The Impact of Information Quality of Job Descriptions on an Applicant's Decision to Pursue a Job

by

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I hereby declare that I am the sole author of this thesis. This is a true copy of thesis, including any required final revisions, as accepted by my examiners.

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Abstract

Job descriptions are one of the major mechanisms that organizations use to convey job and company information to job applicants. Consequently, job descriptions play a major role in the recruitment process to attract job candidates. However, it is unclear whether the quality of a job description influences a job applicant's decision making. It is in the organizations' interest to understand this phenomenon to make better decisions on how to present job descriptions in order to achieve qualified applicants and a desirable applicant pool size.

The purpose of this thesis is to determine the impact of the quality of information of job descriptions on a job applicant's decision to pursue a job. A model is developed to quantify job descriptions. The developed model contains three axes: i) x-axis – job description components, ii) y-axis – information quality dimensions, and iii) z-axis – job industries. This investigation analyzed 127 job descriptions for students majoring in accounting at the University of Waterloo to determine the relationship between the qualities of different components of the job descriptions with the corresponding number of applications.

The results of this investigation suggest that information quality has a positive impact on job applicants' decision to pursue a job. In addition, information quality has different magnitudes of impact for jobs that have similar organization reputation or geographic location. Future research is recommended to analyze other information quality dimensions by using a similar experimental approach as the one used in this thesis.

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Dedication

I would like to dedicate this thesis to my family and my friends. The unconditional love from my family is irreplaceable, and it is the one source of energy that keeps me running. The support from my friends provided strength for me to complete my studies especially during the time when I was struggling. I cannot express more on how much I appreciate your care.

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Introduction

Recruitment is a critical process for many organizations since it has a direct impact on their labour force. It is desirable for organizations to operate an efficient recruitment process where they can hire qualified employees, achieve a low turnover rate, and to obtain a highly productive performance from their employees. In order to achieve this, organizations need to understand how to effectively convey information to job applicants so that they can make better hiring decisions.

Many organizations are interested in attracting a larger pool of job candidates because it will provide them a higher chance in hiring qualified employees. As a result, many studies have been performed on different recruitment strategies (Barber, 1998; Breaugh, 1992; Lievens et al., 2001). In the recruitment process, the job description is one of the major mechanisms utilized to transfer company and job information to job seekers. In order to attract more and better job applicants, it is beneficial for the organization to understand how to write attractive job descriptions.

This research focuses on the characteristics of job descriptions and how job applicants respond to them. Although exploratory, this research has resulted in a preliminary information taxonomy and analysis method for analysing the information quality (IQ) of a job description. IQ refers to the quality of information content where different information quality dimensions can be used to evaluate the level of value of different components of a job description. As suggested by Reeves and Bednar (1994), there are four main aspects of quality that can be used for different implications including excellence, value, conformance to specifications, and meeting and/or exceeding

expectations. A controlled experiment applying the concepts suggests that these initial ideas have the potential to provide insights to recruitment researchers and companies on how job applicants perceive job descriptions and how the content of job descriptions impacts job applications.

The thesis begins with a broad analysis on the recruitment process, followed by a discussion on the problem formulation in Chapter 1. Chapter 2 provides a more in-depth literature review on information quality and job descriptions. Chapter 3 presents the formulation of the model that quantifies job descriptions. Chapter 4 outlines the hypotheses with a subsequent discussion in Chapter 5 on the experimental design to verify those hypotheses. The data analysis and results associated with the experiment are found in Chapter 6. A thorough discussion on each hypothesis is then presented in Chapter 7. Limitations and future research are presented in Chapter 8 and are followed by the conclusions in Chapter 9.

Chapter 1
Recruitment Overview

1.1 Motivation

The key inspiration for this research comes from the largest cooperative education program in Canada. This program is run by Cooperative Education and Career Services (CECS) at the University of Waterloo. Cooperative education functions with an employment process that involves three major stakeholders which include employers, students, and CECS employees. Employers submit job descriptions to the co-op system to advertise job positions. Students search and apply to job positions of their interest by submitting job applications. Employers then screen job applications and choose candidates for interviews. After interviews, employers and students rank each other according to their preferences. Finally, a matching system determines the final match of jobs and students. CECS employees are responsible for the overall operation of the employment system which includes information transfer between employers and students, student counselling program, and the co-op information technology (IT) system management.

Due to the large volume of students and jobs that CECS manages every term, CECS faces many challenges. One of the challenges is the process of making decisions in designing the employment system specification for each term. The employment system specification defines the milestones (e.g. the dates for job postings, the time period for interviews, and others), the constraints (e.g. the number of jobs each student is allowed to apply to, the number of job postings to be listed on each day, and others), and the

resource allocation (e.g. how many CECS employees are necessary to assist employers during interview time, how many hours of student counselling are necessary for the first month of the school term, and others). Many of these decisions depend on how many students are expected to get matched in the main round of interviews, and this number depends on the students applying to their best job opportunities. The job opportunity is presented to the students via the job description and at the end of the main round, there are many students who have not been interviewed, others interviewed but still without a job, and many employers who did not have sufficient (or any) students to interview. The jobs without sufficient applicants might in fact be very good jobs, but are not presented in a way that attracts students. CECS has suspected that the job descriptions affect the process, but have not been able to analyze this situation in the past. Hence, this research attempts to understand student behaviour with regard to their reaction to different job descriptions: why are some jobs more attractive than others and does the job description content impact a student's perception and decision to apply?

Cooperative (co-op) students at the University of Waterloo are usually placed in a four-month or eight-month work term. Students searching for a four- or eight-month temporary placement possess different characteristics than graduating students seeking full-time employment or experienced employees looking for a different job. For example, job advertisements for co-op students are for temporary hire, which may be different than job advertisements that are for permanent hire. Temporary hire positions might require less specific skills than permanent hire positions because companies expect co-op students to gain experience through the job. Co-op students that are looking for a temporary placement may seek different job characteristics than graduating students who

are seeking for a permanent job. Co-op students may be interested in finding a job that allows them to gain a wide-spectrum of skills; whereas graduating students may be seeking jobs that require specific qualifications so that they can utilize a specific skill set. Furthermore, employees in the workforce have previous experience in job search, thus they may be more competent in terms of understanding what they are looking for when reading a job description. However, co-op students (especially those that are on their first work term) have never been employed, or have little experience in the job market prior to their job search; as a result, the content of a job description can become very crucial to the decision process. Experienced hires might be able to interpret missing information while inexperienced co-op students might not. Co-op students might attend to all the specific details in a job description and take all of the information at face value.

Although employers submit their job descriptions for their job positions one to four weeks prior to the posting date, the hiring process occurs four months prior to the actual starting date of employment. As a result, the job descriptions are written four to six months before the actual starting date for a student. This creates challenges for employers. For example, employers might have difficulty in writing specific job responsibilities for the job positions. This is because employers usually do not have well-defined projects or tasks where they can plan detailed actions that can be carried out four months in advance. However, students often request details in job descriptions from employers. This creates a gap between what employers can provide and what students are seeking.

Strauss and Howe (1991) defined the *Millennial* generation as people that are born from

1982 to 2003. The co-op students at the University of Waterloo from the year 2001 to 2007 belong to this generation. As a result, the behaviour, the perception, and the knowledge of the students from the Millennial generation is different than the previous generations such as *Generation X* (1961 to 1981) or *Boom* (1943 to 1960) (Howe and Strauss, 2000). Howe and Strauss defined a number of generational personas that distinctively describe the Millennial generation apart from the previous generation. Generational persona is a "distinctly human, and variable, creation embodying attitudes about family life, gender roles, institutions, politics, religion, culture, lifestyle, and the future." The Millennials possess seven generational personas which include: special, sheltered, confident, team-oriented, achieving, pressured, and conventional (Howe and Strauss, 2000). Since the oldest of this generation have only begun to enter secondary or post-secondary education, there are still lots of characteristics yet to be determined in terms of their behaviour. However, what is understood is that there are many ways in which the Millennial generation behaves differently from other generations as suggested by the different generational personas. For example, the Millennial generation are believed to be the best-educated adults and have high self-confidence. They have high expectations of themselves and of others. Will this impact the behaviour of the job applicants in the recruitment process?

The above discussions become important issues when studying the recruitment process. The literature provides a wide range of studies that investigate experienced employees and campus recruiting for permanent hires and less emphasis on cooperative students. In addition, the literature presents many studies that were conducted using samples from the previous generation(s). As a result, the findings may not be applied directly to the young

job applicants in the current generation. This study investigates the recruitment process considering the perspective of the cooperative education. Specifically, using data from the cooperative education at the University of Waterloo, this thesis investigates how job applicants attend to the content of job descriptions and the impact on the job response rate. Although the topic of the Millennial generation is discussed, this subject will not be investigated in further detail. While this topic is not part of the scope of this thesis, additional research is highly recommended to investigate this subject matter since it is believed to have a significant impact to the recruitment research.

This chapter continues with a broad literature review of the recruitment research. The following sections provide an overview of four different categories of the recruitment process.

1.2   Recruitment Research

Recruitment research has been identified as a critical field of study for organizations (Barber, 1998; Breaugh, 1992). Previous studies established a close correlation between recruitment management and organizations' performance including return on investments, profitability, and organizational survival (Barber, 1998). However, due to the complexity of the employee recruitment process, Breaugh and Starke (2000) found that many deficiencies existed in the literature such as experiments that are poorly designed and studies that are narrow in focus. A number of other review papers (e.g. Ryan and Polyhart, 2000; Anderson et al., 2004) and publications (e.g. Barber, 1998; Breaugh, 1992) also suggest the lack of research in the recruitment field and/or the need

for improved research.

The researchers claim that society will benefit from the value gained from studies of the recruitment process. For example, Barber (1998) states that "Recruitment performs the essential function of drawing an important resource – human capital – into the organization. The success of later human resource efforts, including selection, training, and compensation, depends in part on the quality and quantity of new employees identified and attracted through the recruitment process." Ryan and Polyhart (2000) suggest that there are four incentives for the increasing interest in the recruitment research, specifically in the area of the applicants' perception towards the selection process: i) as a result of competition and low employment rate, organizations are investigating strategies to improve the recruitment process, ii) key researchers in the recruitment field have called for improved research, iii) there is an increasing interest in investigating if and how social justice theory is applicable to job candidate selection perspective, and iv) organizations are concerned about their attractiveness to minority groups due to increasing diversity of workforce. In addition, Breaugh (1992) proposes that organizations can benefit from recruitment research because recruitment activities have a direct relationship with human resource management. The recruitment strategy an organization uses can highly affect the quality and quantity of job applicants it receives. Ultimately, some of these job candidates will be the workforce for the organization (Breaugh, 1992).

The general recruitment literature includes a wide range of topics, some of which are:

- the determination of feasible and effective selection tools and recruitment

strategies (Ryan and Tippins, 2004)

- the perception of classroom experience versus work experience from employers (Barr and McNeilly, 2002)

- the difference between experienced hiring versus college recruiting (Rynes et al., 1997)

- the effects of compensation to job applicants (Rynes et al., 2004; Rynes et al., 1989)

For convenience and clarity, the various recruitment literature topics can be categorized into four main topics:

i) applicant attraction strategies (see Chapter 1.4.1)

ii) applicants' decision making and job choice (see Chapter 1.4.2)

iii) person-organization (P-O) fit (see Chapter 1.4.3)

iv) job description content (see Chapter 1.4.4)

Although the selected publications to be discussed can be broadly categorized into the four areas, many of them are interrelated. One of the ways that these categories are interrelated pertains to information. For example, information is a recurring theme in the following recruitment literature:

- perception of information (e.g. Cable and Graham, 2000; Chapman and Webster, 2006; Connerley and Rynes, 1997; Ryan and Polyhart, 2000)

- the technique of information transfer (e.g. Kim and Gelfand, 2001; Phillips, 1998; Rafaeli et al., 2005)

- the content of information (e.g. Barber and Roehling, 1993; Feldman et al.,

2006; Smith et al, 1990)

All of these are noted as important attributes in job candidates' decision-making processes. Barber (1998) suggests that it is wise to break down the recruitment process and perform a literature review by logical stages. In addition, Barber and Roehling (1993) comment that early stages make up the most important phase of a recruitment process. If information is perceived positively by the job applicants during this phase, and a perceived likelihood to receive an offer is created, more interest will be generated for the job seekers to apply for a job (Breaugh and Starke, 2000). Using the above suggestions as benchmarks, this thesis focuses on the early stages of a recruitment process and the impact of information on a job applicant's decision to pursue a job.

Three questions directed the literature review activity:

i) why is it important to study the impact of information quality in job descriptions on the applicant's initial decision to pursue a job application?

ii) what research has been done in the past?

iii) what research is needed to address the gaps found in the literature?

The following sections review studies from various sources and present the recruitment literature starting from a very broad perspective and progressively narrowing down the focus to the impact of information quality. Two books, *Recruiting Employees, Individual and Organizational Perspectives* by Barber (1998) and *Recruitment: Science and Practice* by Breaugh (1992) were used to provide a topic foundation. Furthermore, three recent review papers were analyzed:

i) *Future Perspectives on Employee Selection: Key Directions for Future Research and Practice* by Anderson et al. (2004)

ii) *Research on Employee Recruitment: So Many Studies, So Many Remaining Questions* by Breaugh and Starke (2000)

iii) *Applicants' Perceptions of Selection Procedures and Decisions: A Critical Review and Agenda for the Future* by Ryan and Ployhart (2000)

Finally, scholarly studies from different fields of research were used including advertisement, applied psychology, business and psychology, behavioural decision making, consumer affairs, human resource management, and organizational research methods.

1.3 Definition of Recruitment

This thesis uses a working definition of *Recruitment*. Many researchers attempted to define *recruitment*, thus there are many different definitions. This paper focuses on definitions from three of the main researchers in the recruitment field:

i) "Encompass all organizational practices and decisions that affect either the number, or types, of individuals who are willing to apply for, or to accept, a given vacancy" (Rynes, 1991)

ii) "Employee recruitment involves those organizational activities that (1) influence the number and/or the types of applicants who apply for a position and/or (2) affect whether a job offer is accepted" (Breaugh, 1992)

iii) "Recruitment includes those practices and activities carried on by the

organization with the primary purpose of identifying and attracting potential

employees" (Barber, 1998)

Considering the above definitions, a composite definition of recruitment is used in this

research:

Recruitment is the set of organizational practices and activities that are performed with

the objective to attract and employ job seekers to fill job positions.

1.4   The Four Major Recruitment Topics

1.4.1   Applicant Attraction Strategies

Many scholarly studies focused on the topic of applicant attraction strategies in the past

decade due to reasons such as labour shortages and competition (Barber, 1998; Breaugh,

1992; Lievens et al., 2001; Ryan and Ployhart, 2000; Rynes and Barber, 1990; Trank et

al., 2002). Organizations wanted to determine optimal methods to attract qualified

candidates to apply to their company. They realized that a company's success depends

heavily on the recruitment process. Barber (1998) comments that by using the correct

recruitment strategies, organizations can employ the most qualified employees resulting

in a lower turnover rate, lower cost in recruitment process, and a higher quantity and

quality in production rate.

Breaugh and Starke (2000) presented a theoretical framework for understanding the

recruitment process in their recruitment review paper.   This framework includes five

main components: recruitment objectives, strategy development, recruitment activities, intervening and process variables, and recruitment results. One of the main attributes in the recruitment activities component is the recruitment message. Breaugh and Starke (2000) suggest that the message plays an important role in affecting the attractiveness of a job and/or an organization to job seekers. This observation implies that the information in a job description is a key factor in influencing an applicant's decision to pursue a job.

According to Breaugh and Starke (2000), most of the applicant attraction strategies studies can be categorized into three fields: recruitment sources (see Chapter 1.4.1.1), recruiters (see Chapter 1.4.1.2), and realistic job previews (see Chapter 1.4.1.3). There is evidence from each of these areas of studies that demonstrates how information quality relates to applicant attraction strategies.

1.4.1.1   Recruitment Sources

Many types of recruitment sources have been studied in the literature including:

- outsourcing (e.g. school placement offices, hiring agency) (Breaugh, 1992)

- newspaper or other advertisements (Rafaeli et al., 2005)

- employee referrals (Breaugh and Starke, 2000; Rafaeli et al., 2005; Shinnar et al., 2004)

- online recruitments (Cober et al., 2003; Cober et al., 2004)

- direct applications (Breaugh, 1992; Breaugh and Starke, 2000)

All of these studies suggest that the usage of different recruitment methods results in

different effects in the recruitment outcomes. In their recruitment research review paper, Breaugh and Starke (2000) examined a number of studies including: a commonly-cited study of source usage that was conducted by the Bureau of National Affairs (BNA) in 1988, the National Organizations Study which entails a national probability sample of employers, and a report on national probability sample of employees by Vecchio in 1995. Breaugh and Starke (2000) found common evidence from these studies that suggest there are a wide range of recruitment sources that are commonly used such as newspaper ads, employee referrals, direct applications, and recruiting at schools. Furthermore, they state that the realistic information hypothesis is one of the theories that received the most attention. This theory explains "why sources may be differentially associated with recruitment outcomes". It states that i) "persons recruited via certain sources are likely to have more accurate information about what a job entails" and ii) "possessing such information is thought to enable an applicant to make a more informed decision about whether to pursue a job". These findings suggest that the level of realism of information can be considered as an information quality dimension.

From a sociological point of view, Kim and Gelfand (2003) used an information processing perspective to investigate the impact of recruitment brochures on the recruitment process. They studied how ethnic identity can influence a job candidate's perspective towards organizations using 238 students from the Psychology and Business Management classes at a university of United States as participants. There are two hypotheses in this study. The first hypothesis states that there should be a positive correlation between students with higher level of ethnic identity with the inference with the companies that issue brochures with diversity initiative statements. The second

hypothesis states that there should be a positive correlation between students with higher level of ethnic identity and the willingness to accept an offer with the companies that issue brochures with diversity initiative statements. Findings conclude that higher levels of ethnic identity in recruitment brochures create a greater incentive for job seekers to complete the application process and pursue the rest of the recruitment process (Kim and Gelfand, 2003). In addition, their findings suggest that ethnic identity can be considered as an attribute of information quality.

1.4.1.2   Recruiters

Many scholarly publications propose that recruiters have strong influences on job candidates' application decisions. For example, Barber and Starke (2000) indicate that many studies suggest different recruiters provide different kinds of information to job candidates and in turn this will have different impacts on the applicants' decisions. Some recruiters are more informative than others and some are perceived as more trustworthy. The informativeness of a recruiter's message is often weighted by the level of realism of the information compared to the level of positive information (Breaugh and Starke, 2000). Positive information is usually preferred over negative information. An example of positive information is attractive working environment and an example of negative information is that the job requires extensive overtime without pay. If an organization provides solely positive information, applicants may perceive that as inaccurate and unrealistic. As a result, applicants often desire a balance between realistic and positive information. Barber (1998) argues that it is important to understand the differences (if any) between the values and goals of recruiters and organizations. Understanding

recruiters' behaviour is an important factor because they are one of the essential mechanisms that organizations use to convey information to job candidates. Therefore, recruiters have a high influence in affecting an applicant's perception of an organization.

In an empirical study on the perception of recruiters by applicants, Connerley and Rynes (1997) stated eight hypotheses. The most notable hypothesis is hypothesis seven which states that "recruiters who are more informed about applicants and vacancies will (also) be perceived as more effective." To test this hypothesis, data was collected from both applicants and recruiters to verify whether there were common views between the two sides. The data was collected from 1571 student applicants and 216 matched recruiters who interviewed them in campus interviews in the colleges of business, liberal arts, and engineering at a university in the United States. Using regression analysis, the applicants' perception results suggest that the recruiter characteristics and actions can highly affect the variance of job seekers. There is strong evidence ($\beta = 0.32$, $P < 0.001$) to support hypothesis seven which suggest that the perception of information is important. Although the recruiter's perception regression analysis result is relatively lower ($\beta = 0.10$, $P < 0.05$), it still provides moderate support to the above argument.

While it is important for recruiters to be informative, some studies also suggest that many recruiters are misleading. For example, Breaugh (1992) and Rynes (1997) agree that recruiters and organizations often fail to convey important job information or they often provide inaccurate messages to 'sell' job positions. Breaugh (1992) summarized a number of recruiter studies and suggest that one of the biggest reasons why job candidates have different perceptions of an organization is because of the

miscommunications between recruiters and job seekers. Therefore, it is essential for

recruiters to be knowledgeable about their company and more importantly, to be able to

present this knowledge accurately (Breaugh, 1992).

1.4.1.3   Realistic Job Previews

Breaugh (1992) notes that the term realistic job preview (RJP) is mostly referred to as "a

presentation of factual information about a job opening that is given to job candidates by

an organization". In addition, in his book, Barber (1998) comments that RJP has been

one of the most "thoroughly and systematically studied areas of recruitment" where most

of the RJP studies were done upon the effects of realistic information conveyed to

applicants. One of the primary objectives of RJP is to reduce the employee turnover rate

(Barber, 1998). Some of the areas of studies that relate to RJP include attrition from the

job recruitment process, job expectations, affective reactions, job performance (Phillips,

1998), turnover rate (Phillips, 1998; Popovich and Wanous, 1982), and decision making

(Caligiuri and Phillips, 2003).

Breaugh and Strake (2000) point out that the RJP literature is "more or less trying to

answer the question: does providing accurate job information result in a higher level of

job satisfaction for new employees?" In addition, they compared the RJP theory and

models and summarized that most of the RJP models hypothesize "that providing realistic

job information to applicants results in their having their job expectations met." The RJP

models hypothesized "that providing an RJP influences role clarity and individuals'

perceptions that the organization is honest with them" (Breaugh and Starke, 2000).

These findings suggest that RJP, similar to information quality, influences applicants'
judgment and decision making. Furthermore, it is reasonable to suggest that the level of
realism of information in job descriptions perceived by applicants can be categorized as
an information quality dimension. Other literature also suggests that RJP and
information quality in job descriptions share common characteristics. For instance,
Roberson et al. (2005) argue that more specific job information allows job seekers to
make more informed decisions, which is indeed similar to the RJP theory where more
realistic information allows applicants to make better decisions. In their study, Roberson
et al. (2005) hypothesize that more specific recruitment messages will provide a more
positive perception of person-organization fit and create a higher intention to apply.
Using a sample size of 171 undergraduate students in a human resource management
course, the students were asked to complete questionnaires after reading a recruitment
message that was randomly assigned. The recruitment message was designed to contain
specific or general information about the organization and the job responsibilities. The
results support the hypothesis and the researchers suggest that recruitment advertisement
specificity influences applicant perceptions of organization attributes and person-
organization fit (Roberson et al., 2005).

Phillips (1998) conducted a meta-analysis of 40 journals (26 of which were published) on
RJP. The study analyzes three main factors: setting, timing, and medium of RJP.
Although there are no major findings that show a direct relationship to information
quality, the general results suggest that a realistic job preview can provide a higher
performance and a lower turnover rate. This finding also corresponds to Breaugh and
Starke's (2000) comment that RJP provides a higher level of job satisfaction, a lower

level of voluntary turnover, and a higher level of performance.

1.4.2   Applicant Decision Making and Job Choice

Applicant decision making and job choice is a topic that also receives a considerable amount of attention in the recruitment literature (Anderson et al., 2004; Barber, 1998; Breaugh, 1992; Slaughter et al., 2006). Some of the points explored are:

- ▪   researchers want to understand the different areas that impact job candidates' decision making, namely the applicant reaction mechanisms (Chapman and Webster, 2006)
- ▪   the impact of job attributes on job choice (Boswell et al., 2003)
- ▪   the impact of early recruitment-related activities on job choice (Collins and Stevens, 2002; Collins and Han, 2004)

In addition to these, many organizations and researchers such as Barber (1998) and Breaugh (1992) aim to identify the reasons and logic behind how job candidates make their decisions to either apply or not to apply to a specific job, continue or not to continue in a recruitment process, and to accept or not to accept a job offer.

Slaughter and Highhouse (2003) present their empirical study results of the effects of job features and applicants' job choice. Using 398 undergraduate psychology students as participants, they studied the relationship between applicants' job choices versus 14 job attribute preferences including income, opportunities for promotion, geographic location, freedom and autonomy, coworkers, prestige and recognition, supervisor, interesting

work, and dress code. One of the notable findings suggests "that jobs with unique

positive features and shared negative features were preferred over those with unique

negative features and shared positive features *only* when information was presented in a

simple (versus complex) format". This implies that the level of complexity of

information affects the level of attention job candidates contribute.

In his book, Barber (1998) suggests that in the early stages of the recruitment process, job

seekers are exposed to information provided by the employer, which often significantly

affects the applicant's initial job search decisions. To study this phenomenon, Murphy

and Tam (2004) analyzed job applicants' decision making using the Bayesian theory.

They suggest that one can use this theory to determine what an applicant should (rather

than will) do when they receive new or additional information regarding a job

opportunity (e.g. received additional information from an employee currently working in

the organization and received well-informed and specific information from an interview).

The Bayesian approach emphasizes that in order to make good decisions, applicants

require some benchmark information that they can use to compare with existing

information or knowledge. An example of the benchmark information is the knowledge

of other job opportunities or information regarding other organizations. However, most

studies in the recruitment literature only ask questions relating to what the applicants

know or feel about a particular job or an organization. As an alternative, they could have

asked the applicants questions on what and how they feel about other organizations and

job opportunities. The downside of the study done by Murphy and Tam (2004) is that it

does not contain any empirical analysis and only provides a single hypothetical

illustration of the use of the Bayesian method. The biggest limitation of this study is that

it is very difficult to obtain and quantify the 'benchmark' data regarding what applicants knew or felt about other organizations and job opportunities. Nevertheless, they developed a similar opinion as Barber (1998) who stated that the additional information and the quality of information presented to job candidates plays a major role in the recruitment process.

1.4.3   Person-Organizational Fit

Person-organizational (P-O) fit appears to receive a considerable amount of interest in the recruitment research. P-O fit is one of the many categories under person-environment (P-E) fit, which is defined as "the degree of congruence or match between a person and environment (Sekiguchi, 2004). P-O fit "refers to the compatibility between a person and the organization, emphasizing the extent to which a person and the organization share similar characteristics and/or meet each others' needs" (Sekiguchi, 2004). Kristof (1996) comments that one of the reasons why P-O fit is an important area of study is because "achieving high levels of P-O fit through hiring and socialization is often touted as the key to retaining a workforce with the flexibility and organizational commitment necessary to meet these competitive challenges".

An empirical study done by Lievens et al. (2001) investigated how a short description about an organization would affect the organization's attractiveness to job seekers. They performed the investigation from the P-O perspective and found that candidates were more attracted to some attributes over others. In this investigation, 359 final-year engineering and business students volunteered to participate in two separate studies. The

first study dealt with the attractiveness of the organization in which students read organization descriptions and answered a set of questions that probe the reason why a student will be attracted (or not attracted) to the company. The second study analyzed the personality of the applicant which requested the students to complete a personality inventory that relates to their background and biographical information (e.g. gender and age). The results showed that the participants are more attracted to "large-sized, medium-sized, decentralized, and multinational organizations". This study indicates that there is a relationship between organization description contents and job seekers' decision making.

Although many researchers suggest that it is important to improve P-O fit in organizations, Breaugh (1992), after reviewing many studies in the recruitment literature, comments that it is a very difficult task. One of the most complicated challenges to improve P-O fit is for candidates to provide information that is truthful. It is likely that in the recruitment process, organizations and job applicants both have the tendency to provide biased or inaccurate information in order to stay attractive and competitive (Breaugh, 1992).

1.4.4 Job Content

Recently, there seems to be a growing trend in studying job descriptions in the literature of business and psychology (Roberson et al., 2005), selection and assessment (Reeve and Schultz, 2004; Reeve et al., 2006), and advertising (Feldman et al., 2006). Due to the diverse areas of study, the presentation of job related information in an attempt to

advertise the job position has been given many names in the literature. Some examples include job description (Smith et al., 1990), recruitment advertisement (Belt and Paolillo, 1982; Mason and Belt, 1986), job advertisement (Feldman et al., 2006; Reeve and Schultz, 2004), and recruitment message (Reeve et al., 2006; Roberson et al., 2005). This research uses 'job description' when referring to the content on a recruitment advertisement.

Yüce and Highhouse (1998) investigated the effects of multi-level attributes in job descriptions on job candidates. They performed an experimental study using 104 introductory psychology students from a university in the United States. The experiment probed the effects of attribute set size (different attribute or information in job descriptions such as work shifts and benefits), attribute relevance, and pay ambiguity to applicants' perception of job descriptions. The results showed that job descriptions that contained more attributes increased their attractiveness. At the same time, they discovered that students in the study paid attention to the missing information and viewed the missing information as a negative quality of the organization.

In another empirical study, Reeve and Schultz (2004) studied "to what extent individuals utilize selection process information contained in job ads in making evaluations of organizational attractiveness and decisions to apply." The study was performed with 207 undergraduate introductory psychology students at a university. Each student was instructed to read a list of job descriptions and to answer questionnaires. These questionnaires probe the relationship between the attributes of the selection process information and the reactions of the applicants. The results indicate that job seekers

attend to the information contained in job descriptions to make "initial job-pursuit evaluations".

Smith et al. (1990) performed a study to analyze the impact of job description on job evaluation. They performed three experiments using students from a university to test two hypotheses. The first hypothesis stated that "job descriptions presented with positive information first and negative information last will be evaluated more highly than the same descriptions with the information presented in reverse order." The second hypothesis stated that "moderately scaled job-descriptive information will lower the evaluation of highly scaled job-descriptive information and raise the evaluation of lowly scaled job descriptive information." One of their research objectives was to determine if the scale of job description complied with the additive model or the averaging model. The additive and the averaging models indicate the reaction of candidates to job descriptions as a sum and an average of the content values respectively. The results showed evidence supporting the averaging model. They also found that the sequence of the information presented affected applicants' judgment. Furthermore, job titles proved to have a very high influence on job evaluations. Finally, they commented that there were no clear guidelines for constructing job descriptions. Subsequently, evaluations of job descriptions can be inconsistent and may be influenced by the way the job descriptions are written.

In reviewing a number of scholarly studies that related to the content of recruitment materials, Barber (1998) comments that job descriptions should be informative in order to provide value to job seekers. Although many studies reveal that there is a positive

correlation between the amount of information and the probability of applying for a job, he also suggests that information overload may be a concern and should be studied. Job applicants can only retain or understand a certain level of information; beyond that, there is a possibility that any additional information will have a negative impact. Furthermore, he comments that many scholarly studies on job content use fictitious companies as subjects. Hence, it could be beneficial to conduct additional studies using real applications to provide more realistic results.

1.5   Summary

Each of the four main categories of the recruitment research provides support that information quality in job descriptions has a certain degree of impact on job applicants' decision making in the early stages of the recruitment process. Studies also imply that there are different kinds of dimensions of information quality in job descriptions such as realism of information (Roberson et al., 2005; Breaugh and Starke, 2000), specificity of information (Roberson et al., 2005), complexity of information (Slaughter and Highhouse, 2002), and job description contents such as organization description (Lievens et al., 2001) and ethnic identity (Kim and Gelfand, 2003). Many of these attributes were studied independently by different scholars. This observation suggests that it may be beneficial to combine multiple elements into a single study so that interactions of the attributes can be analyzed. For example, organization description might only be significant to job applicants if the organization has a low reputation. Organizations with a high reputation do not necessarily require detailed organization description to attract applicants. Finally, recruitment researchers such as Barber (1998) suggest that it is

beneficial to study real job descriptions and organizations instead of using fictitious

companies and job contents as experimental subjects.

Chapter 2
Job Descriptions and Information Quality

2.1   Information about the Job

As noted in Chapter 1, a number of research papers investigated job seekers' reactions to recruitment materials such as job descriptions. Barber (1998) indicated that many of these investigation results point out that job seekers gained important and critical information from job descriptions before making their decision to whether to apply for a job. Furthermore, Breaugh (1992) emphasized that the level of accuracy and completeness of information communicated between job seekers and organizations is very important in regards to the entire recruitment process. These research results imply that the impact of information quality exchanged between job seekers and organizations is an important area of study. However, the literature provides limited insight on this topic.

Barber (1998) states that the recruitment process is very complex in nature; as a result, it is not logical to study the process as a whole. Instead, he advises researchers to break down the process and study each stage in detail. In addition, he also advises that researchers should study the recruitment process systematically and so that they can accumulate research findings to produce a better overview. However at the time when Barber wrote his book, he claimed that there was inadequate research to support conclusions that could reflect the recruitment process as a whole. Based on these observations, this thesis focuses on the job application stage.

The following sections present i) previous studies that examine information quality and job descriptions, ii) a gap analysis between what has been done and what needs to be addressed, and iii) the process to arrive with the research question.

2.2 Previous Research on Information Quality of Job Descriptions

This section discusses the studies which have investigated how information quality impacts an applicant's decision making. Breaking down the subject into two sub-topics, the following sections a) examine and answer the question: *what is quality of information?*, and b) review studies of information quality in job descriptions.

2.2.1 Definition of Quality of information

Reeves and Bednar (1994) tried to define quality. Through their search for a universal definition, they realized that it is very difficult to identify a single definition for quality. As a result, by using theories and definitions from history and related literature, they proposed four main aspects of quality that can be used for different purposes i) excellence, ii) value, iii) conformance to specifications, and iv) meeting and/or exceeding expectations. They discussed the strengths and weaknesses of each. The quality of *excellence* is beneficial in marketing and human resources and is easily recognized universally. However, excellence is difficult to measure and may not be a practical measurement for practitioners. The quality of *value* incorporates multiple attributes and is beneficial for measuring an organization's internal efficiency and external effectiveness. However, it is difficult to extract individual components of a value

judgment. The quality of *conformance to specifications* is relatively easier to use for practical and precise measurement if the specification can be stated. This dimension of quality leads to increased efficiency and is a common definition for many customers and practitioners. However, internal specifications may not be recognized by outside customers and may potentially become obsolete in a rapidly changing environment. In addition, quality of conformance to specifications may not be appropriate for service industries. Lastly, the quality of *meeting and/or exceeding expectations* is used in measuring customer's perspective and is applicable across service industries. Although it is responsive to market changes, it is the most complex definition. This dimension is considered complicated to measure, and confusion may arise between customer service and customer satisfaction.

From the marketing literature, Preston (2002 and 2003) investigates and criticizes the quantity and quality of information that are present in current advertisements. Using research and public policy to support his opinions, he claims that consumer advertisements possess "antifactual" content and proposes solutions to minimize or to eliminate it. Most of his discussion relates to consumer advertisements, public policy, and law. There is very little that in his papers that can be directly related to job advertisement. However, there is one point from these papers which supports the idea that "non-informative, false claim, deceptive, and misleading" are dimensions in measuring "bad" quality of information.

O'Reilly (1982) performed an investigation to address the extent "to which decision makers would select accessible or quality information sources for the use in decision

making". In his experimental study, a survey was completed by 163 employees in 4

branch locations of a county welfare agency. Out of eight hypotheses, hypothesis one is

relevant to this research and states: "information sources providing information of higher

perceived quality will be used more frequently than will those of lower perceived

quality". The survey questions probed the employee information quality perception level

from sources such as handbooks, procedures, memoranda, newsletter, the unit supervisor,

other group members, clients, other workers outside the unit, training sessions, and other

sources outside the unit. Specifically, 18 questions were generated to probe the

dimensions of quality and accessibility of information including "accessibility, accuracy,

specificity, timeliness, relevance, and the amount of information obtained from three

information sources (files, communication within the group, sources external to the

group)". Using regression analysis, the results showed clear support for hypothesis one

(i.e., frequency = 0.26, 0.49, 0.23, for quality of written documents, internal group

members, and external sources respectively; frequency = 0.32, 0.36, 0.25, for

accessibility to written documents, internal group members, and external sources

respectively; all with $P < 0.001$). O'Reilly noted: "significant associations among both

quality and accessibility of information sources and the frequency of their use." His

research concluded that accessibility to information is an important dimension in decision

making. He also advocated that quality of information is a determinant of information

use.

Wang and Strong (1996) conducted a study to develop a framework "that captures the

aspects of data quality that are important to data consumers." They developed two

surveys to collect data from consumers. The first survey's objective was to determine

dimensions of data quality, and the second survey's objective was to determine the level

of importance of each dimension. Using the two survey results, related research findings,

and literature studies, they generated a "hierarchical framework for organizing data

quality dimensions." Later, Kahn et al. (2002) used the same framework and generated a

product and service performance/information quality (PSP/IQ) model that measured

information quality. Kahn's information quality model is based on the last two of the

four definitions that Reeves and Bednar (1994) developed: iii) conformance to

specifications and iv) meeting and/or exceeding customer expectations. They also

surveyed 45 professionals to determine suitable information quality dimensions for the

model. To test the efficacy of the PSP/IQ model, Kahn and co-workers conducted a case

study using data collected from three large healthcare organizations. Each study was

comprised of approximately 75 participants who completed a 70-item questionnaire

"assessing the quality of their patient information on the IQ (information quality)

dimensions." Using the chi-square test, they analyzed the data for any significant

differences between the results from each organization. The results indicated a clear

pattern for all three organizations and there were no significant differences. Kahn et al.

concluded that the PSP/IQ model is useful in many applications especially in measuring

or determining benchmark values for information quality.

2.2.2   Information Quality in Job Descriptions

Although the reviewed research often indirectly suggested that information quality in job

descriptions has potential impact in applicant's decision-making process, there are very

few studies that address this topic directly or rigorously. One of the aspects of

information quality that receives relatively more attention in the literature is the third

definition of information quality defined by Reeves and Bednar (1994): *conformance to*

specifications. Although there are no studies that relate conformance to specifications to

the recruitment process or to job descriptions, information specificity is discussed in a

number of research results.

One of the earliest investigations on information specificity in recruitment process was

done by Belt and Paolillo (1982). They investigated the impact of corporate image on job

applicants and the "degree of specificity of the candidate qualifications on the likelihood

of reader response to a recruitment advertisement." The first hypothesis of the study

states: "there is a greater likelihood of reader response to a given recruitment

advertisement when the advertisement is identified with a firm having a high corporate

image than when the advertisement is identified with a firm having a low corporate

image." The second hypothesis states: "there is a greater likelihood of reader response to

a given recruitment advertisement when the advertisement contains a non-specific

description of the candidate requirements than when the advertisement contains a specific

description of the candidate requirements." Belt and Paolillo conducted two independent

experiments to test the two hypotheses. A survey was completed by 218 graduate and

undergraduate students; they were asked to rank twenty firms on the basis of the firm's

corporate image. A second experimental investigation was conducted on 200 graduate

and undergraduate students. Students completed a questionnaire that was related to

specificity in job advertisements. The results showed significant support ($p < .001$) for

hypothesis one; where readers had higher respond rates to recruitment advertisements

from a firm with higher corporate image. However, the results from the second

experiment were inconclusive. They suggest that the reason for the inconclusive results was that "the experimental design actually served to mask the impact of specificity of the candidate qualifications. Respondents may have been sufficiently stimulated by the impact of corporate image that they simply did not consider the specificity variable in determining the likelihood of their response." This reasoning suggests that although information quality in job descriptions is an important factor, the level of impact may be significant only at certain levels. For example, if applicants perceive the organization reputation as a more important determinant factor, information quality will have smaller impact on applicants' decision making when applying to a more well-known company. This finding appears to be very significant and will form part of the information framework proposed in this thesis.

A second investigation (extending Belt and Paolillo, 1982) was conducted by Mason and Belt (1986) on the specificity in job descriptions. They carried out an experimental investigation on two groups of senior-level engineering students. One group of 215 electrical engineering students with a GPA of 2.7 or higher was considered as the qualified group. A second group of 125 non-electrical engineering students with a GPA of lower than 2.7 was considered as the unqualified group. Four electrical engineering job descriptions were designed for the students to read and they were asked to complete a questionnaire. The questionnaire was designed to measure the likelihood that engineering students will respond to those job advertisements. Results indicated "that specificity of job candidate qualifications has a significant negative effect on probability of response for unqualified individuals." Belt and Paolillo realized that more specific information in job descriptions will automatically filter out unqualified candidates. The

use of two groups of students was very useful. However, this investigation was based only on four fictitious recruitment advertisements.

A number of recruitment researchers used the above research that related job descriptions to organization attractiveness (Roberson et al., 2005; Feldman et al., 2006). Roberson et al. (2005) used "the elaboration likelihood model (ELM) from marketing research to explain and examine how recruitment message specificity influences job seeker attraction to organizations." ELM is a model that "suggests receivers of an advertising message are active participants in the persuasion process because they develop cognitive responses in response to the stimulus to which they have been exposed". Furthermore, the ELM and advertising specificity theory proposes that one of the benefits of message specificity is that they become tangible to job applicants. As a result, it is more likely for job applicants to perceive "as directly relevant to receivers and to enhance their abilities to process the content" (Roberson et al., 2005). Roberson et al's empirical study was based on a controlled experiment where a random sample of 171 college-level job seekers were asked to read different job descriptions and to answer message specificity related questions. They calculated the means, standard deviations, and correlations of all variables in the experiment. The results ($p < 0.01$) supported their hypothesis which stated that there is a positive relationship between job description specificity and intention to apply for the organization. In addition, the results also showed that "detailed recruitment messages led to enhanced perceptions of organization attributes and person organization (P-O) fit". However, the experiment was based on two hypothetical designed job advertisements. As a result, the descriptions in the advertisement may not reflect the content found in realistic job advertisements.

It is very interesting to note that although Roberson et al. did not use Breaugh's publication (1992) as a reference, they derived similar findings. Breaugh dedicated one chapter of his book on the topic of how recruitment information can improve person-job fit. He suggests that there are five key properties in job descriptions which include accuracy, specificity, breadth, credibility, and importance. In the specificity section, he claims that specific information is more beneficial than general information. For example, job seekers pay more attention to a specific salary range over "competitive salary". Candidates pay more attention to 'you will travel 40% of your time' over 'some traveling will be required'. Specific information allows candidates to make better and more informed decisions. Although general information allows the employers to increase the job applicant pool size, the chances of hiring a candidate who does not fit the specific requirement will increase; and in turn, this will jeopardize the turnover rate of newly hired employees.

Although information is important in job descriptions, there are also possible downfalls associated with information. After many years of research on recruitment, Breaugh (1992) argues that employers and job seekers often exaggerate their job description and qualifications respectively. The biggest reason to exaggerate information is to increase attractiveness in the hopes for job seekers to secure a better job interview and for employers to secure more qualified candidates. Furthermore, Breaugh (1992) claims that job seekers attend to missing information and they need to make decisions with incomplete information. One of the main reasons why missing information exists is because employers do not want to reveal negative information for impression management purposes. Inevitably, employers and job seekers hold the responsibility for

the level of information quality; unfortunately information provided by one party does not necessary reflect the truth and thus misleads the other party.

The second study that relates to job description specificity was recently performed by Feldman et al. (2006). They studied the impact of job description specificity in three aspects: the company, the job itself, and the work context. They hypothesized that when the specificity of information provided about the company, the job itself, and the work context increase, there will be a higher level of perceived truthfulness, appropriateness, and informativeness of the job, and that there will be a higher likelihood of individuals actually applying. The study was conducted on 270 business administration undergraduates. Participants were asked to read job descriptions and to answer questionnaires. The results suggest that job seekers perceive job descriptions as more informative when the job description possesses more specific information. Applicants also perceive an organization as more truthful when the job description is more specific. However, the results also suggest that more specific information does not correlate with the likelihood of candidates to further follow up with the organization in the recruitment process (Feldman et al., 2006).

Although the studies by Roberson et al. (2005) and Feldman et al. (2006) are the only two sources found in the literature that explicitly target the research on the impact of recruitment job description specificity, there is support from other studies that indirectly illustrate the benefits of studying job description specificity. In their recruitment image investigation, Gatewood et al. (1993) indicate that those candidates who have "exposure to a greater amount of information enhances image and is also positively correlated with intentions of pursuing employment". Barber and Roehling (1993) conducted a verbal

protocol analysis study on job postings and their results concluded that "the absence of specific information did appear to reduce the attractiveness of the position for some participants. Providing specific pay information early in the interview process may have advantages, particularly when salaries are at or above market levels". Breaugh (1992) also comments that exchanging specific and accurate information is very helpful in the recruitment process. Although providing specific information may decrease the applicant pool size, more qualified candidates will be processed. Theoretically, with more specific job descriptions, the turnover rate should be lower since job candidates make decisions based on specific and more accurate information (Breaugh, 1992).

2.3   Gap analysis

There appears to be strong encouragement in the literature to conduct more research investigating the impact of information to gain a better understanding of the recruitment process. After completing a literature review on applicant reactions and decision making, Anderson et al. (2004) recommend future investigation to study and answer the question "how do applicants process information and reach outcome decisions in selection processes?" Barber (1998) comments that job descriptions should be informative and possess specific information that presents the job characteristics clearly. However, there is a relatively small number of studies that have addressed these areas. Furthermore, Barber (1998) stress that replications of these studies are needed in order to validate the results and make stronger conclusions. In an employee recruitment review paper, Breaugh and Starke (2000) reviewed studies that relate to recruitment advertisements. The conclusion that they derived is that the literature has some insights in the impact of

information of job descriptions, however "it is important for future research to investigate what other inferences may be drawn from recruitment (job descriptions)". Organizations may benefit from investigating the above ideas because they can understand job applicants' perception towards job descriptions. Organizations can change their job description contents to fit their objectives.

Many of the above studies used hypothetical and fictitious job and company descriptions in their investigations. This may generate ambiguity in the level of realism and credibility of the results. Instead, real job and company descriptions could be used for experimental studies. One could a priori identify a sample of descriptions, quantify them, and randomly distribute them to participants. This method provides a more controlled experimental environment and will generate more realistic results; providing more practical implications to organizations.

Although some recruitment studies use information quality findings from the information and consumer literature, only *information specificity* received notable attention (Belt and Paolillo, 1982; Feldman et al., 2006; Mason and Belt, 1986; Roberson et al., 2005). Other quality dimensions could potentially have an impact on a job seekers' decision-making process, but they do not appear to have been addressed by the research community. In addition, Belt and Paolillo (1982) suggest that information specificity has different levels of impact depending on the organization reputation of the job. Similar to the organization's reputation, the geographic location is also a common factor that many job seekers highly value. Therefore, researchers could continue to investigate and to understand the extent of the impact of information quality on a job applicant with the

consideration of the organization's reputation and the geographic location of the job.

There does not appear to be a model in the recruitment literature for identifying or measuring information quality. The development of such a model would appear to be the first step in moving the research base ahead. If information quality is important for understanding the effectiveness of job descriptions, and if it is desired to improve the effectiveness, it is necessary to be able to identify information quality, isolate it, and measure it.

To summarize, four significant gaps in the recruitment literature concerning the effectiveness of job descriptions appear to be:

i)   information specificity received notable attention; other information quality dimensions have not

ii)   the extent of impact of information quality may be different due to other factors such as the organization reputation and the geographic location of the job

iii)   many researchers use fictitious job descriptions and company information

iv)   no model exists for identifying or measuring the information quality in a job description

To address the above gaps, this thesis utilizes the following strategy, summarized in Table 2-1:

Table 2-1: Summary of gap analysis

GAP	Approach to Address the Gap	Importance or Contribution
information specificity received notable attention; other information quality dimensions have not	to analyze multiple information quality dimensions in addition to information specificity	to determine whether other information quality dimensions are important to the recruitment research
the extent of impact of information quality may be different due to other factors such as the organization reputation and the geographic location of the job	to analyze the impact of information quality at three different levels: job descriptions from companies that have similar organization reputation, job descriptions that have similar geographic location, and no filter	to understand what is the extent of the impact of information quality on job applicants
many researchers use fictitious job descriptions and company information	to perform the experimental analysis using real job descriptions and company information	to generate more realistic and practical results and conclusions
no model exists for identifying or measuring the information quality in a job description	to develop a model to identify and measure information quality	to quantify job descriptions to assist in recruitment research

2.4　　　Summary

In the four main areas of the recruitment literature, quite a few studies were found that provided results loosely relating to the impact of information on job descriptions. However, there were few research studies that directly related the quality of information to job descriptions. Within these limited studies, there is common agreement that information specificity in job descriptions creates a significant impact on a job applicant's decision making. These studies also support the concept that more research should be done in this area to further understand and relate how quality of information impacts a job applicant's decision making, especially in the early stages of the recruitment process. In addition, the literature suggests that the quality of information

has different levels of impact under different circumstances. Therefore, it is important to investigate the impact of the quality of information under different contexts.

Many studies in the recruitment literature used hypothetical job and company descriptions. Although the findings from these studies support their hypotheses, fictitious job and company descriptions can generate speculations regarding the realistic level and credibility of the results. Therefore, it might be beneficial to use real job and company descriptions in future studies to develop stronger conclusions that can provide realistic and practical recommendations.

In summary, this research will address the gaps that are outlined in the above analysis and will analyze the following research question:

> ***What is the impact of information quality of a job description on a job applicant's decision to pursue a job?***

Chapter 3
Information Quality Model

One of the gaps in the literature is the lack of a model that can identify, isolate, and measure information quality and be used to help quantify job descriptions. Kahn et al. (2002) developed the PSP/IQ model that can measure general information quality which proved to be useful in evaluating information content, but there is not one that ties together the content and attractiveness dimension. It is suggested that such a model can be beneficial for recruitment researchers when analysing the impact of the content of a job description. This type of model could also allow researchers to systematically evaluate multiple job descriptions, and to compare the quality of job descriptions quantitatively. For example, one can correlate the rating of a job description with the corresponding number of applications to determine the attractiveness of a job.

Various researchers, including Belt and Paolillo (1982) and Roberson et al. (2005), suggest that the information specificity of job descriptions impacts a job applicant's decision making process. Researchers have also suggested that the impact of information quality is moderated when other factors such as organization reputation (Belt and Paolillo, 1982) or geographic location (Barber, 1998; Barber and Roehling, 1993; Breaugh, 1992) are considered. As a result, a single model that measures multiple information quality dimensions, and other influential factors such as organization reputation and geographic location may be highly beneficial.

This chapter discusses the formulation of an Information Quality model that i) identifies, isolates, and measures information quality, and ii) assists with quantifying job

descriptions.

3.1 The Model

To quantify job descriptions, the model needs to distinguish different components and has to assign measuring dimensions for each. For example, one can attempt to quantify how *well* the content of the job responsibilities is written for a job description. However, it is difficult to define *well*. In order to be more specific, information quality dimensions can be used to measure the job content. For example, using specificity as one of the information quality dimensions, one can quantify the specificity of the information on job responsibilities for a job description. A job description that has very specific content on job responsibilities would receive a high rating where as a job description that has very vague content on job responsibilities would receive a low rating.

Another of the gaps in current knowledge is that the information quality dimensions, other than specificity, have received very little attention. To enrich the model, more than one information quality dimensions are measured. Using various information quality dimensions to measure different components of different job descriptions, one can rate and compare multiple job descriptions.

To improve the quality of the model, different job industries need to be distinguished; because different industries possess and require different job description characteristics. For example, a company in the marketing industry will seek different experience from a candidate than a company in the engineering industry. In order to compare similar

objects with a minimum number of uncontrolled variables, job descriptions should be measured and compared under similar industries. This is beneficial for analysis because it eliminates a critical variable, which is the applicant's judgement factor due to different industries. If all job descriptions from different fields are compared together, it will not be clear whether the field of a job is a significant factor that impacts a job applicant's decision.

As identified above, the model addresses three major issues:

    i)   different job industries (see Chapter 3.2)

    ii)   different information quality dimensions (see Chapter 3.3)

    iii)   different components of a job description (see Chapter 3.4)

The objective of the model is to compare multiple job descriptions using one systemic method. Figure 3-1 shows the developed model which is comprised of three axes including job industries (z-axis), information quality dimensions (y-axis), and job description components (x-axis).
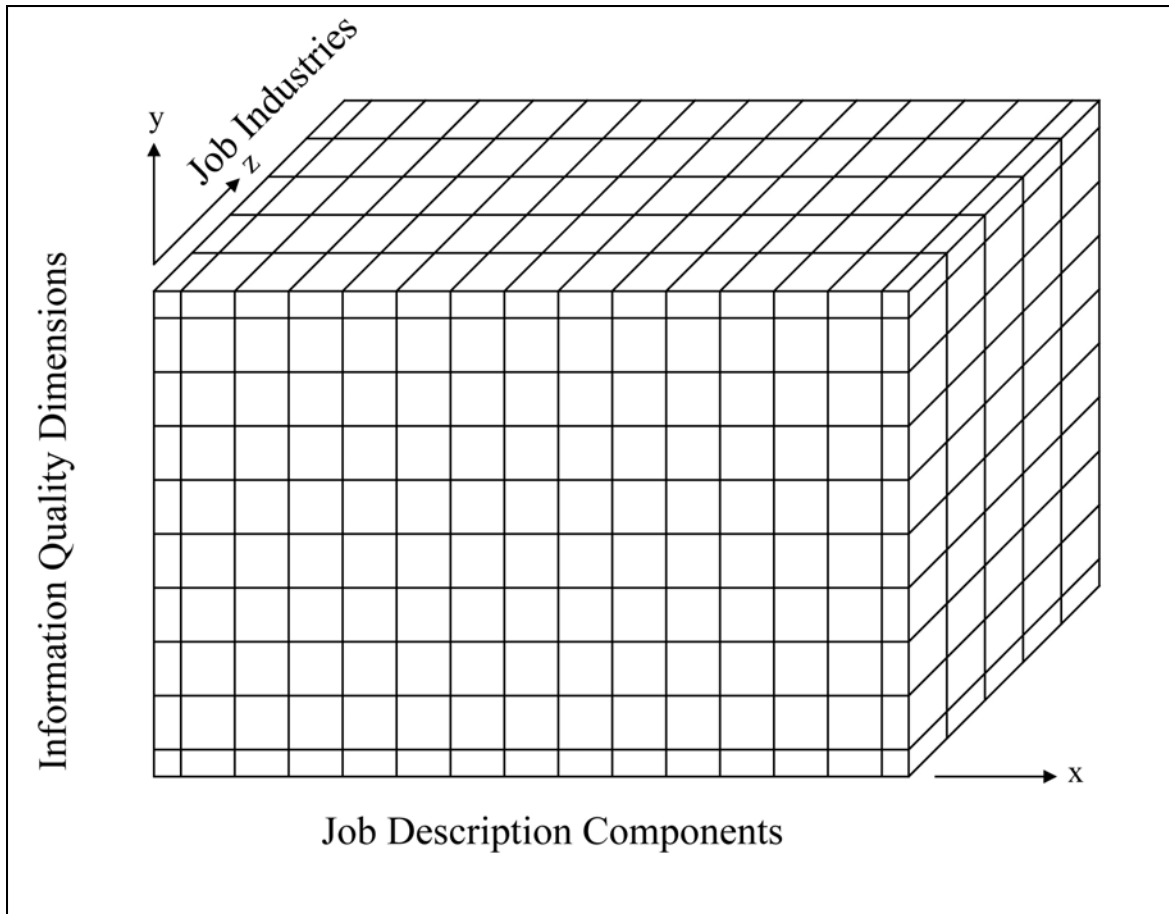
Figure 3-1: Information Quality model – three axes.

3.2   Job Industries (z-axis)

The z-axis captures different job industries such as accounting, engineering, and

marketing. Different job industries possess dissimilar job characteristics and require

different qualifications from candidates. For example, a company looking for a candidate

to fill an accounting position might look for audit and tax experience as compared to a

company who is looking for a candidate to fill an engineering position, which might

require safety regulation and technical report writing experience. Some examples of

different job industries are summarized in Table 3-1. Figure 3-2 shows the z-axis which

can contain up to *n* number of job industries.

Table 3-1: Examples of job industries.

Job Industries	Reference	Job Industries	Reference
Accounting	(Monster, 2007; University of Waterloo, 2007; Workopolis, 2007)	Healthcare	(Monster, 2007; University of Toronto, 2007; University of Waterloo, 2007; Workopolis, 2007)
Administrative	(Workopolis, 2007)	Hospitality	(Workopolis, 2007)
Arts and business	(University of Waterloo, 2007)	Human resource	(Monster, 2007; Workopolis, 2007)
Arts and media	(Monster, 2007; Workopolis, 2007)	Insurance	(Monster, 2007; Workopolis, 2007)
Automotive	(Monster, 2007)	Legal	(Monster, 2007; Workopolis, 2007)
Banking	(Monster, 2007)	Marketing	(Workopolis, 2007)
Biotechnology	(Workopolis, 2007)	Product management	(Monster, 2007)
ECommerce	(Workopolis, 2007)	Production	(Workopolis, 2007)
Education	(Workopolis, 2007)	Retail	(Monster, 2007; Workopolis, 2007)
Energy	(Workopolis, 2007)	Sales	(Monster, 2007; Workopolis, 2007)
Engineering	(Monster, 2007; University of Toronto, 2007; University of Waterloo, 2007; Workopolis, 2007)	Science	(Monster, 2007; University of Toronto, 2007; University of Waterloo, 2007; Workopolis, 2007)
Environmental studies	(University of Waterloo, 2007)	Technology	Technology (Workopolis, 2007)
Finance	(Workopolis, 2007)	Trades	Trades (Workopolis, 2007)
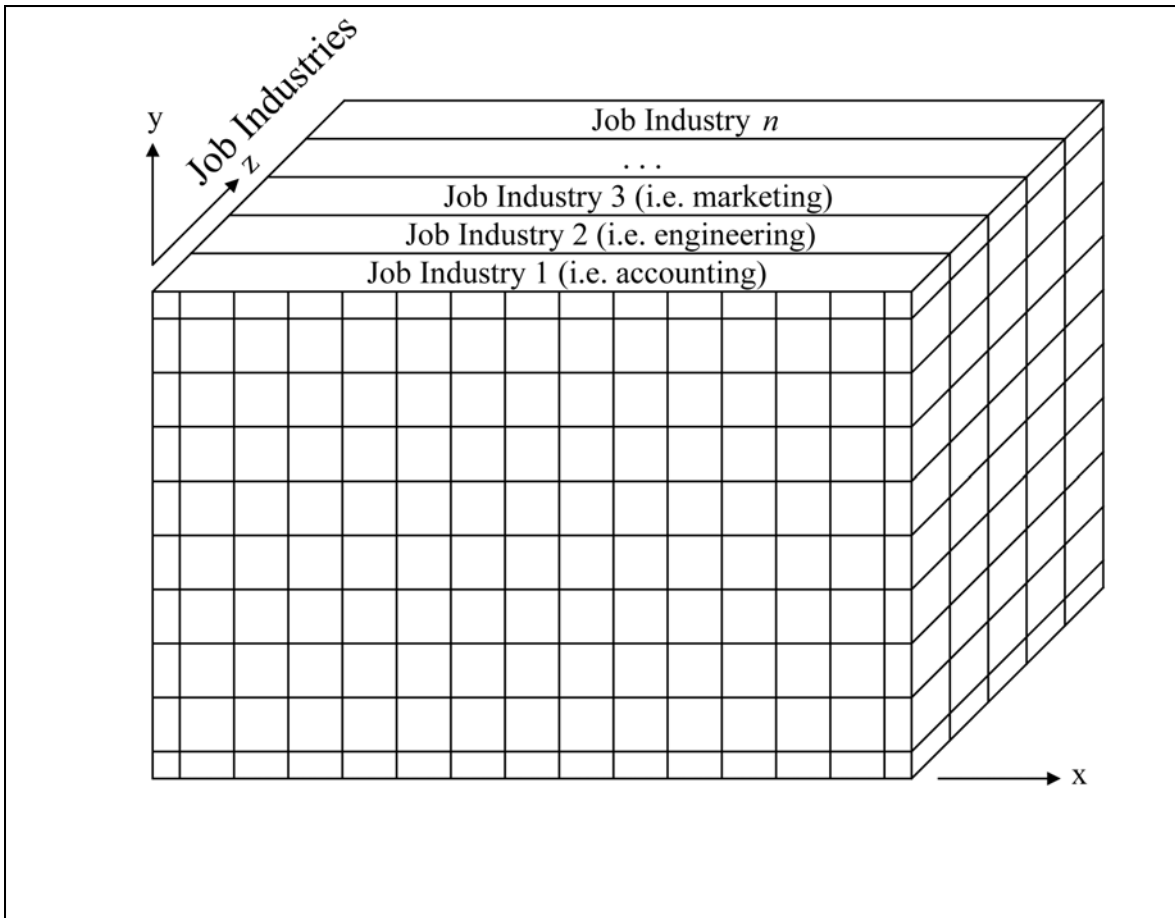
Figure 3-2: Information Quality model – z-axis.

3.3   Information Quality and Other Measuring Dimensions (y-axis)

To quantify job descriptions, information quality (IQ) and other measuring (OM) dimensions are used to rate different components of a job description. Information quality dimensions are used to rate the content of a job description such as job responsibilities, qualifications, and company information. The quality of these contents varies from one job description to another; thus, they can be rated by IQ dimensions such as importance, completeness, and believability. For example, if one of the dimensions of information quality is information specificity, and the component of the job description is

job compensation, then the model can measure the level of information specificity of job

compensation of a job description. The ratings of different information quality

dimensions can be used to quantify and compare the overall quality of the job

descriptions. Although many job descriptions have similar components such as job

qualifications, job responsibilities, and company information, the quality of the given

information may vary from one job description to another. Consequently, it is important

to understand whether the differences will have an impact on job applicants. Some

examples of information quality dimensions that are noted from the literature are listed in

Table 3-2.

Table 3-2: Examples of information quality dimensions.

Information Quality Dimension	Reference	Information Quality Dimension	Reference
Accessibility	(Kahn et al., 2002)	Interpretability	(Kahn et al., 2002)
Accuracy of information	(Breaugh, 1992)	Objectivity	(Kahn et al., 2002)
Appropriate amount of information	(Breaugh, 1992; Kahn et al., 2002)	Realism of information	(Breaugh and Starke, 2000; Reeve et al., 2006; Roberson et al., 2005)
Believability	(Kahn et al., 2002)	Relevancy	(Kahn et al., 2002)
Completeness	(Kahn et al., 2002)	Reputation	(Kahn et al., 2002)
Complexity of information	(Slaughter and Highhouse, 2002)	Scope	(Breaugh, 1992)
Concise representation	(Kahn et al., 2002)	Security	(Kahn et al., 2002)
Consistent representation	(Kahn et al., 2002)	Specificity of information	(Barber, 1998; Breaugh, 1992; Feldman et al., 2006; Roberson et al., 2005)
Credibility	(Breaugh, 1992)	Timeliness	(Kahn et al., 2002)
Ease of manipulation	(Kahn et al., 2002)	Understandability	(Kahn et al., 2002)
Free-of-error	(Kahn et al., 2002)	Value-added	(Kahn et al., 2002)
Importance	(Breaugh, 1992)		

There are other characteristics of a job that cannot be quantified by information quality

dimensions such as the organization reputation or geographic location. These

characteristics are rated by measuring dimensions such as high, medium, and low or

excellent, moderate, and satisfactory. Subsequently, the y-axis contains *information*

quality dimensions that are used to measure different components of a job description and

other measuring dimensions that are used to rate different characteristics of a job. The y-

axis must contain at least one measuring dimension for every job description component.

The y-axis is illustrated in Figure 3-3. The y-axis is divided into two sections which are

information quality dimensions (IQD) and other measuring dimensions (OMD). Each

section can contain up to *n* number of elements. For example, OM dimension 1 is low,

medium, and high, while OM dimension 2 is yes or no, IQ dimension 1 is completeness,

and IQ dimension 2 is importance. Each of these dimensions is assigned to rate one or

more corresponding job description components.
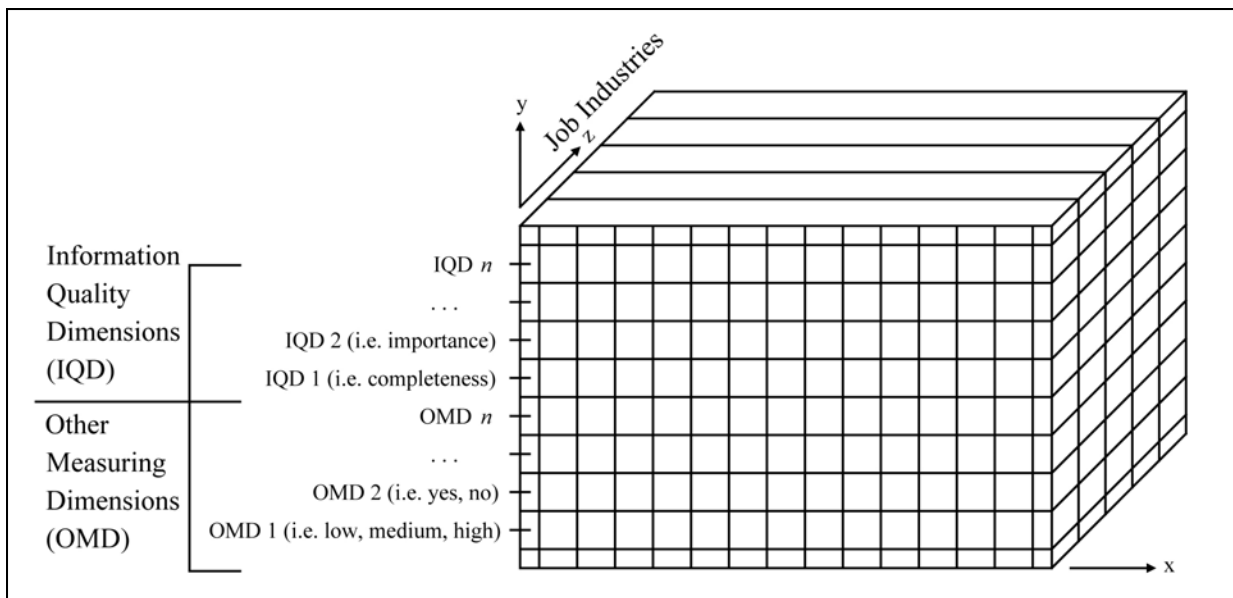
Figure 3-3: Information Quality model – y-axis.

3.4 Job Description Components (x-axis)

In order to quantify a job description, the content of the job description needs to be rated. However, rating a job description as a whole is difficult. It is simpler to break down a job description into various components and rate each of them independently. The total score of the combined ratings reflects the quality of the entire job description.

The x-axis categorizes the various components of a job description. There are two groups of job description components: the common components (CC) and the job-specific components (JSC).   As indicated in the gap analysis, jobs from different industry possess different characteristics. As a result, the model distinguishes job description components that are common to all job industries and those that are unique to a specific job industry.

Although there are numerous ways to write a job description, there are many common components that exist between job descriptions. For example, job descriptions often outline the responsibilities that a position possesses and the qualifications and/or experience that an employer is seeking. Other common components may include company information and insights on the work environment. Examples of the common components are listed in Table 3-3.

Table 3-3: Examples of the common components of job descriptions.

Common Components	Reference	Common Components	Reference
Application process information	(JobMine, 2007; Monster, 2007; Workopolis, 2007)	Job responsibilities	(Breaugh, 1992; Chatman, 1991; JobMine, 2007; Workopolis, 2007)
Career development and support	(JobMine, 2007; Workopolis, 2007)	Local transportation	(University of Waterloo, 2007)
Career path	(Barber, 1998; Breaugh, 1992; JobMine, 2007; Workopolis, 2007)	Organization description and values	(Lievens et al., 2001)
City information	(Breaugh, 1992)	Organization reputation	(Barber, 1998; Belt and Paolillo, 1982; Breaugh, 1992; Breaugh and Starke, 2000; Gatewood et al., 1993; Lievens et al., 2001; Rynes and Barber, 1990)
Company surrounding environment	(Breaugh, 1992; Workopolis, 2007)	Opportunities for promotion	(Barber, 1998; Breaugh, 1992; JobMine, 2007; Monster, 2007; Workopolis, 2007)
Compensation	(Breaugh, 1992; JobMine, 2007; Rynes et al., 2004; Slaughter and Highhouse, 2002; Workopolis, 2007)	Prestige and recognition	(Workopolis, 2007)
Coworkers	(Slaughter and Highhouse, 2002)	Supervisor	(Slaughter and Highhouse, 2002)
Dress code	(Slaughter and Highhouse (2002); JobMine, 2007; Workopolis, 2007)	Travel requirement	(JobMine, 2007; Workopolis, 2007)
Ethic identity	(Kim and Gelfand, 2003)	Website information	(Cober et al., 2003; JobMine, 2007; Monster, 2007; Workopolis, 2007)
Geographic location	(Barber, 1998; Barber and Roehling, 1993; Breaugh, 1992; JobMine, 2007; Monster, 2007; Workopolis, 2007)	Workforce Diversity	(Breaugh, 1992; Kim and Gelfand, 2003)
Housing	(University of Waterloo, 2007)	Working environment	(Breaugh, 1992; Workopolis, 2007)
Interesting work	(Slaughter and Highhouse (2002); JobMine, 2007; Workopolis, 2007)	Working hours	(Monster, 2007; Workopolis, 2007)
Job qualifications	(Chatman, 1991; JobMine, 2007; Workopolis, 2007)		

Job-specific components (JSC) are very diverse and can be very specific for different job industries. For example, accounting jobs may contain JSC such as charter accounting license, tax, advisory, audit, and client information; whereas, mechanical engineering jobs may contain JSC such as professional engineering license, experience in safety practice, and knowledge in various types of engineering calculations. Due to the fact that there are a countless number of JSCs, this study does not provide a suggested list.

The x-axis is illustrated in Figure 3-4. The common components and job-specific components can both contain up to n elements. The examples of common components shown in Figure 3-4 include job responsibilities, job qualifications, company information, and compensation.
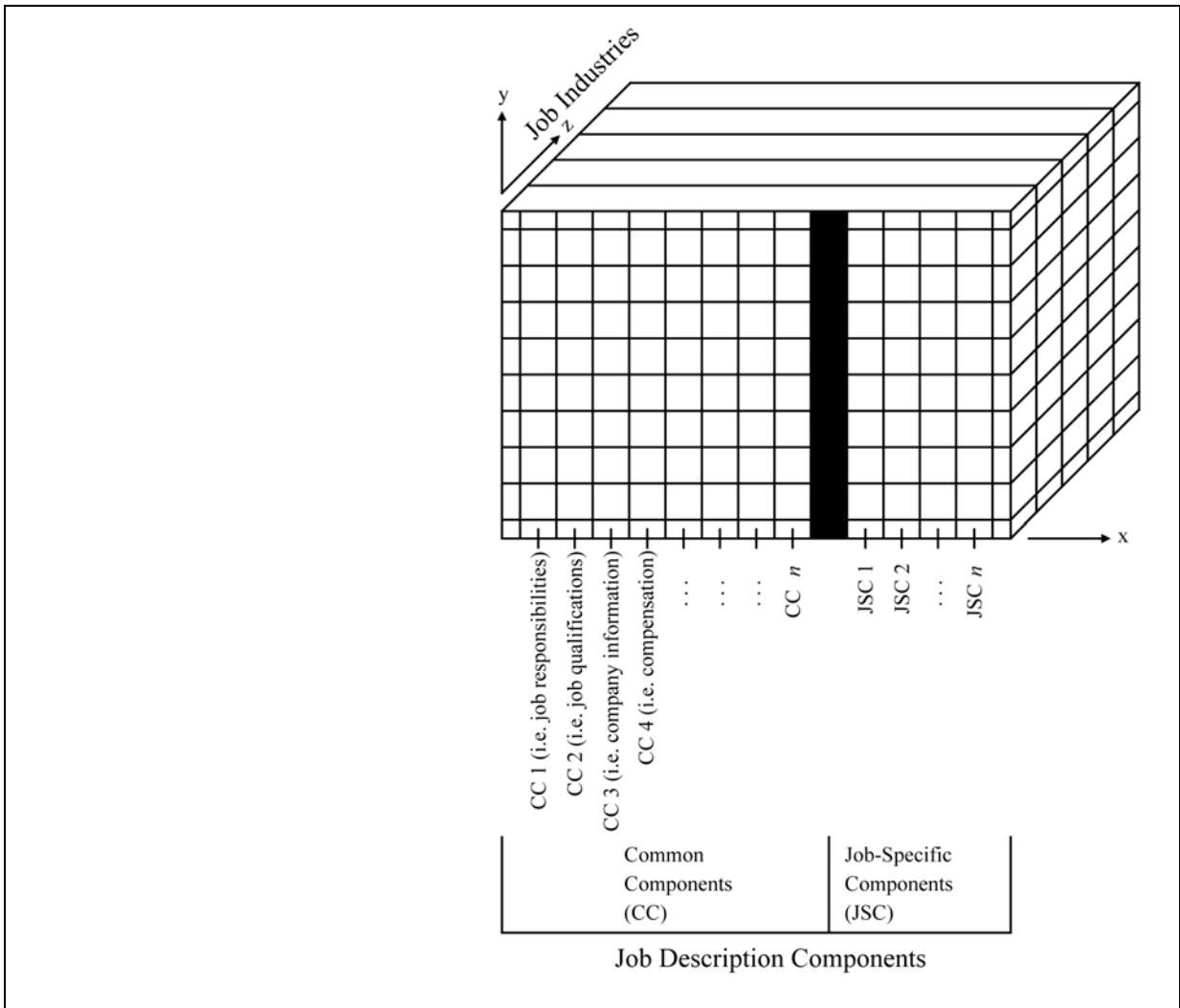
Figure 3-4: Information Quality model – x-axis.

3.5   Summary

It is proposed that the Information Quality model is useful in understanding the behaviour associated with applicant's decision making concerning job descriptions - identifying, isolating, measuring, and analysing. For example, the model could be used to systematically measure the degree of specificity of job responsibilities for multiple engineering job descriptions. This result could be compared with various dependent

variables, such as the number of applications, the qualifications of job applicants, and the successful matches of job applicants. Consequently, the model allows users to potentially correlate different information quality dimensions, different components of job descriptions, and different job industries with different dependent parameters. The complete model is shown in Figure 3-5.
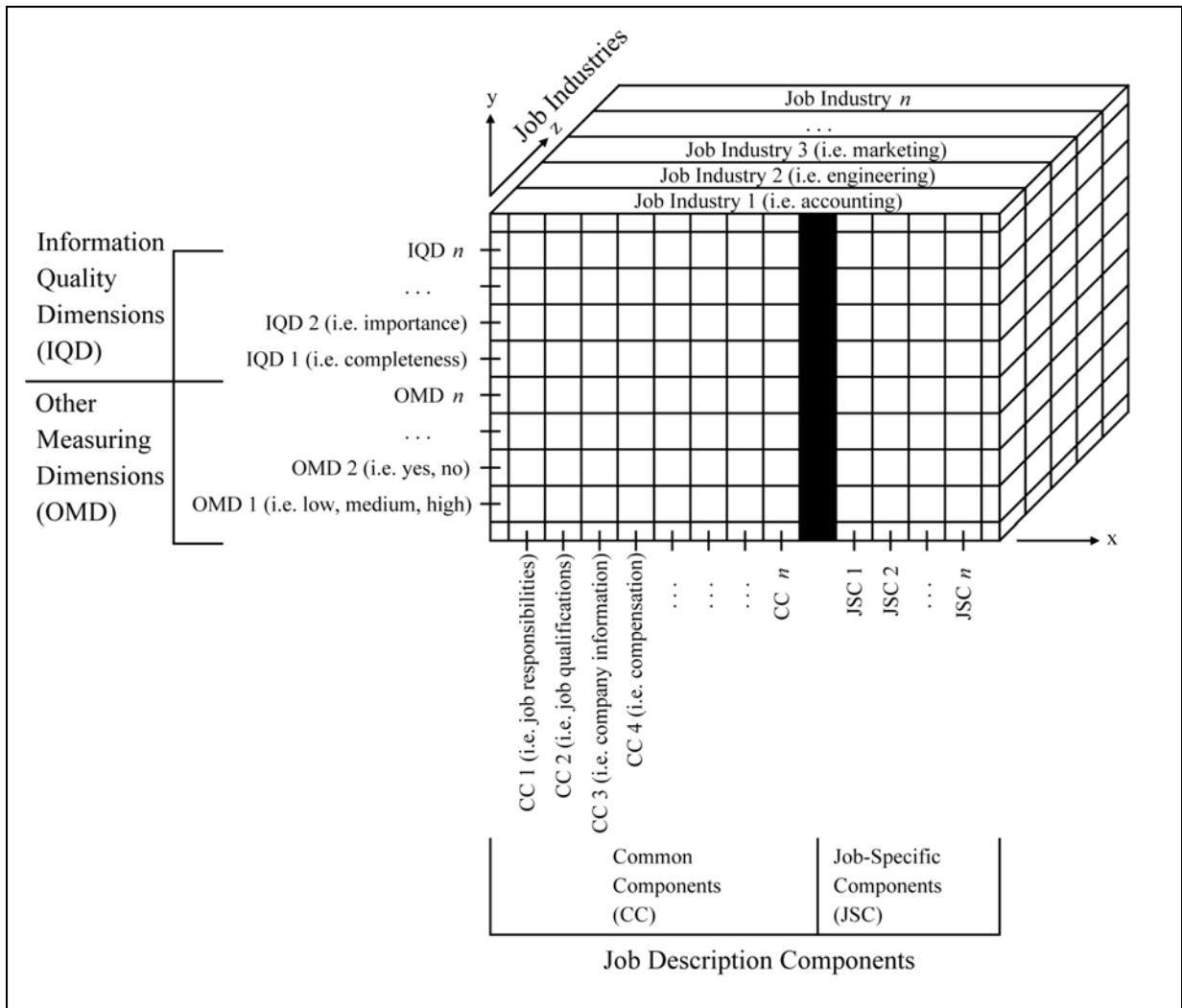
Figure 3-5: The complete Information Quality model.

Chapter 4
Research Hypotheses

The findings from the literature review in Chapter 1 and Chapter 2 suggest that the information quality of job descriptions has potential impact on a job applicant's decision in pursuing a job. Some studies indicate that job applicants perceive more informative job descriptions as a positive factor in their decision-making processes. Thus, it is reasonable to hypothesize that there is a positive correlation between the two factors. The following three hypotheses are proposed:

Hypothesis I: as the information quality of the job-specific components of a job description increases, the number of job applications increases.

Hypothesis II: as the information quality of the common components of a job description increases, the number of job applications increases.

Hypothesis III: as the information quality of the entire job description increases, the number of application increases.

Several scholars comment that the two factors, organization reputation (Barber, 1998; Belt and Paolillo, 1982; Breaugh, 1992; Gatewood et al., 1993; Lievens et al., 2001) and geographic location (Barber, 1998; Barber and Roehling, 1993) of jobs are extremely influential to an applicant's decision to pursue a job. To explore this proposition, the following two hypotheses are proposed:

Hypothesis IV: organization reputation has a significant positive impact on the number of job applications where the average number of job applications is significantly greater for job postings from a higher reputable organization than job postings from a less reputable organization.

Hypothesis V: geographic location has a positive significant impact on the number of job applications where the average number of job applications is significantly greater for jobs that are located in more convenient geographic locations than jobs that are located in less convenient geographic locations.

In addition, Belt and Paolillo (1982) suggest that the impact of information quality may be significant only at certain levels. For example, if applicants perceive the organization reputation as a more significant determinant factor than the information quality, then information quality will have a smaller impact on the applicants' decision-making process when applying to a more well-known company. Therefore, it is beneficial to explore the significance of the interaction factors: i) organization reputation and information quality and ii) geographic location and information quality. Based on that, the following two hypotheses are proposed:

Hypothesis VI: the correlation between the number of job applications and the job-specific components of a job description is significant for all jobs that have similar organization reputation and/or geographic location.

Hypothesis VII: the positive correlation between the number of job applications and the common components of a job description is significant for all jobs that have similar organization reputation and/or geographic location.

Chapter 5
Experimental Design

5.1   Methodology – Job Description Samples

The emphasis of the experimental design is to select a set of simple and well-defined samples to test the model with. The objective is to maximize the number of useful insights generated from the analysis, and to minimize the unnecessary variables in the investigation.

127 accounting job descriptions from the Cooperative Education and Career Services (CECS) at the University of Waterloo were used for this investigation. These job descriptions were used by employers to recruit cooperative students in the Fall 2006 school term. The corresponding number of applications for each job description was collected for the analysis.

The reason for selecting only accounting job descriptions is to eliminate the variable of job industries. This will highly reduce the variability of the analysis. The number of factors that must be controlled is significantly larger if multiple job industries are included. For example, if the same student is allowed to apply for an accounting, engineering, and a marketing job, then the factor of why a student will choose one field over another must be considered. CECS at the University of Waterloo categorizes accounting students and other students into separate groupings. As a result, only accounting students are allowed to apply for accounting jobs (i.e. an engineering student cannot apply for an accounting job). This setting benefits the analysis because it

eliminates a large but irrelevant factor that can highly impact the results. For example, if students from other fields can apply for accounting jobs, the relationship between how much a student favours accounting jobs, and the student's major of study must be considered. However, this relation is difficult to measure or to estimate.

Based on insights from CECS, it is known a priori that accounting job descriptions have fewer variations relative to other fields such as engineering, arts, and mathematics. As a result, it is relatively easier to specify the job-specific components of the job descriptions. For example, many accounting jobs for the cooperative students have job responsibilities that involve one or a combination of the following: tax, advisory, and audit.

In addition, this thesis includes only samples from one school term to create a consistent list of job descriptions and the corresponding number of applications. Different terms can potentially create undesirable seasonal factors. For example, a Spring term might have fewer employers and the number of applications might also be lower due to fewer students on campus, while a Fall term might have more employers because many organizations are more active during that time, which in turn might generate more applications in the aggregate. Hence, the analysis was limited to a single term to avoid seasonal factors confounding potential insights.

However, using only accounting job descriptions also introduces a number of potential challenges and limitations. For example, approximately 23% of the sample job descriptions belong to the "Big Four" accounting firms, Deloitte, Ernst and Young, KPMG, and Pricewaterhouse Coopers. Each of the four firms submits typically six job

descriptions to CECS. However, the remaining 77% of the sample job descriptions are submitted by over 50 firms. There are no other firms that submit more than three job descriptions. This creates an uneven distribution of the companies and job descriptions. Jobs that have higher organization reputation are represented by a small number of companies and jobs that have a lower organization reputation are represented by a large number of companies. As a result, bias may potentially be introduced in the sample due to organization reputation.

In addition, since accounting job descriptions have less variation (i.e. as compared to engineering, arts, or math), it may be difficult to detect significant factors in the data. For example, the majority of the accounting jobs have job responsibilities under one or a combination of tax, audit, and advisory. It may be possible to detect if there is significance between jobs that possess some versus none of the three characteristics; however, it may be very difficult to detect if there is significance between jobs that possess one versus more than one of the three characteristics.

Nevertheless, although there are potential challenges, using only accounting job descriptions generate a relatively less complex set of samples. Since one of the main purposes of this investigation is to test the feasibility of the model, a more simple methodology is preferred. Eliminating irrelevant factors such as various job industries and seasonal factors will generate a stronger support to the findings. Since accounting job descriptions from a single school term provide a relatively simpler sample with fewer variations, they are selected as samples to be tested in this thesis.

5.2   Methodology - Model

In Table 3-1, Table 3-2, and Table 3-3, there were many factors mentioned. Taking an exploratory approach to investigate the feasibility of the model, a subset of the factors has been selected to be probed in this research. The factors with the rationalization are presented below.

5.2.1   Information Quality Dimensions

Although there are a wide range of information quality (IQ) dimensions (as suggested in Table 3-2), many are difficult to quantify without a secondary set of data. For example, in order to measure the *accuracy* or the *completeness* of a job description, data that relates the job description to the real work environment is required. To simplify the problem, three IQ dimensions have been selected that are relatively simpler to measure and do not require an additional dataset other than what can be obtained from the samples of the accounting job descriptions. The three IQ dimensions that are used in this experiment are specificity, relevancy, and the amount of information.

5.2.1.1   Specificity

Specificity refers to how specific the information is conveyed to readers from a job description. For example, a job description that describes the compensation as "salary is competitive" is less specific than a compensation that reads "salary range is between $40,000 to $50,000". As discussed in a number of scholarly studies (Barber, 1998; Belt

and Paolillo, 1982; Breaugh, 1992; Feldman et al., 2006; Roberson et al., 2005),

specificity is an information quality dimension that has a significant impact in one's

decision making process. Since this dimension is feasible to detect and has proved to

have value in past studies, it is included in this investigation.

5.2.1.2   Relevancy

Kahn et al. (2002) specifies that relevancy is one of the IQ dimensions which can be used

to describe the usefulness of information content. Relevancy refers to "the extent to

which information is applicable and helpful for the task at hand", or from the recruitment

point of view, relevancy can be interrupted as how relevant the information provided

from the job description is to the actual job. For example, relevancy can be used to

measure the information quality of the qualification content of a job description. An

accounting job requesting for auditing skills is more relevant than an accounting job

requesting for mathematical modeling skills.

5.2.1.3   Amount of Information

Kahn et al. (2002) also specifies that the amount of information is one of the information

quality dimensions that can be used to describe the usefulness of information content.

The amount of information refers to "the extent to which the volume of information is

appropriate for the task at hand". Breaugh (1992) defines the amount of information as a

dimension that accesses the breath of the information. From the job description's

perspective, this IQ dimension can provide insights to questions such as "is the job

description providing too little or too much information?" For example, is there enough

information regarding the responsibilities of the job? Is there too much information

regarding the background information of the company? Previous studies have suggested

that people are sensitive to this dimension of information quality. For example, Yüce and

Highhouse (1998) and Breaugh (1992) suggest that job applicants attend to missing

information when reading job descriptions. Since the amount of information is an IQ

dimension that has proved to have value and is relatively simple to measure, it is included

in the experimental model. The dimensions of the IQ are illustrated in Figure 5-1.
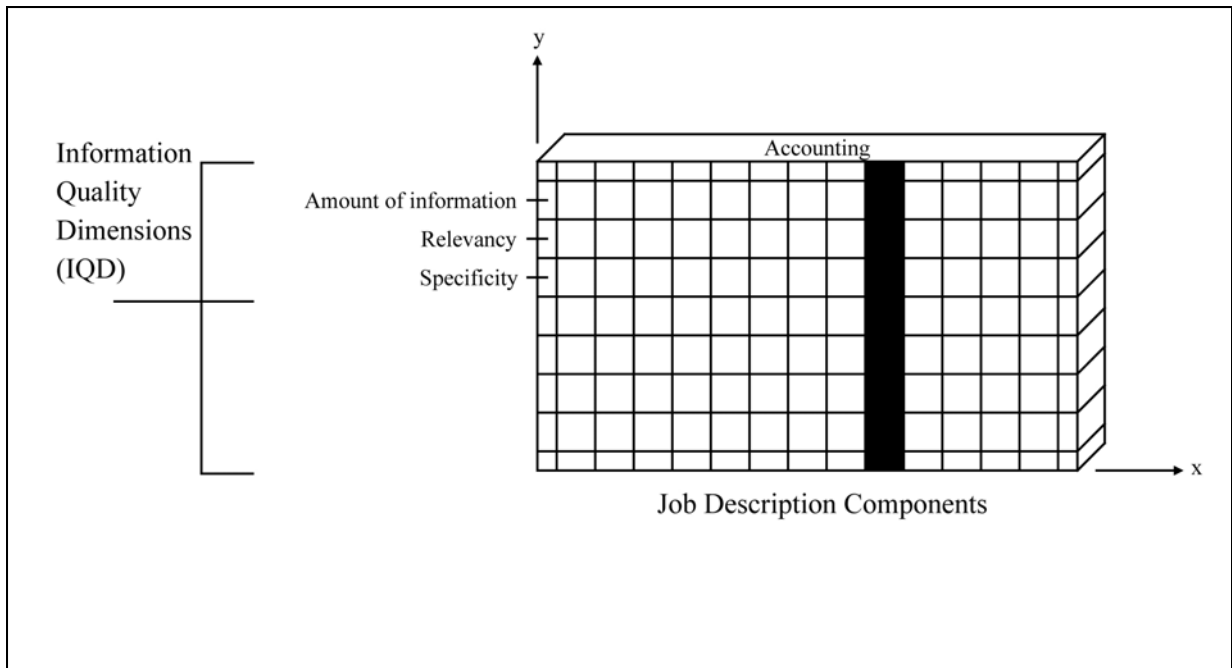
Figure 5-1: Model with the selected information quality dimensions.

5.2.2 Common Components

Although job descriptions vary from one to another, many have common components.

For example, most job descriptions contain sections on job responsibilities, job

qualifications, and company background information.

To set up the model for this analysis, a preliminary examination of the sample of accounting job descriptions was conducted. Through the preliminary analysis, five commonly used components were identified. They are listed as follow:

i) *Job Responsibilities*: this refers to the duties that an individual is responsible for in a specific position

ii) *Qualifications*: this refers to the characteristics and experience that an employer is seeking for from job candidates

iii) *Career Development and Support:* this refers to information that relates to career development which includes career path, promotion, continuous education, and other job related supports that an employee can expect

iv) *Company Information and Values*: this refers to the information that discusses directly about the company such as company history, background, past projects, news, performance, and others. Company values may refer to company mission statement, their culture, working environment, and others

v) *Compensation/Benefits/Working Hours:* this refers to any information regarding the compensation, benefits, and working hours that job candidates can expect

Although the above components are common to most of the job descriptions, the quality of the content varies from one to another. To compare these job descriptions, each of these components are rated against one or more IQ dimensions. The common components: job responsibilities, job qualifications, career development and support, and

company information and values, are measured against all three IQ dimensions including specificity, relevancy, and the amount of information. Note that the common component *compensation/benefits/working hours* is only measured against specificity and the amount of information because there is not value to measure this component with relevancy. Table 5-1 summarizes the common components and their corresponding IQ dimensions. Figure 5-2 illustrates the model with the selected common components.

Table 5-1: The selected common components and their corresponding information quality dimensions.

Common Components	Measuring Dimensions
Job Responsibilities	Specificity Relevancy Amount of Information
Job Qualifications	Specificity Relevancy Amount of Information
Career Development and Support	Specificity Relevancy Amount of Information
Company Information and Values	Specificity Relevancy Amount of Information
Compensation/Benefits/Working Hours	Specificity Amount of Information
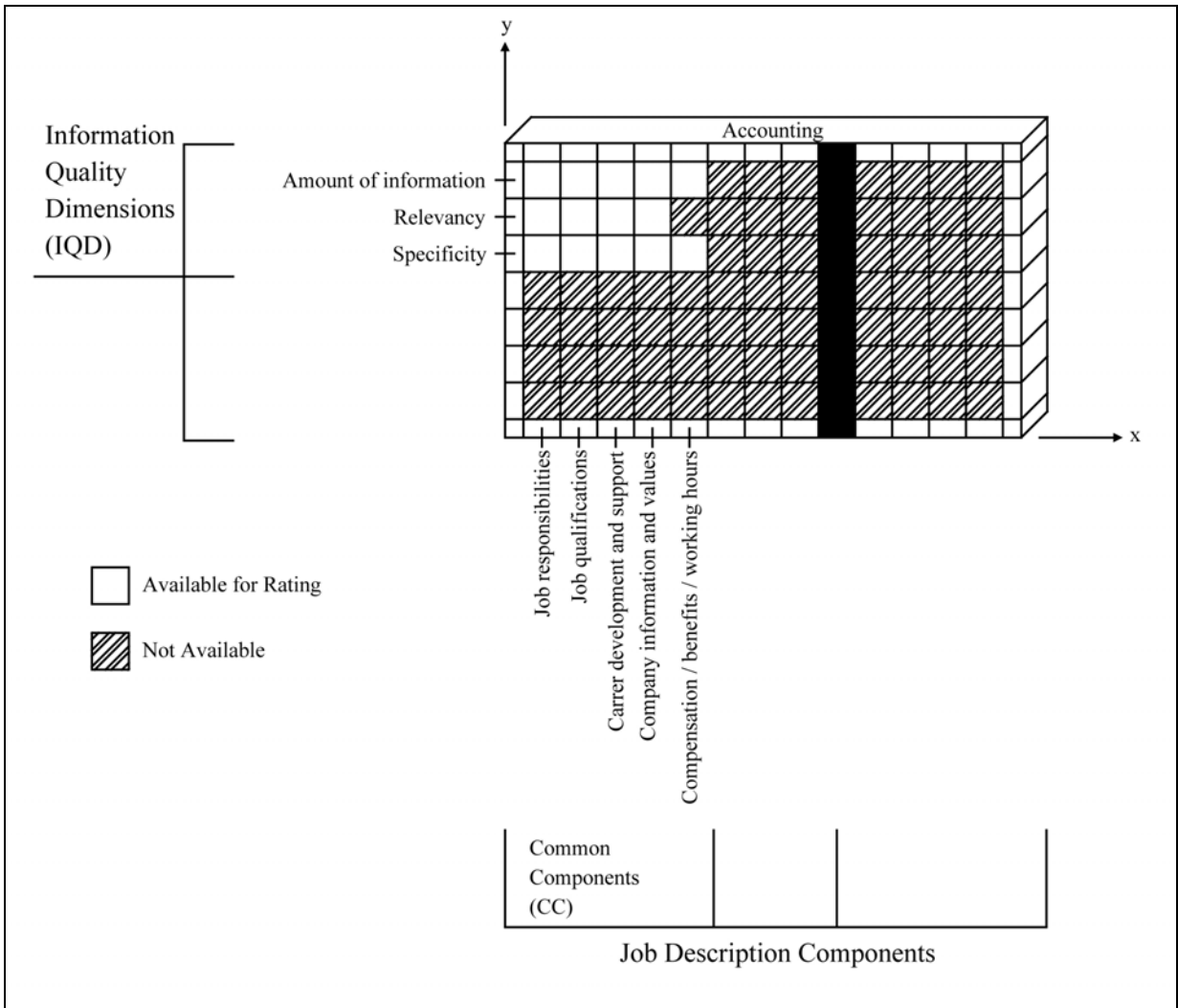
Figure 5-2: Model with the selected common components of the job descriptions.

5.2.3   Accounting-Specific Components

As discussed earlier, it is beneficial to incorporate different job-specific components

(JSC) in the model. The reason is because different jobs from different industries usually

possess different characteristics. Job descriptions usually contain elements that are

unique to an industry. Therefore, common components alone are not sufficient to

quantify all types of job descriptions. In addition, it is of interest in this thesis (as stated

in Hypothesis I) to test whether students attend to the IQ of JSCs of a job description. Therefore, a number of components that are specific to the accounting field are selected for the model. Since accounting job descriptions are used as samples for this investigation, the JSCs are defined as being accounting-specific components.

After a preliminary examination of the sample job descriptions, four accounting-specific components can be identified: audit, tax, advisory, and client information. Audit, tax, and advisory are mainly referred to as the general job responsibilities and qualifications for accounting jobs. Client information refers to the characteristics of clients that the candidates will work with. For example, some job descriptions specify that the students will have the opportunity to work with large clients such as companies from the Fortune 500, whereas some reveal the various industries of clients that the students will work with.

The four accounting-specific components are measured against two IQ dimensions: *specificity* and *the amount of information*. Since all of the components are accounting-specific, they are all *relevant* to accounting. As a result, there is no value to rate the accounting-specific components against the IQ dimension of *relevancy*.

In addition, client information is measured against two other measuring (OM) dimensions:

    i)   *Work closely with large clients*: this rating refers to whether the successful candidate will have the opportunity to work with large clients. Students tend to value a job more if they have the opportunity to work closely with well-

known clients

ii)   *Work with a wide range of clients*: this rating refers to whether the successful

candidate will have the opportunity to work with a wide range of clients.

Students tend to value a job more if they have the opportunity to work with a

wider range of clients to get experience from a wider spectrum

Table 5-2 summarizes the accounting-specific components of the job descriptions and

their corresponding IQ dimensions. Figure 5-3 illustrates the model with the selected

accounting-specific components.

Table 5-2: The selected accounting-specific components and their corresponding
information quality and other measuring dimensions.

Accounting-specific Components	Measuring Dimensions
Audit	Specificity
	Amount of Information
Tax	Specificity
	Amount of Information
Advisory	Specificity
	Amount of Information
Clients	Specificity
	Amount of Information
	Work closely with large clients
	Work with a wide range of clients
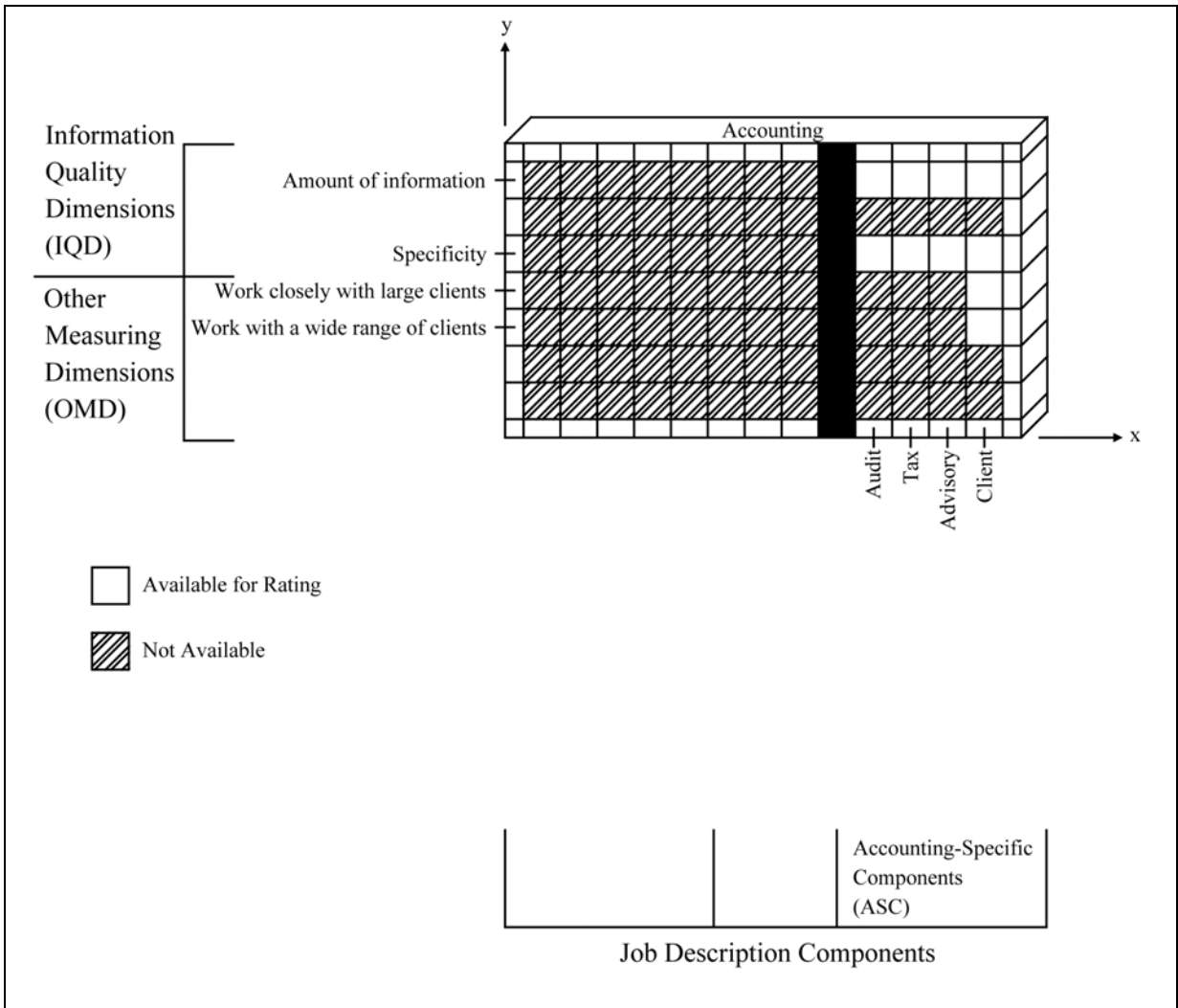
Figure 5-3: Model with the selected accounting-specific components of the job descriptions.

5.2.4   Other Components

The common and accounting-specific components refer to the content of the job description that can be rated by one or more IQ dimensions. However, there are other components that are important to detect but cannot be rated using IQ. For example, in the literature, organization reputation and geographic location are the two critical characteristics of a job that are noted as two highly influential factors (Barber, 1998;

Barber and Roehling, 1993; Belt and Paolillo, 1982; Breaugh, 1992; Breaugh and Starke, 2000; Gatewood et al., 1993; Lievens et al., 2001; Rynes and Barber, 1990). In addition, Belt and Paolillo (1982) suggest that the magnitude of the impact of IQ may vary when other factors such as the organization reputation is considered. Using the above findings as support, the developed model includes organization reputation and geographic location as two additional common components.

However, organization reputation and geographic location cannot be quantified using IQ dimensions. For example, it is meaningless to rate *the amount of information* of the organization reputation of a job. Instead, they can be quantified using other measuring dimensions such as low, moderate, and high. For example, a job advertised by a multi-million international company can be categorized as a job with high organization reputation; whereas a job advertised by a recent start-up company can be categorized as a job with low organization reputation. Similarly, a job that is located in the downtown area of a large city can be assumed to have a highly preferred geographic location, whereas a job that is located in a small city or in a rural setting can be assumed to have a less preferred geographic location.

Furthermore, the cooperative education students at the University of Waterloo can be categorized into three levels based on a combination of their academic year and the amount of cooperative work experience they have obtained. The three levels are junior, intermediate, and senior. Companies will indicate the level of student they are seeking on their job descriptions. This factor has a direct influence on the size of the applicant pool; thus, an additional component, *the level of student requirement* is included in the model

for testing.

Table 5-3 summarizes other selected common components of the job descriptions and their corresponding measuring dimensions. Figure 5-4 illustrates the model with the additional common components.

Table 5-3: Other selected common components and their corresponding measuring dimensions.

Other Common Components	Measuring Dimensions
Organization Reputation	Low Moderate High
Geographical Location	Low Moderate High (rating of preference)
Student Level Requirement	Yes No (for each of Junior, Intermediate, and Senior level)
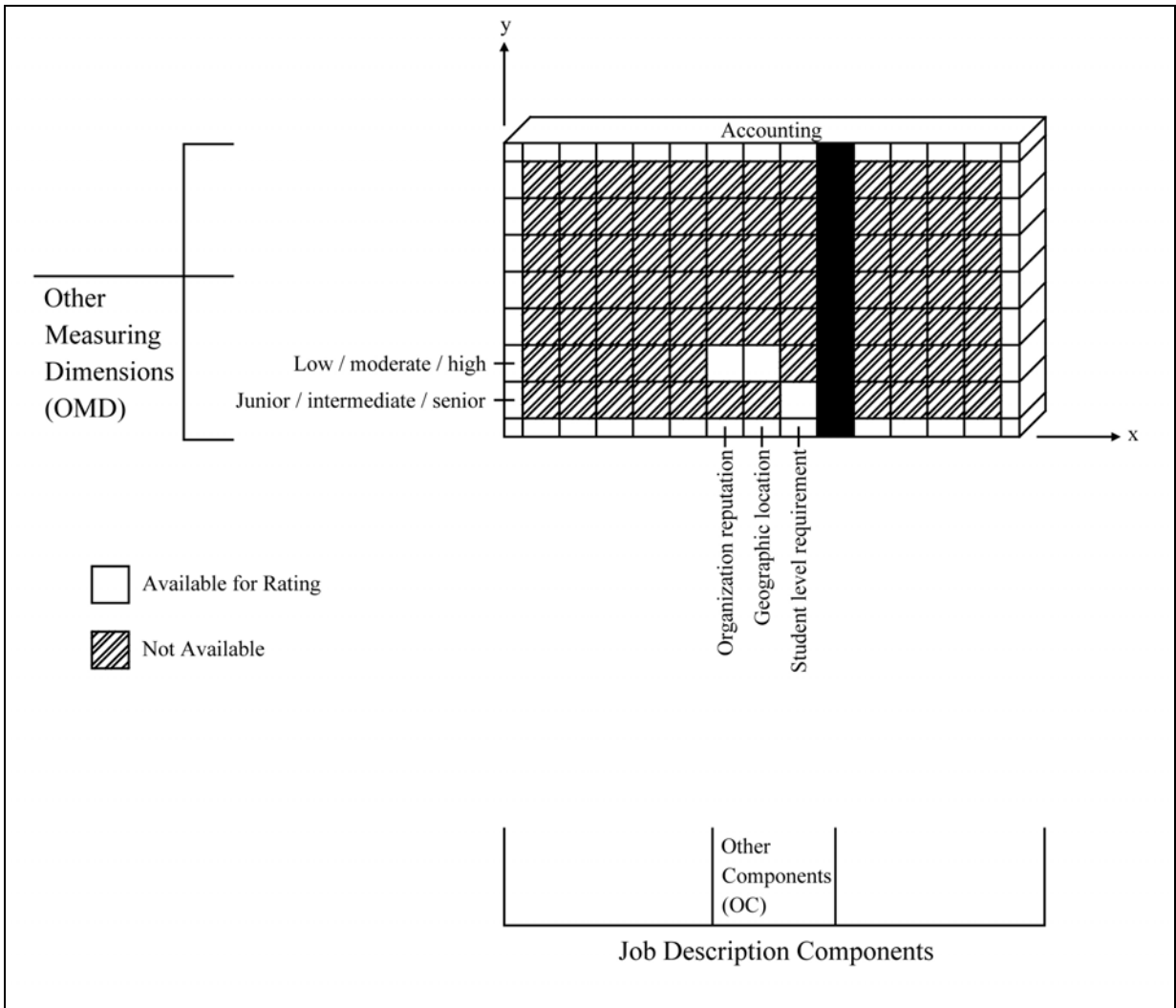
Figure 5-4: Model with the additional common components of the job descriptions.

5.2.5   Summary

The developed model for experimentation contains a y-axis for information quality and other measuring dimensions and an x-axis for the common and accounting-specific components for the job descriptions. Since only accounting job descriptions are used as samples, there is only one industry for the model; consequently, the z-axis is removed from the model. Figure 5-5 illustrates the complete model used to quantify accounting

job descriptions for this investigation.
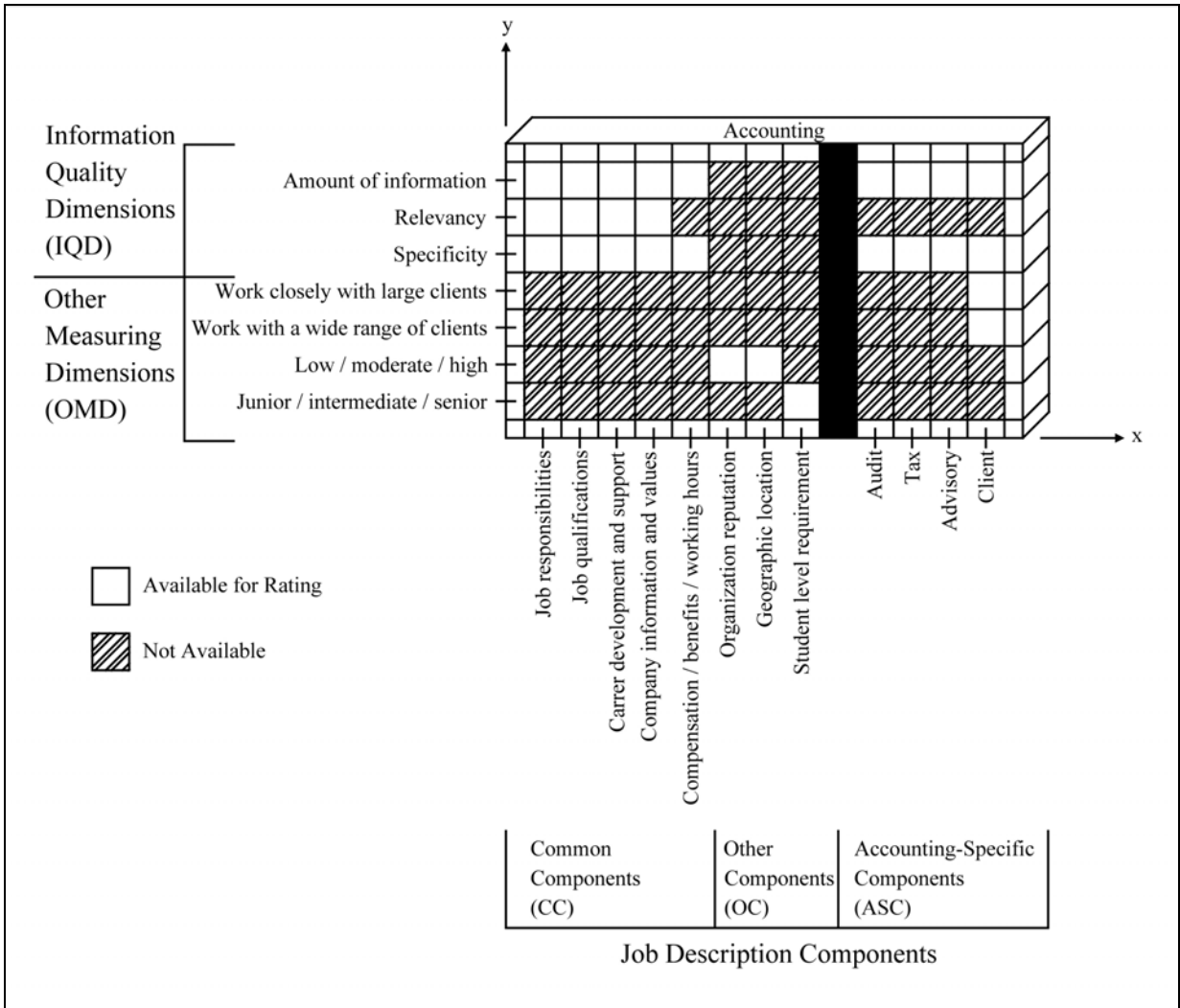
Figure 5-5: The complete model used to quantify accounting job descriptions.

5.3   Rating System of the Model

To quantify the job descriptions using the developed model, a rating system was derived. The rating system assigns a range of values used for each set of the job description components and their corresponding measuring dimensions. The following sections discuss the detail of the rating system for each component of the model.

5.3.1   Common Components

The four common components (CC): job responsibilities, qualifications, career development and support, and company information and values, are rated on a scale from –2 to +2 against the three IQ dimensions: specificity, relevancy, and the amount of information. A –2 represents a very poor rating, whereas a +2 represents a very good rating. For example, a job description that has a very specific content on job responsibilities will receive a +2 for that component, while a job description that has a very vague content on job responsibilities will receive a –2. A job description will also receive a –2 if no information is provided for the specific component. A five level scale system (–2, –1, 0, +1, +2) is used to incorporate the relatively large variability between the job descriptions. A three level scale system is too narrow to distinguish the difference between the qualities of the job descriptions.

Furthermore, the common component *compensation/benefits/hours* is rated against two IQ dimensions: specificity and the amount of information on a scale from –1 to +1. Since there is no value to rate *compensation/benefits/hours* against *relevancy*, this element is not included in this part of the model. In addition, the variability of *compensation/benefits/hours* is relatively smaller than other common components, as a result the rating scale is set to –1 to +1 (as opposed to –2 to +2). The rating system for the common components is summarized in Figure 5-6. For example, the first cell of the model indicates that the common component *job responsibilities* is measured against the amount of information and can have a value between –2 to +2.
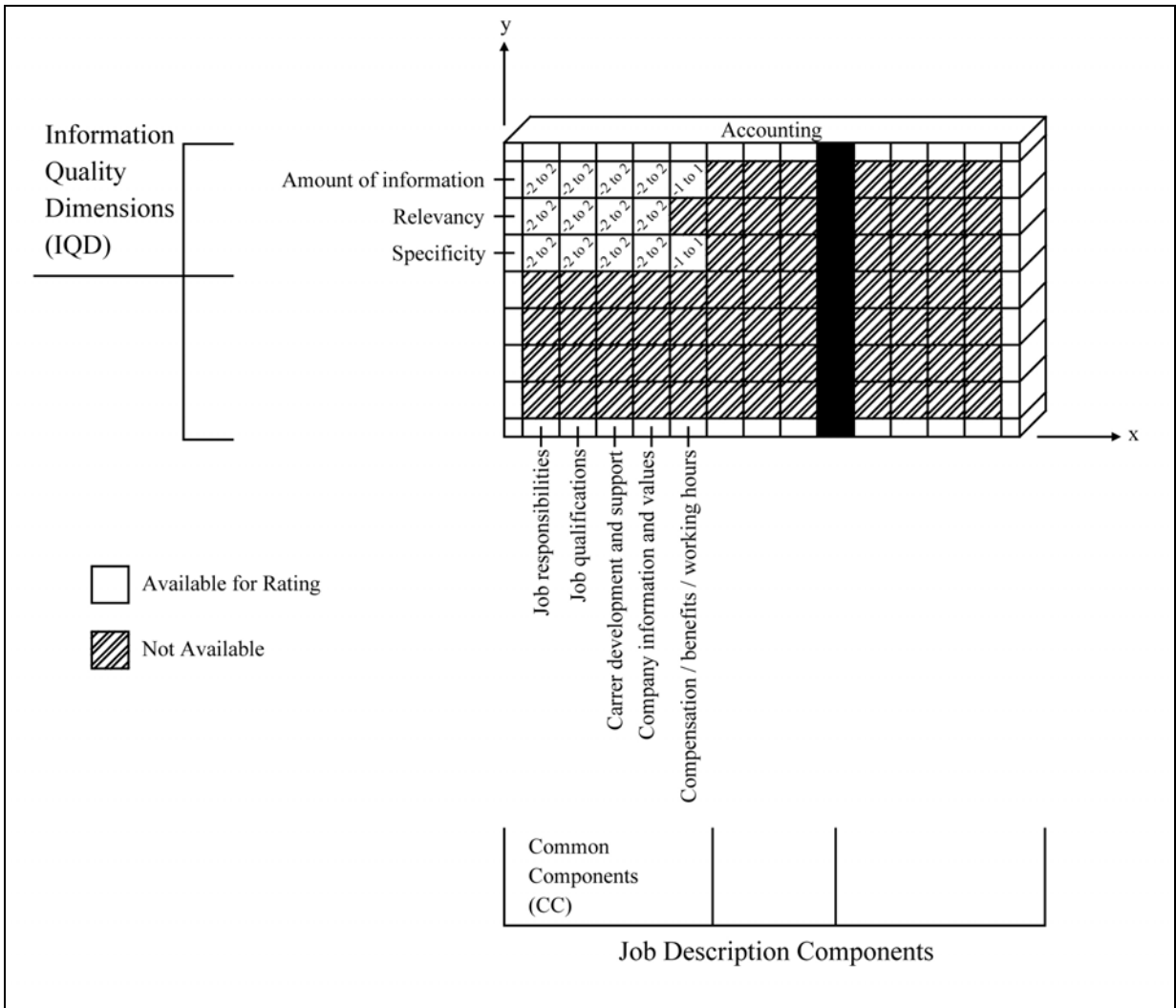
Figure 5-6: Model with the rating system for the common components.

5.3.2   Accounting Components

The four accounting-specific components, audit, tax, advisory, and client information are measured against two IQ dimensions: specificity and the amount of information, on a scale from −1 to +1. As discussed previously, the accounting-specific components are assumed to be relevant to the job description; therefore there is no value to rate these components against the information quality dimension of *relevancy*. Furthermore, client

information is rated on a scale from −1 to +1 against two other measuring dimensions: i) work closely with large clients and ii) work with a wide range of clients. Through preliminary examination of the job descriptions, it was found that the variation of the accounting components between the job descriptions was relatively smaller than the common components. As a result, a three level rating system is used (−1, 0, +1). The rating system for the accounting components is illustrated in Figure 5-7.
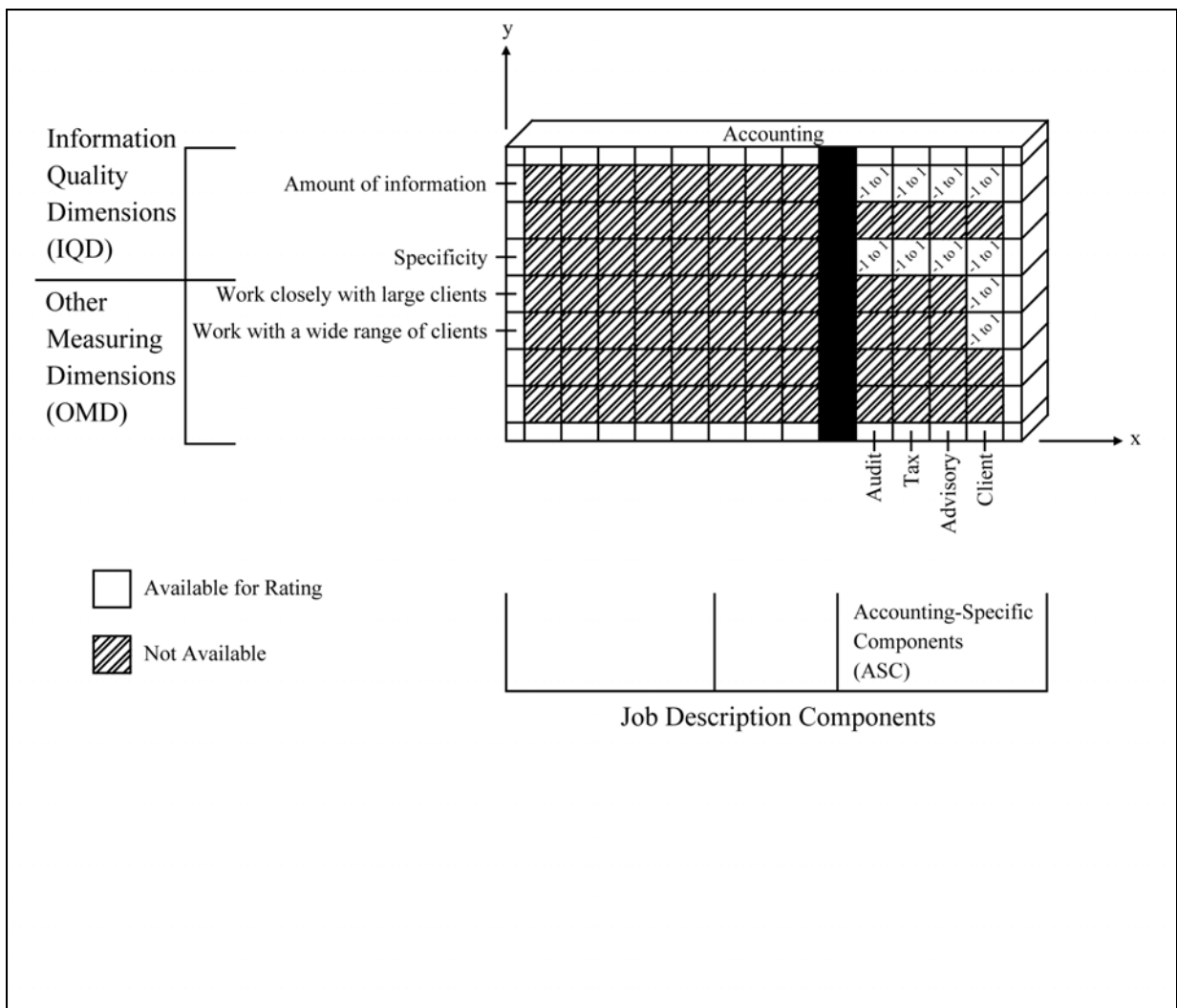
Figure 5-7: Model with the rating system for the accounting components.

5.3.3 Other Components

The additional components including organization reputation, geographic location, and student level requirements are rated using other measuring dimensions. Organization reputation is rated according to how well an organization performs (company size) in Canada compared to its competitors. The top four accounting firms receive a +1, the top five to twenty accounting firms receive a 0, and the rest of the accounting firms receive a −1 for their organization reputation rating. This component is scaled between −1 to +1 according to the measuring system summarized in Table 5-4 (University of Western, 2007).

Table 5-4: Organization reputation measuring system.

Rating	Rating in Canada	Accounting company (by revenue in 2005)
+1	Top four	Deloitte; Ernst and Young; KMPG; Pricewaterhouse Coopers
0	Top five to twenty	Grant Thornton; Arthur Andersen; BDO Dunwoody; Meyers Norris & Penny; Rihter, Usher & Vineberg; Collins Barrow/Mintz & Parnters; HLB/Schwartz Levitsky Feldman; BHD; Evancic Perrault Robertson; Zeifman & Co.; Verrier Paquin Hebert; Porter Hetu International; MacKay & Partners; Welch & Company; Soberman Isenbaurn & Colomby; Ginsberg Gluzman Fage & Lievitz
−1	The remaining	---

The company size is used as a proxy for the company reputation in this investigation because there are only a small number of accounting companies to be considered. For investigations having larger sample size which includes higher number of companies, a

secondary set of data providing the public's perception of the companies' reputation may be necessary. For example, just because a company is large does not mean that it has a good reputation. However, in the case of accounting firms, the large firms seem to be widely regarded as having 'good' reputations (based on informal interviews with students of University of Waterloo and employees of CECS).

Cooperative Education and Career Services (CECS) at the University of Waterloo assign different numbers of field coordinators to different sectors in different cities. Field coordinators are responsible for finding more job placements by marketing the co-op program to different employers. As the demand of job placements in a particular city increases, CECS assigns more field coordinators to that sector. For example, GTA has approximately 29% of the total number of field coordinators in Ontario, whereas the entire central Ontario region has approximately 26% of the field coordinators. Eastern Ontario, Southern Ontario, Western, and Northern Ontario contain 12%, 24%, 4%, and 4% of the total number of field coordinators in Ontario respectively. This suggests that the higher ratio of the number of coordinators to the size of the city, the more popular the jobs are located at those cities. Informal interviews with field coordinators suggested that the popularity of the cities is highly dependent to the level of convenience of the job placement. For example, if many of the students' parents live in Toronto, many of these students will like to locate in Toronto for convenience.

Using the above logic, all of the geographic locations of all the accounting jobs advertised for Fall 2006 were collected and were rated according to the measuring system summarized in Table 5-5 (University of Waterloo, 2007). Jobs that were located in

highly preferred locations received a +1, jobs that were located in moderately preferred locations received a 0, and jobs that were located in the less preferred locations received a −1 for the geographic location rating. The level of convenience and popularity was determined by CECS employees.

Table 5-5: Geographic location measuring system.

Rating	Level of convenience and popularity	Locations
+1	High	GTA, Toronto, Markham, Richmond Hill, North York
0	Moderate	Kitchener, Waterloo, Vaughan, Mississauga, Concord, Etobicoke
−1	Low	Ottawa, Kingston, Peterborough, Orangeville, Burlington, Brantford, Aurora, Ancaster, Belleville, Cambridge, London, St. Mary's, Stratford

Furthermore, each job advertisement specifies the student requirement level from junior, intermediate to sensor. This component is scaled between −1 to +1. A −1 is assigned to the level rating if that level is not desired and a +1 is assigned to the level rating if that level is desired. For example, a job description that indicates a requirement for junior and intermediate students, a +1 is assigned to the junior and intermediate rating, while a −1 is assigned to the senior rating. A summary of the entire rating system for all of the components is illustrated in Figure 5-8.
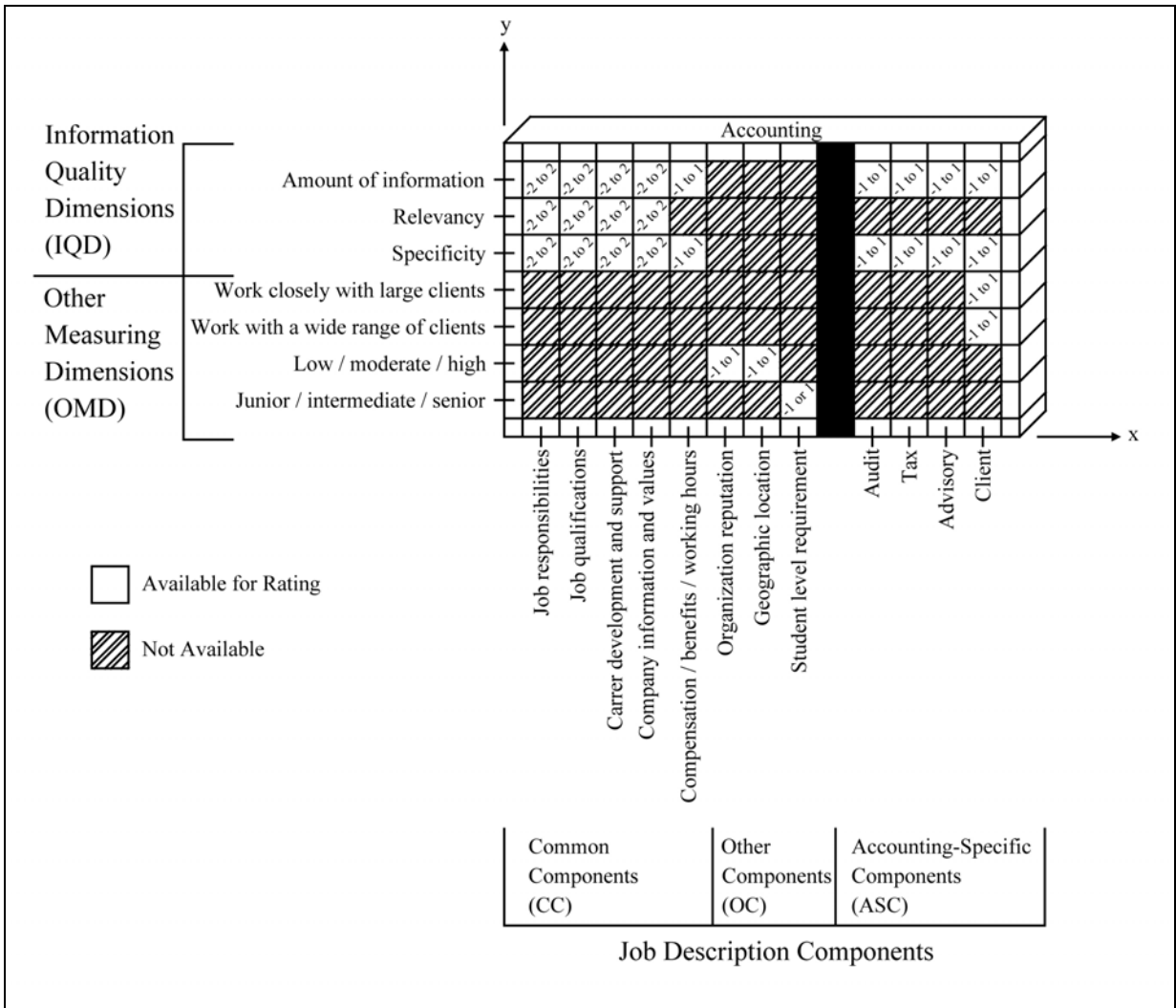
Figure 5-8: Model with the complete rating system.

5.4 Quantifying Job Descriptions

Using the experimental model, each of the 127 accounting job descriptions was
quantified. Each job description was read in a random order and each component of the
job descriptions was rated against the corresponding measuring dimension(s).
Components that were well written receive a higher rating than components that were
poorly written. Components that were not present in the job descriptions received the

lowest possible rating. One example of a high, moderate, and low quality job description is chosen and their corresponding ratings are illustrated in Appendix A. Please refer to Appendix B for the rating data of the 127 accounting job descriptions.

The job descriptions were rated solely by the author. There are risks for this approach of using a single encoder which include introducing human bias in the encoded values, the rating might not reflect the students' perspective, and the rating represents only one person's opinion versus the entire student population. However, the emphasis of this investigation is to explore the preliminary feasibility of the developed model and to evaluate whether there is value in using such a model. The actual data (e.g., accounting) is not important at this stage, as it is more important to determine whether it is possible to generate useful insights using the model's framework. As a result, the accuracy of each encoding is considered to be a minor concern as long as the encoding was done consistently by the encoder. If the purpose had been to explicitly analyze the accounting job descriptions and to provide insights to the accounting industry, it would have been important to use a second encoder and control for a single encoder bias.

To analyze the data, the rating of the accounting-specific components and the rating of the common components are combined into the Accounting Total (ACC) and Common Total (COM) rating respectively. The total rating of ACC and COM are combined to create a third overall rating called the Grand Total (GRA). Lastly, the additional components including organization reputation (ORG), geographic location (LOC), junior level student requirement (JUN), intermediate level student requirement (INT), and senior level student requirement (SEN) are rated against their corresponding measuring

dimensions. These ratings represent the *single factors* that are tested for significance in
the data analysis. The single factors are summarized in Table 5-6. Regression analysis is
applied to test the significance of the single factors to access the seven hypotheses. The
regression model is:

$$Y_i = \beta_0 + \beta_1 ACC_i + \beta_2 COM_i + \beta_3 GRA_i + \beta_4 ORG_i + \beta_5 LOC_i + \beta_6 JUN_i$$
$$+ \beta_7 INT_i + \beta_8 SEN_i + \varepsilon_i$$

Y_i = number of applications (independent variable)

ε_i = error

$$(5.1)$$

Please refer to Chapter 6 for the detail discussion of the regression analysis.

Table 5-6: Single factors for the data analysis.

Single Factor	Full Name: Description
ACC	Accounting Total: the total score of all of the accounting-specific components of the job descriptions
COM	Common Total: the total score of all the common components of the job descriptions
GRA	Grand total: the total score of accounting total (ACC) and common total (COM)
ORG	Organization Reputation
LOC	Geographic Location
JUN	Junior level student
INT	Intermediate level student
SEN	Senior level student

5.4.1   Hypotheses Test

To test the seven hypotheses outlined in Chapter 4, the significance of the single factors outlined in the previous section are tested. The ratings of the various components of the job descriptions represent the dependent variables and the corresponding number of job applications represents the independent variable (Y_i). When a single factor is found to be significant, it represents that the factor has a significant contribution to the number of job applications. If the constant (β) of the single factor is positive, it means that as the rating of the single factor increases, the number of the corresponding applications also increases and vice versa.

> *Hypothesis I: as the information quality of the accounting-specific components of a job description increases, the number of job applications increases.*

The single factor, ACC is the total information quality rating of all of the accounting-specific components of the job descriptions. To validate hypothesis one, ACC should be positive and significant.

> *Hypothesis II: as the information quality of the common components of a job description increases, the number of job applications increases.*

COM is the total information quality rating of all of the common components of the job descriptions. To validate hypothesis two, COM should be positive and significant.

> *Hypothesis III: as the information quality of the entire job description increases,*

the number of application increases.

GRA is the total information quality rating of the combined accounting-specific and common components of the job descriptions. To validate hypothesis three, GRA should be positive and significant.

Hypothesis IV: organization reputation has a significant positive impact on the number of job applications where the average number of job applications is significantly greater for job descriptions from a higher reputable organization than job descriptions from a less reputable organization.

ORG is the rating of the organization reputation for the accounting jobs. To validate hypothesis four, ORG should be positive and significant. In addition, the average number of job applications for job descriptions with an organization reputation rating of +1 should be greater than the average number of job applications for job descriptions with an organization reputation rating of 0 and −1.

Hypothesis V: geographic location has a positive significant impact on the number of job applications where the average number of job applications is significantly greater for jobs that are located in more convenient geographic locations than jobs that are located in less convenient geographic locations.

LOC is the rating of the geographic location for the accounting jobs. To validate hypothesis five, LOC should be positive and significant. Moreover, the average number of job applications for job descriptions with a geographic location rating of +1 should be

greater than the average number of job applications for job descriptions with a

geographic location rating of 0 and –1.

Hypothesis VI: the correlation between the number of job applications and the

accounting-specific components of an accounting job description is significant for

all jobs that have similar organization reputation and/or geographic location.

A two-factor interaction term represents the interaction between two single factors. For

example, the two-factor interaction ORG × ACC symbolizes the interaction between the

single factors ACC and ORG. For this investigation, ORG × ACC represents the impact

of the single factors ORG and ACC simultaneously on the number of applications. If

ORG × ACC is significant, then the correlation between the number of job applications

and the accounting-specific components is significant for all samples that have similar

organization reputation. Similarly, LOC × ACC symbolizes the interaction between the

single factors LOC and ACC. To validate hypothesis six, one or the combination of the

interaction terms ORG × ACC and LOC × ACC should be significant.

Hypothesis VII: the correlation between the number of job applications and the

common components of a job description is significant for all jobs that have similar

organization reputation and/or geographic location.

ORG x COM represents the interaction between the ratings of the common components

of the job descriptions and the corresponding organization reputation. Similarly, LOC ×

COM represents the interaction between the rating of the common components of the job

descriptions and the corresponding geographic location. Using the same argument as Hypothesis VI, to validate Hypothesis VII, one or the combination of the interaction terms ORG × COM and LOC × COM should be significant.

Note that the single factors JUN, INT, and SEN, which are used to detect the significance of the student level requirements, are not used to validate any of the seven hypotheses. However, these single factors are tested for significance because they have the possibility to impact the number of applications. Refer to Table 5-7 for a summary of all of the hypotheses tests and their corresponding single factors for validations. The term "to fail to reject a hypothesis" implies that the hypothesis cannot be declined. Since a test cannot prove that a specific hypothesis is flawless, one can only "fail to" reject the hypothesis.

Table 5-7: Summary of the hypotheses tests.

To Fail to Reject Hypothesis #	Factor(s) to be Tested	Result(s) to Test for
I	ACC	Positive and significant
II	COM	Positive and significant
III	GRA	Positive and significant
IV	ORG	Positive and significant
V	LOC	Positive and significant
VI	ORG × ACC and LOC × ACC	Significant
VII	ORG × COM and LOC × COM	Significant

5.5   Data Clean-up

During initial data examination, 9 outliers and 16 poor data points were identified.

Outcasts are defined as data points that are either extremely high in grand total score but

received very low number of job applications or vice versa. Poor data points are defined

as job descriptions that have extremely short content. These job descriptions have

minimal value to the investigation since the information quality of the content cannot be

evaluated. As a result, 25 out of 127 data points were removed from the data set. These

data points will be discussed in limitations and recommended future research in Chapter

8. Consequently, 102 job descriptions were examined in the final data analysis.

Chapter 6
Data Analysis and Results

Regression analysis was used to examine the data and to assess the seven hypotheses. Since historical data is used, the data is considered as un-designed data. The number of job applications for each job description represents the dependent variable. The values of the single factors represent the independent variables.

A preliminary regression analysis was performed to analyze the significance level of the single factors and the two-factor interaction terms. Three or higher interaction terms are not considered in this investigation. These interactions are relatively unimportant and they are not significant to the hypothesis tests.

Due to the high number of single and two-factor interaction terms, the regression analyzes were performed in various batches. The details of the preliminary analysis can be found in Appendix C. The preliminary regression analyzes suggest that the single and the interaction terms that are significant include JUN, ACC, ORG, LOC, ORG × COM, ORG × LOC, LOC × COM, COM, INT × SEN, and GRA. The regression model is:

$$Y_i = \beta_0 + \beta_1 JUN_i + \beta_2 ACC_i + \beta_3 ORG_i + \beta_4 LOC_i + \beta_5 ORG_i COM_i + \beta_6 ORG_i LOC_i + \beta_7 LOC_i COM_i + \beta_8 COM_i + \beta_9 INT_i SEN_i + \beta_{10} GRA_i + \varepsilon_i$$

$$(6.1)$$

A secondary regression analysis was performed where all of the significant terms were combined into a single regression model. The main effect, GRA, is the sum of COM and ACC. Due to this correlation, GRA, COM and ACC were analyzed under two different

regression models. The first model is:

$$Y_i = \beta_0 + \beta_1 LOC_i + \beta_2 ORG_i + \beta_3 GRA_i + \varepsilon_i \qquad (6.2)$$

The second model contains all of the significant terms except for GRA:

$$Y_i = \beta_0 + \beta_1 JUN_i + \beta_2 ACC_i + \beta_3 ORG_i + \beta_4 LOC_i + \beta_5 ORG_i COM_i + \beta_6 ORG_i LOC_i$$
$$+ \beta_7 LOC_i COM_i + \beta_8 COM_i + \beta_9 INT_i SEN_i + \varepsilon_i$$

$$(6.3)$$

In the first regression model, GRA was tested with ORG and LOC. ORG and LOC are found to be relatively more significant than other terms in the preliminary analysis; therefore, testing GRA with ORG and LOC will generate a stronger conclusion. Table 6-1 shows the regression analysis of the main effects of LOC, ORG, and GRA. The table shows that GRA has a P-value of less than 0.0001, a $\beta = 33.482$, and that the constant is between 17.374 and 49.589 under a 95% confidence interval (the value 0 is not contained in the range of the constant under a 95% confidence interval). In addition, the two significant terms, ORG and LOC both have a P-value greater than 0.0001 and less than 0.0005. This shows that GRA is more significant than ORG and LOC. The above findings suggest that GRA is positive and is highly significant.

Table 6-1: Regression analysis for single factor LOC, ORG, and GRA.

	β	Std Error	t-Stat	P-value	Lower 95%	Upper 95%	Lower 90.0%	Upper 90.0%
Intercept	38.574	3.826	10.082	8.017E-17	30.982	46.167	32.221	44.927
LOC	13.483	3.666	3.678	**3.836E-04**	6.209	20.757	7.396	19.570
ORG	15.496	3.980	3.894	**1.803E-04**	7.598	23.394	8.888	22.105
GRA	**33.482**	8.117	4.125	**7.781E-05**	**17.374**	**49.589**	20.003	46.960

The second regression model (6.3) includes all of the significant terms except for GRA.

Table 6-2 presents a summary of the analysis and Table 6-3 illustrates the ANOVA table.

The tables show that the regression model has an R value greater than 0.75 with a

standard error of 27.242. The significance of F is found to be less than 10E-12.

Table 6-2: Regression summary of the remaining single and two-factor interaction effects.

Multiple R	0.759
R Square	0.577
Adjusted R Square	0.525
Standard Error	27.242
Observations	102

Table 6-3: ANOVA table for the remaining main and two-factor interaction effects.

	Df	SS	MS	F	Significance F
Regression	11	90931.551	8266.505	11.139	9.971E-13
Residual	90	66793.203	742.147		
Total	101	157724.755			

Figure 6-1 illustrates the regression model prediction versus the actual number of job

applications. The diamond dots represent the prediction of the number of applications by

the model and the square dots represent the actual number of job applications. The figure

shows a reasonable fit between the prediction and the actual number especially for

predictions below 60 applications. The lack of fit for predictions of above 60

applications is due to the smaller number of observations within a wider range. There are

89 observations (81.3%) that received 0 to 60 applications and only 13 observations

(12.7%) that received 60 to 166 applications. As a result, there is a more apparent lack of

fit for observations that received more than 60 applications. However, this does not

affect the objective of the investigation because the purpose of the regression analysis is

to identify the significant single and two-factor interaction terms. A model that provides

a reasonable fit is sufficient in this case.
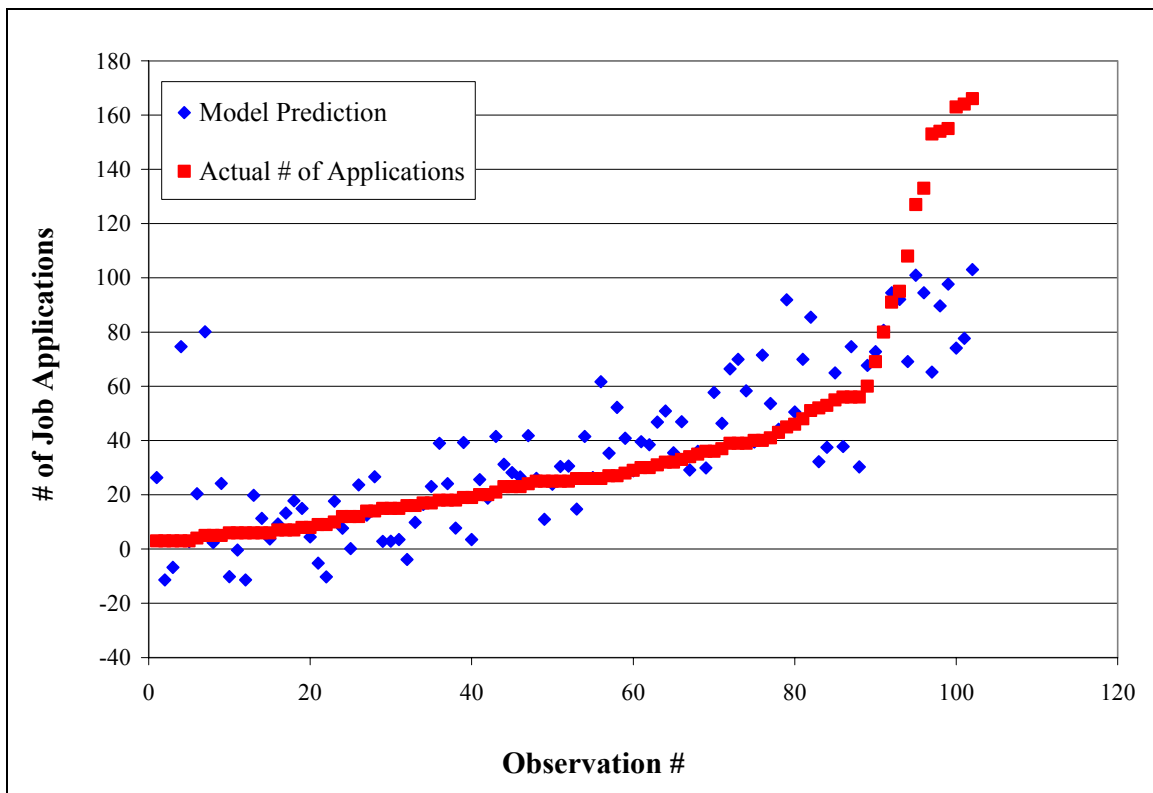
Figure 6-1: Regression model and the actual number of job applications.

Table 6-4 shows the regression analysis of the single and two-factor interaction terms

individually. The table shows that JUN, ORG, and LOC all have a P-value less than

0.0001. ACC has a P-value of less than 0.002. The interaction term LOC × COM has a P-value of less than 0.05. All of the above terms do not contain the value 0 within the range of their constant (β) under a 95% confidence interval. Furthermore, all of their β values are greater than 10 and are positive. The above results suggest that JUN, ORG, LOC, ACC, and LOC × COM are all significant as determined by the second regression model (6.3).

Table 6-4: Regression analysis for the remaining main and two-factor interaction effects.

	β	Std Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 90.0%	Upper 90.0%
Intercept	42.499	4.289	9.909	4.407E-16	33.979	51.020	35.372	49.627
JUN	10.556	2.951	3.578	5.605E-04	4.695	16.418	5.653	15.460
ACC	25.441	7.822	3.253	1.611E-03	9.901	40.980	12.441	38.440
ORG	18.478	4.471	4.133	8.005E-05	9.597	27.360	11.048	25.908
LOC	17.524	4.061	4.315	4.078E-05	9.457	25.591	10.775	24.272
ORG × COM	-24.381	11.387	-2.141	3.497E-02	-47.003	-1.759	-43.306	-5.456
ORG × LOC	7.047	4.459	1.580	1.176E-01	-1.813	15.906	-0.365	14.458
LOC × COM	16.016	8.532	1.877	6.374E-02	-0.935	32.967	1.836	30.196
COM	-8.137	10.982	-0.741	4.606E-01	-29.954	13.679	-26.388	10.114
INT × SEN	2.292	3.046	0.752	4.537E-01	-3.759	8.343	-2.770	7.354

The interaction term ORG × COM has a P-value of less than 0.05 and a β value of –24.38. The sign of the constant of ORG × COM is not a critical factor in any of the hypothesis tests. Although the constant value is negative, the term is still significant. The other terms including INT × SEN, COM, and ORG × LOC have a P-value greater than 0.1. The value 0 exists within the range of their constant values (β) under a 90% confidence interval. As a result, these terms are found to be insignificant.

Table 6-5 summarizes the findings of the data analysis results. Note that JUN, INT × SEN, and ORG × LOC are included in the regression analysis but do not impact in any of the hypothesis tests. JUN is found to be significant and thus should be included in future analysis to generate a better model to predict the behaviour of the independent variable(s). The modified regression model with all of the significant terms is:

$$Y_i = \beta_0 + \beta_1 JUN_i + \beta_2 ACC_i + \beta_3 ORG_i + \beta_4 LOC_i + \beta_5 ORG_i COM_i + \beta_6 LOC_i COM_i + \varepsilon_i$$

$$(6.4)$$

The linear model was found to be appropriate as a second order model was tested and found to be insignificant. The data was also analyzed using a root and log model and similar results were found. The details of these analyses can be found in Appendix C.

Table 6-5: Summary of the significant terms of the regression model.

Main effect	Two-factor interaction	β	P-value	Significance	Hypothesis Test #
ACC	-	25.44 (β_2)	< 0.002	95%	I
COM	-	-8.14	> 0.45	not significant	II
GRA	-	33.48	< 0.0001	95%	III
ORG	-	18.48 (β_3)	< 0.0001	95%	IV
LOC	-	17.52 (β_4)	< 0.0001	95%	V
-	ORG × ACC	15.72	> 0.1	not significant	VI
-	LOC × ACC	9.13	> 0.1	not significant	VI
-	ORG × COM	-24.38 (β_5)	< 0.05	95%	VII
-	LOC × COM	16.02 (β_6)	< 0.07	90%	VII
JUN	-	10.56 (β_1)	< 0.001	95%	N/A
-	INT × SEN	2.292	> 0.1	not significant	N/A
-	ORG × LOC	7.047	> 0.1	not significant	N/A

Chapter 7

Discussion

Hypothesis I: as the information quality of the accounting-specific component of a job description increases, the number of job applications increases.

To test Hypothesis I, the single factor ACC was analyzed for significance. ACC represents the quality rating of the accounting-specific components of the job descriptions and was found to be positive and significant ($\beta = 25.44$, P-value < 0.002, CI = 95%). This result fails to reject Hypothesis I. This suggests that the information quality of the accounting-specific related components of job descriptions has a positive impact on an applicant's decision to pursue a job. Figure 7-1 shows the relationship between the average numbers of applications versus the rating of the accounting-specific components of the job descriptions. The figure demonstrates that as the score of the accounting rating increases, the average number of applications also increases.

The above results suggest that job applicants attend to the information quality of the accounting-specific components of job descriptions. The attractiveness of the job, which is represented by the number of job applications, increases as the quality of the job description increases.
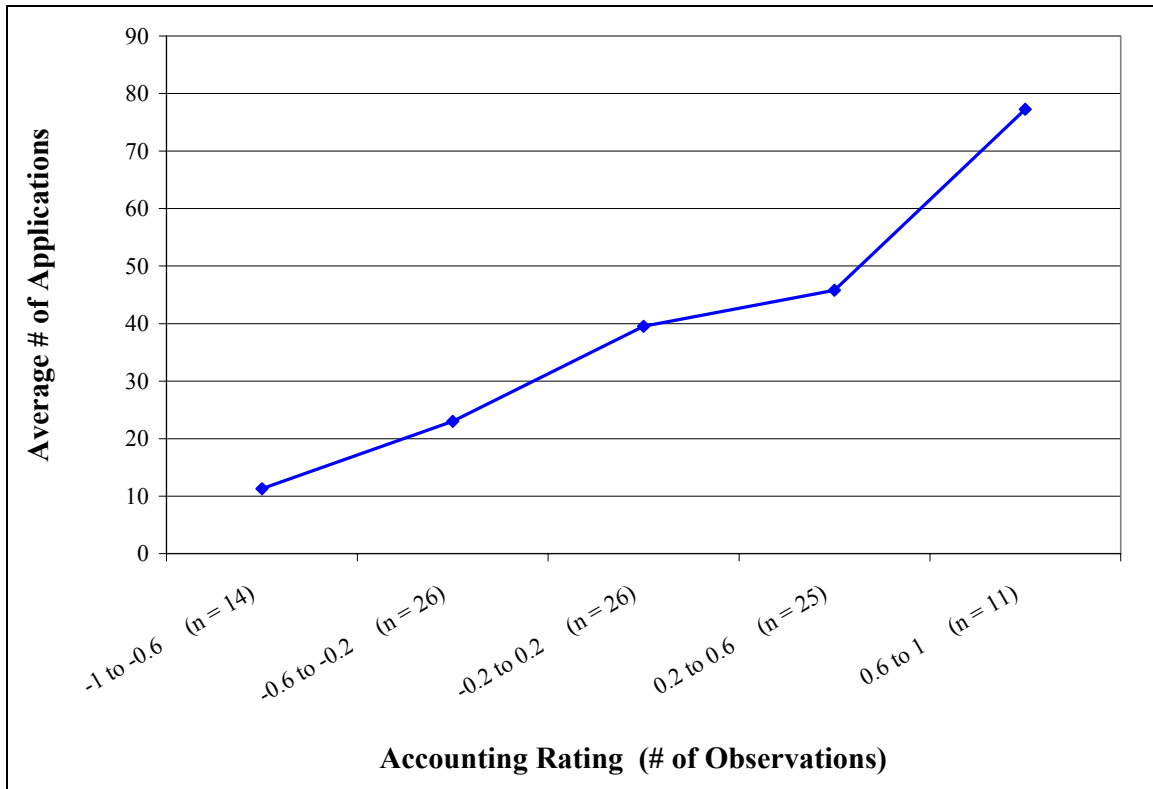
Figure 7-1: Average number of applications versus accounting rating.

Hypothesis II: as the information quality of the common component of a job description increases, the number of job applications increases.

Hypothesis II was tested by analysing the single factor COM. COM represents the rating of the common components of the job descriptions and was found to be insignificant (β = -8.14, P-value > 0.45). This result rejects Hypothesis II, which suggests that the information quality of the common components of the job descriptions has a minimal impact on an applicant's decision to pursue a job. Since this contradicts the initial assumption of this investigation, additional analyzes were performed to determine the relationship between the single factor COM and the number of job applications.

Figure 7-2 is an illustration of the relationship between the average numbers of applications versus the rating of the common components of the job descriptions. The figure reveals a positive relationship between the two variables.
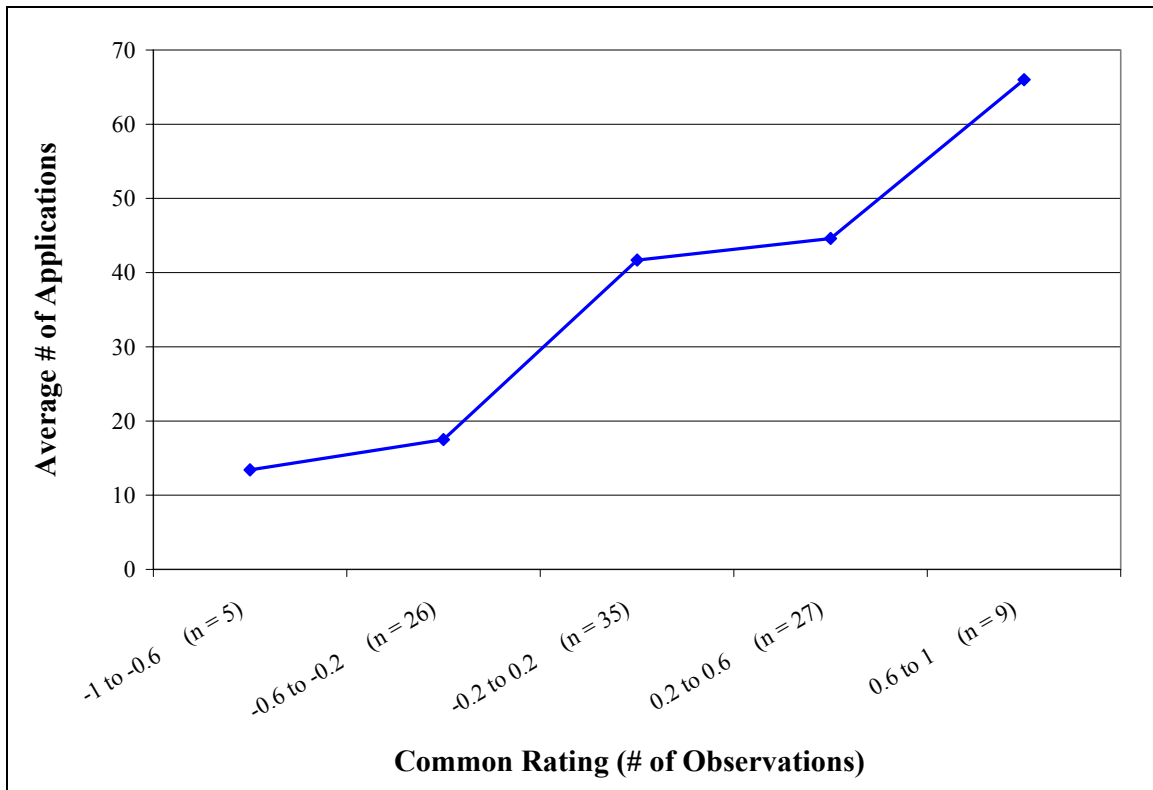
Figure 7-2: Average number of applications versus common rating.

A possible cause for the inconsistency is due to other significant single factors and two-factor interaction terms. Figure 7-2 shows that the single factor COM is significant when it is analyzed by itself. This figure confirms that as the common rating increases, the average number of applications also increases. However, the significance of COM alone decreases when it is analyzed in a single regression model where other significant single factor and two-factor interaction terms are included. Refer to Appendix C for the details of the regression analysis. In addition, the two-factor interaction terms ORG × COM and

LOC × COM were found to be significant, which suggest that COM is significant when the additional components including organization reputation and geographic location are considered. Consequently, these results suggest with a reasonable degree of support that the information quality and the common components of the job descriptions have a positive impact on an applicant's decision in pursuing a job.

The above analysis suggests that job applicants attend to the quality of the common components of job descriptions. In this investigation, the common components include job responsibilities, job qualifications, career development and support, company information and values, and compensation/benefits/working hours. Consequently, there is evidence to support that the students pay attention to these elements when reading job descriptions and that the attractiveness of a job is partially dependent on these elements.

> ***Hypothesis III: as the information quality of the entire job description increases, the number of application increases.***

To validate Hypothesis III, the single factor GRA was tested for significance. GRA is the combination rating of ACC and COM which represents the overall quality rating of the accounting-specific and common components of the job descriptions. GRA was found to be positive and significant ($\beta = 33.48$, P-value < 0.0001, CI = 95%). This result fails to reject Hypothesis III, suggesting that the information quality of the job description has a positive impact on an applicant's decision to pursue a job. Figure 7-3 shows the relationship between the average numbers of applications versus the overall rating of the job descriptions. The figure reveals that as the GRA increases, the average number of job

applications also increases.

The objective of this research was to investigate whether information quality of job descriptions influences a job applicant's decision to pursue a job. The above analysis suggests that students appear to attend to the content of the job descriptions. Subsequently, they make a decision to whether to apply for the job partially based on the quality of the job description. As the overall quality of a job description increases, there is a greater chance for a student to apply for the job.
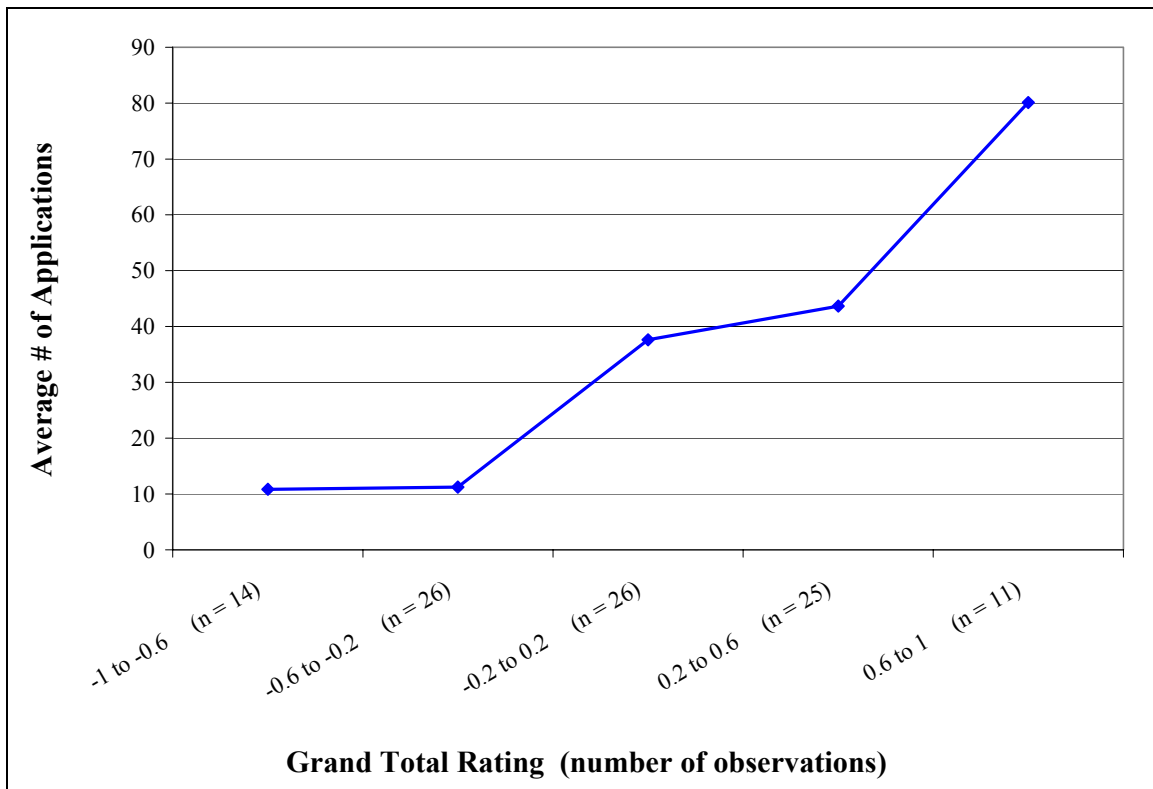
Figure 7-3: Average number of applications versus grand total rating.

Hypothesis IV: organization reputation has a significant positive impact on the

number of job applications where the average number of job applications is

significantly greater for job postings from a higher reputable organization than job postings from a less reputable organization.

ORG is the single factor that corresponds to the organization reputation rating of the job descriptions. ORG was tested for significance to validate Hypothesis IV. The regression analysis determined that ORG is positive and significant (β = 18.48, P-value < 0.0001, CI = 95%). Figure 7-4 illustrates the relationship between the organization reputation rating and the independent variable. The figure shows that the average number of applications is greater for job descriptions that have a higher organization reputation than job descriptions that have a lower organization reputation. These results fail to reject Hypothesis IV, implying that organization reputation has a positive impact on an applicant's decision to pursue a job. This result supports the finding by Gatewood et al. (1993), which states that organization reputation is highly related to a job candidate's decision to pursue employment.

In this investigation, organization reputation is determined by the size of the company, which is determined by the annual revenue generated by the company. The "Big Four" accounting companies receive a +1 for their organization reputation rating. The job advertisements from these companies received an average of approximately 58 job applications each. Accounting companies that are rated below twentieth receive a –1 for their organization reputation rating. Their advertised job positions received an average of approximately 30 job applications each. This represents that the highly reputable companies received almost double the number of job applications than the less reputable companies. This result illustrates that organization reputation is a highly influential

factor for job applicants when deciding whether to apply for a job or not.
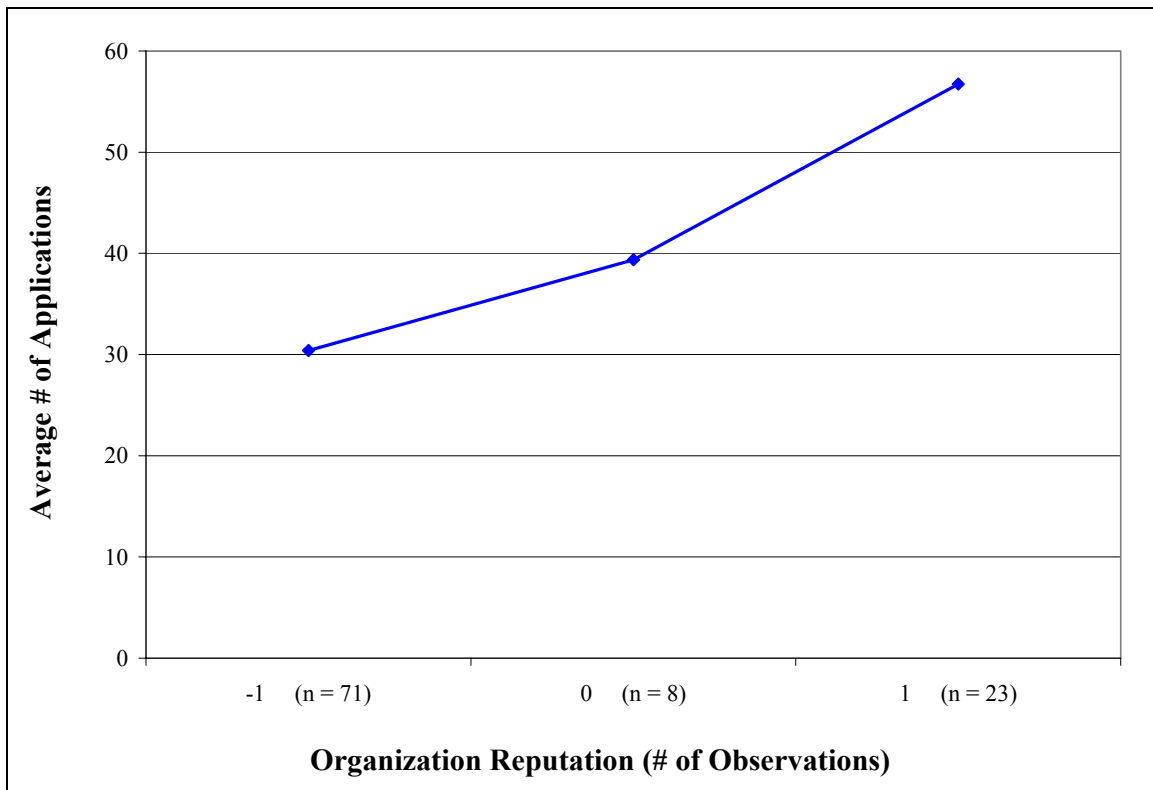
Figure 7-4: Average number of applications versus organization reputation.

Hypothesis V: geographic location has a positive significant impact on the number of job applications where the average number of job applications is significantly greater for jobs that are located in more convenient geographic locations than jobs that are located in less convenient geographic locations.

To test Hypothesis V, LOC was tested for significance. LOC is the geographic location preference rating. A higher LOC rating corresponds to a job that is located in a more convenient location. From the regression analysis, the single factor LOC was found to be positive and significant ($\beta = 17.52$, P-value < 0.0001, CI $= 95\%$). Figure 7-5 illustrates

the relationship between the average numbers of applications and the LOC rating. The figure shows that the average numbers of applications are significantly greater for jobs that are located at a more convenient location than jobs that are sited at a less convenient location. These results fail to reject Hypothesis V, thus suggesting that the geographic location has a positive impact on an applicant's decision to pursue a job.

In this investigation, 53 out of the 102 (> 50%) accounting jobs received a LOC rating of +1. These jobs are located in GTA, Toronto, Markham, Richmond Hill, or North York. Students view these locations as highly popular. Jobs that are located in a highly preferred location received an average of approximately 45 job applications. Conversely, jobs with a poor geographic location rating received an average of approximately 22 job applications. Jobs located at a better location received on average more than double the number of applications than jobs that are located in a poorly rated location. This indicates that students value highly the location of a job.

Although previous discussions showed that a student's decision to apply for a job is partially dependent to the quality of the job description, the above results suggest that organization reputation and geographic location are two factors that must be highly regarded.
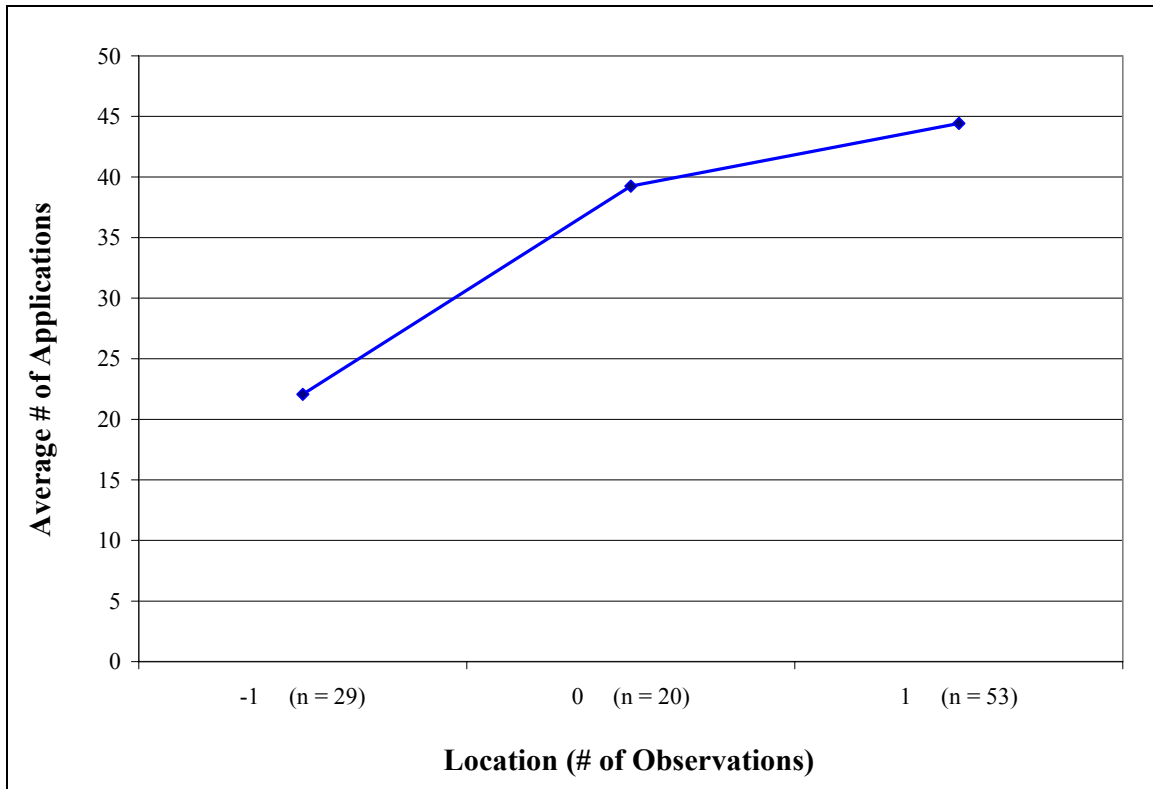
Figure 7-5: Average number of applications versus geographic location.

Hypothesis VI: the correlation between the number of job applications and the accounting-specific component of job descriptions is significant for all jobs that have similar organization reputation and/or geographic location.

To test Hypothesis VI, the two two-factor interaction terms ORG × ACC and LOC × ACC were analyzed. ORG × ACC and LOC × ACC represent the relationship between the quality rating of the accounting-specific components and the organization reputation and geographic location of the job respectively. The two-factor interaction terms ORG × ACC ($\beta = 15.72$, P-value < 0.1) and LOC × ACC ($\beta = 9.13$, P-value >0.25) were found to be insignificant. Please note that although the 90% confidence interval of ORG × ACC is 0.568 to 30.873 (see Table 6-2), the lower boundary of 0.568 is very close to zero.

Subsequently, ORG × ACC is considered as insignificant compared to the other significant terms. Although the accounting-specific components, organization reputation, and geographic location all have significant impact on the number of job applications independently; the terms do not have significant interactions.

Initially, it was suspected that information quality of the job-specific components of the job descriptions has an impact on the number of job applications at different levels. For example, jobs that have similar organization reputation or geographic location will have similar job response rate behaviour with respect to the accounting rating. However, the above results suggest that there is no pattern in the number of job applications in relation to the quality rating of the accounting-specific components for jobs that have similar organization reputation or geographic location. This generates an inconsistency when compared to the findings of Belt and Paolillo (1982) where they suggest that the impact of information quality can have different magnitudes for jobs that have similar organization reputation. However, the study by Belt and Paolillo (1982) investigated only the specificity of job qualifications of job advertisements (only one component of job descriptions) whereas Hypothesis VI of this thesis investigates four job-specific components. In addition, Belt and Paolillo used fast-food industry job advertisements to conduct their investigation which may have considerable differences with respect to accounting job advertisements.

Hypothesis I has verified that the rating of accounting-specific components has significant impact on the response rate. The rejection of Hypothesis VI only suggests that there is no interaction between the rating of accounting-specific components and

organization reputation and geographic location. This might simply imply that the co-op students attended to accounting-specific components, organization reputation, geographic location independently, and not all three characteristics simultaneously.

Furthermore, an earlier section (see Chapter 5.1) discussed the potential limitations of using only accounting job descriptions. Accounting job descriptions possess relatively less variation as compared to other industries. Most accounting job descriptions contain information about one or a combination of tax, audit, and advisory. Since the majority of the job descriptions contain similar information, it may be difficult to detect significant differences. For example, for the mechanical engineering industry, jobs that possess design as a component of job responsibilities may be very attractive but not common. Therefore, jobs that require employees to design may generate a significant amount of applications. Although Hypothesis I implied that accounting-specific components are significant, the level of significance may not be large enough to interactively impact on organization reputation or geographic location. However, for other industries, this may not be the case. It is possible that job applicants may pay attention to the job-specific components and the organization reputation and geographic location simultaneously. Future research may be conducted to investigate this subject in greater detail.

Nevertheless, only the rating of the accounting-specific components is determined to have no interaction with organization reputation or geographic location. The other category of job description components, common components, is found to be significant with the organization reputation and geographic location of the jobs. The details of the interaction are discussed below.

Hypothesis VII: the correlation between the number of job applications and the common component of job descriptions is significant for all jobs that have similar organization reputation and/or geographic location.

To test Hypothesis VII, the two-factor interaction terms ORG × COM and LOC × COM were tested for significance. ORG × COM and LOC × COM correspond to the interaction between the rating of the common components of the job descriptions with the organization reputation and the geographic location rating respectively. ORG × COM (β = -24.38, P-value < 0.04, CI = 95%) and LOC × COM (β = 16.01, P-value < 0.07, CI = 90%) were found to be significant. These results fail to reject Hypothesis VII.

Similar to the findings by Belt and Paolillo (1982), the results suggest that the magnitude of the impact of information quality varies at different levels. The analysis implies that some applicants view organization reputation more highly than the information quality of job descriptions. Therefore, it is possible that the impact of the information quality becomes insignificant for jobs that are from organizations that are highly reputable. It appears that the results from this thesis might support the suggestion made by Belt and Paolillo (1982). The support is shown in Figure 7-6 which illustrates the interaction between the average number of job applications with the organization reputation and the common component rating of job descriptions. It shows that for job descriptions that have low organization reputation (–1), the common component rating has a significant positive impact on the number of job applications. In other words, for jobs that are less reputable, job applicants attend closely to the information quality of the job description. On average, 30 more applications was received for job descriptions that have a better

common component rating than jobs descriptions that were poorly written. However, as the organization reputation rating increases, the significance of the common component rating decreases. For job descriptions with a moderate organization reputation rating (0), there is no apparent relationship between the common component rating and the average number of applications. Furthermore, job descriptions that have a high organization reputation rating (+1) have a decreasing average number of applications as the common component rating increases. The two findings imply that organization reputation has a high impact on a job applicant's decision to pursue a job. When organization reputation is low, a job applicant's decision-making is influenced by the information quality conveyed from a job description. When organization reputation is moderate or high, an applicant's attraction to the organization is relatively higher regardless of the information in the job descriptions. This can be further supported by another observation made in Figure 7-6. The average number of job applications is significantly higher for jobs that possess a moderate or high organization reputation than job descriptions that have a low organization reputation.

In addition to the interaction between the quality rating of common components and organization reputation, the interaction between the quality rating of the common components and the geographic location is also significant. Figure 7-7 shows the relationship between the average number of job applications with geographic location and the common component rating of the job descriptions. The figure shows that geographic location is a significant factor that influences a job applicant's decision to pursue a job. For job descriptions that have poorly written common components, the average number of job applications is comparable regardless of the location. However,

as the common component rating increases, the number of job applications increases
dramatically for jobs that are situated in more favourable geographic locations. The
common component rating has a minor affect on the average number of job applications
for job descriptions that are situated in inconvenient locations. The above observations
imply that jobs that have poorly written job descriptions and that are located in
inconvenient locations are very unattractive. As the geographic rating increases, the
attractiveness of the job increases substantially.
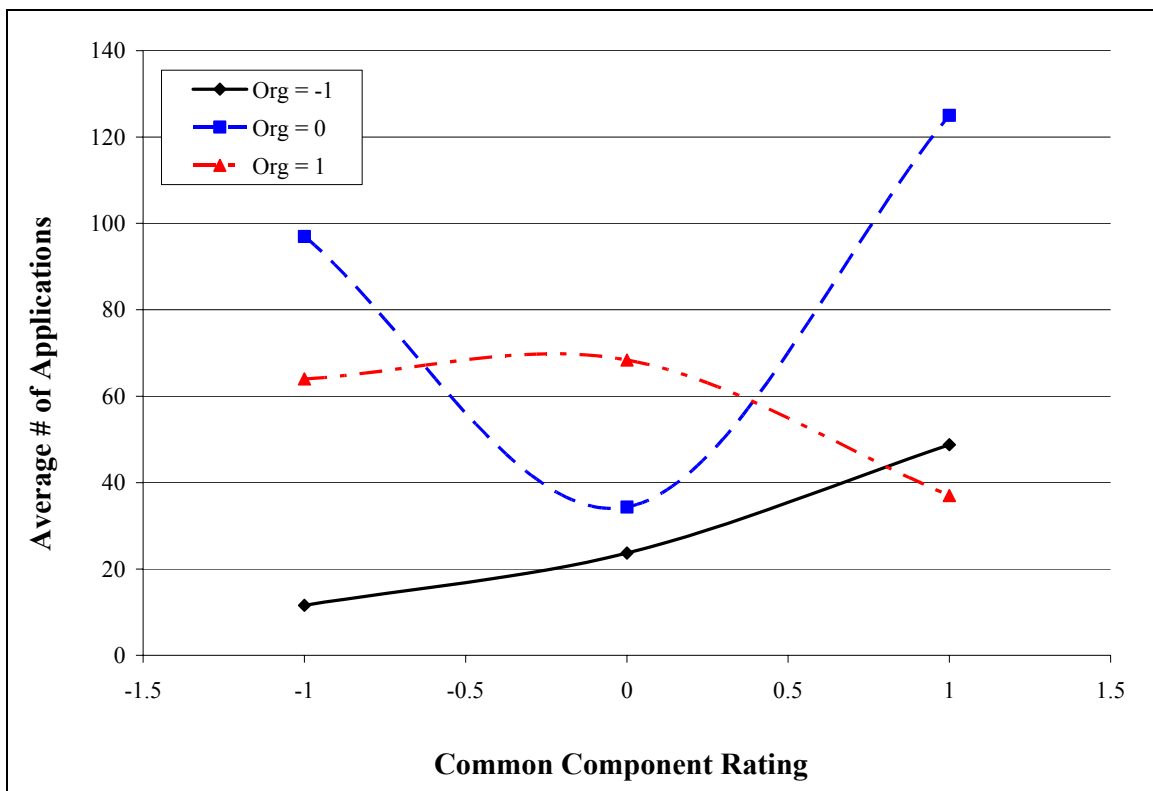
Figure 7-6: Average number of applications versus COM and ORG rating.
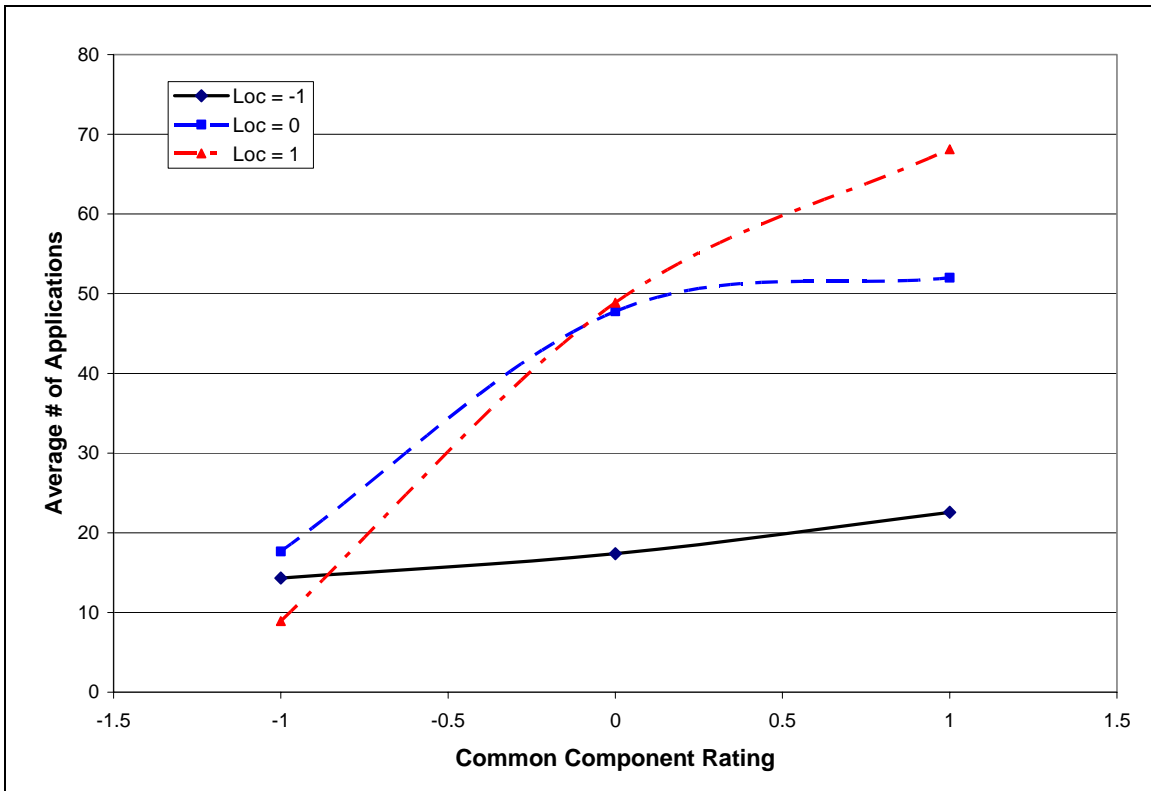
Figure 7-7: Average number of applications versus COM and LOC rating.

In summary, Hypothesis I to V and Hypothesis VII were validated by the analysis of this investigation. Conversely, Hypothesis VI was rejected by the findings. Table 7-1 summarizes the results and implications of the seven hypotheses of this thesis.

Table 7-1: Summary of the findings from the seven hypotheses.

Hypothesis #	Reject (yes/no)	Implication
I	no	As the information quality of the **job-specific components** of the job description increases, the attractiveness of the job increases
II	no	As the information quality of the **common components** of the job description increases, the attractiveness of the job to increases
III	no	As the information quality of the entire job description increases, the attractiveness of the job increases
IV	no	The organization reputation of a job is highly influential to a job applicant's decision to pursue a job
V	no	The geographic location of a job is highly influential to a job applicant's decision to pursue a job
VI	yes	The interaction between the information quality rating of the job-specific components of a job description is not significant to the corresponding number of applications
VII	no	Information quality (especially for the common components of a job description) has different magnitudes of impact on an applicant for jobs that have similar organization reputation and/or geographic location

Chapter 8
Limitations and Suggested Future Research

In terms of creating a model for systematically viewing a job description's information content and its quality, this thesis is very preliminary and exploratory. There are a number of risks and limitations when attempting an initial framework for classifying and measuring. As such, the results of this work need to be considered carefully.

In terms of experimentation, there are three key factors – size of sample, type of sample, and single encoder. For example, the number of accounting job descriptions in the Fall 2006 pool was only 127, and the accounting model possesses a limited number of measuring variables.

Although the model is designed to categorize multiple job industries, this thesis analyzed accounting job descriptions only. Therefore, this thesis has not provided any evidence to demonstrate that different job descriptions from different job industries should be quantified differently. However, it is not imprudent to make this assumption in the initial investigation since it is known that jobs in different fields possess different job characteristics. As a result, job applicants search for different kinds of qualities in different types of job descriptions. Consequently, future research should consider analyzing job descriptions from different industries. It may also be beneficial for future research to initially determine suitable job-specific components before quantifying a selected list of job descriptions. For example, this investigation used advisory, audit, tax, and client information as four of the accounting-specific components. Similarly, safety,

problem solving, and design experience may be used as engineering-specific components for engineering jobs.

This thesis combines all of the job description components into two categories, which are accounting-specific components and common components. As a result, all of the components are weighed equally. Future research may consider evaluating each component independently. One could identify components that are more significant than others. As a result, there could be a weighting system that allows more significant terms to contribute more, while less significant terms to have less impact to the overall result. Nevertheless, the developed model of this thesis possesses only five common components, four accounting-specific components, and three information quality dimensions. To conduct other investigations with different objectives, different elements of interest can be added to or subtracted from the model. A list of suggested elements is provided in Chapter 3.2, 3.3, and 3.4.

Another limitation to this investigation is that the job descriptions were quantified by one individual only. Human bias and value sensitivity issues may possibly exist in the results. Since there is only one encoder, some of the values in the data set may be highly sensitive. For example, if the encoder's opinion towards the job descriptions is different than the general population, than the rating becomes highly inaccurate. Future research may consider using a group of people to evaluate the job descriptions while using a similar experimental approach to minimize human bias. For the initial probing, it is assumed that the encoder had internal consistency and that this was sufficient for exploring the basic concept of having a model that could be used for analysing

information quality.

102 job descriptions were used in the regression analysis as data. This may generate limitations since there are a small number of sample points for different combinations of the experimental factors. However, many of the two-factor interactions were determined to be insignificant. In addition, three or higher factor interactions are not considered in this investigation as they are pre-determined to be unimportant. As a result, the validity of the results still holds. Nevertheless, future research could consider using more data points to generate stronger conclusions.

A number of job descriptions were eliminated from this investigation which include:

i)   job descriptions that were very short in length, thus provided very little information to readers

ii)   job descriptions that were well-written but have a very low number of applications (outcast)

iii)   job descriptions that were poorly-written but have a very high number of applications (outcast)

These characteristics do not provide a good fit to this investigation since they contradict the notion that job descriptions with higher information quality generate more responses. However, the samples are real job descriptions with actual corresponding number of job applications; thus they should not be overlooked. It is important to understand why some poorly-written job descriptions still received a high number of applications and vice versa. Some possible reasons include:

- job applicants had other ways in getting information regarding the job such as from the company website and company information sessions

- job applicants were mainly referred by internal employees

- a sudden change in the reputation of the company which is not obvious; such as recent news related to the success of the company

Although studies should use the 80/20 rule (i.e. findings should be applicable to 80% of the cases, not 100%), the above indication shows that it is important to realize that information quality is not the sole factor that influences a job applicant's decision in pursing a job. There are many other possible factors that should not be overlooked. The above suggestions include only a small portion of the possibilities. Future research can expand into other areas to investigate additional but uncommon factors that influence the job response rate. This research was performed without looking at any personal or private data associated with the employers or applicants – only the job descriptions. A future study could include surveys or other instruments to address these issues.

The relationship between the information specificity and a job applicant's qualifications is a topic of interest to many researchers (Belt and Paolillo, 1982; Breaugh, 1992; Feldman et al., 2006; Roberson et al., 2005). This relationship can be examined further by incorporating new data such as student qualifications, employer resume screening results, ranking results, and matching results. One can analyze the correlation between information specificity of job descriptions, organization reputation, and geographic location with the above suggested datasets. From these analyzes, one can determine whether more specific job descriptions can attract more qualified students. In addition,

these analyzes can verify whether the magnitude of the impact of job description specificity is different at distinct levels such as for all jobs that have similar organization reputation or geographic location.

Finally, earlier discussions suggested that cooperative students possess different characteristics as compared to graduating students and experienced hires. The literature presents many studies using graduating students and experienced hires as samples but lack the emphasis on cooperative students. Nevertheless, since the job descriptions used for this thesis were written for cooperative students, the findings may or may not be applicable to all types of recruitment process. Future research can investigate the different characteristics and whether they are significant between cooperative students versus graduating students and experienced hires. Furthermore, it is suspected that the job applicants' generation may also have an impact on their behaviour in the recruitment process. Since the cooperative students in this study belong to the Millennial Generation, they might possess different characteristics as compared to previous generations. Future research can investigate whether there are differences in the content of job descriptions between generations and how this impacts on the response rate. Additional research questions may include i) is it important to differentiate different generations in the recruitment process, ii) do job applicants from different generations attend to different kinds of information, and iii) do organizations need to treat job applicants from different generations differently?

Chapter 9
Conclusions

This thesis has investigated the application of information quality dimensions in measuring the quality of job descriptions. In this research, job descriptions are evaluated by two main components, which are i) the job-specific components and ii) the common components.

The literature indicates that there are many factors that can influence a job applicant's decision, which affects the corresponding number of job applications. The basic premise of this thesis is that job applicants generally make their decision to pursue a job based on the information from the job description, the organization reputation, and the geographic location of the job.

A conceptual model was developed in this thesis to quantify the information quality in job descriptions. The generic model contains three axes: i) x-axis – job description components, ii) y-axis – information quality dimensions, and iii) z-axis – job industries. Using a version of this model crafted for accounting, 127 job descriptions were quantified and used to test various elements in each of the axis. The data was analyzed using regression analysis. The ratings of the elements of each axis represent the independent variables; whereas the corresponding number of applications represents the dependent variable.

The results from the analysis reveal three major findings:
    i)   the information quality of a job description has a positive impact on a job

applicant's decision to pursue a job

ii)   the organization reputation and the geographic location of a job have a significant impact on the corresponding number of job applications, which suggest that these factors play a major role in a job applicant's decision to pursue a job

iii)   the information quality of job descriptions has different magnitudes of impact for jobs that have similar organization reputation or geographic location

The result of this thesis shows that on average, well-written job descriptions are more attractive to the students than job descriptions that are poorly written. This result is similar to the findings by Breaugh (1992), Feldman et al. (2006), and Roberson et al. (2005), where they suggest that more specific job descriptions are more informative; and more informative job descriptions are more attractive to job applicants.

Furthermore, this thesis suggests that organization reputation has a significant impact on the decision-making process of a job applicant. Jobs that have a moderate or high organization reputation are especially attractive to the students regardless of the information quality of the common components of the job description. However, when the organization reputation of a job is low, information quality becomes a significant factor in a student's decision to pursue a job. These results concur with Belt and Paolillo's (1982) findings which suggest that corporation image has a significant impact on a job applicant's decision. Additionally, their results suggest that information quality of job descriptions influences the response rate of job advertisements. However, the level of influence has different magnitudes for jobs that have similar organization reputation.

This thesis also suggests that the geographic location of a job has a significant impact on a job applicant's decision making. Jobs that have a moderate or high geographic location rating receive a higher average number of job applications especially when the information quality of the job descriptions is above average. Conversely, jobs that are located in a less popular area receive a lower average number of job applications regardless of whether the information quality of the job description is good or bad.

These findings may be beneficial to recruitment researchers and companies. Although it may seem obvious that job descriptions that possess higher quality attracts more job applicants, the relatively higher degree of impact of the organization reputation and geographic location on the job response rate may not be as apparent. The data from this investigation indicates that for every job advertisement, companies with a high corporate image receive almost double the number of job applications compared to companies with a low corporate image. Moreover, jobs that are located at more convenient locations receive more than double the number of job applications compared to those that are located in less convenient locations. Subsequently, companies that have a good corporate image may consider spending more resources on improving other recruitment strategies than focus on the quality of job descriptions to attract more applicants. Furthermore, companies that are highly reputable frequently receive a large pool of applicants. This might not necessary be an advantage since it requires more resources to process the applications.

Past studies (Belt and Paolillo, 1982; Feldman et al., 2006; Roberson et al., 2005) suggest that more specific job descriptions will attract fewer but more qualified applicants. Since

highly reputable companies have a lesser chance to suffer from a small applicant pool size, they may consider increasing the specificity of their job descriptions to attract fewer but more qualified applicants to reduce cost. On the other hand, organizations that have a low reputation may consider investing more resources to improve the quality of their job descriptions to increase their applicant pool size.

This thesis demonstrates the feasibility of the developed model to quantify job descriptions. This generic model is flexible since it can capture different characteristics for different job industries by adding or subtracting the appropriate elements. Recruitment researchers can potentially use this model to quantify and analyze job descriptions.

There is no intention with this research to determine the actual correlation between information quality dimensions, job description contents, the organization reputation, and the geographic location of a job with the corresponding number of job applications. There is insufficient data to produce an accurate correlation. The objective of this research is to provide sufficient insights that can trigger future research to investigate the relationship between information quality of job descriptions and job applicants' behaviour. This thesis provides preliminary evidence to support the notion that job applicants attend to information quality. As a result, the information quality of job descriptions influences job applicants' judgement and their response rate. Additional research is required to provide a stronger support to the findings of this research. Nevertheless, future research could investigate and generate a more accurate relation between information quality of job descriptions and the corresponding number of job

applications.

Lastly, it is important to note that the sample job descriptions were written for cooperative students seeking temporary placement. It is suspected that there may be differences between the perception of information of cooperative students, graduating students, and experienced hires. The results from this study may not be applicable directly for full-time or permanent hires. In addition, it is suspected that the difference between generations may impact on the behaviour of the job applicants. The samples used for this investigation belongs to the Millennial generation. This may have an impact on the findings as compared to an investigation that is conducted using samples from a different generation. Future research can study these subjects in greater detail.

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Appendixes

Appendix A – Three Examples of the Accounting Job Descriptions

The following are three examples of job descriptions and their ratings. The examples are ordered from lowest quality to highest quality. The first, second, and third job description example received 6, 32, and 69 applications respectively. Using the developed model, the three examples are quantified by rating each component of the job descriptions against their corresponding measuring dimension(s).

Some of the content of the job descriptions are removed for privacy purposes.

Job Descriptoin #	JOB ID	APPL	Common total	Accouting Total	Grand	Org. rep. specificity	Location	Job resp. specificity	relevancy	amount of info	Qual. specificity	relevancy	amount of info	Career path specificity	relevancy	amount of info	Company Info specificity	relevancy	amount of info	Compensation specificity	amount of info	audit specificity	amount of info	Tax specificity	amount of info	Advisory specificity	amount of info	Client work closely with large clients	work with wide range of clients	specificity	amount of info	Note	Junior	Intermediate	Senior
1	0000001	6.00	-5	-4	-9	-1	-1	-1	1	1	-2	1	-1	-1	0	-2	0	1	0	-1	-1	0	0	1	1	-1	-1	-1	-1	-1	-1		N	Y	N
2	0000002	32.00	1	-2	-1	1	0	-2	-1	-1	-2	-1	-2	2	2	2	2	2	2	-1	-1	-1	-1	-1	-1	1	1	-1	0	0	1		N	N	Y
3	0000003	69.00	7	5	12	1	0	1	1	0	1	1	2	0	1	-1	1	1	1	-1	-1	1	1	-1	-1	0	0	0	2	1	2		Y	Y	N

Job Description Example 1

Job ID: 0000001

Number of Applications: 6

Junior Student: N

Intermediate Student: Y

Senior Student: N

Job Title: XX1

Company Name: XYZ1

Location: ABC1

The company is a small tax firm that does mainly personal tax but also some commercial and farm taxation and small audits. They are located in downtown ▮▮▮▮ and have ▮▮▮▮ major partners who are all CAs in addition to ▮ CMAs and ▮ CGAs who work in the office.

Student will be assisting the company during tax season with personal, farm and commercial taxations as well as with any audits. They will basically get a feel for all of the different types of work the company does and assist wherever needed.

Skills:

Student will gain skills on personal, business and farm taxation as well as audits. They will also be involved in any other small projects that the company has on the go during that time.

Job Description Example 2

Job ID: 0000002

Number of Applications: 32

Junior Student: N

Intermediate Student: N

Senior Student: Y

Job Title: XX2

Company Name: XYZ2

Location: ABC2

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██████████ people in more than ██████ countries around the globe are committed to ████████, ██████ and ████████████ in the provision of audit, tax and ████████ services. We strive to help all of our people achieve both their professional and personal goals through an inclusive environment that values everyone's contributions, ████████, ████████████████████ growth, and provides continuous opportunities for development. Recognized as ████████████████████████, one of the ████████████ Top 10 Best Companies to Work for in ██████, one of ████████████ ██████ magazine's Best Workplaces in ██████, and one of ████████ Top 10 ████████████ Companies by ████████████, ████████████ continually strives to be a great place to work.

Our ████████████ practice has laid the foundation for ████████████ brand of responsive, ████████, independent and ██████ service to our clients. As talented, trusted business advisors, we consistently ask the right questions, listen, analyze, and offer a breadth of knowledge and experience to cultivate personal and professional trust in our client relationships and in the marketplace.

As a co-op student, you'll pool your talents, knowledge and skills with the many people you'll work with in teams. People like you and people with backgrounds and skill levels very different from yours. When you graduate, you will have the opportunity to start your career as a ███████████ while completing all the requirements to obtain the prestigious chartered accountant designation. Later you can choose from a range of career options as varied as your interests. By matching your needs with ours, we create an environment that encourages professional excellence while remaining responsive to your need to balance the demands of work and life. Through learning, teaming and leadership, at ███████████ you can achieve so much more.

We are currently accepting Co-op Work-Term applications in our ███████████ ███████████ Services practice in our ███████████ and ███████████ ████████ offices ███████████ for ██████████. This application is open until ███████████.

To apply, visit ███████████████████████████████████

For more information about exciting career opportunities with ███████████ please visit ███████████ pick up a copy of our recruiting brochure, or speak with your campus career counsellor.

███████████ is committed to diversity and equity.

Job Description Example 3

Job ID: 0000003

Number of applications: 69

Junior Student: Y

Intermediate Student: Y

Senior Student: N

Job Title: XX3

Company Name: XYZ3

Location: ABC3

Company XYZ1 is one of ████'s leading professional services firms, providing ████, █, ██████ and ██████████ services to a wide range of ██████ and ████████ clients. We have more than █████ talented people in █ offices dedicated to helping our clients excel.

██ ████████ Take a close look at ████████ and you'll understand why we have earned our position as a leader in the ████████████, and why it can put a unique spin on your career.

██ ████████████████

As a ████████ Co-op, you will develop an understanding of the business and economic environment in which our clients operate. You will work with a great number of professionals, both inside and outside of █████, which will build your insight into prevalent business practices. You will focus on the substantiation of financial and control assertions made by our clients in the public and private domain and contribute to our clients success through your involvement in procedures of a more consultative nature.

Our ███████ are key team members from day one. Initial responsibilities would be:

- Assist in the planning and execution of financial and audit statements;
- Design and execute audit strategies;
- Provide solutions to our clients considering current business and financial conditions;
- Interact extensively with clients.

Successful candidates will have the following attributes:

- Pursuing a Bachelor of Commerce or other degree, along with completion of the CA School of Business pre-requisite courses for entrance into the CA Program
- Intention to obtain CA Designation
- Demonstrated academic excellence and leadership ability
- Effective communication skills, both verbal and written, that allow you to adapt to a variety of clients and industries
- Excellent interpersonal relations and demonstrated ability to work with others effectively in teams
- Ability to thrive in an environment of pressing deadlines and constantly changing conditions
- Proven creativity, the ability to develop and present new ideas and conceptualize new approaches and solutions
- Ability to focus on client service and strive to exceed clients' needs while remaining committed to ███████ vision and objectives ███████
- Proven analytical skills with ability to tackle problems systematically to determine causes and produce effective solutions
- Strong business acumen and knowledge of the current economic climate

Appendix B – Job Descriptions Rating Data

					Common Component																Accounting Component										Student		
Obs #	APPL	Common total	Accouting Total	Grand	Organization reputation	Location	Job responsibility spec.	relevancy	amount of info	Qualifications spec.	relevancy	amount of info	Career path / development support / continuous learning spec.	relevancy	amount of info	Company Info / Values spec.	relevancy	amount of info	Compensation / benefits / hours spec.	amount of info	audit spec.	amount of info	Tax spec.	amount of info	Advisory spec.	amount of info	Client work closely with large clients	work with wide range of clients	spec.	amount of info	Note	Junior	Intermediate	Senior
1	3.00	-4	-4	-8	-1	-1	1	1	1	0	0	-1	-2	-2	-2	0	1	1	-1	-1	0	0	1	1	-1	-1			-1	-1		Y	Y	Y
2	3.00	3	-8	-5	-1	-1	1	1	1	1	1	0	1	0	-1	-1	0	0	0	-1	-1	-1	0	0	-1	-1			-1	-1		N	Y	N
3	3.00	-8	-7	-15	-1	1	-1	0	-1	1	1	1	-2	-2	-2	0	0	-1	-1	-1	0	0	-1	-1	-1	-1			-1	-1		N	N	Y
4	3.00	1	-3	-2	1	1	-2	-2	-2	0	0	1	1	1	1	1	2	2	-1	-1	0	0	1	1	-1	-1			0	-1		N	Y	Y
5	3.00	-6	-6	-12	-1	-1	0	1	1	-2	-2	-2	-1	0	-2	1	1	1	-1	-1	1	1	-1	-1	-1	-1			-1	-1		N	Y	Y
6	4.00	-8	-4	-12	-1	1	0	1	0	0	0	0	-2	-2	-2	0	0	-1	-1	-1	-1	-1	1	1	-1	-1			-1	-1		Y	Y	N
7	4.00	1	-4	-3	1	0	1	1	1	-2	-2	-2	1	1	1	1	1	1	-1	-1	1	1	-1	-1	-1	-1			0	-1	Outcast	Y	N	N
8	5.00	-25	-8	-33	-1	-1	-2	-2	-2	-2	-2	-2	-2	-2	-2	-1	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1			0	-1	short description	N	N	N
9	5.00	-5	-2	-7	1	0	-2	-2	-2	-2	-2	-2	1	1	1	2	2	2	-1	-1	-1	-1	-1	-1	1	1			0	1	out cast - take out	Y	N	N
10	5.00	-8	-4	-12	-1	0	0	1	-1	-1	0	-2	-2	-2	-2	1	1	1	-1	-1	0	-1	0	0	-1	-1			-1	1		N	N	Y
11	5.00	-14	-6	-20	-1	-1	-1	0	-2	1	1	1	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	1	1	-1	-1			-1	-1	three line job description	Y	Y	Y
12	5.00	0	-4	-4	-1	-1	0	0	-1	1	0	1	-1	-1	-1	1	1	2	-1	-1	0	-1	0	0	-1	-1			1	-1		Y	Y	Y
13	6.00	-15	-10	-25	-1	1	0	-2	0	1	-1	1	-2	-2	-2	-2	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1			-1	-1		Y	Y	N
14	6.00	-6	-8	-14	-1	1	-1	0	-2	1	0	-2	1	1	-1	1	0	0	-1	-1	0	-1	0	0	-1	-1			-1	-1		N	Y	Y
15	6.00	-10	-7	-17	-1	1	0	0	-1	1	1	1	-2	-2	-2	-1	-1	-2	-1	-1	-1	-1	0	0	-1	-1			-1	-1		N	N	Y
16	6.00	0	-4	-4	-1	-1	2	1	1	0	-1	-2	1	1	0	0	-2	-1	-1	-1	-1	-1	-1	-1	-1	-1			0	0		Y	Y	N
17	6.00	6	2	8	-1	-1	0	1	1	1	0	-1	1	0	-1	2	2	2	-1	-1	0	0	1	1	-1	-1			1	1		N	N	Y
18	6.00	-7	-4	-11	-1	-1	-1	-1	-1	0	1	-1	-1	0	-2	0	1	0	-1	-1	0	0	1	1	-1	-1			-1	-1		N	Y	N
19	7.00	-15	-2	-17	-1	-1	0	1	-1	-2	-2	-2	-2	-2	-2	0	0	-1	-1	-1	-1	-1	1	1	-1	-1			1	1		Y	Y	N
20	7.00	-9	-6	-15	-1	1	0	1	-1	1	0	-1	-2	-2	-2	1	-1	-1	-1	-1	-1	-1	0	0	-1	-1			-1	0		Y	Y	N
21	7.00	-7	-6	-13	-1	1	1	1	1	1	1	-1	-2	-2	-2	0	-1	-2	-1	-1	-1	-1	1	1	-1	-1			-1	0		Y	Y	Y
22	7.00	-14	-5	-19	-1	0	-2	-2	-2	-1	1	-2	-2	-2	-2	0	1	0	-1	-1	-1	-1	-1	-1	-1	-1			-1	0	extremely short job desciprion	N	Y	Y
23	8.00	-1	-8	-9	-1	-1	0	0	0	1	1	0	-2	-2	-2	1	1	1	0	0	0	0	-1	-1	-1	-1			-1	-1		Y	N	N
24	8.00	0	-6	-6	-1	0	0	1	0	1	1	0	0	1	-1	0	0	-1	-1	-1	-1	-1	0	0	-1	-1			-1	0		N	N	Y
25	9.00	-6	-10	-16	-1	1	1	-2	1	1	-2	1	-2	-2	-2	1	-1	2	-1	-1	-1	-1	0	0	-1	-1			-1	-1		N	Y	N
26	9.00	1	-8	-7	-1	-1	0	1	0	0	0	0	1	1	-1	0	0	0	-1	-1	-1	-1	0	0	-1	-1			-1	-1		N	Y	N
27	10.00	-9	4	-5	-1	1	1	1	0	-1	-2	-2	-1	-1	-1	0	0	-1	-1	-1	1	1	1	1	-1	-1			1	1		N	N	Y
28	11.00	-16	-6	-22	-1	-1	-2	-2	-2	-1	-1	-1	0	0	-1	-1	-1	0	-1	-1	-1	-1	-1	-1	-1	-1	1		-1	0	very short and poor written job description	Y	Y	N
29	12.00	8	-6	2	1	-1	2	0	2	1	1	2	-1	1	-1	1	0	2	-1	-1	-1	-1	-1	-1	0	0			-1	-1		Y	Y	N
30	12.00	-6	-6	-12	-1	1	1	1	1	2	1	1	-2	-2	-2	-2	-2	-1	-1	-1	-1	-1	1	1	-1	-1			-1	-1		N	Y	N
31	12.00	-4	0	-4	-1	1	0	0	0	0	0	0	0	0	0	0	0	-1	-1	-1	0	0	0	0	-1	-1	2		0	-1		N	Y	Y
32	14.00	11	-2	9	1	-1	1	1	1	1	2	2	-1	0	-1	2	2	2	-1	-1	-1	-1	1	0	0	0			0	-1		Y	Y	Y
33	14.00	-5	-6	-11	-1	1	1	1	1	0	1	0	-2	-2	-2	1	0	1	0	0	-1	-1	1	1	-1	-1			-1	-1		Y	Y	N
34	15.00	8	-8	0	1	-1	-1	-1	0	1	1	2	0	1	1	2	2	2	-1	-1	-1	-1	-1	-1	-1	1			-1	-1		Y	Y	N
35	15.00	-11	-7	-18	-1	-1	0	0	1	1	0	1	-2	-2	-2	-2	-2	-2	-1	-1	0	1	-1	-1	-1	1			-1	-1		N	Y	N
36	15.00	-9	-10	-19	-1	1	-1	0	-1	2	1	1	-2	-2	-2	-2	-1	-1	-1	-1	-1	-1	-1	-1	-1	1			-1	-1		Y	Y	N
37	16.00	-12	-10	-22	-1	-1	-2	-2	-2	0	0	-1	-2	-2	-2	1	1	1	-1	-1	-1	-1	-1	-1	-1	-1			-1	-1		N	Y	Y
38	16.00	-5	-2	-7	-1	0	0	1	-1	0	0	1	1	1	-1	0	0	-1	-1	-1	0	0	1	0	-1	-1			1	0		N	N	N
39	17.00	-1	-4	-5	-1	1	0	1	1	0	0	-1	1	1	-1	0	0	-1	-1	-1	1	0	1	0	-1	-1			-1	-1		N	N	Y
40	17.00	0	-4	-4	-1	1	1	1	1	0	-2	-2	1	1	0	0	0	0	1	1	0	0	1	1	-1	-1			-1	-1		N	Y	Y
41	18.00	-5	1	-4	-1	-1	0	1	1	0	0	-2	-2	-2	-2	0	0	0	-1	-1	0	1	1	-1	-1	0			1	1		Y	Y	Y
42	18.00	-4	-8	-12	-1	1	0	0	-1	1	0	-1	-2	-2	-2	1	0	0	1	1	-1	-1	0	0	-1	-1			-1	-1		Y	N	N
43	18.00	-4	-5	-9	-1	0	-1	-2	-2	1	0	0	1	1	-1	1	1	1	-1	-1	0	1	0	-1	-1	-1			0	-1		N	Y	Y
44	19.00	-15	-6	-21	-1	1	0	0	0	-1	-1	-1	-2	-2	-2	-1	-1	-2	-1	-1	0	0	0	0	-1	-1			-1	-1	bad job description - extremely short	Y	N	N
45	19.00	1	-2	-1	-1	0	0	1	-1	-1	0	-1	1	1	1	0	0	0	0	0	-1	-1	1	0	-1	-1			0	1		Y	Y	Y
46	19.00	-10	-6	-16	0	-1	0	0	-2	-2	-2	-2	1	0	-2	0	1	0	-1	-1	-1	-1	-1	-1	-1	-1			-1	1	very short job description	Y	N	N
47	19.00	-3	-5	-8	-1	-1	-2	-2	-2	1	0	0	0	1	1	1	1	0	-1	-1	-1	-1	0	0	-1	-1			1	-1		N	Y	Y
48	20.00	4	-4	0	-1	0	1	0	1	1	0	1	1	1	1	-1	-1	-1	-1	-1	0	0	0	0	-1	-1			0	0		Y	N	N
49	20.00	1	-6	-5	-1	-1	2	2	2	-2	-2	-2	0	0	-1	1	1	0	0	0	0	-1	0	-1	-1	-1			-1	-1		Y	Y	Y
50	21.00	10	-4	6	-1	1	-1	0	-1	1	0	-1	2	2	2	2	2	2	0	0	0	-1	0	-1	-1	-1			0	1		N	N	Y

Common Component | Accounting Component | Student (group headers)

Observation #	APPL	Common total	Accouting Total	Grand	Organization reputation	Location	Job responsibility – specificity	Job responsibility – relevancy	Job responsibility – amount of info	Qualifications – specificity	Qualifications – relevancy	Qualifications – amount of info	Career path/development support/continuous learning – specificity	Career – relevancy	Career – amount of info	Company Info/Values – specificity	Company – relevancy	Company – amount of info	Compensation/benefits/hours – specificity	Compensation – amount of info	audit – specificity	audit – amount of info	Tax – specificity	Tax – amount of info	Advisory – specificity	Advisory – amount of info	Client – specificity	Client – amount of info	work closely with large clients	work with wide range of clients – specificity	work with wide range of clients – amount of info	Note	Junior	Intermediate	Senior
62	25.00	-9	-2	-11	-1	0	1	1	0	-2	-2	-2	1	1	-1	-1	-1	-2	-1	-1	-1	-1	1	1	-1	-1	-1	-1	1	-1	1		Y	Y	Y
63	26.00	4	0	4	1	-1	1	1	1	-2	-2	-2	1	1	1	2	2	2	-1	-1	-1	-1	1	1	-1	-1	-1	-1	1	1	1		N	Y	N
64	26.00	-2	0	-2	-1	0	1	1	1	1	0	-1	0	1	-1	-1	-1	-1	-1	-1	1	0	1	1	-1	-1	-1	-1	1	-1	0		Y	N	N
65	26.00	14	0	14	-1	-1	0	1	1	0	1	0	2	2	2	1	1	1	1	1	0	0	0	0	-1	-1	-1	-1	1	1	1		Y	Y	Y
66	26.00	8	-2	6	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	-1	-1	-1	1	1	-1	-1	-1	-1	1	-1	1		Y	Y	Y
67	27.00	4	0	4	0	-1	-1	0	1	-1	-1	-1	0	1	1	1	1	1	1	1	0	0	0	0	-1	-1	-1	-1	1	1	1		Y	Y	Y
68	27.00	6	-4	2	-1	1	1	1	1	1	1	1	1	1	0	1	1	0	0	0	-1	-1	1	1	-1	-1	-1	-1	0	-1	0		Y	Y	Y
69	28.00	1	-3	-2	-1	-1	-2	-2	-2	0	0	1	1	1	1	1	2	2	-1	-1	0	0	1	1	-1	-1	-1	-1	0	-1	-1		Y	Y	Y
70	29.00	0	-8	-8	-1	1	-1	-1	-1	1	1	1	0	-1	-1	2	1	1	-1	-1	-1	0	-1	0	-1	-1	-1	-1	-1	-1	-1		Y	Y	N
71	30.00	3	0	3	-1	1	0	1	1	-1	0	-1	1	1	0	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	1	1	1		N	Y	Y
72	30.00	1	-4	-3	1	-1	1	1	1	-2	-2	-2	1	1	1	1	1	1	-1	-1	1	1	-1	-1	-1	-1	-1	-1	0	-1	0		Y	Y	Y
73	31.00	-11	-1	-12	-1	1	-1	-1	-1	0	0	0	-2	-2	-2	0	1	-1	-1	-1	0	0	0	0	-1	-1	-1	-1	1	0	1	bad job description - very short - not specific, but has 31 applications	N	Y	Y
74	31.00	-1	1	0	0	1	1	1	0	1	0	0	1	1	-1	1	-1	-1	-1	-1	0	0	1	1	-1	-1	-1	-1	1	0	1		Y	N	N
75	31.00	-16	-4	-20	-1	-1	2	1	1	-2	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	0	0	1	1	-1	-1	-1	-1	-1	-1	-1	very short description	Y	N	N
76	32.00	-2	-2	-4	1	0	-1	-1	-1	-2	-2	-2	1	1	1	2	2	2	-1	-1	-1	-1	1	1	-1	1	1	-1	0	0	1		N	N	Y
77	32.00	6	2	8	-1	-1	0	1	1	1	0	-1	1	0	-1	2	2	2	-1	-1	0	0	1	1	-1	-1	-1	-1	1	-1	0		Y	N	N
78	33.00	6	2	8	-1	1	1	1	1	1	0	2	-1	0	-1	1	1	1	-1	0	1	1	1	1	0	0	-1	-1	-1	0	0		N	N	Y
79	34.00	-2	-6	-8	-1	1	1	1	0	0	0	0	0	0	-1	0	0	-1	-1	-1	-1	-1	1	1	-1	-1	-1	-1	-1	-1	-1		Y	Y	N
80	35.00	1	-6	-5	-1	1	0	0	0	0	1	-1	1	1	-1	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1	-1		Y	Y	N
81	36.00	-2	-3	-5	-1	0	0	1	-1	0	0	0	0	0	0	1	0	-1	-1	0	1	0	-1	-1	-1	-1	-1	-1	1	1	1		Y	Y	N
82	36.00	2	2	4	-1	1	1	1	1	1	0	0	1	1	-1	0	0	-1	-1	-1	0	0	1	1	-1	-1	-1	-1	1	1	1		N	N	Y
83	37.00	10	-2	8	-1	1	1	1	1	1	1	1	1	1	1	1	1	1	-1	-1	1	0	1	1	-1	-1	-1	-1	-1	-1	0		N	N	Y
84	38.00	-8	-7	-15	-1	1	-1	-1	-1	-1	0	-1	-1	0	-1	1	0	0	-1	-1	-1	-1	0	0	-1	-1	-1	-1	-1	-1	0	bad job description - short, no information on job responsibility	Y	Y	N
85	39.00	5	1	6	-1	1	1	1	1	1	1	1	-1	0	-1	1	1	1	-1	-1	0	0	1	1	-1	-1	-1	-1	0	1	1		Y	Y	Y
86	39.00	4	0	4	1	0	1	1	1	-2	-2	-2	1	1	1	2	2	2	-1	-1	-1	-1	1	1	-1	-1	-1	-1	1	-1	1		Y	Y	N
87	39.00	-2	6	4	-1	1	0	1	1	-1	0	-1	1	0	0	0	0	-1	-1	-1	1	0	1	0	-1	-1	1	-1	2	1	2		Y	Y	N
88	39.00	-10	-2	-12	-1	1	1	0	1	-2	-2	-2	-2	-2	-2	1	1	0	-1	-1	0	0	1	0	-1	-1	-1	-1	-1	-1	0	outcast	N	N	Y
89	40.00	4	-1	3	-1	1	0	1	1	0	1	1	0	1	-1	1	1	0	-1	-1	0	0	0	0	0	0	-1	0	1	-1	0		N	Y	Y
90	40.00	4	4	8	-1	1	1	1	1	2	2	2	-2	-2	-2	1	1	1	-1	-1	1	1	1	1	0	0	0	0	1	-1	0		Y	N	N
91	41.00	10	1	11	-1	1	0	1	1	2	2	2	2	2	2	1	1	1	0	0	0	0	1	0	0	0	-1	0	0	-1	1		N	Y	Y
92	43.00	5	0	5	-1	1	0	1	0	-2	-2	-2	2	2	2	2	2	2	-1	-1	0	0	1	1	-1	-1	-1	-1	1	0	1		Y	N	N
93	45.00	11	-3	8	1	1	2	1	1	0	0	1	1	1	1	1	2	2	-1	-1	0	0	1	1	-1	-1	-1	-1	0	-1	-1		Y	N	N
94	46.00	-11	1	-10	-1	1	1	1	0	-2	-1	-1	-2	-2	-2	1	0	0	-1	-1	1	0	1	0	-1	-1	-1	-1	1	0	1	Bad job description - very short	N	Y	Y
95	46.00	-2	1	-1	-1	-1	1	1	1	0	0	-1	1	1	-1	-1	-1	-1	-1	-1	0	0	1	1	-1	-1	-1	-1	1	0	1		Y	N	N
96	47.00	-8	-3	-11	-1	1	0	1	0	-1	-1	-1	-1	-1	-1	0	0	-1	-1	-1	0	1	1	1	-1	-1	-1	-1	-1	-1	-1	outcast	Y	Y	N
97	48.00	-14	-6	-20	-1	1	0	1	1	-1	-2	-2	-2	-2	-2	-1	-1	-1	-1	-1	-1	-1	1	1	-1	-1	-1	-1	-1	-1	-1	short description	Y	N	N
98	48.00	4	0	4	1	0	1	1	1	-2	-2	-2	1	1	1	2	2	2	-1	-1	-1	-1	1	1	-1	-1	-1	-1	1	1	1		N	N	N
99	51.00	-12	-5	-17	0	-1	0	1	1	-1	1	-1	-2	-2	-2	-2	-2	-2	-1	-1	1	0	0	0	-1	-1	-1	-1	-1	-1	-1	short description	N	N	N
100	51.00	6	2	8	1	1	0	0	-1	2	2	2	0	1	-1	1	1	1	-1	-1	1	1	-1	-1	0	0	-1	0	-1	1	1		N	Y	Y
101	52.00	-1	4	3	-1	0	1	1	1	1	0	1	-2	-2	-2	1	1	0	-1	-1	1	1	1	1	-1	-1	-1	-1	1	1	1		N	Y	Y
102	53.00	7	5	12	1	-1	1	1	0	1	1	2	1	1	1	1	1	1	-1	-1	1	1	-1	-1	0	0	0	0	2	1	2		Y	Y	Y
103	55.00	5	1	6	0	1	2	1	1	0	1	1	-1	0	-1	1	1	1	-1	-1	0	0	1	1	-1	-1	-1	-1	0	-1	1		N	Y	Y
104	56.00	1	1	2	0	0	0	1	0	0	1	1	-1	0	-1	1	0	0	0	0	0	0	1	0	-1	-1	-1	-1	1	1	1		N	Y	Y
105	56.00	1	-3	-2	1	1	-2	-2	-2	0	0	1	1	1	1	1	2	2	-1	-1	0	0	1	1	-1	-1	-1	-1	0	-1	-1		N	Y	Y
106	56.00	4	-3	1	-1	1	1	1	1	1	1	1	0	0	0	1	1	1	-1	-1	0	0	1	1	-1	-1	-1	-1	1	-1	-1		N	Y	Y
107	60.00	1	-3	-2	1	0	-2	-2	-2	0	0	1	1	1	1	1	2	2	-1	-1	0	0	1	1	-1	-1	-1	-1	0	-1	-1		Y	N	N
108	61.00	2	-4	-2	-1	0	1	1	1	1	1	1	-1	-1	-1	0	0	-1	0	0	0	0	1	1	-1	-1	-1	-1	-1	-1	-1	outcast	Y	Y	N
109	65.00	-2	-3	-5	-1	1	1	1	0	1	1	1	-2	-2	-2	0	1	0	-1	-1	-1	-1	1	0	-1	-1	-1	-1	1	-1	1	outcast	Y	Y	N
110	66.00	-3	-5	-8	-1	1	1	1	1	0	0	-1	0	1	-1	-1	-1	-1	-1	-1	0	0	1	0	-1	-1	-1	-1	-1	-1	-1	short description	N	Y	Y

Appendix C – Preliminary Regression Analysis

The following regression analyzes were performed to identify the significant effects and a suitable regression model to represent the dataset. The single factors Common Total (COM), Accounting Total (ACC), and Grand Total (GRA) are coded into the range between -1 to +1 to minimize correlation (other single factors are already in the range between -1 and +1). Although only nine single and two-factor interaction terms are used to test the seven hypotheses (see Chapter 4 and Chapter 5), this section outlines all of the regression analyzes that are performed to examine the above and additional factors that may have significant impact to the results. The additional factors include JUN, INT, SEN, and their interactions. The following two figures consist of all of the coded single factor and two-factor interaction data.

Observation #	APPL	Common total	Accouting Total	common sq	accounting sq	Grand	grand sq	Common	Accounting	common sq	accout sq	Grand	Organization reputation	Location	Junior	Inter	Senior	JI	JIS	Common x Accout	org x Jun	Org x Common	Org x Loc	loc x junior	loc x comm	Org x Accou	Org x IS	IS	loc x acc	loc x is	Accout x common	acc x IS	acc x junior	com x ju	com x is
1	3	-4	-4	16	16	-8	64	-0.241	-0	0.0583	0.06	-0	-1	-1	1	1	-1	1	1	0.06	-1	0.2	1	-1	0.2	0.25	-1	1	0.25	-1	0.06	-0.3	-0.3	-0.2	-0.2
2	3	3	-8	9	64	-5	25	0.241	-1	0.0583	0.56	-0	-1	-1	-1	1	-1	-1	1	-0.18	1	-0	1	1	-0	0.75	1	-1	0.75	1	-0.2	0.75	0.75	-0.2	-0.2
3	3	-8	-7	64	49	-15	225	-0.517	-1	0.2675	0.39	-1	-1	1	1	-1	-1	1	-1	0.32	1	0.5	-1	-1	-1	0.63	1	-1	-0.6	-1	0.32	0.63	0.63	0.52	0.52
4	3	1	-3	1	9	-2	4	0.103	-0	0.0107	0.02	0.1	1	1	-1	1	1	-1	-1	-0.01	-1	0.1	1	-1	0.1	-0.1	1	1	-0.1	1	-0	-0.1	0.13	-0.1	0.1
5	3	-6	-6	36	36	-12	144	-0.379	-1	0.1439	0.25	-0	-1	-1	-1	1	-1	-1	1	0.19	1	0.4	1	1	0.4	0.5	-1	1	0.5	-1	0.19	-0.5	0.5	0.38	-0.4
6	4	-8	-4	64	16	-12	144	-0.517	-0	0.2675	0.06	-0	-1	1	1	1	-1	-1	1	0.13	-1	0.5	-1	1	-1	0.25	1	-1	-0.3	-1	0.13	0.25	-0.3	-0.5	0.52
7	5	-5	-2	25	4	-7	49	-0.31	0	0.0963	0	-0	-1	0	1	-1	-1	-1	-1	0	1	-0	0	0	0	0.25	1	1	0	0	0	0	0	-0.3	-0.3
8	5	-8	-4	64	16	-12	144	-0.517	-0	0.2675	0.06	-0	-1	0	-1	1	1	-1	-1	0.13	1	0.5	0	0	0	0.25	1	-1	0	0	0.13	0.25	0.25	0.52	0.52
9	5	0	-4	0	16	-4	16	0.034	-0	0.0012	0.06	0	-1	-1	1	1	1	1	1	-0.01	-1	-0	1	-1	-0	0.25	-1	1	0.25	-1	-0	-0.3	-0.3	0.03	0.03
10	6	-15	-10	225	100	-25	625	-1	-1	1	1	-1	-1	1	1	-1	1	-1	-1	1	-1	1	-1	1	-1	1	1	-1	-1	-1	1	1	-1	-1	1
11	6	-6	-8	36	64	-14	196	-0.379	-1	0.1439	0.56	-0	-1	1	-1	1	1	-1	-1	0.28	1	0.4	-1	-1	-0	0.75	1	-1	-0.8	1	0.28	-0.8	0.75	0.38	-0.4
12	6	-10	-7	100	49	-17	289	-0.655	-1	0.4293	0.39	-1	-1	1	1	-1	1	1	-1	0.41	1	0.7	-1	-1	-1	0.63	1	-1	-0.6	-1	0.41	0.63	0.63	0.66	0.66
13	6	0	-4	0	16	-4	16	0.034	-0	0.0012	0.06	0	-1	-1	1	1	1	1	1	-0.01	-1	-0	1	-1	-0	0.25	1	-1	0.25	1	-0	0.25	-0.3	0.03	-0
14	6	6	2	36	4	8	64	0.448	0.5	0.201	0.25	0.6	-1	-1	1	-1	1	1	-1	0.22	1	-0	1	1	-0	-0.5	1	-1	-0.5	1	0.22	-0.5	-0.5	-0.4	-0.4
15	6	-7	-4	49	16	-11	121	-0.448	-0	0.201	0.06	-0	-1	-1	-1	1	-1	-1	1	0.11	1	0.4	1	1	0.4	0.25	1	-1	0.25	1	0.11	0.25	0.25	0.45	0.45
16	7	-15	-2	225	4	-17	289	-1	0	1	0	-1	-1	1	1	1	-1	1	-1	0	-1	1	1	1	1	0	1	-1	0	-1	0	-0	0	-1	1
17	7	-9	-6	81	36	-15	225	-0.586	-1	0.3436	0.25	-1	-1	1	1	1	-1	1	-1	0.29	-1	0.6	-1	-1	-1	0.5	1	-1	-0.5	-1	0.29	0.5	-0.5	-0.6	0.59
18	7	-7	-6	49	36	-13	169	-0.448	-1	0.201	0.25	-0	-1	1	1	1	-1	1	1	0.22	1	0.4	-1	-1	-0	0.5	1	-1	-0.5	-1	0.22	0.5	-0.5	-0.4	0.45
19	8	-1	-8	1	64	-9	81	-0.034	-1	0.0012	0.56	-0	-1	-1	1	-1	-1	-1	1	0.03	-1	0	1	-1	0	0.75	-1	1	0.75	-1	0.03	-0.8	-0.8	-0	-0
20	8	0	-6	0	36	-6	36	0.034	-1	0.0012	0.25	-0	-1	0	-1	-1	1	1	-1	-0.02	1	-0	0	0	0	0.5	1	-1	0	0	-0	0.5	0.5	-0	-0
21	9	-6	-10	36	100	-16	256	-0.379	-1	0.1439	1	-1	-1	1	1	1	-1	1	-1	0.38	1	0.4	-1	-1	-0	1	-1	1	-1	-1	0.38	-1	0.38	1	0.38	-0.4
22	9	1	-8	1	64	-7	49	0.103	-1	0.0107	0.56	-0	-1	-1	1	-1	-1	-1	1	-0.08	1	-0	1	-1	-0	0.75	-1	1	0.75	-1	-0.1	0.75	0.75	-0.1	-0.1
23	10	-9	4	81	16	-5	25	-0.586	0.8	0.3436	0.56	-0	-1	1	-1	-1	1	1	-1	-0.44	1	0.6	-1	-1	-1	-0.8	1	-1	0.75	-1	-0.4	-0.8	-0.8	0.59	0.59
24	12	8	-6	64	36	2	4	0.586	-1	0.3436	0.25	0.3	1	-1	1	1	-1	1	-1	-0.29	1	0.6	-1	-1	-1	0.5	-1	1	0.5	-1	-0.3	0.5	0.5	0.59	-0.6
25	12	-6	-6	36	36	-12	144	-0.379	-1	0.1439	0.25	-0	-1	1	1	1	-1	1	1	0.19	1	0.4	-1	-1	-0	0.5	1	-1	-0.5	1	0.19	0.5	0.5	0.38	0.38
26	12	-4	0	16	0	-4	16	-0.241	0.3	0.0583	0.06	-0	-1	1	1	1	-1	1	1	-0.06	1	0.2	-1	-1	-0	-0.3	-1	1	0.25	1	-0.1	0.25	-0.3	0.24	-0.2
27	14	11	-2	121	4	9	81	0.793	0	0.629	0	0.6	1	-1	1	1	-1	1	1	0	0.8	-1	-1	-1	0	1	-1	0	0	0	0	0	0.79	0.79
28	14	-5	-6	25	36	-11	121	-0.31	-1	0.0963	0.25	-0	-1	1	1	1	1	1	1	0.16	-1	0.3	-1	1	-0	0.5	-1	1	-0.5	1	0.16	-0.5	-0.5	-0.3	-0.3
29	15	8	-8	64	64	0	0	0.586	-1	0.3436	0.56	0.2	1	-1	1	1	-1	1	-1	-0.44	1	0.6	-1	-1	-1	-0.8	-1	1	0.75	-1	-0.4	0.75	-0.8	0.59	-0.6
30	15	-11	-7	121	49	-18	324	-0.724	-1	0.5244	0.39	-1	-1	1	1	1	-1	1	1	0.45	1	0.7	-1	1	0.7	0.63	1	-1	0.63	1	0.45	-0.6	0.63	0.72	-0.7
31	15	-9	-10	81	100	-19	361	-0.586	-1	0.3436	1	-1	-1	1	1	1	-1	1	-1	0.59	-1	0.6	-1	1	-1	1	1	-1	-1	-1	0.59	1	-1	-0.6	0.59
32	16	-12	-10	144	100	-22	484	-0.793	-1	0.629	1	-1	-1	1	1	1	-1	1	1	0.79	1	0.8	1	0.8	1	-1	1	1	0.79	-1	1	1	0.79	0.72	0.72
33	16	-5	-2	25	4	-7	49	-0.31	0	0.0963	0	-0	-1	0	-1	-1	1	1	-1	0	1	0.3	0	0	0	0.5	1	-1	0	0	0	0	0	0.31	0.31
34	17	-1	-4	1	16	-5	25	-0.034	-0	0.0012	0.06	-0	-1	1	1	1	1	1	1	0.01	1	-0	-1	-1	-0	0.25	1	-1	-0.3	1	0.01	0.25	0.25	0.03	0.03
35	17	0	-4	0	16	-4	16	0.034	0	0.0012	0.06	0	-1	1	1	1	-1	1	-1	-0.01	1	-0	-1	-1	0	0.25	1	-1	-0.3	1	-0	-0.3	0.25	-0	0.03
36	18	-5	1	25	1	-4	16	-0.31	0.4	0.0963	0.14	0	-1	-1	1	1	1	1	1	-0.12	-1	0.3	1	-1	0.3	-0.4	1	-1	-0.4	1	-0.1	0.38	0.38	-0.3	-0.3
37	18	-4	-8	16	64	-12	144	-0.241	-1	0.0583	0.56	-0	-1	1	1	-1	-1	-1	-1	0.18	-1	0.2	-1	1	-0	0.75	-1	1	-0.8	-1	0.18	-0.8	-0.8	-0.2	-0.2
38	18	-4	-5	16	25	-9	81	-0.241	-0	0.0583	0.14	-0	-1	0	-1	1	1	0	0	0.09	1	0.2	0	0	0	0.38	1	1	0	0	0.09	-0.4	0.38	0.24	-0.2
39	19	1	-2	1	4	-1	1	0.103	0	0.0107	0	0.1	-1	0	1	1	1	1	1	0	-1	-0	0	0	0	0	1	-1	0	0	0	0	0	0.1	0.1
40	19	-3	-5	9	25	-8	64	-0.172	0	0.0297	0.14	-0	-1	-1	1	-1	1	1	-1	0.06	1	0.2	1	1	0.2	0.38	-1	1	0.38	-1	0.06	-0.4	0.38	0.17	-0.2
41	20	4	-4	16	16	0	0	0.31	-0	0.0963	0.06	0.2	0	-1	1	1	-1	1	-1	-0.08	0	0	0	-1	-0	0	0	1	0.25	-1	-0.1	-0.3	-0.3	0.31	0.31
42	20	1	-6	1	36	-5	25	0.103	-0	0.0107	0.25	-0	-1	1	1	1	-1	1	1	-0.05	1	-0	-1	-1	-0	0.5	1	-1	0.5	1	-0.1	-0.5	-0.5	0.1	0.1
43	21	10	-4	100	16	6	36	0.724	-0	0.5244	0.06	0.5	-1	1	-1	1	1	-1	1	-0.18	1	-1	-1	-1	0.7	0.25	1	-1	-0.3	-1	-0.2	0.25	0.25	-0.7	-0.7
44	23	-6	-1	36	1	-7	49	-0.379	0.1	0.1439	0.02	-0	-1	0	1	1	-1	1	-1	-0.05	-1	0.4	0	0	0	-0.1	1	-1	0	0	-0	-0.1	0.13	-0.4	0.38
45	23	-11	-3	121	9	-14	196	-0.724	-0	0.5244	0.02	-0	-1	1	1	1	-1	1	-1	0.09	-1	0.7	1	-1	0.7	0.13	1	-1	0.13	1	0.09	0.13	-0.1	-0.7	0.72
46	23	-8	-3	64	9	-11	121	-0.517	-0	0.2675	0.02	-0	-1	1	1	1	1	1	-1	0.06	1	0.5	1	-1	0.5	0.13	1	-1	0.13	1	0.06	0.13	-0.1	-0.5	0.52
47	24	-9	4	81	16	-5	25	-0.586	0.8	0.3436	0.56	-0	-1	1	1	-1	-1	-1	-1	-0.44	1	0.6	-1	1	-1	-0.8	-1	1	0.75	1	-0.4	0.75	0.75	-0.6	-0.6

Observation #	APPL	Common total	Accouting Total	common sq	accounting sq	Grand	grand sq	Common	Accounting	common sq	accout sq	Grand	Organization reputation	Location	Junior	Inter	Senior	JI	JIS	Common x Accout	org x Jun	Org x Common	Org x Loc	loc x junior	loc x comm	Org x Accou	Org x IS	IS	loc x acc	loc x is	Accout x common	acc x IS	acc x junior	com x ju	com x is
48	25	1	-3	1	9	-2	4	0.103	-0	0.0107	0.02	0.1	-1	-1	1	-1	-1	-1	-1	-0.01	-1	-0	1	-1	-0	0.13	-1	1	0.13	-1	-0	-0.1	-0.1	0.103	0.1
49	25	-1	-3	1	9	-4	16	-0.034	-0	0.0012	0.02	0	-1	0	-1	-1	1	1	-1	0	1	0	0	0	0.13	1	-1	0	0	0.13	0.13	0.034	0.03		
50	25	-2	0	4	0	-2	4	-0.103	0.3	0.0107	0.06	0.1	-1	1	-1	-1	1	1	-1	-0.03	1	0.1	-1	-1	-0	-0.3	1	-1	0.25	-1	-0	-0.3	-0.3	0.103	0.1
51	25	3	-2	9	4	1	1	0.241	0	0.0583	0	0.2	-1	1	-1	-1	1	1	-1	0	1	-0	-1	-1	-1	0.2	0	1	-1	0	-1	0	0	-0.24	-0.24
52	25	-9	-2	81	4	-11	121	-0.586	0	0.3436	0	-0	-1	0	1	1	1	1	1	0	-1	0.6	0	0	0	0	-1	1	0	0	0	0	0	-0.59	-0.59
53	26	4	0	16	0	4	16	0.31	0.3	0.0963	0.06	0.4	1	-1	-1	1	-1	-1	1	0.08	-1	0.3	-1	1	-0	0.25	-1	-1	-0.3	1	0.08	-0.3	-0.3	-0.31	-0.31
54	26	-2	0	4	0	-2	4	-0.103	0.3	0.0107	0.06	0.1	-1	0	1	-1	-1	-1	-1	-0.03	-1	0.1	0	0	0	-0.3	-1	1	0	0	-0	0.25	0.25	-0.1	-0.1
55	26	14	0	196	0	14	196	1	0.3	1	0.06	0.9	-1	-1	1	1	1	1	1	0.25	-1	-1	1	-1	-1	-0.3	-1	1	-0.3	-1	0.25	0.25	0.25	1	1
56	26	8	-2	64	4	6	36	0.586	0	0.3436	0	0.5	-1	1	1	1	-1	1	-1	0	-1	-1	-1	1	0.6	0	1	-1	0	-1	0	0	0	0.586	-0.59
57	27	4	0	16	0	4	16	0.31	0.3	0.0963	0.06	0.4	0	-1	1	1	1	1	1	0.08	0	0	-1	-0	0	-0.3	-1	-1	0.08	0.25	0.25	0.31	0.31		
58	27	6	-4	36	16	2	4	0.448	-0	0.201	0.06	0.3	-1	1	1	1	-1	1	-1	-0.11	-1	-0	-1	1	0.4	0.25	1	-1	-0.3	-1	-0.1	0.25	-0.3	0.448	-0.45
59	28	1	-3	1	9	-2	4	0.103	-0	0.0107	0.02	0.1	1	-1	1	1	-1	1	1	-0.01	1	0.1	-1	-1	-0	-0.1	1	1	0.13	-1	-0	-0.1	-0.1	0.103	0.1
60	29	0	-8	0	64	-8	64	0.034	-1	0.0012	0.56	-0	-1	1	1	1	-1	1	-1	-0.03	-1	-0	-1	1	0	0.75	1	-1	-0.8	-1	-0	0.75	-0.8	0.034	-0.03
61	30	3	0	9	0	3	9	0.241	0.3	0.0583	0.06	0.3	-1	1	-1	1	1	-1	-1	0.06	1	-0	-1	-1	0.2	-0.3	-1	1	0.25	1	0.06	0.25	-0.3	-0.24	0.24
62	30	1	-4	1	16	-3	9	0.103	-0	0.0107	0.06	0	1	-1	1	1	-1	1	1	-0.03	1	0.1	-1	-1	-0	-0.3	1	1	0.25	-1	-0	-0.3	-0.3	0.103	0.1
63	31	-1	1	1	1	0	0	-0.034	0.4	0.0012	0.14	0.2	0	-1	1	-1	-1	-1	-1	-0.01	0	0	0	-1	0	0	0	1	-0.4	-1	-0	0.38	0.38	-0.03	-0.03
64	32	-2	-2	4	4	-4	16	-0.103	0	0.0107	0	1	0	1	-1	1	-1	1	-1	0	-1	-0	-1	1	0	0	0	1	0	0	-0	0	0	0.103	0.1
65	32	6	2	36	4	8	64	0.448	0.5	0.201	0.25	0.6	-1	-1	1	-1	-1	-1	-1	0.22	-1	-0	1	-1	-0	-0.5	-1	1	-0.5	-1	0.22	0.5	0.5	0.448	0.45
66	33	6	2	36	4	8	64	0.448	0.5	0.201	0.25	0.6	-1	1	-1	-1	1	1	-1	0.22	1	-0	-1	-1	0.4	-0.5	1	-1	0.5	-1	0.22	-0.5	-0.5	-0.45	-0.45
67	34	-2	-6	4	36	-8	64	-0.103	-1	0.0107	0.25	-0	-1	1	1	1	-1	1	-1	0.05	-1	0.1	-1	-1	-0	0.5	1	-1	-0.5	-1	-0.05	0.5	-0.5	-0.1	-0.1
68	35	1	-6	1	36	-5	25	0.103	-1	0.0107	0.25	-0	-1	1	1	1	-1	1	-1	-0.05	-1	-0	-1	1	0.1	0.5	1	-1	-0.5	-1	-0.1	0.5	-0.5	0.103	-0.1
69	36	-2	-3	4	9	-5	25	-0.103	-0	0.0107	0.02	-0	-1	0	1	1	-1	1	-1	0.01	-1	0.1	0	0	0	0.13	1	-1	0	0	0.01	0.13	-0.1	-0.1	0.1
70	36	2	2	4	4	4	16	0.172	0.5	0.0297	0.14	0.3	-1	1	1	1	-1	1	-1	0.09	-1	-0	-1	1	0.2	-0.5	1	-1	0.5	-1	0.09	-0.5	0.5	0.172	-0.17
71	37	10	-2	100	4	8	64	0.724	0	0.5244	0	0.6	-1	1	-1	-1	1	1	-1	0	-1	-1	-1	1	0.7	0	1	-1	0	-1	0	0	0	-0.72	-0.72
72	39	5	1	25	1	6	36	0.379	0.4	0.1439	0.14	0.5	-1	1	1	1	1	1	1	0.14	-1	-0	-1	1	0.4	-0.4	-1	1	0.38	1	0.14	0.38	0.38	0.379	0.38
73	39	4	0	16	0	4	16	0.31	0.3	0.0963	0.06	0.4	1	0	1	1	1	1	1	0.08	1	0.3	0	0	0	0.25	1	1	0	0	0.08	0.25	0.25	0.31	0.31
74	39	-2	6	4	36	4	16	-0.103	1	0.0107	1	0.4	-1	1	1	1	-1	1	-1	-0.1	-1	0.1	-1	1	-0	-1	1	-1	1	-1	-0.1	-1	1	-0.1	0.1
75	40	-1	1	16	1	3	9	0.31	0.1	0.0963	0.02	0.3	-1	1	-1	1	1	-1	-1	0.04	1	-0	-1	-1	0.3	-0.1	-1	1	0.13	1	0.04	0.13	-0.1	0.31	0.31
76	40	4	4	16	16	8	64	0.31	0.8	0.0963	0.56	0.6	-1	1	-1	1	-1	1	-1	0.23	-1	-0	-1	1	0.3	-0.8	-1	1	0.75	1	0.23	0.75	0.75	0.31	0.31
77	41	10	1	100	1	11	121	0.724	0.4	0.5244	0.14	0.7	-1	1	-1	-1	1	1	-1	0.27	1	-1	-1	-1	0.7	-0.4	1	-1	-0.38	-1	0.27	-0.4	-0.4	-0.72	-0.72
78	43	5	0	25	0	5	25	0.379	0.3	0.1439	0.06	0.4	-1	1	-1	1	1	1	1	0.09	1	-0	-1	-1	0.4	-0.3	-1	1	0.25	1	0.09	0.25	-0.3	-0.38	0.38
79	45	11	-3	121	9	8	64	0.793	-0	0.629	0.02	0.6	1	1	1	-1	-1	-1	-1	-0.1	1	0.8	1	1	0.8	-0.1	1	-1	-0.1	1	-0.1	-0.1	-0.1	0.793	0.79
80	46	-2	1	4	1	-1	1	-0.103	0.4	0.0107	0.14	0.1	-1	1	-1	1	-1	-1	-1	-0.04	-1	0.1	-1	1	-0	-0.4	-1	1	0.38	1	-0.04	-0.38	0.38	-0.1	-0.1
81	48	4	0	16	0	4	16	0.31	0.3	0.0963	0.06	0.4	1	0	1	-1	-1	-1	-1	0.08	1	0.3	0	0	0	0.25	1	1	0	0	0.08	0.25	0.25	0.31	0.31
82	51	6	2	36	4	8	64	0.448	0.5	0.201	0.25	0.6	1	1	-1	1	1	-1	-1	0.22	1	0.4	-1	-1	0.4	-0.5	1	1	0.5	1	0.22	0.5	-0.5	-0.45	0.45
83	52	-1	4	1	16	3	9	-0.034	0.8	0.0012	0.56	0.3	-1	0	-1	1	1	-1	-1	-0.03	1	0	0	0	0	-0.8	-1	1	-0	0.75	-0.8	0.034	-0.03		
84	53	7	5	49	25	12	144	0.517	0.9	0.2675	0.77	0.8	1	-1	1	1	-1	1	-1	0.45	1	0.5	-1	-1	-1	0.88	-1	-1	-0.9	1	0.45	-0.9	0.88	0.517	-0.52
85	55	5	1	25	1	6	36	0.379	0.4	0.1439	0.14	0.5	0	-1	1	1	1	1	1	0.14	0	0	-1	0.4	0	0	0.38	1	0.14	0.38	-0.38	0.38			
86	56	1	1	1	1	2	4	0.103	0.4	0.0107	0.14	0.3	0	0	1	-1	1	-1	-1	0.04	0	0	0	0	0	0.04	1	-1	0	0	0.04	-0.4	-0.4	-0.1	-0.1
87	56	1	-3	1	9	-2	4	0.103	-0	0.0107	0.02	0.1	1	1	1	-1	-1	-1	-1	-0.01	-1	0.1	1	-1	0.1	-0.1	1	1	-0.1	1	-0	-0.1	0.13	-0.1	0.1
88	56	4	-3	16	9	1	1	0.31	-0	0.0963	0.02	0.2	-1	1	-1	1	1	1	1	-0.04	1	-0	-1	1	0.3	0.1	1	-1	-0.1	-1	-0	0.13	0.13	-0.31	-0.31
89	60	1	-3	1	9	-2	4	0.103	-0	0.0107	0.02	0.1	1	0	1	-1	-1	-1	-1	-0.01	1	0.1	0	0	0	-0.1	1	1	0	0	-0	-0.1	-0.1	0.103	0.1
90	69	7	5	49	25	12	144	0.517	0.9	0.2675	0.77	0.8	1	0	1	-1	-1	-1	-1	0.45	1	0.5	0	0	0	0.45	-1	-1	-0.9	0.88	0.45	-0.9	0.88	0.517	-0.52
91	80	11	3	121	9	14	196	0.793	0.6	0.629	0.39	0.9	-1	1	1	-1	1	-1	-1	0.5	1	-1	-1	1	0.8	-0.6	1	-1	0.63	-1	0.5	-0.6	0.63	0.793	-0.79
92	91	1	-3	1	9	-2	4	0.103	-0	0.0107	0.02	0.1	1	1	1	-1	-1	-1	-1	-0.01	1	0.1	1	1	0.1	-0.1	1	1	-0.1	1	-0	-0.1	-0.1	0.103	0.1
93	95	1	-4	1	16	-3	9	0.103	-0	0.0107	0.06	0	1	1	1	-1	-1	-1	-1	-0.01	1	0.1	1	1	0.1	-0.3	1	1	-0.3	1	-0	-0.3	-0.3	0.103	0.1
94	108	7	2	49	4	9	81	0.517	0.5	0.2675	0.25	0.6	-1	1	1	-1	-1	-1	-1	0.26	-1	-1	-1	1	0.5	-0.5	1	1	0.5	1	0.26	-0.5	0.5	0.517	-0.52
95	127	4	0	16	0	4	16	0.31	0.3	0.0963	0.06	0.4	1	1	1	-1	-1	-1	-1	0.08	1	0.3	1	1	0.3	0.25	1	1	0.25	1	0.08	0.25	0.25	0.31	0.31
96	133	1	-3	1	9	-2	4	0.103	-0	0.0107	0.02	0.1	1	1	1	-1	-1	-1	-1	-0.01	1	0.1	1	1	0.1	-0.1	1	1	-0.1	1	-0	-0.1	-0.1	0.103	0.1
97	153	1	-4	1	16	-3	9	0.103	-0	0.0107	0.06	0	1	0	1	-1	-1	-1	-1	-0.03	1	0.1	0	0	0	-0.3	1	1	0	0	-0	-0.3	-0.3	0.103	0.1
98	154	5	3	25	9	8	64	0.379	0.6	0.1439	0.39	0.6	0	1	1	1	1	1	1	0.24	0	0	0	0.4	0	0.63	1	0.24	0.63	0.63	0.379	0.38			
97	153	1	-4	1	16	-3	9	0.103	-0	0.0107	0.06	0	1	0	1	-1	-1	-1	-1	-0.03	1	0.1	0	0	0	-0.3	1	1	0	0	-0	-0.3	-0.3	0.103	0.1
98	154	5	3	25	9	8	64	0.379	0.6	0.1439	0.39	0.6	0	1	1	1	1	1	1	0.24	0	0	0	0.4	0	0.63	1	0.24	0.63	0.63	0.379	0.38			
99	155	-2	-2	4	4	-4	16	-0.103	0	0.0107	0	1	1	1	-1	1	-0	1	-1	0	1	-0	0	1	1	0	-0	-0	-0.1	-0.1					
100	163	-5	5	25	25	0	0	-0.31	0.9	0.0963	0.77	0.2	0	0	1	-1	-1	-1	-1	-0.27	0	0	0	0	0	1	0	0	-0.3	0.88	0.88	-0.31	-0.31		
101	164	11	0	121	0	11	121	0.793	0.3	0.629	0.06	0.7	-1	1	1	1	1	1	1	0.2	-1	-1	-1	1	0.8	-0.3	-1	1	0.25	1	0.2	0.25	0.25	0.793	0.79
102	166	11	6	121	36	17	289	0.793	1	0.629	1	1	0	1	1	1	1	1	1	0.79	0	0	0	1	0.8	0	0	1	1	0.79	1	1	0.793	0.79	

Due to the high number of factors, the data analysis is divided into three groups: i) JUN,
INT and SEN, ii) COM and ACC, and iii) GRA, ORG and LOC.

Single factor and two-factor interaction regression analysis of: JUN, INT, SEN

	β	Std Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 90.0%	Upper 90.0%
Intercept	35.889	4.054	8.852	3.734E-14	27.844	43.934	29.157	42.621
JUN	12.997	4.485	2.898	4.632E-03	4.098	21.897	5.550	20.444
INT	-5.086	4.016	-1.267	2.083E-01	-13.056	2.883	-11.755	1.582
SEN	2.425	4.391	0.552	5.821E-01	-6.289	11.139	-4.867	9.716

	β	Std Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 90.0%	Upper 90.0%
Intercept	36.857	4.654	7.919	3.769E-12	27.622	46.093	29.129	44.586
JUN × INT	1.322	4.654	0.284	7.770E-01	-7.914	10.558	-6.406	9.050
INT × SEN	11.115	4.654	2.388	1.884E-02	1.880	20.351	3.387	18.844
JUN × INT × SEN	1.705	4.654	0.366	7.149E-01	-7.531	10.941	-6.023	9.433

	β	Std Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 90.0%	Upper 90.0%
Intercept	35.625	3.967	8.980	2.130E-14	27.752	43.498	29.037	42.213
JUN	8.149	4.854	1.679	9.640E-02	-1.485	17.783	0.088	16.210
INT	-3.792	3.967	-0.956	3.415E-01	-11.665	4.082	-10.380	2.796
SEN	-3.229	4.931	-0.655	5.142E-01	-13.016	6.559	-11.419	4.961
INT × SEN	10.105	4.332	2.333	2.173E-02	1.508	18.703	2.911	17.300

The single factor(s) and two-factor interaction term(s) that are found to be significant from the regression analysis include JUN (P-value < 0.005) and INT × SEN (P-value <

0.02).

Single factor and two-factor interaction regression analysis of: COM, ACC

	β	Std Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 90.0%	Upper 90.0%
Intercept	35.635	3.680	9.683	5.903E-16	28.332	42.938	29.524	41.746
ACC	29.917	7.822	3.825	2.304E-04	14.394	45.440	16.928	42.906
COM	21.444	8.657	2.477	1.496E-02	4.264	38.623	7.068	35.819
ACC × COM	24.071	15.361	1.567	1.203E-01	-6.412	54.555	-1.437	49.579

	β	Std Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 90.0%	Upper 90.0%
Intercept	35.225	5.095	6.914	5.022E-10	25.113	45.337	26.764	43.687
COM	22.488	8.877	2.533	1.290E-02	4.870	40.105	7.746	37.229
ACC	28.870	7.883	3.662	4.073E-04	13.224	44.516	15.778	41.962
COM Square	-7.211	15.430	-0.467	6.413E-01	-37.835	23.413	-32.835	18.413
ACC Square	15.892	13.004	1.222	2.246E-01	-9.917	41.700	-5.704	37.487

The single factors COM Square and ACC Square are tested to determine if a second order model is necessary. The single factor(s) and two-factor interaction term(s) that are found to be significant from the regression analysis include ACC (P-value < 0.001) and COM (P-value < 0.02). Second order terms, COM Square and ACC Square are found to be insignificant; therefore a second order model is not necessary.

Single factor and two-factor interaction regression analysis of: LOC, ORG, and GRA

	β	Std Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 90.0%	Upper 90.0%
Intercept	38.574	3.826	10.082	8.017E-17	30.982	46.167	32.221	44.927
LOG	13.483	3.666	3.678	3.836E-04	6.209	20.757	7.396	19.570
ORG	15.496	3.980	3.894	1.803E-04	7.598	23.394	8.888	22.105
GRA	33.482	8.117	4.125	7.781E-05	17.374	49.589	20.003	46.960

	β	Std Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 90.0%	Upper 90.0%
Intercept	41.667	4.761	8.752	7.101E-14	32.217	51.117	33.760	49.574
LOC	11.886	3.559	3.340	1.195E-03	4.822	18.951	5.975	17.797
ORG	19.410	4.766	4.073	9.546E-05	9.951	28.870	11.495	27.325
GRA	16.670	12.499	1.334	1.854E-01	-8.140	41.481	-4.089	37.430
GRA × LOC	25.663	8.526	3.010	3.339E-03	8.738	42.588	11.502	39.824
GRA × ORG	-8.493	12.889	-0.659	5.115E-01	-34.077	17.091	-29.900	12.913

	β	Std Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 90.0%	Upper 90.0%
Intercept	43.418	3.821	11.363	1.378E-19	35.835	51.001	37.073	49.763
ORG	18.977	4.001	4.743	7.145E-06	11.038	26.916	12.334	25.620
LOC	21.223	4.466	4.752	6.904E-06	12.360	30.086	13.807	28.639
ORG × LOC	12.404	4.662	2.661	9.111E-03	3.153	21.656	4.663	20.146

The single factor(s) that are found to be significant from the regression analysis include

LOC (P-value < 0.0005), ORG (P-value < 0.0002), and GRA (P-value < 0.0001). When

two-factor interaction terms are included in the model for analysis, GRA is found to be

insignificant (P-value > 18.5) and GRA × LOC is found to be significant (P-value <

0.005). Lastly, the interaction term ORG × LOC is found to be significant (P-value <

0.01).

Two-factor interaction regression analysis of: ORG and other significant terms

	β	Std Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 90.0%	Upper 90.0%
Intercept	50.995	4.283	11.907	1.521E-20	42.493	59.498	43.881	58.110
ORG	20.935	4.517	4.634	1.140E-05	11.967	29.903	13.431	28.439
ORG × LOC	1.919	4.195	0.457	6.484E-01	-6.409	10.248	-5.049	8.887
ORG × ACC	-8.946	8.439	-1.060	2.918E-01	-25.699	7.807	-22.963	5.071
ORG × JUN	-1.491	3.729	-0.400	6.901E-01	-8.893	5.911	-7.684	4.702
ORG × INT x SEN	0.999	3.690	0.271	7.873E-01	-6.328	8.325	-5.131	7.129
ORG × COM	-29.588	9.194	-3.218	1.766E-03	-47.840	-11.335	-44.860	-14.316

The regression analysis determines that the term ORG x COM is significant (P-value <

0.002).

Two-factor interaction regression analysis of: LOC and other significant terms

	β	Std Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 90.0%	Upper 90.0%
Intercept	35.677	3.636	9.813	4.138E-16	28.459	42.894	29.638	41.715
LOC	13.479	5.331	2.528	1.311E-02	2.895	24.063	4.624	22.335
LOC × ORG	7.362	5.327	1.382	1.702E-01	-3.214	17.938	-1.487	16.211
LOC × ACC	7.319	8.770	0.835	4.060E-01	-10.091	24.729	-7.248	21.886
LOC × COM	20.452	9.741	2.099	3.842E-02	1.113	39.791	4.271	36.633
LOC × INT × SEN	7.786	4.031	1.931	5.641E-02	-0.217	15.788	1.090	14.481
LOC × JUN	6.807	4.012	1.697	9.298E-02	-1.157	14.771	0.144	13.471

The regression analysis determines that the term LOC × COM is significant (P-value < 0.05).

At this point, the terms that are determined to be significant include JUN, ACC, ORG, LOC, ORG × COM, ORG × LOC, LOC × COM, COM, INT × SEN, and GRA. Chapter 6 begins the analysis starting from this point where all of the above significant terms are combined into a single regression model:

$$Y_i = \beta_0 + \beta_1 JUN_i + \beta_2 ACC_i + \beta_3 ORG_i + \beta_4 LOC_i + \beta_5 ORG_i COM_i + \beta_6 ORG_i LOC_i + \beta_7 LOC_i COM_i + \beta_8 COM_i + \beta_9 INT_i SEN_i + \beta_{10} GRA_i + \varepsilon_i$$

However, additional regression analysis is performed and is discussed below to generate a stronger support on the significance of the model. The rest of this section provides the

details of additional but not critical regression analysis.

Additional regression analysis

The following analysis combines all of the significant terms into a single regression model. Additional techniques such as residual plots and the box-cox transformation are used to validate the significance of the model. Although these analyzes are not critical in validating the seven hypotheses, they are performed to ensure that the regression model is at a reasonable accuracy.

Combine all significant terms

Note that the single factors GRA, COM, and ACC can not be analyzed in the same model due to their correlation (COM + ACC = GRA). Previous analysis indicates that all three single factors are significant to the model. However, the significance level of GRA decreases as additional terms are added to the regression model. This suggests that GRA is only significant in a model with small number of variables. GRA is not included in any further regression analyzes.

The following regression analysis examines all of the significant terms determined so far:

	β	Std Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 90.0%	Upper 90.0%
Intercept	43.187	4.299	10.046	1.831E-16	34.649	51.725	36.044	50.330
JUN	9.928	2.947	3.369	1.105E-03	4.075	15.782	5.031	14.825
ACC	19.437	6.357	3.057	2.924E-03	6.810	32.063	8.873	30.000
ORG	17.322	4.439	3.902	1.814E-04	8.505	26.139	9.946	24.698
ORG × COM	-18.412	10.954	-1.681	9.617E-02	-40.167	3.342	-36.613	-0.212
ORG × LOC	8.013	4.455	1.799	7.537E-02	-0.835	16.861	0.610	15.416
LOC	16.682	3.970	4.202	6.112E-05	8.798	24.567	10.086	23.279
LOC × COM	20.407	7.855	2.598	1.092E-02	4.807	36.007	7.356	33.458
COM	-5.790	10.961	-0.528	5.986E-01	-27.560	15.981	-24.003	12.424
INT × SEN	2.162	3.055	0.708	4.809E-01	-3.906	8.230	-2.914	7.239

The terms that are found to be significant at a confidence interval of 95% include JUN (P-value < 0.002), ACC (P-value < 0.005), ORG (P-value < 0.0002), LOC (P-value < 0.0001), and LOC × COM (P-value < 0.02). The terms that are found to be significant at a confidence interval of 90% include ORG × COM (P-value < 0.1) and ORG × LOC (P-value < 0.1). The terms COM and INT × SEN are found to be insignificant.

The following regression analysis is the result of the removal of the insignificant factors COM and INT × SEN.

Regression Analysis

Multiple R	0.747
R Square	0.557
Adjusted R Square	0.524
Standard Error	27.252
Observations	102

ANOVA

	df	SS	MS	F	Significance F
Regression	7	87912.045	12558.864	16.91	0.000
Residual	94	69812.710	742.688		
Total	101	157724.755			

	β	Std Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 90.0%	Upper 90.0%
Intercept	42.448	3.494	12.148	5.662E-21	35.510	49.386	36.643	48.253
JUN	10.184	2.891	3.522	6.620E-04	4.443	15.924	5.381	14.986
ACC	19.115	6.226	3.070	2.795E-03	6.754	31.476	8.773	29.457
ORG	16.464	3.510	4.691	9.202E-06	9.496	23.432	10.634	22.294
ORG × COM	-14.608	7.654	-1.909	5.938E-02	-29.806	0.589	-27.324	-1.893
ORG × LOC	9.501	4.121	2.306	2.333E-02	1.319	17.682	2.656	16.346
LOC	17.362	3.849	4.511	1.861E-05	9.721	25.004	10.969	23.756
LOC × COM	19.806	7.675	2.581	1.141E-02	4.567	35.045	7.056	32.556

Residual plots:

Residual vs Predicted # of Applications

Residual vs Observation #
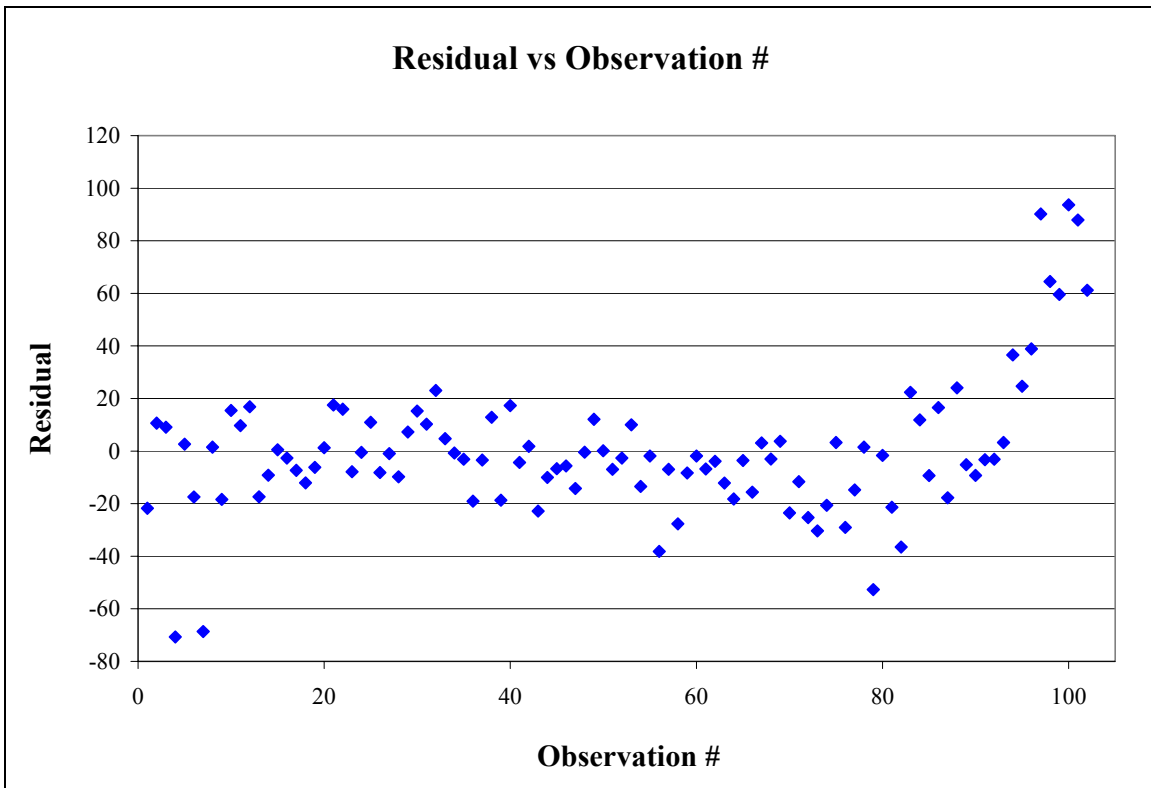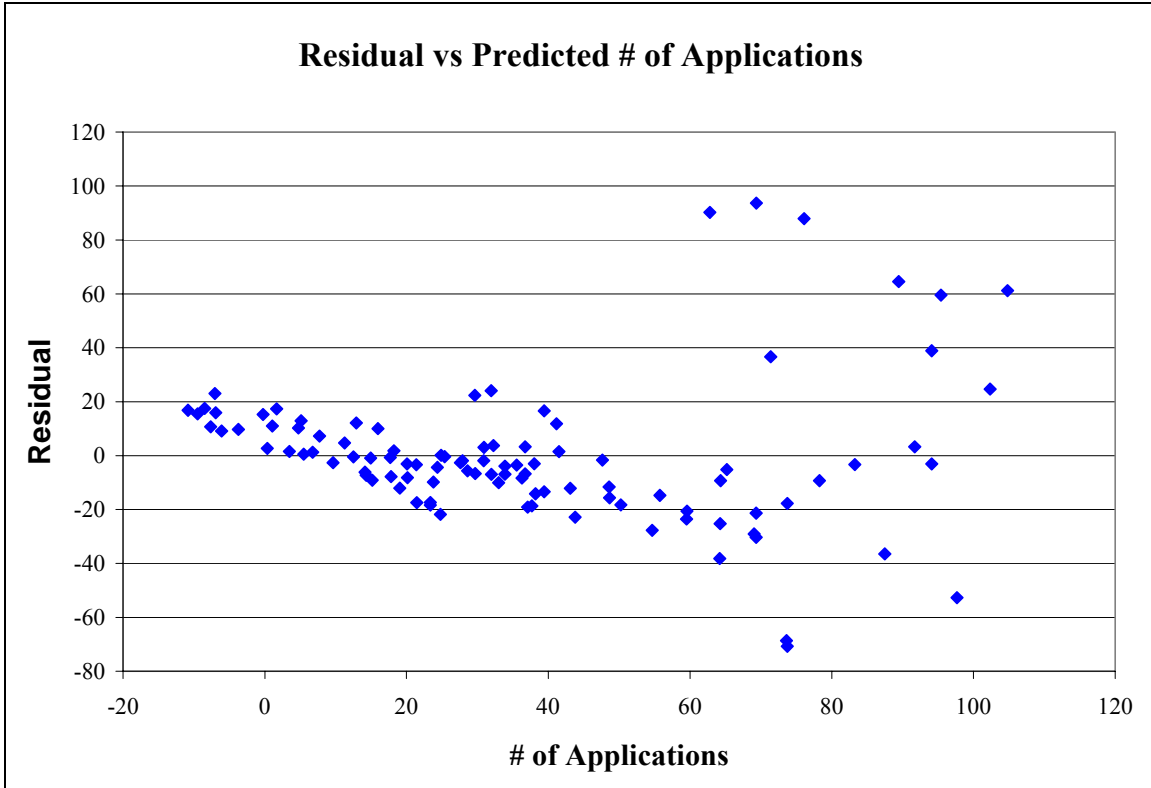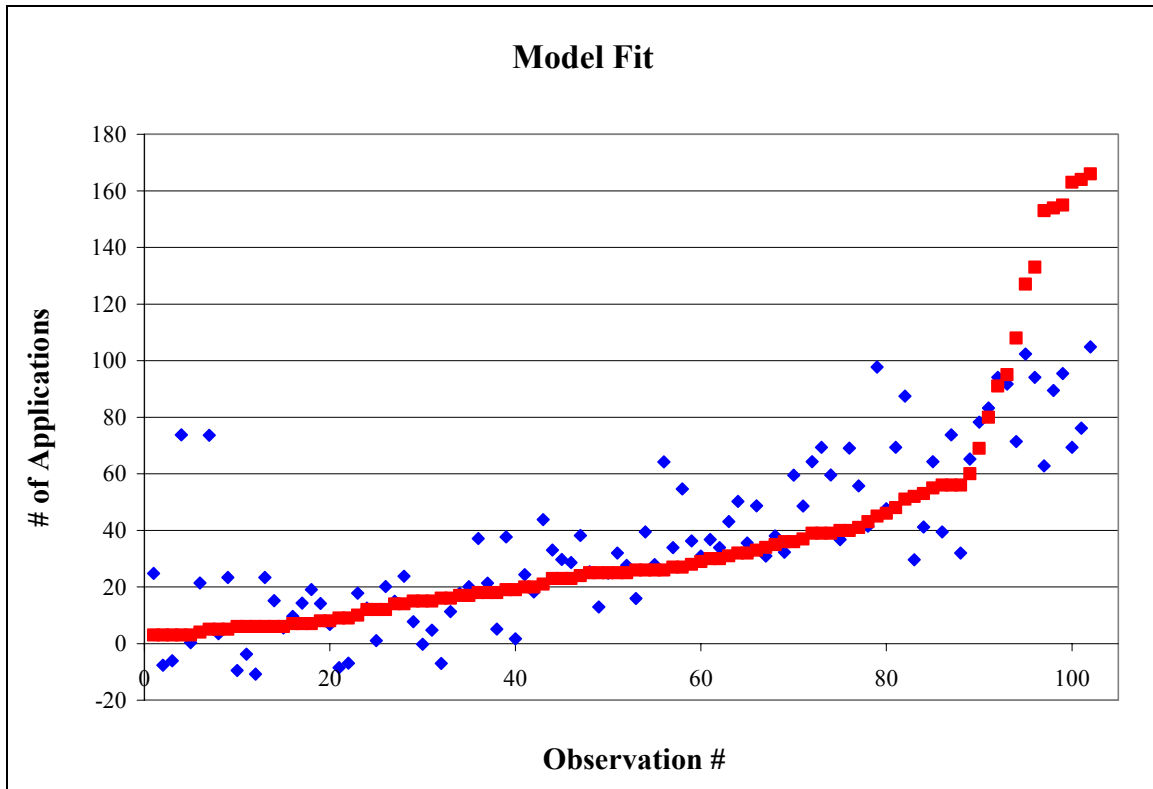
Model Fit

The residual and model-fit plots suggest that the model provides a good fit for predictions below 60 applications, a moderate fit between 60 and 85 applications, and a less accurate fit for 85 or above applications. This does not affect the objective of this thesis because the purpose of the regression analysis is to determine single and two-factor interaction terms that are significant in effect. Since the model provides a reasonable fit to the data, it is concluded that the following single factor and two-factor interaction terms are significant: JUN, ACC, ORG, LOC, ORG $\times$ COM, ORG $\times$ LOC, and LOC $\times$ COM. The regression model is:

$$Y_i = \beta_0 + \beta_1 JUN_i + \beta_2 ACC_i + \beta_3 ORG_i + \beta_4 LOC_i + \beta_5 ORG_i COM_i + \beta_6 ORG_i LOC_i + \beta_7 LOC_i COM_i + \varepsilon_i$$

Additional regression analysis and model fitting tests

Additional regression analyzes and model fitting tests are made to concur the significant terms and to make the above conclusion stronger.

The standard error of the model is 27.252. By performing the same regression with job descriptions that has up to 80 applications (91 observations), the standard error decreases substantially to 11.363.

Regression Analysis

Multiple R	0.768
R Square	0.590
Adjusted R Square	0.556
Standard Error	11.363
Observations	91

ANOVA

	df	SS	MS	F	Significance F
Regression	7	15432.578	2204.654	17.076	8.628E-14
Residual	83	10716.147	129.110		
Total	90	26148.725			

	β	Std Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 90.0%	Upper 90.0%
Intercept	29.942	1.641	18.251	8.584E-31	26.679	33.205	27.213	32.671
JUN	2.523	1.274	1.981	5.089E-02	-0.010	5.057	0.405	4.642
ACC	14.700	2.759	5.328	8.342E-07	9.213	20.187	10.111	19.289
ORG	7.251	1.650	4.394	3.261E-05	3.969	10.533	4.506	9.995
LOC	4.238	1.956	2.167	3.314E-02	0.347	8.129	0.984	7.492
ORG × COM	-5.699	3.313	-1.720	8.917E-02	-12.288	0.891	-11.210	-0.187
ORG × LOC	-0.978	2.063	-0.474	6.367E-01	-5.081	3.125	-4.410	2.453
LOC × COM	13.662	3.359	4.067	1.080E-04	6.980	20.344	8.074	19.250

Residual vs Predicted # of Applications (91 Observations)

Residual vs Observation #

Observation # (91 Observations)
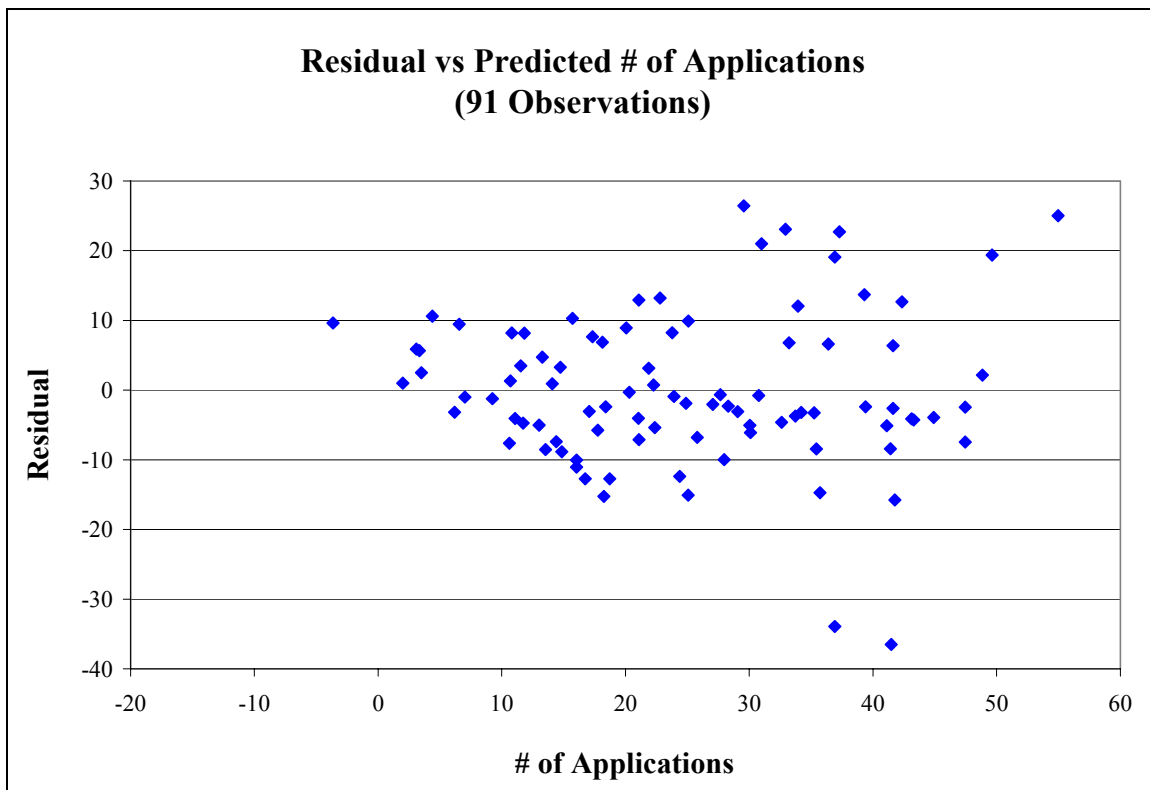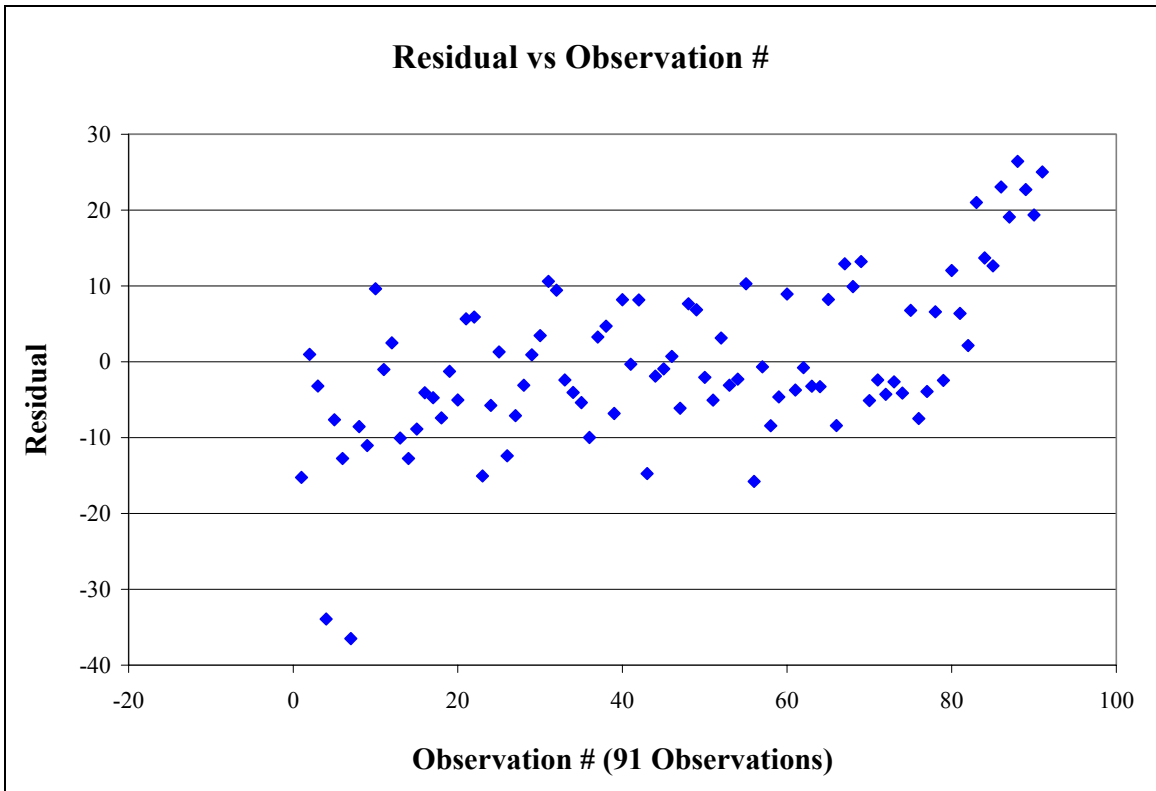
All of the single and two-factor interaction terms are still significant except for ORG ×

LOC. The interaction effect ORG × LOC is not critical in any of the hypothesis tests.

Box-cox transformation is used to further improve the fit of the model. This analysis

suggests that the log or root transformation will provide a better fit.

Box Cox Transformation
(Residual Sum of Squres as a function of λ)
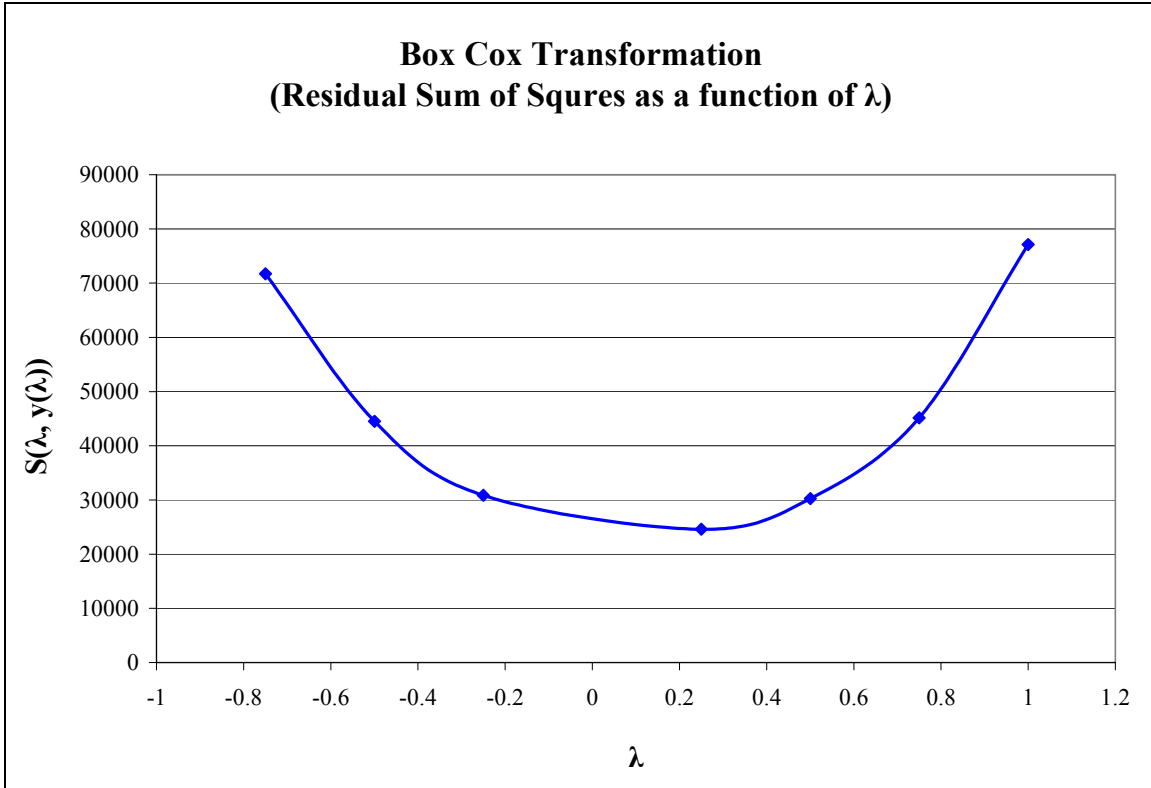
Box – Cox transformation raw data

-1				-0.75				-0.5				-0.25				0			
Z	Ẑ		S	Ẑ	Z		S	Ẑ	Z		S	Ẑ	Z		S	Ẑ	Z		S
356	477	493	14692	182.08	268	282	7358.670383	93.81	156	168.7	3838.82	48.635	94.49	107	2103.067059	11.0188	26.2	31.5	231
356	454	6.6	9680.7	182.08	249	5.4	4512.021128	93.81	140	4.693	2108.6	48.635	79.76	4.39	968.9590244	11.0188	19.9	1.92	79
356	464	24	11692	182.08	256	21	5460.173242	93.81	145	18.26	2582.47	48.635	83.64	16.9	1225.62755	11.0188	21.4	7.11	108
356	494	3.9	19029	182.08	287	4	10914.02397	93.81	177	4.211	6850.19	48.635	117.9	4.62	4791.460606	11.0188	37.8	2.27	715
356	454	22	9778.5	182.08	249	19	4520.183109	93.81	140	16.73	2088.46	48.635	79.4	15.1	946.3120417	11.0188	19.7	6.11	76.1
400	486	4.2	7386.2	209.7	274	3.4	4194.512692	111	161	2.799	2488.32	59.313	98.77	2.39	1557.121729	13.9041	27.9	0.93	196
427	501	5.7	5507.6	227.38	289	6.2	3790.741129	122.7	175	6.86	2762.54	67.083	113.5	7.79	2158.410271	16.1422	34.7	3.93	346
427	461	-6	1172.2	227.38	254	-3	729.1370232	122.7	144	-0.79	446.388	67.083	83.38	1.18	265.586819	16.1422	21.4	1.31	28.1
427	483		3164.8	227.38	273		2093.22735	122.7	160		1420.31	67.083	98.66		997.1841289	16.1422	27.9		138
444	457		159.1	239.78	250		101.2229721	131.3	139		59.9627	73.117	78.79		32.1666299	17.9709	19.6		2.75
444	472		762.98	239.78	263		529.8979261	131.3	150		357.4	73.117	88.39		233.2453858	17.9709	23.2		27.4
444	461		261.06	239.78	253		184.1695605	131.3	142		120.467	73.117	81.56		71.30246266	17.9709	20.6		6.68
444	475		909.42	239.78	266		707.2925982	131.3	155		549.459	73.117	93.88		431.2533103	17.9709	26		65.2
444	489		1961.8	239.78	279		1531.312464	131.3	166		1202.38	73.117	104		956.5213936	17.9709	30.1		146
444	451		38.046	239.78	246		43.67842024	131.3	137		35.7541	73.117	77.81		22.02200472	17.9709	19.2		1.63
457	481		578.54	249.01	276		457.4049502	138.1	157		371.925	78.008	95.71		313.4697663	19.5169	26.7		52.2
457	478		450.46	249.01	268		360.8806669	138.1	155		291.577	78.008	93.5		240.0110218	19.5169	25.7		38.4
457	481		590.69	249.01	271		467.7516017	138.1	157		375.701	78.008	95.58		308.8995325	19.5169	26.6		49.5
467	469		7.0032	256.2	262		28.44331713	143.5	150		43.7189	82.096	89.16		49.85527667	20.8562	23.9		9.38
467	467		0.2722	256.2	260		12.69700589	143.5	148		25.0209	82.096	87.48		29.00173682	20.8562	23		4.77
474	466		64.688	261.96	258		18.56980783	148	146		5.24192	85.59	84.16		2.050326058	22.0376	21.4		0.37
474	451		538.75	261.96	247		235.2583805	148	137		111.333	85.59	77.68		62.5646282	22.0376	19.1		8.84
480	495		235.04	266.71	283		263.4644179	151.8	169		282.801	88.629	105.9		297.3986447	23.0943	30.8		58.7
489	501		144.36	274.08	286		140.6615225	157.9	169		133.915	93.703	104.9		124.9159347	24.9229	29.6		21.5
489	470		365.22	274.08	261		166.4254972	157.9	149		75.1295	93.703	87.84		34.34323988	24.9229	23.1		3.21
489	499		108.05	274.08	286		141.8790469	157.9	171		167.314	93.703	107.4		187.5303213	24.9229	31.2		38.9
495	526		941.05	279.57	307		748.183297	162.6	188		625.473	97.816	121.2		548.8771432	26.469	36.2		95.3
495	493		5.7129	279.57	280		0.209580534	162.6	165		7.37399	97.816	102.4		21.41802401	26.469	29.2		7.73
498	495		8.4606	281.83	281		1.070290237	164.7	165		0.05833	99.607	100.6		1.085293039	27.161	27.8		0.38
498	444		2922.1	281.83	240		1735.837268	164.7	131		1101.75	99.607	72.07		758.0807191	27.161	16.7		108
498	466		991.05	281.83	258		580.9978805	164.7	146		347.456	99.607	85.04		212.2484516	27.161	22.2		25
500	433		4471.7	283.84	231		2777.444325	166.5	123		1850.3	101.25	64.68		1337.272188	27.8083	13.7		200
500	472		809.03	283.84	263		415.2351732	166.5	152		213.74	101.25	90.74		110.63205	27.8083	24.5		11
502	484		340.33	285.65	273		162.5526237	168.1	160		73.5259	102.78	97.28		30.18894217	28.4163	27		1.96
502	493		73.726	285.65	281		21.86962583	168.1	166		3.32532	102.78	103.1		0.105370826	28.4163	29.3		0.76
504	490		179.46	287.27	279		61.89777191	169.6	166		13.0679	104.19	104		0.025890875	28.9896	30.2		1.55
504	488		235.64	287.27	276		122.4915161	169.6	162		59.3173	104.19	99.25		24.37291432	28.9896	27.9		1.2
504	472		982.03	287.27	264		549.6337008	169.6	152		320.095	104.19	90.21		195.5535373	28.9896	24.1		24
505	502		8.6244	288.75	289		0.021784569	171	174		7.37673	105.51	110.5		25.33624653	29.5319	32.7		10.1
505	462		1865.2	288.75	256		1083.326611	171	145		664.919	105.51	84.64		435.7213665	29.5319	21.9		58.3
507	499		57.399	290.09	285		21.24410978	172.3	170		5.41383	106.75	106.3		0.223660313	30.0464	30.5		0.25
507	478		797.5	290.09	269		432.2156394	172.3	157		235.88	106.75	95.47		127.1579723	30.0464	26.5		12.3
508	500		56.003	291.33	287		15.6777093	173.5	172		1.64304	107.91	108.7		0.69166885	30.5357	31.7		1.24
510	486		571.37	293.51	282		324.2055469	175.7	162		177.256	110.04	100.6		89.1822873	31.4481	28.8		7.01
510	461		2447.2	293.51	254		1523.612374	175.7	144		979.771	110.04	84.54		649.9732349	31.4481	22.3		83.7
510	465		2011.4	293.51	258		1231.126904	175.7	148		775.077	110.04	87.67		500.4034542	31.4481	23.6		62.2
511	517		33.051	294.48	300		35.98052331	176.7	184		47.8334	111.01	119.4		70.89573132	31.875	36.5		21
512	487		601.31	295.38	277		337.2319469	177.6	164		189.046	111.94	101.8		102.5218381	32.2844	29.2		9.47
512	475		1391.4	295.38	266		853.8681517	177.6	154		546.922	111.94	92.79		366.988664	32.2844	25.3		49
512	494		322.51	295.38	282		182.6498404	177.6	168		100.761	111.94	104.7		52.41941928	32.2844	30.1		4.56
512	496		265.46	295.38	283		145.9065536	177.6	169		78.0656	111.94	105.7		39.22856363	32.2844	30.5		3.26
512	487		628.71	295.38	276		385.6109103	177.6	162		235.629	111.94	100.1		139.5793661	32.2844	28.5		14.3
513	500		173.76	296.22	285		118.7343706	178.4	169		86.0251	112.83	104.6		67.27929172	32.6778	29.4		11
513	504		82.444	296.22	290		37.56969121	178.4	175		12.7485	112.83	111.7		1.381542439	32.6778	33.2		0.3
513	517		13.915	296.22	302		31.43149477	178.4	186		52.352	112.83	121.7		78.8376011	32.6778	37.4		21.8
513	517		14.401	296.22	301		19.66987466	178.4	184		29.7693	112.83	119.7		46.8362489	32.6778	36.4		14.1
514	511		5.8607	297.01	296		1.537529371	179.2	179		0.01223	113.67	114.7		1.140653864	33.0563	34.1		1.09
514	508		36.96	297.01	293		16.9995249	179.2	177		4.97713	113.67	113.4		0.097954802	33.0563	33.8		0.57
514	508		46.094	297.74	291		42.78729038	180	174		38.2635	114.47	108.7		33.18269492	33.4211	31.1		5.26
515	486		826.63	298.44	275		562.9526739	180.7	161		391.42	115.24	98.64		275.5015019	33.773	27.7		36.6
516	510		30.165	299.09	295		15.12010704	181.4	179		6.45153	115.98	114.7		1.66372239	34.1131	34.1		0
516	504		122.69	299.09	289		109.3219754	181.4	172		97.8338	115.98	106.6		88.01232358	34.1131	30.2		15
516	506		93.174	299.7	292		63.07182221	182.1	176		41.5665	116.69	111.6		25.40514388	34.4419	32.9		2.44
517	484		1069.2	300.28	275		621.3448541	182.7	164		360.607	117.36	103.1		203.2719199	34.7604	30.3		19.9
517	510		40.983	300.28	296		14.73173703	182.7	181		2.96129	117.36	117.6		0.05798257	34.7604	35.8		0.99
517	512		22.805	300.83	298		10.92200785	183.3	181		3.98556	118.02	117.3		0.56031564	35.069	35.3		0.05
518	489		812.32	301.35	277		582.5158189	183.9	163		427.537	118.64	100.8		318.7057332	35.3684	28.7		45
518	494		591.92	301.85	281		427.8601732	184.4	167		315.547	119.25	103.9		235.1011247	35.6592	29.9		32.9
519	486		1033.7	302.32	276		712.9054941	185	162		508.669	119.83	100.5		372.7535153	35.9417	28.7		52.3
519	519		0.8568	302.32	303		0.523946005	185	186		1.2748	119.83	121.9		4.199984034	35.9417	37.5		2.3

Box – Cox transformation raw data

0.25 · z	ẑ		s	0.5 · z	ẑ		s	0.75 · z	ẑ		s	1 · z	ẑ		s
13.32	41	54	768	7.04	30.1	43.3	531	3.74	24.1	38.4	415	2	21.4	37.3	378
13.32	25.7	4.8	152	7.04	12.6	5.53	31	3.74	2.99	6.74	0.57	2	-5.5	8.57	56
13.32	29.1	17	249	7.04	16.4	17.4	88.6	3.74	7.67	19.2	15.4	2	0.56	22.1	2.08
13.32	71.9	6.1	3429	7.04	66.5	7.24	3539	3.74	68.1	8.81	4137	2	75.5	10.9	5396
13.32	25.4	14	147	7.04	12.8	13.5	33.1	3.74	3.91	14	0.03	2	-3.3	15.1	28.2
17.45	44.9	2	752	9.61	34.1	2.11	598	5.34	28.3	2.4	529	3	26	3	528
20.87	62.2	11	1710	11.9	54	13.1	1770	6.85	52	16.3	2041	4	55.1	20.7	2616
20.87	29.5	4.9	73.8	11.9	17	7.13	26.5	6.85	8.42	9.83	2.46	4	1.48	13.3	6.33
20.87	44.8		571	11.9	33.8		481	6.85	28		446	4	25.6		466
23.81	25.9		4.49	13.9	14.4		0.26	8.28	7.18		1.21	5	2.15		8.1
23.81	33		83.6	13.9	20.3		41.1	8.28	12		13.8	5	5.88		0.77
23.81	27.2		11.6	13.9	14.6		0.42	8.28	5.73		6.5	5	-1.5		42.5
23.81	40.7		285	13.9	29.6		245	8.28	23.2		222	5	19.6		213
23.81	49.1		641	13.9	37.2		542	8.28	29.9		467	5	25.2		409
23.81	24.6		0.58	13.9	12		3.73	8.28	2.94		28.6	5	-4.8		96.6
26.4	42.5		258	15.8	31.9		258	9.66	26.4		280	6	24.2		332
26.4	39.8		180	15.8	28.8		168	9.66	22.6		167	6	19.4		180
26.4	41.7		233	15.8	30.6		219	9.66	24.5		221	6	21.5		240
28.73	35.6		46.7	17.6	24.2		43.3	11	17.4		41.3	7	13.5		42.3
28.73	32.8		16.6	17.6	20.1		6.52	11	11.3		0.13	7	4.27		7.44
30.85	28.8		4.11	19.2	16		10.5	12.3	7.2		25.7	8	0.36		58.4
30.85	23.8		49.9	19.2	10.7		72	12.3	1.06		126	8	-7.6		242
32.8	50.9		328	20.8	39.5		350	13.5	33.1		384	9	29.9		436
36.29	46.3		101	23.7	32.9		85.2	15.9	24.1		66.2	11	17.6		43.8
36.29	33		10.7	23.7	20.5		10.2	15.9	12		15.4	11	5.39		31.4
36.29	51.4		227	23.7	39.7		255	15.9	33.1		297	11	30		362
39.37	61.5		488	26.4	48.6		497	18.2	41.4		535	13	37.8		614
39.37	47.6		67.9	26.4	36.7		107	18.2	31.2		169	13	29.6		275
40.79	42.2		1.99	27.6	28.6		0.88	19.4	19.3		0.01	14	12.1		3.62
40.79	18.7		488	27.6	5.94		470	19.4	-3.3		514	14	-11		638
40.79	31.5		85.6	27.6	20		57.4	19.4	13		40.7	14	8.38		31.5
42.14	11.6		935	28.8	-1.5		922	20.5	-11		1021	15	-21		1266
42.14	36.4		32.9	28.8	24.2		21.6	20.5	16.1		18.8	15	10.1		23.8
43.43	41.8		2.54	30	29.5		0.25	21.5	21.6		0.01	16	16.1		0.01
43.43	46.8		11.6	30	34.7		21.6	21.5	27.4		34.2	16	23.1		51
44.66	50.4		33.4	31.2	40		78.9	22.6	35.2		157	17	34.2		295
44.66	44.4		0.06	31.2	33.3		4.46	22.6	27.4		23	17	25.1		65.5
44.66	35.2		89.4	31.2	22.8		70.1	22.6	14.7		62.9	17	8.88		65.9
45.84	55.7		96.5	32.3	45.1		163	23.7	40.2		273	18	39.5		462
45.84	30.3		241	32.3	17.8		211	23.7	9.2		209	18	2.57		238
46.97	49.7		7.17	33.4	37.6		18.3	24.7	30.8		37.3	19	27.4		69.9
46.97	41.6		29.2	33.4	30.4		8.94	24.7	24.1		0.33	19	21.1		4.42
48.07	52.1		16.4	34.4	39.8		28.5	25.8	32.3		42.3	20	27.5		56.6
50.14	47.1		9.11	36.5	36.5		0	27.8	31		10.6	22	29		48.7
50.14	32.5		312	36.5	21.5		224	27.8	15		164	22	10.9		123
50.14	35.3		220	36.5	24.3		148	27.8	17.9		98.5	22	14		63.5
51.13	64.5		180	37.5	54.8		300	28.8	51.4		512	23	53		901
52.09	47.8		18.6	38.4	36.9		2.32	29.8	31.3		2.53	24	29.4		28.9
52.09	38.1		196	38.4	25.7		162	29.8	17.6		148	24	11.5		156
52.09	49.2		8.52	38.4	37.3		1.3	29.8	30.3		0.26	24	26.1		4.42
52.09	49.7		5.67	38.4	37.6		0.7	29.8	30.3		0.29	24	25.8		3.15
52.09	46.3		33.3	38.4	35.7		7.33	29.8	30.5		0.62	24	29.1		26.1
53.02	45.4		57.8	39.4	31.2		67.2	30.7	21.1		92.2	25	12.9		147
53.02	57		15.8	39.4	46.6		52.3	30.7	42.1		129	25	41.9		285
53.02	66.1		172	39.4	55.6		262	30.7	51.1		415	25	51.2		684
53.02	64		120	39.4	53.3		194	30.7	48.6		319	25	48.1		534
53.92	57.9		16	40.3	46.4		36.5	31.7	40.4		76.3	26	38.4		154
53.92	58		16.4	40.3	47.1		46	31.7	41.9		103	26	40.5		211
54.79	50.1		22.4	41.2	37.1		16.9	32.7	29.3		11.2	27	24.6		5.63
55.65	44.1		134	42.1	32.8		87.5	33.6	26.5		50.9	28	23.2		22.6
56.48	57.9		2.03	43	46.2		9.94	34.5	39.9		28.7	29	37.3		68.8
56.48	48		72.1	43	35		65.1	34.5	26.9		58.3	29	21.9		50.9
57.29	55.3		3.91	43.9	43.9		0	35.5	38		6.38	30	36		35.6
58.09	51.4		45.1	44.8	41.5		10.8	36.4	36.6		0.06	31	35.1		16.9
58.09	62.8		22.1	44.8	52.5		59.8	36.4	48.2		139	31	48.4		302
58.86	60.8		3.69	45.6	49.1		12.4	37.3	42.8		30	32	39.9		62.8
59.62	46.4		176	46.4	35.3		124	38.2	29.3		79.1	33	26.7		39.8
60.36	49.2		125	47.2	38.1		83.9	39.1	32.2		47.6	34	29.8		17.6
61.08	46.7		206	48.1	35.9		148	40	30.1		98.8	35	27.6		54.5
61.08	66.6		30.8	48.1	56.5		70.7	40	52.4		153	35	52.9		321

The following is the root transformation regression results:

Regression Analysis

Multiple R	0.797
R Square	0.635
Adjusted R Square	0.608
Standard Error	1.728
Observations	102

ANOVA

	Df	SS	MS	F	Significance F
Regression	7	487.960	69.709	2.334E+01	4.539E-18
Residual	94	280.725	2.986		
Total	101	768.685			

	β	Std Error	T Stat	P-value	Lower 95%	Upper 95%	Lower 90.0%	Upper 90.0%
Intercept	5.845	0.222	26.378	3.123E-45	5.405	6.285	5.477	6.213
JUN	0.707	0.183	3.855	2.114E-04	0.343	1.071	0.402	1.011
ACC	1.621	0.395	4.106	8.573E-05	0.837	2.405	0.965	2.277
ORG	1.225	0.223	5.505	3.183E-07	0.783	1.667	0.856	1.595
LOC	1.071	0.244	4.388	2.992E-05	0.586	1.555	0.665	1.476
ORG × COM	-1.135	0.485	-2.338	2.152E-02	-2.098	-0.171	-1.941	-0.328
ORG × LOC	0.388	0.261	1.484	1.412E-01	-0.131	0.907	-0.046	0.822
LOC × COM	1.731	0.487	3.556	5.910E-04	0.765	2.697	0.922	2.539

Residual vs Predicted # of Applications
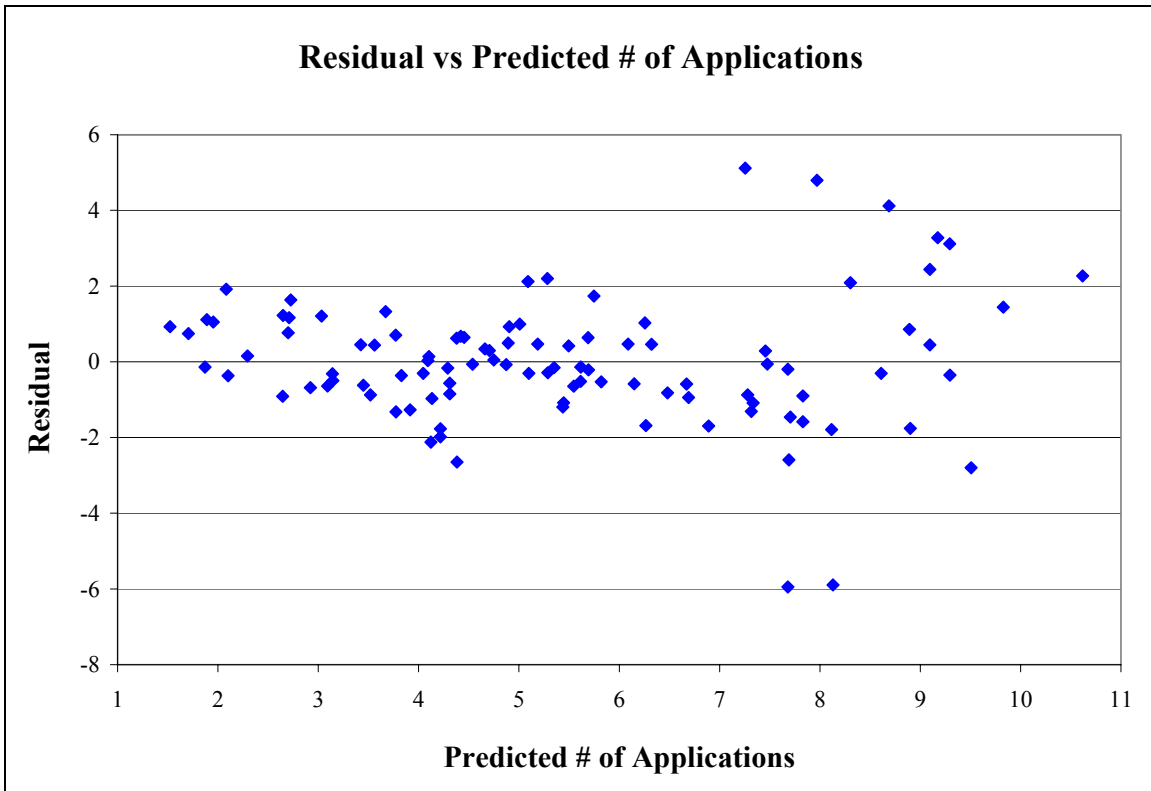
The following is the log transformation regression results:

Regression Analysis

Multiple R	0.782
R Square	0.611
Adjusted R Square	0.582
Standard Error	0.283
Observations	102

ANOVA

	Df	SS	MS	F	Significance F
Regression	7	11.819	1.688	2.108E+01	8.201E-17
Residual	94	7.530	0.080		
Total	101	19.349			

	β	Std Error	T Stat	P-value	Lower 95%	Upper 95%	Lower 90.0%	Upper 90.0%
Intercept	1.424	0.036	39.225	4.558E-60	1.351	1.496	1.363	1.484
JUN	0.107	0.030	3.553	5.982E-04	0.047	0.166	0.057	0.157
ACC	0.283	0.065	4.378	3.109E-05	0.155	0.411	0.176	0.390
ORG	0.183	0.036	5.010	2.551E-06	0.110	0.255	0.122	0.243
LOC	0.118	0.040	2.940	4.129E-03	0.038	0.197	0.051	0.184
ORG × COM	-0.177	0.079	-2.232	2.801E-02	-0.335	-0.020	-0.309	-0.045
ORG × LOC	-0.008	0.043	-0.193	8.471E-01	-0.093	0.077	-0.079	0.063
LOC × COM	0.319	0.080	4.004	1.245E-04	0.161	0.477	0.187	0.452

Residual vs Predicted # of Applications (log y)
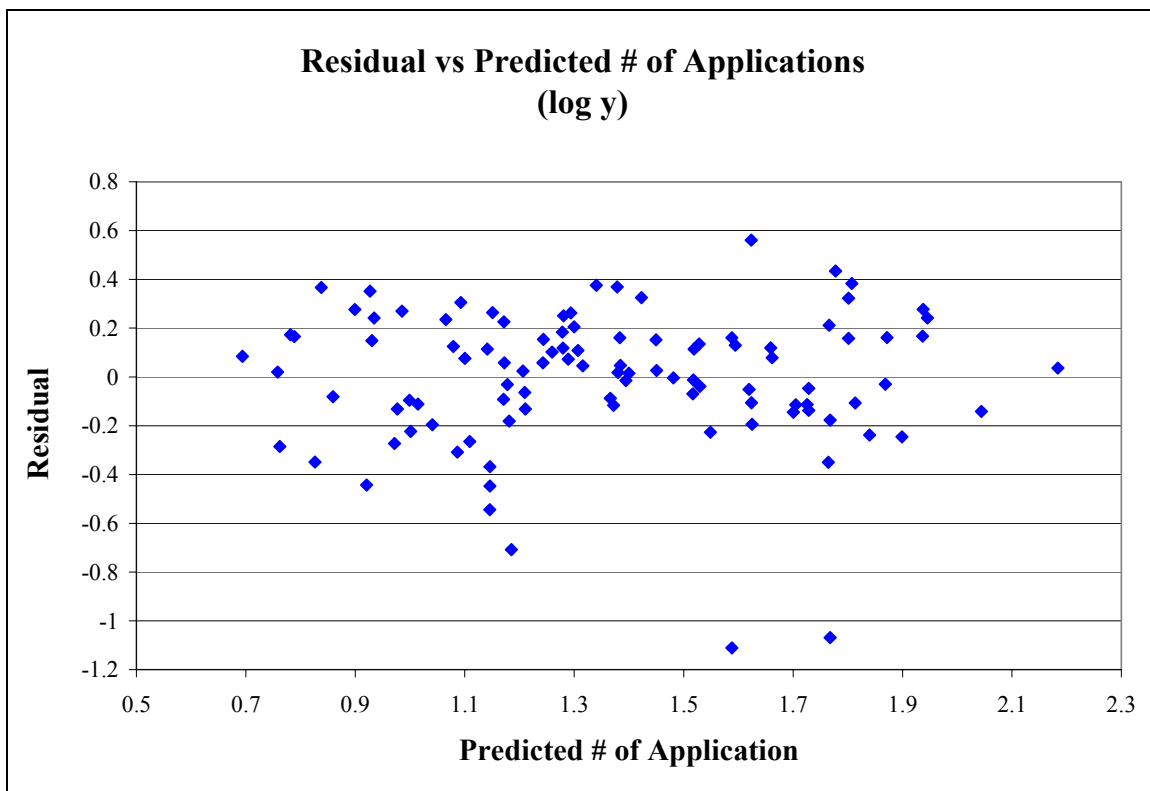
The log transformation possessed a better model-fit than the root transformation.

Two outcast points are removed from the model which resulted in the following plot:

Residual vs Predicted # of Applications (log y)
(removed two outcast)

Model Fit (log y)
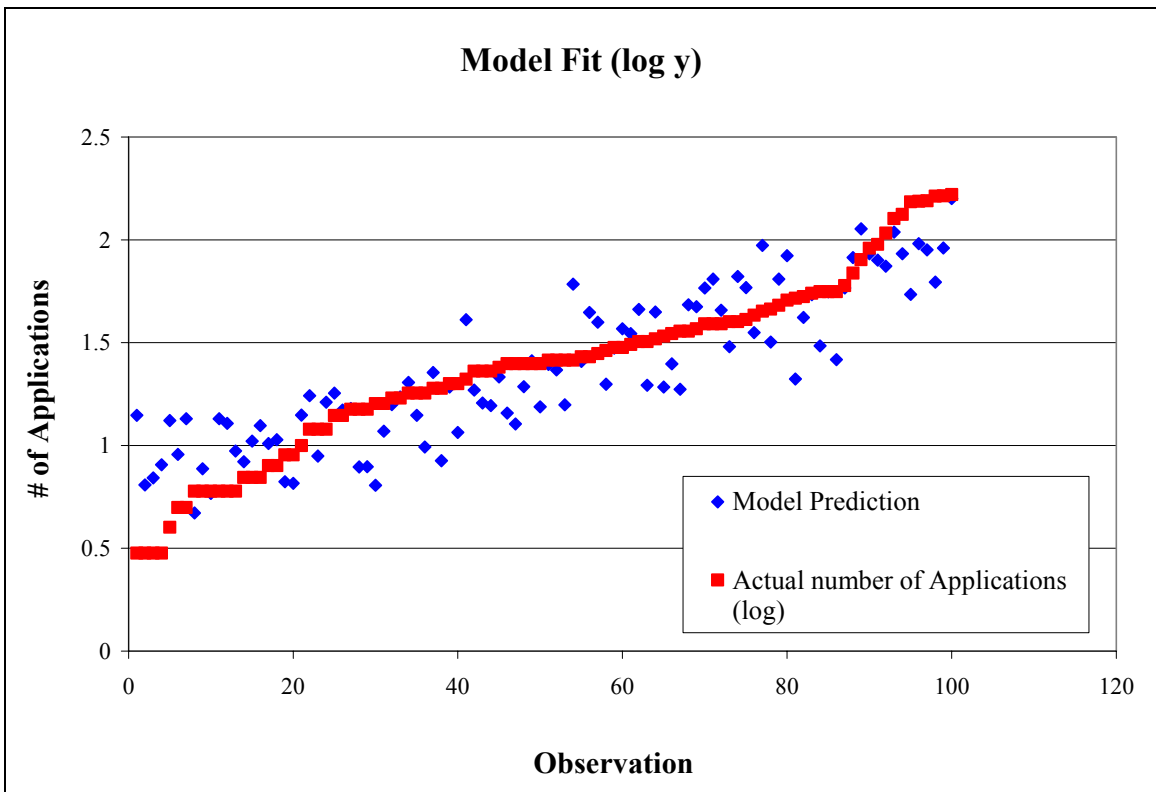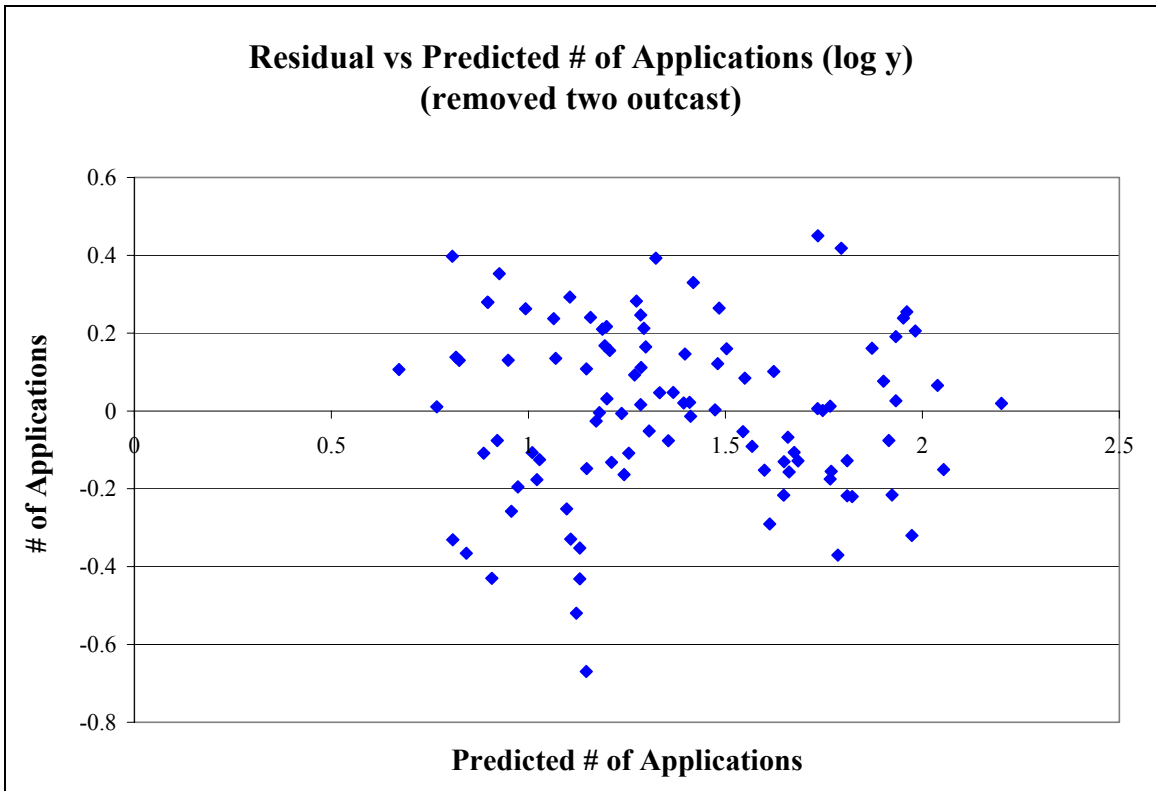
The model fit plot shows a good fit between the predicted number of applications to the actual number of applications. The regression results indicate that the significant terms are the same as the model without the box-cox transformation. This box-cox transformation analysis verifies that the significant terms detected from the original model (without the box-cox transformation) is conclusive. The significant factors are concluded to be: JUN, ACC, ORG, LOC, ORG × COM, and LOC × COM. The regression model is:

$$Y_i = \beta_0 + \beta_1 JUN_i + \beta_2 ACC_i + \beta_3 ORG_i + \beta_4 LOC_i + \beta_5 ORG_i COM_i + \beta_6 LOC_i COM_i + \varepsilon_i$$

Although the above six terms are concluded to be significant, Chapter 6 begins the discussion of the data analysis using the eleven significant terms which include JUN, ACC, ORG, LOC, ORG × COM, ORG × LOC, LOC × COM, COM, INT × SEN, and GRA. These ten terms were determined to be significant in the early stages of Appendix C.