledge transfer, knowledge gap, networks/knowledge pipeline	(Ramasubbu, Mithas, Krishnan, & Kemerer, 2008); (Bailey, Leonardi, & Barley, 2012); (Trippl, Todtling, & Lengauer, 2009)
Cultural sensitivity	2	Intercultural competencies, cultural theory	(Lloyd & Hartel, 2010); (Boden, Nett, & Wulf, 2007)
Decision making	2	Decision making models, articulation work, articulation theory	(Boden, Nett, & Wulf, 2007); (de Looff, 1995)
Outsourcing models	2	Offshoring, gig economy	(Prikladnicki, Luis, & Audy, 2010); (Bailey, Leonardi, & Barley, 2012)
Contracts	2	Contracts	(Boden, Nett, & Wulf, 2007); (Goo & Huang, 2008);

Development/delivery models	1	Development quality	(Ramasubbu, Mithas, Krishnan, & Kemerer, 2008)

Table 1: Literature review 1995-2012

The Team Dynamics articles contain discussions about power differentials between teams (local and outsourced), the importance of developing trust and social levels of engagement to have stronger virtual teams.

The Knowledge Sharing articles are an offshoot of the team dynamics. Building trust between teams opens up the knowledge flow between teams. This however is also dependent on the level of trust at the business relationship level, where companies choose to provide only a slice of information to the outsourcing vendor, thereby causing challenges for the vendor to make good decisions regarding their project.

Current Literature

The latter group of forty-five papers revealed a different focus in the academic direction that become apparent in more recent years. These articles tend to leverage the wealth of research that happened during the previous 15 years.

Category	**# Articles**	**Content**	
Outsourcing models	27	Outsourcing models, reshoring, offshoring, nearshoring, crowd sourcing, freelancing	(Chang & de Burca, 2016); (Bagchia, Kirsa, Udoa, & Cerveny, 2015); (Moe, Smite, Hanssen, & Barney, 2014); (Manning, Larsen, & Bharati, 2015); (Filho M. S., Pinheiro, Albuquerque, & Rodrigues, 2018); (Ibertonia, Elia, Massini, & Piscitelloa, 2017); (Moe, Smite, Hanssen, & Barney, 2014); (Clampit, Kedia, Fabian, & Gaffney, 2015); (Bass, 2016); (Zahedia & Babarab, 2016); (Meyer & Su, 2015); (Khan & Khan, 2017); (Khan & Azeem, 2014); (Betz, Oberweis, & Stephan, 2014); (Gerbl, McIvor, Loane, & Humphreys, 2015); (Clampit, Kedia, Fabian, & Gaffney, 2015); (Chang & de Burca, 2016); (Gerbl, McIvor, Loane, & Humphreys, 2015); (Manning, Larsen, & Bharati, 2015); (Nevoa & Kotlarsky, 2014); (Callaghan, 2016); (Mazza & Azzali, 2014); (Graham, Hjorth, & Lehdonvirta, 2017); (Wright, Wailes, & Bamber, 2017)
Decision making	9	Decision making models, transaction cost theory, dependency theory	(Mukherjee, Gaur, & Datta, 2013); (Bagchia, Kirsa, Udoa, & Cerveny, 2015); (Upadhyayula, Dhandapani, & Karna, 2017); (Mihalache & Mihalache, 2016); (Ibertonia, Elia, Massini, & Piscitelloa, 2017); (Gerbl, McIvor, Loane, & Humphreys, 2015); (Nie & Hammouda, 2017); (Zimmerman & Ravishankar, 2016)

Category	# Articles	Content	
Development/delivery models	10	Development models, task allocation, development quality, Agile, "follow-the-sun", creating value	(Nuwangi, Sedera, Srivastava, & Murphy, 2014); (Manning, Larsen, & Bharati, 2015); (Yu, Yin, Wang, Yang, & Wang, 2016) (Nie & Hammouda, 2017); (Filho M. S., Pinheiro, Albuquerque, & Rodrigues, 2018); (Ichinotsubo, Nakamura, Saga, & Tsuji, 2015); (Filho, Pinheiro, & Alburquerque, 2017); (Bass, 2016); (Kroll, da Silva, Bernardo, Audy, & Prikladnicki, 2014)
Cultural sensitivity	7	Impacts to developing country employees, intercultural competence, culture	(Graham, Hjorth, & Lehdonvirta, 2017); (Calefato, Lanubile, & Sportelli, 2013); (Clampit, Kedia, Fabian, & Gaffney, 2015); (Meyer & Su, 2015); (Khan & Azeem, 2014); (Betz, Oberweis, & Stephan, 2014); (Moe, Smite, Hanssen, & Barney, 2014)
Vendor Relationships	6	Vendor turnover, vendor perspective, client/vendor relationship	(Moe, Smite, Hanssen, & Barney, 2014); (Khan & Khan, 2017); (Khan & Azeem, 2014); (Nevoa & Kotlarsky, 2014); (Khan & Azeem, 2014); (Betz, Oberweis, & Stephan, 2014)
Knowledge Sharing	6	Conditions for success, knowledge transfer, networks, knowledge pipeline, communication	(Chang & de Burca, 2016); (Zahedia & Babarab, 2016); (Meyer & Su, 2015); (Betz, Oberweis, & Stephan, 2014); (Moe, Smite, Hanssen, & Barney, 2014); (Ichinotsubo, Nakamura, Saga, & Tsuji, 2015)
Organizational Design	6	Organizational capabilities, organizational design, multinational enterprises, cluster presence/subsidiaries	(Ichinotsubo, Nakamura, Saga, & Tsuji, 2015); (Manning, Larsen, & Bharati, 2015); (Mukherjee, Gaur, & Datta, 2013); (Upadhyayula, Dhandapani, & Karna, 2017); (Meyer & Su, 2015); (Gannon, Wilson, & Powell, 2014)
Team Dynamics	5	Virtual team effectiveness, trust, motivation	(Calefato, Lanubile, & Sportelli, 2013); (Calefato, Lanubile, & Sportelli, 2013); (Nuwangi, Sedera, Srivastava, & Murphy, 2014); (Moe, Smite, Hanssen, & Barney, 2014); (Zimmerman & Ravishankar, 2016)

Table 2: Literature Review 2013-2018

It is clear that evaluating new models of outsourcing is emphasized in more recent years. Additionally a greater emphasis is given to different development models that leverage the capabilities achieved through outsourcing. There also appears to be a greater interest in nearshoring. This could potentially be because of the extensive body of work that identified cultural differences and communication being a driver for reshoring (returning capabilities in-house), which may turn attention to options closer to the client.

Innovative outsourcing models are also being explored. For example, crowd sourcing software development has been reviewed using different models, including completely isolated development managed through an intermediary "gate keeper". These are seen in "competitive crowdsourcing" (Nevoa & Kotlarsky, 2014). Yu, Yin, Wang, Yang & Wang (2016) suggest

that there are considerable challenges using this methodology, most especially in the process flow of the integrator.

Freelancing is another innovative outsourcing approach that essentially builds off of the contractor/consultant model, but extends it globally (Bailey, Leonardi, & Barley, 2012). Freelance sites such as Upwork.com and Freelancer.com provides a direct connection between client and worker, thereby disrupting the original outsourcing model.

Outsourcing Company – Website Scan

To gain an understanding of the current global outsourcing environment, a scan of 80 outsourcing company websites was conducted. Areas of interest included location, age and size of the company, as well as the services that they offer and how they are promoting those services through their website. The websites chosen came from a Google search of "software development outsourcing", "offshore software development" and "nearshore software development".

There were some interesting findings that came from the search results. First, the results that appeared tended not to be the biggest world players that appear in the top tier outsourcing lists ((2018 Global Outsourcing 100, n.d.). Instead, the results showed a wide variety of companies that have created success from around the world. While some companies had several hundred and even thousands of development staff, the majority had less employees.

# Employees	# Outsourcing Companies	Websites
<50	8	5,20,27,33,42,50,65,66
51-100	11	12,17,39,40,45,46,52,59 61,76,78
101-500	20	3,7,8,9,11,14,18,19,21,22 23,48,49,51,57,60, 63,64 70,77
501-1000	8	4,10,13,43,55,58,67,79
1001-5000	4	25,26,28,74
>5000	1	53
Unavailable	27	1,2,6,15,16,24,29,30,31,32 34,35,36,37,38,41,44,47,54 56,62,68,69,71,72,73,75

Table 3: Outsourcing Company Websites - Number of Employees

Secondly, the countries most represented in the website search were from South America and Eastern Europe. This suggests that there is an increasing movement towards leveraging the near-sourcing capabilities of these countries. There appeared to be less representation from Asia and India in the websites, even though India remains the largest outsourcing country for knowledge-based activities (Accenture, 2018).

Place	Countries*	# Dev Centres Mentioned	Websites
1	Ukraine and Eastern Europe	20	5,7,8,10,11,17,19,23,30,33,35,38,41,50,57,59, 60,,61,63,64,65,70,71,73,77,79
2	Columbia and rest of South America	25	4,39,40,43,44,46,48,52,53,54,55,56,58,66,68,72,74,75,76,78
3	Poland and rest of European Union	14	6,12,20,27,29,49,53,59,62,64,67
4	India	11	1,9,13,14,21,25,26,32,34,45,47,53
5	Costa Rica and rest of Central America	10	40,46,51,53,56,66,68,72
6	Mexico and United States	10	2,4,7,37,43,53,54,69,72
7	Philippines and rest of Pacific Rim	7	15,16,18,23,24,28,31
8	China	3	3,36,53

*Note: First countries identified were the leading country for development centres in that region

Table 4: Outsourcing Company Websites - Development Centres

The age of the companies in the web search also tended to be less than fifteen years old, suggesting that perhaps the more established companies were less interested in developing an online presence and perhaps utilizing existing relationships to grow their business. This is in line with findings from Chang et al where smaller companies were not receiving priority treatment from the larger outsourcing shops (Chang & de Burca, 2016).

Company Age	# Outsourcing Companies	Websites
<2013	3	5,27,63
2003-2012	37	4,6,7,9,11,14,16,17,18,21,24,29, 30,31,33,34,37,39,40,31,45,46,49 51,56,61,65,66,67,69,70,71,72,75 77,78,79
1993-2002	16	3,8,13,19,23,25,26,28,32,36,54,55, 57,58,60,64
<1992	4	10,35,43,53
Unavailable	19	1,4,6,15,20,22,38,42,44,47,48,50 52,59,62,68,73,74,76

Table 5: Outsourcing Company Websites - Age of Company

These websites also provided insight into the direction of the younger companies. First, they tended towards highlighting newer technologies, development methodology and engagement patterns. Often their differentiators focused on the different new technologies such as block chain and mobile/app development. Agile was a very common development methodology.

The scan also documented the key words that each of the company websites focused on, as a means to providing insight into what they felt their key differentiators were. The top word categories were custom, quality, expertise, and cost effective. Several of the websites cited local and international awards for outsourcing, in addition to ISO accreditation designations.

Word	Instances	Websites
Custom	37	10,11,12,13,14,17,18,19,23,24,25 26,28,30,35,36,37,38,42,45,45,46 47,48,49,50,51,52,54,55,60,63,64 65,67,68,70,79
Experience	37	2,4,9,10,15,25,26,27,29,30,36,37 41,42,43,45,46,47,48,49,54,55,57 64,65,66,67,68,69,70,72,73,75,76 77,78,79
Quality	28	2,3,6,8,12,15,19,34,35,36,42,43,44, 45,46,47,50,52,57,62,63,64,65,66 68,73,76,79
Cost Effective	28	3,4,8,9,11,12,15,16,34,36,37,42,44 45,46,47,50,56,62,64,65,68,69,71, 72,73,76,78
Mobile	27	5,13,14,19,22,23,24,26,27,28,30,32 34,36,37,39,46,47,48,51,52,54,60, 63,66,67,77
App Development	26	2,5,8,13,14,18,22,23,24,25,27,28 30,32,33,34,35,36,39,48,51,54,62, 68,69,77
Full Development	24	1,2,4,6,8,10,11,14,15,17,26,28,30, 34,36,37,42,45,50,52,65,76,77,79
Expertise	24	8,9,12,16,17,25,26,30,33,35,41,42, 43,45,47,49,57,60,62,63,67,68,72 77
Agile	23	3,7,12,13,14,24,28,32,27,40,42,43 45,47,50,51,52,53,54,55,57,60,68
Enterprise	23	9,14,19,23,25,26,30,32,35,36,37,42 45,48,50,54,62,65,68,70,73,75,77
Talent	23	4.8,11,15,18,19,22,26,29,33,35,37, 39,40,41,43,44,53,55,64,71,74,76

Table 6: Website Descriptors

Industry Review

Finally, in order to gain an understanding of the current trends within the industry, several articles and reports from business and industry magazines were reviewed, specifically

focusing on trends in the industry. These articles describe opinions and observations with regards to outsourcing from the perspective of the larger global context.

Current Trends

The various environmental scans that have been performed, have resulted in the following observations.

Technology is leveling the playing field

Traditionally, outsourcing has occurred with large established organizations in countries that have substantial experience and resources to support the industry. Examples of Tier 1 companies are Mindtree Limited, headquartered in Bengaluru, India and employing almost 20,000 workers (Mindtree, 2019) and Accenture, based out of the United States and employing 459,000 people worldwide (Accenture, 2018). These and other similarly large firms have dominated the outsourcing landscape through the past decades. The reason for this type of global dominance could come from several genesis. First, these large organizations are able to invest in the outreach that is required to establish presence in such a global industry. Having the established infrastructure provides the ability to build the relationships with the large companies who are seeking outsourcing as an option to lower the global costs.

Ongoing technological advances in communication, software development and development tools have provided an evolution of democratization of outsourcing services. As such, smaller outsourcing companies and even smaller “boutique specialty” companies are establishing themselves as options for smaller companies.

Locations are changing

Outsourcing companies are establishing themselves in countries that have not always been considered for outsourcing. Latin America and Eastern Europe are building on their technological strengths to provide viable options. The Website Scan (See Appendix 1: Global Website Scan – List of Companies) showed that Ukraine led the Internet presence for outsourcing companies. Perhaps more surprising was the prevalence of Costa Rica as a country gaining momentum in the outsourcing space. These companies from countries that are less established than India, Philippines and China are differentiating themselves through the value that comes from near-sourcing. Their websites highlight proximity, and cultural compatibility along with current development approaches such as Agile to demonstrate value to potential clients.

The models for outsourcing are changing

Team augmentation appears to be one of the more prevalent approaches to outsourcing. The majority of sites are now suggesting augmenting client staff with exclusive teams or individuals, and even providing facility and human resources services towards recruiting individuals who are interviewed, selected and managed by the client. This is dramatically different from the idea of development teams that are not engaged with the client, and only directed by the project manager.

Agile development is largely highlighted on outsourcing websites, suggesting that outsourcing vendors are trying to align with the expectations of clients. Agile implies quick development cycles with limited feature sets each cycle.

There is a concept called “vested outsourcing” (Vitasek, 2013) that suggests that relationships between client and vendor become more like partnerships instead of

master/servant. When considering the literature of the early 2000s that suggested that power differential was a substantial problem in ensuring quality output in outsourced development, changing the relationship paradigm has potential value and appears to be gaining momentum.

Technological expertise is becoming an outsourcing asset

Boutique outsourcing companies are highlighting their skills in areas that may not be part of the typical capability set of an organization. Frazzetto (2018) describes in her Forbes Technology Trends report, that access to skill sets as one of the growing reasons to outsource information technology services. She highlights that outsourcing companies have developed skills in cybersecurity, artificial intelligence, machine learning, block chain and cryptocurrency (Frazzetto, Anna; Forbes Technology Council, 2018).

As more technologies become an expected reality in the development of products and services, the reliance on outsourcing companies that have expertise in those areas will also increase until they have become mainstreamed.

Freelancing is becoming more prevalent

With the shift in clients seeking more direct control over their outsourced team members, workers have found opportunities to seek employment directly, instead of through an outsourcing company. As a result, a number of freelance platforms have been built to support individuals offering their services to a global audience. Platforms have different models, ranging from passive resume posting sites to environments where workers bid on projects. Some platforms pre-screen applicants to ensure a level of quality, while other sites use rating mechanisms to self-monitor. Most platforms have a built in payment system that removes that billing/payment component of the relationship.

From the perspective of the smaller company this mechanism provides flexible, direct connection with workers who can extend their capabilities.

While appealing for workers to be able to access work on their own terms, the flexible terms of gig work leave workers vulnerable, with less employment regulations to protect them (Graham, Hjorth, & Lehdonvirta, 2017). Additionally, the platforms have created an environment where individuals are competing for jobs from dramatically different salary paradigms. For example, a worker form the Philippines may be competing with someone from the United States. On the surface it would seem that the Pilipino worker would have an advantage, but in fact may have to undersell themselves to get the work. The "bidding" platforms appear to also create environments where an individual will pose as an independent worker, but then subcontracts the work to others at a much cheaper rate, hiding under the reviews of an individual. Here too, the workers become vulnerable to "sweat shop" conditions because they are off the radar of employment standards (Graham, Hjorth, & Lehdonvirta, 2017).

This trend has also created positive results. Countries such as Malaysia and Nigeria have incorporated global freelancing using "gig" platforms and microwork intermediaries as strategic economic development programs (Graham, Hjorth, & Lehdonvirta, 2017). These programs provide platforms for workers from their countries to access revenue globally that they would otherwise had not been able to connect with.

While there is some literature regarding this trend, more work will need to occur to better understand the models of freelancing that are occurring on line and the potential regulatory frameworks that will need to be adjusted to make them an equitable environment.

Crowd sourcing is being explored

Crowd sourcing is being utilized in some environments to develop software. While this has been a mechanism in open source programs such as Linux, Moodle, Joomla and others, a trend is emerging with software development occurring for companies in an open source manner.

While providing low barriers to entry, this type of development requires a large amount of vetting by the lead developer to ensure that the code works within the program (Yu, Yin, Wang, Yang, & Wang, 2016).

Interestingly, crowdsourcing is one of the mechanisms for developers to become known within the community. More than one website mentioned their developers competing in crowdsourcing competitions.

Social conscience is a differentiator

The Website Scan provided insight into how different companies are leveraging social conscience in their online marketing presence. For example, Cafeto Software (www.cafeto.co) identifies individuals who are "often overlooked and left behind" and trains them in a "hands-on coding boot camp" to be successful developers within their organization. Their slogan is "Your Unfair Competitive Advantage". (Cafeto Software, n.d.) Other organizational websites highlight corporate cultures that encourage healthy living. Commonly, websites will display pictures of their corporate environment, employees during teambuilding events, etc. to demonstrate an attitude of healthy corporate culture.

Global political environments matter

Global political climates are affecting decisions to outsource. Frazetto (2018) describes the foreign policy of the Trump presidency becoming a deterrent for companies in the United States to utilize outsourcing, as seen by a drop in outsourcing contracts (Frazzetto, Anna; Forbes Technology Council, 2018).

Other locations around the world are considered less stable due to their political environment. For example, Venezuela is also experiencing tremendous turmoil, with basic services becoming difficult to procure. (British Broadcasting Corporation (BBC), 2019) These types of disruptions may have an effect on outsourcing decisions (Bremmer, 2005).

Finally, the level of government democratization may also have an effect on outsourcing decisions. For example, the uncertainty about Russian interference in democratic elections may influence a decision to outsource to Russia. Similarly, Chinese hacking allegations may have a similar effect.

Cybersecurity is a factor

Companies will continue to seek confirmation that the relationship with their outsourcing partner protects their intellectual property. Companies that exist in jurisdictions that ensure these protections will become more appealing (Mezak, 2018).

The BC Technology Sector Perspective

The British Columbia technology sector is a unique and vibrant community that has developed over the last thirty years. In 2016, the sector generated 7% of the provincial GDP, equal to industries such as manufacturing and healthcare. High technology employs more people than mining, oil and gas and forestry sectors combined (Schrier, Dan, 2017).

In the last 10 years, the number of companies in the sector increased 18% to 10,236 businesses, and the number of employees increased 16% to 106,430. This places the sector third in Canada behind Ontario and Quebec in high tech workforce (Schrier, Dan, 2017). Of those companies, 98% employ less than 100 employees (BC Technology Association, 2016).

The sector's unique demographics contribute to its unique ecosystem. The BCTechBase database (BC Technology Association, 2019), while not definitive provides insight into this information. Of the 3410 active (not identified as acquired or defunct) companies, 72% are no more than 20 years old, and 20% were established in the last five years. This indicates a vibrant development community.

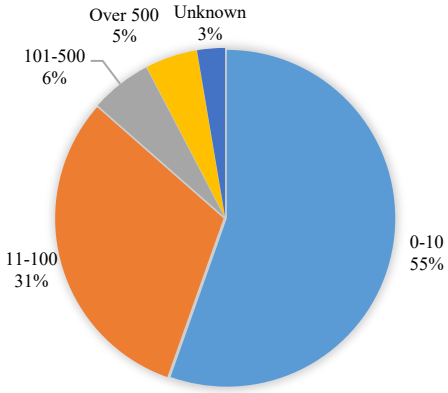

Figure 7: BC TechBase – Number of Development Employees (% of Companies)

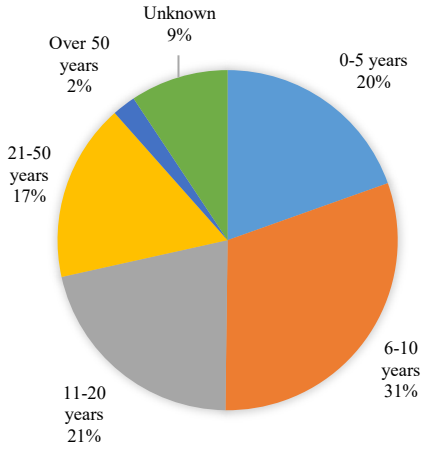

Figure 6: BC TechBase - Age of Company (% of Companies)

The number of local employees in these companies provide further insight and is in line with the age of the majority of the companies. The data shows that 55% of the companies have ten or less local employees and 31% have 100 or less employees.

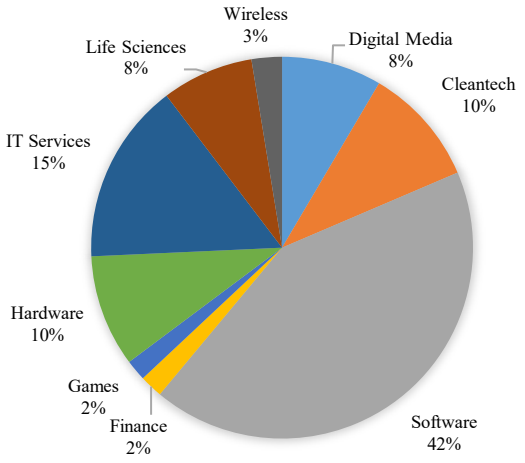

Figure 8: BC TechBase - Types of Companies (% of Companies)

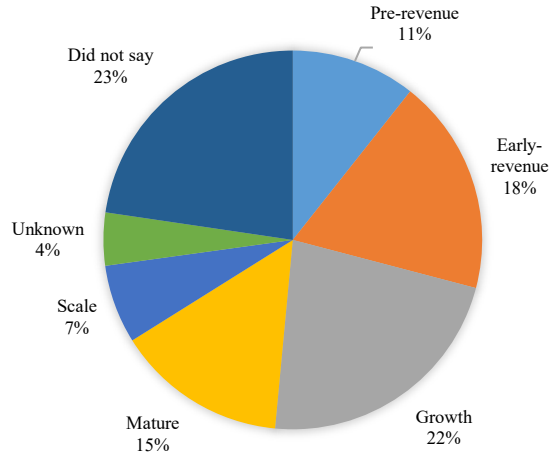

Figure 9: BC TechBase - Operating Status (% of Companies)

The types of companies that are prevalent in the BC technology sector is also valuable to understand. The data demonstrates that there are a wide range of companies including mining, pharmaceutical, design, engineering and gaming. However, the largest category is software development at 42%, with IT services being next at 15%, and clean technology and hardware following at 10% each. This information validates the focus on software development skillsets as critical to the industry.

Finally, the operating status of the companies provides insight into the maturity of the organizations. While there was a larger percent of companies that did not identify a status, only 15% identified themselves as mature. Conversely, 29% of companies who responded are at the early-revenue or pre-revenue stage, once again reflecting the similar statistics with the size and age of the company.

Exploring Sourcing in BC

Given the general information available about the BC technology sector, several questions become apparent, in particular whether sourcing is being used as a strategy to secure talent. The core competencies theory suggests that companies would use sourcing to augment

their existing competency set. Given that the BC technology environment contains a large percentage of start-up companies, the availability of greater resources to support start-up and small companies is potentially compelling for companies to consider.

Accessibility to sourcing resources globally has expanded. Previously, outsourcing was more likely to be through large companies with thousands of employees, and teams that would remain separated from the client. Small companies would not be the clientele that these outsourcing shops would target, and as a result would be difficult to utilize. Subsequently, smaller and boutique outsourcing companies have become more prevalent, which creates opportunity for smaller companies to engage in satisfactory outsourcing relationships. Further, the number of countries that have established themselves as quality outsourcing destinations has increased substantially in the last decade, especially in near-sourcing countries. This trend provides an opening for companies within the British Columbia technology ecosystem.

Additionally, has the onset of new technology influenced the decisions to remotely source resources? With the trends identifying improvements in technology, especially with regards to Internet speeds, secured communications and general communication increasing, the viability to work externally for smaller and mid-sized companies to participate in outsourcing. The onset of cloud technologies demonstrates this change. With these developments, are BC technology companies identifying options with outsourcing that would previously not be possible?

Further, if sourcing is being used, what do the models of engagement look like? Given that companies within BC are primarily small and medium sized companies, there may be different behaviour than in regions such as Silicon Valley. As discussed earlier, companies can choose to insource or outsource, source entire teams or individuals, onshore or offshore,

source isolated tasks or entire functional areas, or engage in low commitment single projects or tightly couple business processes. The global trends suggest that models of outsourcing have become more flexible. Contracts are now negotiated in a variety of ways, and clients have more ability to negotiate terms that work best for them.

When considering the state of the BC technology sector, some theories may prove beneficial. The eclectic theory states that an organization will look at insourcing and outsourcing and consider the best path forward based on that cost analysis (Dunning, 1988). With the evolution of outsourcing to smaller organizations through technology, accessibility and changing models, the assertion that companies would engage in outsourcing using these paradigms.

Additionally, companies are more flexible about the engagement between client and vendor employees. Clients have greater opportunity to choose their teams and to manage the relationship. It would be interesting to see if these trends are reflected in the BC environment.

BC Sourcing Survey

In order to inform these questions, a survey comprised of nineteen questions was created and then distributed using Survey Monkey. The survey was divided into five sections; demographics, insourcing, outsourcing, criteria for outsourcing and final comments.

Section one focuses on questions that answer demographic information including the size of the organization and the status of the organization. By asking questions in this area, any feedback could be related back to the size of the organization. The expectation is that most respondents would be from small to medium sized companies. These questions will verify this assumption and allow the analysis to be built from that information.

Section two focuses on the decisions made regarding internal sourcing. It is designed to provide insight into whether remote employees are utilized as part of their strategy. Once the survey recipient has identified that they do employ an insourcing strategy, they are asked what kind of strategy, where the employees are based and how they are utilized. They are also asked which model of oversight and project management they follow. Finally, they are asked which factors were the driving reasons for making those choices. The results from this set of questions build a profile around each of the decisions that are made by the companies.

The third section is very similar to the second one, focusing instead on outsourcing choices. The questions are the same, except the models described are slightly different to reflect common outsourcing configurations. As with the previous section, these questions build a profile around the types of models of outsourcing that the company has utilized.

The next section asks about how the survey recipient would rate criteria for outsourcing based on importance. This cluster of questions was designed to get a sense of prioritization regarding the factors influencing outsourcing. Survey recipients are asked to reply using a sliding scale. These questions dig into the motivation and priorities of the organization regarding their organizational strategy.

Finally, there is an open ended question that provides an opportunity for individuals to provide any further context. It also asks participants to add contact information if they are interested in participating further, should there be an opportunity.

Survey Recipients

Recipients of the survey were taken from a list of technology sector companies identified in a BC Technology Association database. From this database, the list was scaled

down to BC headquartered companies. This decision was made to avoid including companies that would potentially see the BC office as an outsource itself.

Second, the list was cleaned of all mining and healthcare related companies, unless they indicated software as part of their product set. Finally, all companies that were identified as Acquired or Defunct were removed.

The remaining list included 1500 companies. This list was sorted first by status (pre-revenue, early revenue, growth, scale, mature) and then alphabetically. It was then divided into three waves. In this way the waves were equally divided into different statuses and randomly divided.

Finally, email addresses were found by going onto the company websites for the first two waves (1000 companies). All companies that had an email contact were included in the survey monkey distribution list. In total 334 companies were contacted using the first two waves. There was a subsequent reminder email and a final "closing soon" email sent to both sets of email addresses.

The results of the survey and subsequent analysis are based on the responses from the responding companies.

Results

Of the 334 companies, 17 responded and completed the survey (5%). While the percentage of respondents is low, the results do provide some insight that can lead to further discussion. The figure below shows the demographics of the respondents.

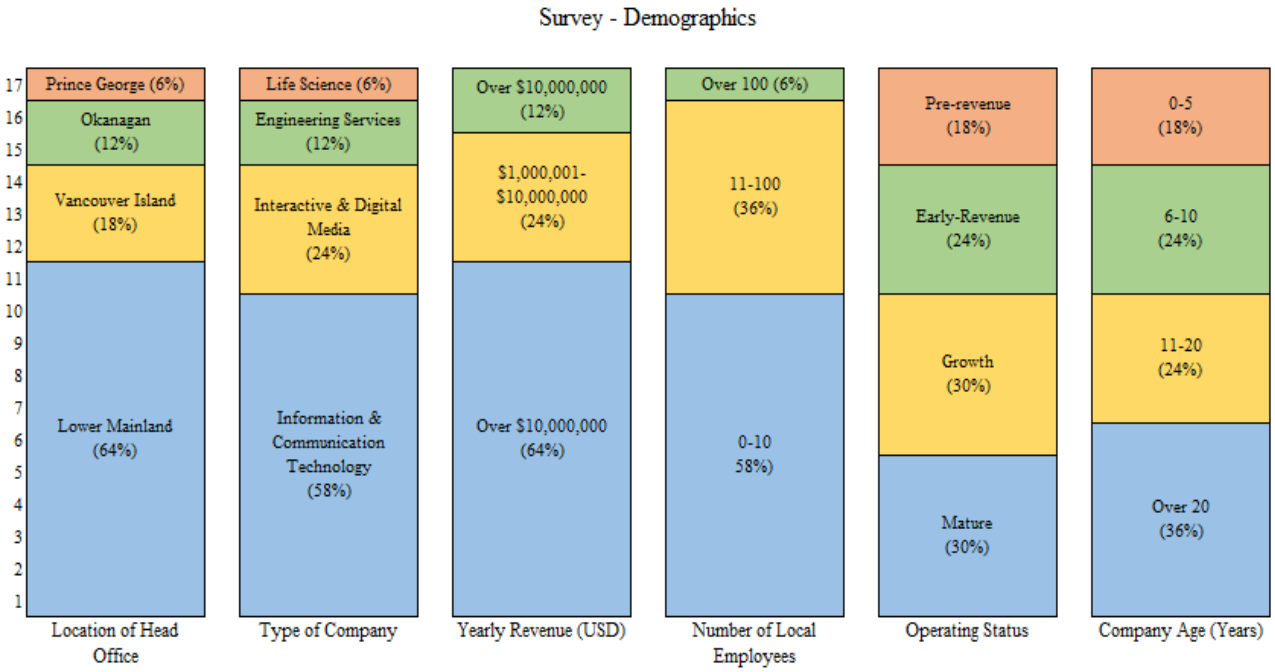

Figure 10: Survey Demographics

Respondents were almost equally distributed between the different age categories and stage of growth categories. Not unexpectedly, the majority of the respondents were from the Lower Mainland area and were situated in Information Technology organizations.

Of the 17 respondents, only one had more than 100 software development employees hired locally. The majority had 0-10. This is not unexpected, as provincially 98% of technology companies have less than one hundred employees (BC Technology Association, 2016).

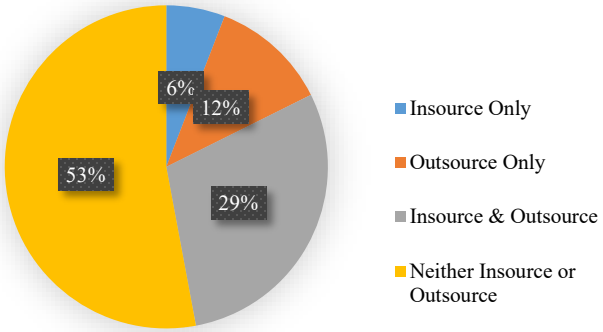

Figure 11: Survey Results - Sourcing Activity

Of the 17 respondents, six responded that they insourced, and seven responded that they outsourced. Five of those respondents both insourced and outsourced. This statistic suggests that the companies that have mechanisms in place to support remote workers are also more likely to consider multiple mechanisms of sourcing.

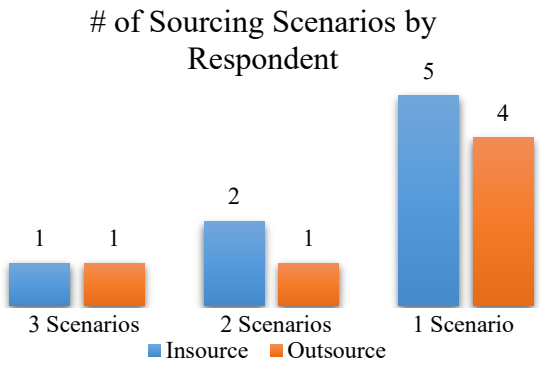

Figure 12: Survey Results - Number of Sourcing Scenarios by Respondent

Further some of the respondents had multiple scenarios of sourcing that they incorporated. In fact the most prolific respondent had the most scenarios in both insource and outsource categories

Insourcing Observations

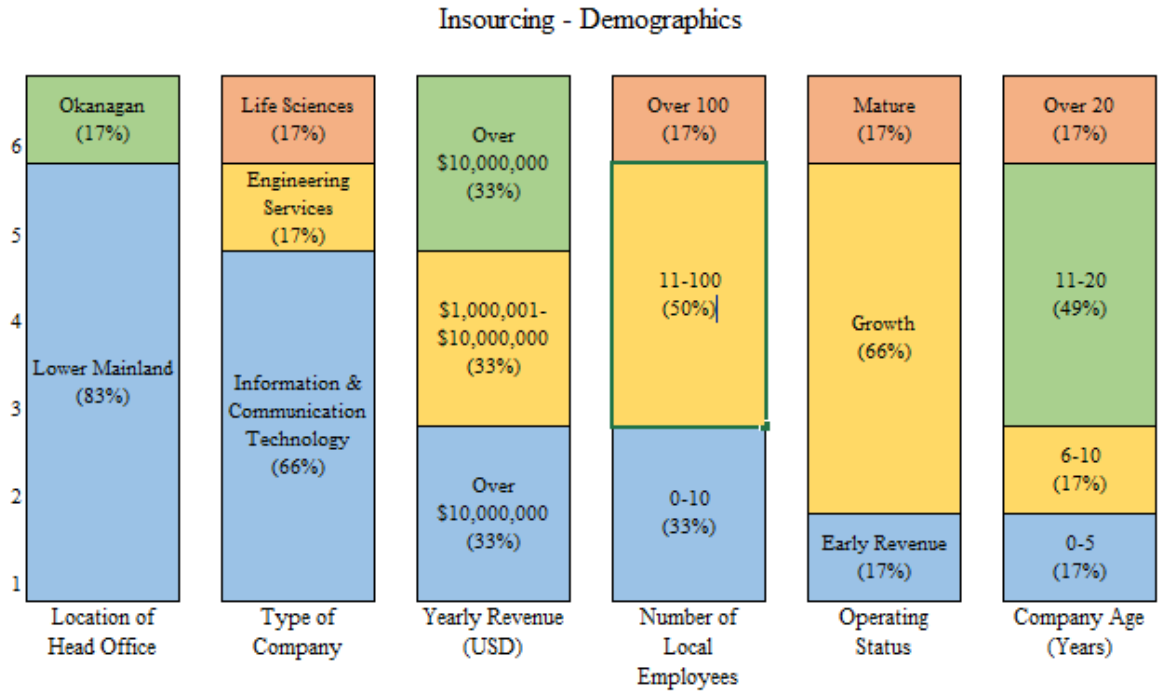

Figure 13: Survey Results - Insourcing Demographics

It is clear from the survey that companies are insourcing software development services. Of the 17 respondents to the survey, six responded that they had insourced. Of those respondents that are insourcing, clearly the majority are based in the Lower Mainland, are in the field of Information and Communication Technology, and are in a growth period of their development. Also, the information shows that the companies are generally more mature, at 11-20 years old. This type of information suggests that companies that choose to insource may only do so when they have a level of financial stability.

The location of insourcing had some surprises. While 50% of the insourcing engagements were within BC, and 80% were in Canada, there was one company that insourced in Ukraine. From this survey, the only overseas insourcing operation came from a company in the growth stage of development, and the only US based insourcing operation was from a company in the mature stage.

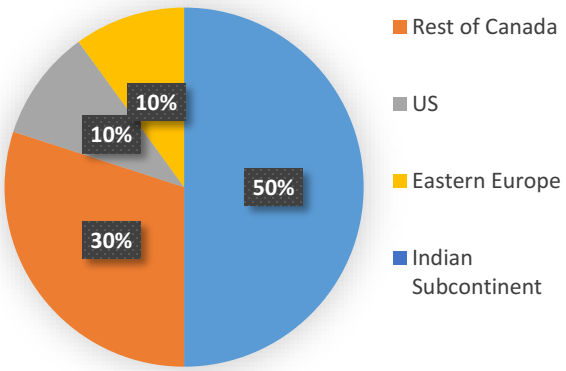

Figure 14: Survey Results - Insourcing Locations

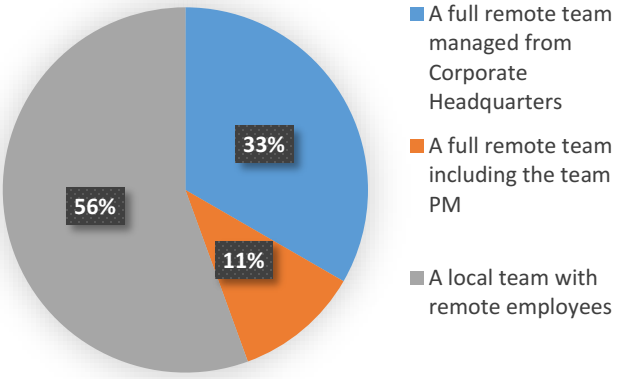

Figure 15: Survey Results - Insourcing Engagement

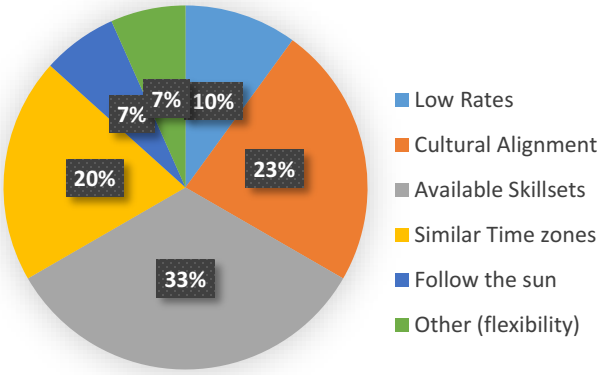

Figure 16: Survey Results - Insourcing Location Reasons

The reasons for those locations were insightful. Available skillsets was the highest ranked reason for the location, but cultural alignment was the second ranked. This is further corroborated by 90% of the locations utilized being within North America.

Looking at engagement, while the majority of engagements identified in the survey were remote individuals who worked with local teams. However, there were also examples of remote teams managed locally and remotely.

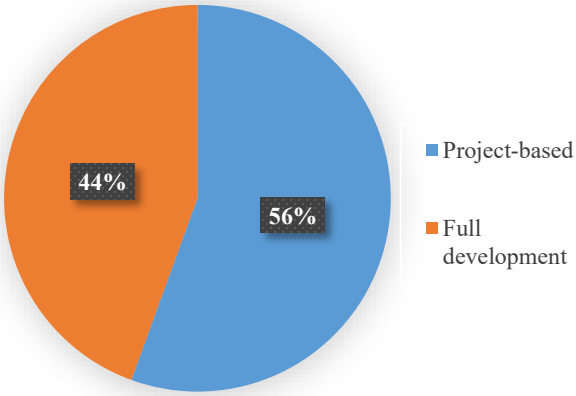

Figure 187: Survey Results - Insourcing Development

Regionally, companies in the Lower Mainland and the Okanagan participated in insourcing, while Vancouver Island and Prince George did not. Of those companies who insourced, the Okanagan companies insourced full development activities, while the Lower Mainland companies were more likely to insource project work. No respondent identified task-based work for insourcing activities.

Location Profiles

Location	Engagement Model	Development Model	Reason for Location
Within BC	1. Local team with remote employees 2. Full remote team either managed remotely or from Corporate Headquarters	1. Project-based 2. Full development	1. Available skillsets 2. Similar time zones Cultural alignment 4. Low rates Flexibility
Rest of Canada	Local team with remote employees	1. Project-based 2. Full development	1. Available skillsets 2. Cultural alignment Similar time zones Flexibility
US	Full remote team managed from Corporate Headquarters	Project-based	1. Available skillsets Cultural alignment Similar time zones
Eastern Europe	Full remote team managed from Corporate Headquarters	Full development	1. Cultural alignment Follow the sun

Table 7: Survey Results – Insourcing Location Profiles

The above table provides additional insight into why different locations are chosen. All of the respondents identified cultural alignment as a reason for making their decision about

how they would model their insourcing. Surprisingly, low rates was identified as a reason for insourcing within British Columbia, which could suggest sourcing through one of the smaller communities where fees would be lower. The engagements within British Columbia and Rest of Canada identify flexibility as one of the reasons, which could suggest proximity aiding flexibility or alternatively could reflect commentary about bureaucracy. It is also interesting to note that all of the development approaches were project or full-development based. This is indicative of having more trust with teams within your organization than outside of your organization.

Insourcing - Top Criteria

Reason	Score
Skillsets	4
Save Office Space	1
Save Money	1
Save Time	0
Flexibility	0

Table 8: Survey - Insourcing Top Criteria

Finally, when the survey asked the respondents about their first priority when considering insourcing, they overwhelming identified skillsets as their motivator. However, one company identified office space and another identified saving money as their primary motivations, demonstrating that those are also considerations.

Outsourcing Observations

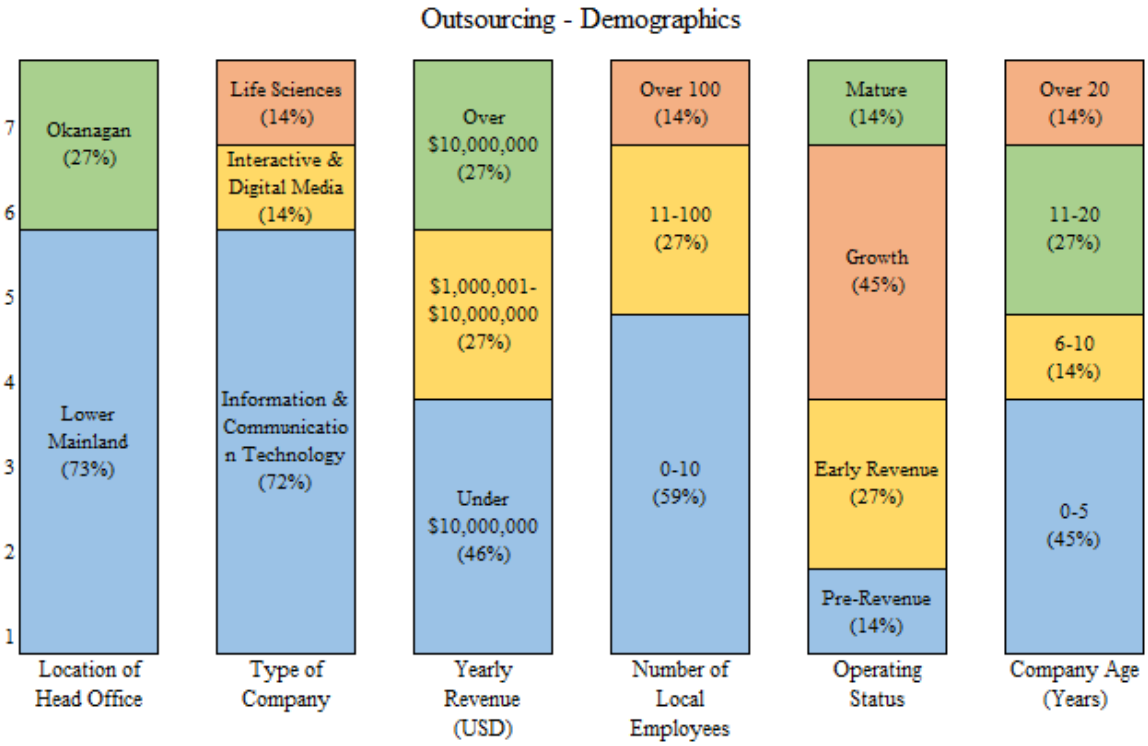

Figure 18: Survey Results - Outsourcing Demographics

Outsourcing occurred in seven of the respondent companies. Of those companies, there were ten separate engagements. Similar to insourcing, the outsourcing engagements came from companies headquartered in the Lower Mainland and Okanagan regions. Five of the outsourcing companies were from Information & Communication Technology categorized companies. Different from the insourcing responses, there were more respondents who were in business five years or less, whereas insourcing respondents leaned more towards 11-20 years.

Further four of the seven outsourcing companies identified ten or less local software development employees, whereas the insourcing companies were more likely to have 11-100. Finally, the operating status of the companies are distributed differently than with insourcing, which had the majority of scenarios occur in growth status companies, whereas outsourcing

had both growth followed by early-revenue status companies using this strategy. This type of data suggests that perhaps the decision to outsource is more likely during earlier stages of a company's development cycle.

Finally the annual revenue distribution with the outsourcing group also shifts. The insourcing responses were equally distributed through the different revenue categories. The outsourcing responses had more respondents who achieved over $10,000,000 USD annually. This information, coupled with the increased number of early-revenue companies could suggest that the outsourcing becomes a short term mechanism during early stages companies. An open comment from one of the respondents speaks to this:

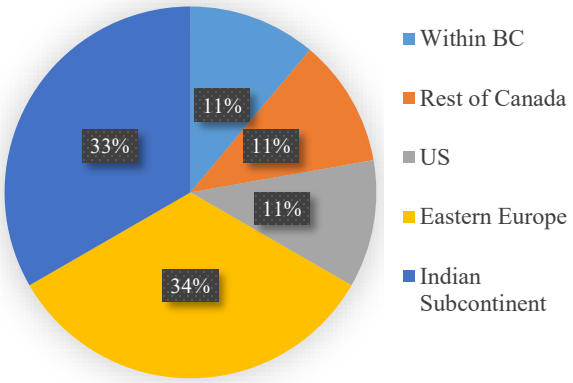

Figure 19: Survey Results - Outsourcing Locations

"We made a choice to "bootstrap" our start-up without significant investment capital - we are also first to market and had to create a minimum viable product to prove our concept in the market. For these reasons, we chose to outsource based on price and cost savings as our most important factor - fortunately we managed to make it work."

In contrast to the insourcing results however, the majority of the locations for outsourcing were overseas, equally in Eastern Europe and the Indian Subcontinent, with the

rest residing in Canada and the United States. Further, the younger companies were more likely to outsource outside of North America.

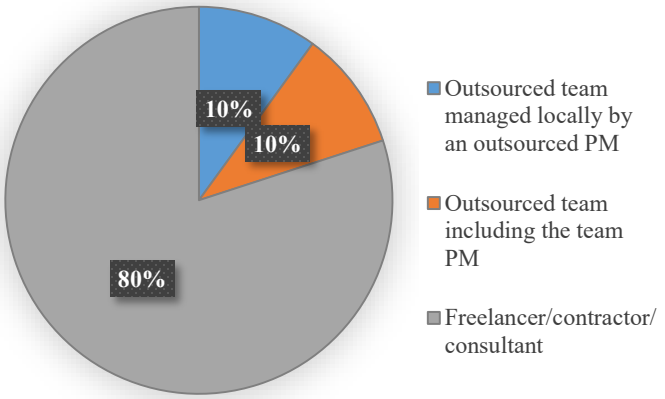

Figure 24: Survey Results - Outsourcing Engagement

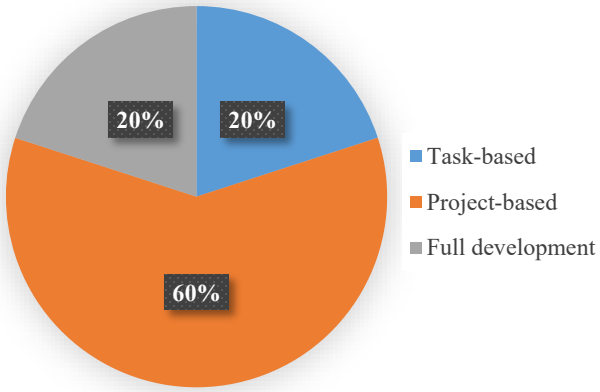

Figure 21: Survey Results - Outsourcing Development

Outsourcing engagements were primarily individual freelancing contracts, however there were also examples of teams managed locally and remotely. This dramatic difference in freelancers compared to teams is in line with the less permanent relationships that outsourcing engagements can provide. It also reflects the trends identified earlier in the paper where freelancers are much more easily accessible.

From the perspective of development models, the outsourcing respondents were more likely to use project-based activities, but also incorporated task-based activities. This is different from the insourcing respondents. Reflecting on Gerbl, McIvor, Loane & Humphreys (2015), however, it would make sense that a company would be less inclined to have an outsourced individual or company have the entire picture of their product expectations, and perhaps just provide piecework.

Location Profiles

Location	Engagement Model	Development Model	Reason for Location
Within BC (1)	Freelancer/Contract managed locally	Project-based	Available skillsets Similar timezones Cultural alignment
Rest of Canada (1)	Freelancer/Contract managed locally	Project-based	Available skillsets Similar timezones Cultural alignment
US (1)	Freelancer/Contract managed locally	Project-based	Available skillsets Similar timezones Cultural alignment
Eastern Europe (3)	Outsourced team managed locally by an outsourced project manager Outsourced team including the team project manager Freelancer/contractor managed locally	1. Project-based 2. Full development	1. Available skillsets 2. Low rates
Indian Subcontinent (3)	Freelancer/Contract managed locally	Task-based Project-based Full development	Available skillsets Low rates

Table 9: Survey Results - Outsourcing Location Profiles

The above table reveals the profiles for the different outsourcing scenarios. Clearly the North American engagements were determined based on ease of working with the teams that had the right skillset. For the off continent engagements, the shift moves towards available skillsets at a lower rate.

Interestingly, the only location that actually utilized full teams was Eastern Europe. One of the companies that outsourced full teams in Eastern Europe also insourced full teams in Eastern Europe, however the other company did not. This does perhaps suggest that Eastern Europe fits the criteria for near-sourcing in the minds of the decision makers, and therefore have an enhanced level of comfort working within that area.

Finally, when the survey asked the respondents about their first priority when considering outsourcing, the two reasons were skillsets, followed by saving money. While slightly different from the insourcing criteria, skillsets remained most important.

Outsourcing - Top Criteria

Reason	Score
Skillsets	5
Save Money	2
Save Office Space	0
Save Time	0
Flexibility	0

Table 10: Survey Results - Outsourcing Criteria

Further Discussion

Flexibility comes from short-term relationships that can be expanded or contracted easily, and with shorter project or task related scope of work. Less flexible relationships would come from fully hiring staff, and engaging in full development activities. This assertion in general appears to bear out. When outsourcing was involved, it was more likely to be project-based. More telling, however, was the predominance in freelance/consulting contracts (80% of engagements) instead of relationships with development teams, which would naturally require less flexible terms.

There appears to be almost an inverse relationship between insourcing and outsourcing based on the age and maturity of the company. Older, more mature companies appear to insource more, whereas younger, start-up companies appear to outsource more. This observation perhaps suggests that as companies become more stable in their organization, they are more likely to hire instead of contract. It may also suggest, however, that younger, start-up companies are more willing to take advantage of outsourcing relationships and may be more proactive in seeking out these kinds of opportunities that have become more available in recent years.

While Eastern Europe is considered near-sourcing in Europe, it could be argued either way in North America because it does not have the same time zone benefits. When reviewing the survey results, however, one of the identified reasons for choosing Eastern Europe as a location was the cultural alignment. With that in mind, it could be asserted that the companies considered Eastern Europe a near-sourced location, in line with one of the criteria for near-sourcing being cultural alignment (Khan & Azeem, 2014) (Schuster & Copeland, 2008).

Contrary to expectations, smaller, younger companies were willing to outsource to the Indian subcontinent. However, each of these engagements were freelance/consultant, which suggests less traditional approaches were used to procure the individuals. Surprisingly, none of the respondents had indicated that they utilized resources in Latin America. Although the sample size is not large enough to be definitive, perhaps this is indicates that near-sourcing as an option may not be prominently understood within the local sector.

From the perspective of motivation, the predominant reason for staff augmentation was talent availability. This falls in line with the expectation that there are challenges procuring talent to accomplish organizational goals. The BC Technology sector has been identified as having a dearth of available skilled workers. (BC Technology Association, 2016)

It is also interesting to consider the fact that cultural alignment was rated as highly important to the respondents. While not a surprising result, it does open the door to further research about the sector's definition of cultural alignment. Were they more concerned about corporate culture or Canadian culture, for example? Additionally, is there a perception that certain areas of the world a less aligned culturally than they are? For example, South and Central America, while not exactly like North America, contains considerable alignment,

where working behavioural differences are moderate and more aligned than other common outsourcing countries such as India and China. (Schuster & Copeland, 2008).

Opportunities within the Business Sector

Utilizing talent, especially in other countries, to augment local resources, has both challenges and rewards. Through the different literature, it is apparent that the challenges faced by companies are similar regardless of whether the model being used is through insourcing and outsourcing. Team dynamics, motivation, cultural competency, development models, etc. are all factors to success in any Sourcing model.

The minimal information provided from the survey suggests that there may be limited awareness of where global sourcing can be obtained and their potential benefits. There are opportunities within the BC Technology sector to develop competencies regarding implementing sourcing options, and as such develop business environments that have more tools to respond to local talent. Developing these competencies could come from leveraging existing best practices certification, such as IAOP, including sourcing as part of the post-secondary curriculum, and through organizations such as the BC Technology Association as a mechanism to host groups and seminars with relation to the topic area.

Conclusion

The availability of software development talent globally has become accessible through the evolution of technology, which is now providing connections between individuals and companies who are both looking for and offering software development services.

When looking at the global trends that have been identified in this project, it is apparent that some already hold true for the BC Technology Sector. In particular, the flexible types of

work arrangements appear to occur within British Columbia. The respondents identified a variety of arrangements with both teams and individuals. Additionally, the use of foreign individual contractors follows that particular trend as well.

British Columbia's technology sector has its own unique characteristics, including the large percentage of companies that have a small number of employees. As a result, it has the opportunity to leverage resources and develop partnerships within locations and using models that may not currently be immediately apparent.

With this opportunity comes risk, and as part of risk mitigation, the sector has an opportunity to develop competencies through cluster organizations, working groups, mentorship and training that could enhance this capability, and as a result provide an additional pathway to meeting the resourcing challenges currently faced by the sector.

Future Research

This project has revealed opportunities for future research regarding sourcing within the British Columbia technology sector. To start, the sample size of the respondents to the survey did not provide a statistically conclusive representation of the behaviours of companies within British Columbia. However there is value gaining a better understanding sourcing, and in particular outsourcing, provides a viable augmentation to the challenges being faced by the industry regarding having the talent to create the product whose sales contribute to a vibrant business sector.

Second, the survey completed for this project could be expanded to better understand how sourced individuals and companies have been procured, in addition to any barriers the potentially prevented companies from considering utilizing remote talent. This line of research

could help determine if there are appropriate resources available locally to help companies consider sourcing as an option that could contribute to achieving their corporate goals.

Additionally, a comment raised by one of the respondents opens a potential new avenue to explore with regards to the external factors that are shaping decision making in the sector. They wrote:

> *"There is a key driver to BC industries public institution's approach to resourcing projects…. It is whether or not funding is provided as part of operational budgets (easier to insource) or as part of one time capital dollars (hard to insource and forces more outsourcing- usually at higher rates). Since public sector drives a lot of the BC Tech sector work this is a key factor in how the industry evolves."*

This comment raises the question about other factors that were not identified and how they may also be shaping the behaviours within the sector.

Finally, the project did not touch upon the level that the decision for sourcing was made within the organizations; whether they were top down strategies or ground up tactics. Further research in this area will provide insight into how sourcing is viewed, and the steps that the organization makes to ensure the success of the strategy.

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Appendix 1: Global Website Scan – List of Companies

1	Virtual Employee	https://www.virtualemployee.com
2	Grio	www.grio.com
3	Shinetech Software	www.shinetechsoftware.com
4	BairesDev	www.go.bairesdev.com
5	Tecsynt Solutions	https://tecsynt.com/
6	Accelerance	www.accelerance.com
7	Intersog	www.intersog.com
8	Kanda Software	www.kandasoft.com
9	ValueCoders	www.valuecoders.com
10	ScienceSoft	www.scnsoft.com
11	Belitsoft	www.belitsoft.com
12	Soldevelo	www.soldevelo.com
13	TatvaSoft	www.tatvasoft.com
14	PixelCrayons	www.pixelcrayons.com
15	Empata	www.empata.com
16	Sourcefit	www.sourcefit.com
17	Redwerk	www.redwerk.com
18	Orient Software	www.orientsoftware.net
19	Qarea	www.qarea.com
20	Asper Brothers	www.asperbrothers.com
21	Adreno Technologies	www.adrenotechnologies.com
22	IT Exchange	www.itexchangeweb.com
23	Elinext	www.elinext.com
24	Manao Software	www.manaosoftware.com
25	Cyfuture	www.cyfuture.com
26	Chetu	www.chetu.com
27	Exact Byte	www.exact-byte.com
28	TMA solutions	www.tmasolutions.com
29	Daitan Group	www.daitan.com
30	Existek	www.existek.com
31	Arcanys	www.arcanys.com
32	Niyati	www.niyati.com
33	Binary Studio	www.binary-studio.com
34	AIS Technolabs PVT LTD	www.aistechnolabs.com
35	Assist Software	www.assist-software.net
36	Objectiva	www.objectivasoftware.com
37	iTexico	www.itexico.com
38	Qubit Labs	www.qubit-labs.com
39	UruIT	www.uruit.com
40	Number 8	www.number8.com
41	Amdaris	www.info.amdaris.com
42	Dreamix	www.dreamix.eu
43	PSL Corp	www.pslcorp.com
44	Abstracta	www.abstracta.us
45	RSK Business solutions	www.rsk-bsl.com
46	Softon	www.softonitg.com
47	BrickRed Systems	www.brickredsys.com
48	Cafeto	www.cafeto.co
49	Nearshore IT	www.nearshore-it.eu
50	UWS Software	www.uws.ie
51	Gorilla Logic	www.gorillalogic.com
52	Moove IT	www.moove-it.com
53	Softtek	www.softtek.com
54	Invid	www.invidgroup.com
55	Hexacta	www.hexacta.com
56	Excel SoftSources	www.excelsoftsources.com
57	Daxx	www.daxx.com
58	Belatrix Software	www.belatrixsf.com
59	Espeo	www.espeo.eu
60	IT Craft	www.itechcraft.com
61	IT Master	www.itmaster-soft.com
62	FlexDev	www.flexdevgroup.com
63	Cleveroad	www.cleveroad.com
64	CN Group	www.cngroup.dk
65	Sytoss	www.sytoss.com
66	Rootstack	www.rootstack.com
67	PGS Software	www.pgs-soft.com
68	Growth Acceleration Partners	www.growthaccelerationpartners.com
69	Scio	www.sciodev.com
70	Diceus	www.diceus.com
71	Mobilunity	www.mobiliunity.com
72	Auxis	www.auxis.com
73	Nearshore-Romania	www.nearshore-romania.com
74	Nearsure	www.nearsure.net
75	Daitan	www.daitan.com
76	Jobsity	www.jobsity.com
77	Arnia Software	www.arnia.com
78	Axeltra	www.axeltra.com
79	Fortech	www.fortech.ro

Appendix 2: BC Tech Sector Survey

Exploring the use of outsourcing within the BC Technology Sector

MBA Research Survey – University of Northern British Columbia

Thank you for your interest in this survey.

As part of my research project for my MBA degree, I am conducting a survey of British Columbia technology companies regarding behaviors associated with utilizing outsourcing models for software development.

The survey is designed to answer the question "How does the BC Technology Sector utilize outsourced software development skill sets in comparison with global trends?"

The survey will focus on the roles directly involved in the software development process such as:

- Business Analyst
- Architect/Engineer
- Project manager
- Developer
- QA

I am seeking participating BC headquartered companies who have both utilized and haven't utilized outsourced resources. The survey should take no longer than 10 minutes to complete.

Your participation provides a valuable contribution to better understanding the Technology sector in British Columbia.

If you have any questions or concerns about this project, please feel free to contact me at hands@unbc.ca or 778-952-6004.

Thanks in advance,
Marian Hands, MBA Candidate

Demographics
The questions on this page are designed to provide an overall framework for understanding the participant responses.

1. Where are your corporate headquarters located?
   (Open text)
2. What segment of the technology sector best describes your company?
   (Drop down)
   - Information and Communication Technology
   - Life Sciences
   - Interactive and Digital Media
   - Clean Tech
   - Engineering Services
3. How many years has your company been in business?
   - 0-5
   - 6-10
   - 11-20
   - Over 20 years

4. Which category describes your annual revenues? (USD)
   (Drop down)
   - Under $1,000,000
   - Between 1,000,001 and 10,000,000
   - Over 10,000,000
5. How many individuals do you employ locally for software development activities (business analyst, architect/engineer, IT project manager, developer, QA)?
   - 0-10
   - 11-50
   - 51-100
   - Over 100
6. Which stage of development would you describe your company?
   - Pre-revenue
   - Early-revenue
   - Growth
   - Scale
   - Mature
   - Acquisition
7. How would you best describe the structure of your organization?
   - Functional departments – Specialists assigned and managed within a functional department
   - Matrix – Specialists assigned to teams but managed functionally
   - Project/product based – Specialists assigned and managed within multi-function teams
   - Other (please specify)

Internal Resourcing (Insourcing)

This set of questions focuses around internally sourced development work within your organization - specifically work associated with the five identified areas; business analyst, architect/engineer, project manager, developer, QA.

By definition, insourcing is the use of **internal employees** to provide service to your organization. In this survey, remote refers to individuals or teams who are not located within the corporate headquarters "campus".

Below are some common insourcing models:

1. A full remote team including the team project manager (satellite office)
2. A full remote team (satellite office) managed from Corporate headquarters
3. A local team supplemented by remote employees

This section will ask questions about the utilization of insourcing models including these and others not defined.

8. Have you utilized remote internal resources to supplement local software development employees?
   - Yes
   - No
9. Please describe the models that you used to supplement your local staff complement using an insourced model. (Use each line for different locations)
   - Location – where were the remotely located individuals/teams located?
   - Insourcing model – how was the insourcing structured?

- Utilization – were the remotely located individuals/teams used for task-based, project based or full development activities?

Scenario#	Location	Type of insourcing models	Utilization
	• British Columbia • Rest of Canada • United States • Mexico • Central America • South America • Eastern Europe • Western Europe • Indian Subcontinent • Middle East • China • Pacific Rim • Africa • Other	• A full remote team including the team project manager • A full remote team (satellite office) managed from Corporate Headquarters • A local team supplemented by remote employees • Other	• Task-based • Project-based • Full Development • Other

10. Please describe your reasons for choosing the locations that you did for insourcing.

Scenario#	Cultural Alignment	Similar Time Zones	"Follow the sun" Development	Available Skill Sets	Low Rates

External Resourcing (Outsourcing)

This set of questions focuses around resourcing development work within your organization - specifically work associated with the five identified areas; business analyst, architect/engineer, project manager, developer, QA.

By definition, outsourcing is the use of **external organizations or individuals** to provide service to your organization. This can be long or short term.

Below are five common outsourcing models

1. An outsourced team including the team project manager
2. An outsourced team managed locally by an outsourced project manager
3. An outsourced team managed locally in-house
4. Development team members exclusive to the company, but managed by outsourcing firm
5. Freelancer/contractor/consultant managed locally

This section will ask questions with regards to outsourcing including these models and others not defined.

11. Have you utilized any outsourcing models to supplement your local development efforts?
    - Yes
    - No
12. Please describe the models that you used to supplement your local staff using an outsourced model. (use each line for different locations)
    - Location – where were the remotely located individuals/teams located?

- Insourcing model – how was the insourcing structured?
- Utilization – were the remotely located individuals/teams used for task-based, project based or full development activities?

Scenario#	Location	Type of outsourcing models	Utilization
	• British Columbia • Rest of Canada • United States • Mexico • Central America • South America • Eastern Europe • Western Europe • Indian Subcontinent • Middle East • China • Pacific Rim • Africa • Other	• Outsourced team including the team project manager • Outsourced team managed locally by an outsourced project manager • Outsourced team managed locally in-house • Development team members exclusive to the company, but managed by outsourcing firm • Freelancer/contractor/consultant managed locally • Other	• Task-based • Project-based • Full Development • Other

13. Please describe your reasons for choosing the locations that you did for outsourcing.

Scenario#	Cultural Alignment	Similar Time Zones	"Follow the sun" Development	Available Skill Sets	Low Rates

Criteria for Outsourcing

Please rate the following criteria for outsourcing based on importance to your organization.
(Sliding scales)

14. Save time — Not important ---------- Neutral ---------- Very Important
15. Save money — Not important ---------- Neutral ---------- Very Important
16. Save office space — Not important ---------- Neutral ---------- Very Important
17. Access skill sets — Not important ---------- Neutral ---------- Very Important
18. Maintain flexibility — Not important ---------- Neutral ---------- Very Important

Final

Thank you for your participation.

19. If you have any further comments that you would like to add to the survey or if you are open to being contacted in the future with regards to this project, please enter your comments and/or contact information below.

    (Comment box)

Appendix 3: Survey Results

Insourcing responses compared to company demographics

				Insourcing Location						Type of Engagement			Scope of Work			Reason for Location						Top Criteria for Outsourcing				
		Total Respondents	**Respondents that did not insource**	**Respondents that insourced**	Within BC	Rest of Canada	US	Eastern Europe	Indian Subcontinent	A full remote team managed from Corporate	A full remote team including the team PM	A local team with remote employees	Task-based	Project-based	Full development	Low Rates	Cultural Alignment	Available Skillsets	Similar Time zones	Follow the sun	Other (flexibility)	Save Time	Save Money	Save Office Space	Skill Sets	Flexibility
Location of Head Office	Lower Mainland *	**11**	**6**	**5**[1]	5	2	1	1	0	3	1	3	0	5	2	3	5	7	4	2	0	0	1	1	3	0
	Okanagan**	**2**	**1**	**1**	1	1	0	0	0	0	0	2	0	0	2	0	2	2	2	0	2	0	0	0	1	0
	Vancouver Island***	**3**	**3**	**0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Prince George	**1**	**1**	**0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Company Classification	Info & Comm Tech	**10**	**6**	**4**[1]	4	1	1	1	0	3	1	1	0	3	2	3	4	5	4	2	0	0	1	0	3	0
	Interactive & DigMed	**4**	**4**	**0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Engineering Services	**2**	**1**	**1**	1	1	0	0	0	0	0	2	0	2	0	0	0	2	0	0	0	0	0	1	0	0
	Life Sciences	**1**	**0**	**1**	1	1	0	0	0	0	0	2	0	0	2	0	2	2	2	0	2	0	0	0	1	0
Annual Revenue (USD)	Under $1,000,000	**11**	**9**	**2**	2	1	0	0	0	0	0	3	0	3	0	1	0	3	0	0	0	0	0	1	1	0
	$1,000,001 – $10,000,000	**4**	**2**	**2**	1	1	0	1	0	1	0	2	0	0	3	1	3	2	2	1	2	0	1	0	1	0
	Over $10,000,000	**2**	**0**	**2**[1]	3	1	1	0	0	3	0	0	0	2	1	1	4	4	4	1	0	0	0	0	2	0

Insourcing responses compared to company demographics		Total Respondents	Respondents that did not insource	Insourcing Location						Type of Engagement			Scope of Work			Reason for Location							Top Criteria for Outsourcing				
				Respondents that insourced	Within BC	Rest of Canada	US	Eastern Europe	Indian Subcontinent	A full remote team managed from Corporate	A full remote team including the team PM	A local team with remote employees	Task-based	Project-based	Full development	Low Rates	Cultural Alignment	Available Skillsets	Similar Time zones	Follow the sun	Other (flexibility)	Save Time	Save Money	Save Office Space	Skill Sets	Flexibility
# Software Dev	0-10	**10**	**8**	**2**	1	0	0	1	0	1	0	1	0	1	1	2	1	1	0	1	0	0	1	0	1	0
	11-50	**6**	**4**	**3**[1]	3	3	0	0	0	0	0	4	0	2	2	1	3	5	3	1	2	0	0	1	2	0
	Over 100	**1**	**0**	**1**	2	0	1	0	0	2	1	0	0	2	1	0	3	3	3	0	0	0	0	0	1	0
Stage of Growth	Pre-Revenue	**3**	**3**	**0**	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Early-Revenue	**4**	**3**	**1**	1	0	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	0	0	1	0
	Growth	**5**	**1**	**4**[1]	3	3	0	1	0	1	0	4	0	2	3	2	4	5	3	2	2	0	1	1	2	0
	Mature	**5**	**4**	**1**	2	1	1	0	0	2	1	0	0	2	1	0	3	3	3	0	0	0	0	0	1	0
Age	0-5 years	**6**	**5**	**1**	1	0	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	0	0	1	0
	6-10 years	**4**	**3**	**1**	0	0	0	1	0	1	0	0	0	0	1	1	1	0	0	1	0	0	1	0	0	0
	11-20 years	**4**	**1**	**2**[1]	3	3	0	0	0	0	0	4	0	2	2	1	3	5	3	1	2	0	0	1	2	0
	Over 20 years	**3**	**2**	**1**	2	0	1	0	0	2	1	0	0	2	1	0	3	3	3	0	0	0	0	0	1	0

* North Vancouver, Vancouver, New Westminster, Port Moody and Surrey ** Kelowna and Penticton *** Victoria and Nanaimo

Table 11: Insourcing results compared to company demographics

Insourcing Evaluation		**Total**	Within BC	Rest of Canada	US	Eastern Europe	Indian Subcontinent
Type of Engagement	A full remote team (satellite office) managed from Corporate Headquarters	**3**	1	0	1	1	-
	A full remote team including the team project manager (satellite office)	**1**	1	0	0	0	-
	A local team supplemented by remote employees	**5**	3	2	0	0	-
Scope of Work	Task-based	**0**	0	0	0	0	-
	Project-based	**5**	3	1	1	0	-
	Full development	**4**	2	1	0	1	-
Reasons for Choosing Location	Low Rates	**2**	1	0	0	1	-
	Cultural Alignment	**6**	3	1	1	1	-
	Available Skillsets	**7**	4	2	1	0	-
	Similar Time zones	**5**	3	1	1	0	-
	Follow the Sun	**1**	0	0	0	1	-
	Other (flexibility)	**2**	1	1	0	0	-
Rankings – Most Important	Save time	**0**	0	0	0	0	-
	Save Money	**1**	0	0	0	1	-
	Save Office Space	**2**	1	1	0	0	-
	Skillset	**4**	3	1	1	0	-
	Flexibility	**0**	0	0	0	0	-

Table 12: Survey results comparing insourcing decisions

Outsourcing responses compared to company demographics

				Outsourcing Location						Type of Engagement			Scope of Work			Reason for Location							Top Criteria for Outsourcing				
		Total Respondents	**Respondents that did not outsource**	**Respondents that outsourced**	Within BC	Rest of Canada	US	Eastern Europe	Indian Subcontinent	Outsourced team managed locally by an outsourced PM	Outsourced team including the team PM	Freelancer/contractor/ consultant	Task-based	Project-based	Full development	Low Rates	Cultural Alignment	Available Skillsets	Similar Time zones	Follow the sun	Other (flexibility)	Save Time	Save Money	Save Office Space	Skill Sets	Flexibility
Location of Head Office	Lower Mainland *	**11**	**6**	**5**[1]	1	1	1	2	2	1	0	6	0	5	2	4	4	8	4	1		0	2	0	3	0
	Okanagan**	**2**	**0**	**2**[1]	0	0	0	1	1	0	1	2	2	1	0	0	0	0	3	3		0	0	0	2	0
	Vancouver Island***	**3**	**3**	**0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Prince George	**1**	**1**	**0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Company Classification	Info & Comm Tech	**10**	**5**	**5**[1]	1	1	1	2	1	1	0	6	2	4	1	4	4	8	4	1	0	0	1	0	4	0
	Interactive & DigMed	**4**	**3**	**1**	0	0	0	0	2	0	0	2	0	1	1	2	0	2	0	0	0	0	1	0	0	0
	Engineering Services	**2**	**2**	**0**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Life Sciences	**1**	**0**	**1**	0	0	0	1	0	0	1	0	0	1	0	1	0	1	0	0	0	0	0	0	1	0
Age	0-5 years	**6**	**3**	**3**[1]	0	0	0	1	3	0	0	5	2	2	1	5	0	5	0	0	0	0	1	0	2	0
	6-10 years	**4**	**3**	**1**	0	0	0	1	0	1	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0
	11-20 years	**4**	**2**	**2**[1]	1	1	1	1	0	0	1	*	0	1	0	1	1	1	2	2	0	0	0	0	2	0
	Over 20 years	**3**	**2**	**1**	1	1	1	0	0	0	0	3	0	3	0	0	3	3	3	0	0	0	0	0	1	0

Outsourcing responses compared to company demographics		Total Respondents	Respondents that did not outsource	Outsourcing Location						Type of Engagement			Scope of Work			Reason for Location						Top Criteria for Outsourcing				
				Respondents that outsourced	Within BC	Rest of Canada	US	Eastern Europe	Indian Subcontinent	Outsourced team managed locally by an outsourced PM	Outsourced team including the team PM	Freelancer/contractor/ consultant	Task-based	Project-based	Full development	Low Rates	Cultural Alignment	Available Skillsets	Similar Time zones	Follow the sun	Other (flexibility)	Save Time	Save Money	Save Office Space	Skill Sets	Flexibility
Annual Revenue (USD)	Under $1,000,000	**11**	**8**	**3**[1]	0	0	0	1	3	0	0	5	2	2	1	5	0	5	0	0		0	1	0	2	0
	$1,000,001 – $10,000,000	**4**	**2**	**2**	0	0	0	2	0	1	1	0	0	1	1	1	0	2	0	0	0	0	1	0	1	0
	Over $10,000,000	**2**	**0**	**2**[1]	2	1	1	0	0	0	0	3	0	3	0	1	4	4	4	1	0	0	0	0	2	0
# Software Dev Employee	0-10	**10**	**6**	**4**[1]	0	0	0	2	3	0	1	5	2	2	2	6	0	6	0	0	0	0	2	0	2	0
	11-50	**6**	**4**	**2**[11]	1	0	0	1	0	0	1	0	0	1	0	2	1	2	1	1	1	0	0	0	2	0
	Over 100	**1**	**0**	**1**	1	1	1	0	0	0	0	3	0	3	0	0	3	3	3	0	0	0	0	0	1	0
Stage of Growth	Pre-Revenue	**3**	**2**	**1**[1]	0	0	0	0	1	0	0	2	2	0	0	2	0	2	0	0	0	0	0	0	1	0
	Early-Revenue	**4**	**2**	**2**	0	0	0	1	2	0	0	3	0	2	1	3	0	3	0	0	0	0	1	0	1	0
	Growth	**5**	**2**	**3**[1]	1	1	0	2	0	1	1	0	0	1	1	2	1	3	4	1	0	0	1	0	2	0
	Mature	**5**	**4**	**1**	1	1	1	0	0	0	0	3	0	3	0	0	3	3	3	0	0	0	0	0	1	0

* North Vancouver, Vancouver, New Westminster, Port Moody and Surrey ** Kelowna and Penticton *** Victoria and Nanaimo

[1] Respondent put "Other" without description

Table 13: Outsourcing results compared to company demographics

Outsourcing Evaluation		**Total**	Within BC	Rest of Canada	US	Eastern Europe	Indian Subcontinent
Type of Engagement	Outsourced team managed locally by an outsourced project manager	**1**	0	0	0	1	0
	Outsourced team including the team project manager	**1**	0	0	0	1	0
	Freelancer/contractor/consultant managed locally	**7**	1	1	1	1	3
Scope of Work	Task-based	**1**	0	0	0	0	1
	Project-based	**6**	1	1	1	2	1
	Full development	**2**	0	0	0	1	1
Reasons for Choosing Location	Low Rates	**5**	0	0	0	2	3
	Cultural Alignment	**3**	1	1	1	0	0
	Available Skillsets	**9**	1	1	1	3	3
	Similar Time zones	**3**	1	1	1	0	0
	Follow the Sun	**0**	0	0	0	0	0
Rankings – Most Important	Save time	**0**	0	0	0	0	0
	Save Money	**2**	0	0	0	1	1
	Save Office Space	**0**	0	0	0	0	0
	Skillset	**6**	1	1	1	2	1
	Flexibility	**0**	0	0	0	0	0

Table 14: Survey results comparing outsourcing decisions