

An Analysis of the Positive and Negative Factors Affecting Job Satisfaction Using Topic Modeling

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ABSTRACT

When a competent employee leaves an organization, the technical skills and know-how possessed by that employee also disappear, which may lead to various problems, such as a decrease in organizational morale and technology leakage. To address such problems, it is important to increase employees' job satisfaction. Due to the advancement of both information and communication technology and social media, many former and current employees share information regarding companies in which they have worked or for which they currently work via job portal websites. In this study, a web crawl was used to collect reviews and job satisfaction ratings written by all and incumbent employees working in nine industries from Job Planet, a Korean job portal site. According to this analysis, regardless of the industry in question, organizational culture, welfare support, work system, growth capability and relationships had significant positive effects on job satisfaction, while time and attendance management, performance management, and organizational flexibility had significant negative effects on job satisfaction. With respect to the path difference between former and current employees, time and attendance management and organizational flexibility have greater negative effects on job satisfaction for current employees than for former employees. On the other hand, organizational culture, work system, and relationships had greater positive effects for current employees than for former employees.

Keywords: Job Satisfaction, Employee Satisfaction, Human Resource Management, Topic Modeling, Path Analysis, Multigroup Analysis

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I . Introduction

Companies make great efforts to secure and manage human resources that offer various skills and knowledge as a means of maintaining their competitive advantage in a rapidly changing business environment (Beugelsdijk, 2008). When a competent employee leaves his or her job, not only does the know-how possessed by the employee disappear, the company's competitiveness is also weakened due to damage such as a decrease in organizational morale or technology leakage (Prajogo, 2019; Zamanan et al., 2020). However, ensure that talented employees maintain their current jobs is a difficult task for companies (Silaban and Syah, 2018). Some of the important factor that influence employee turnover are corporate and work factors, which consist of corporate culture and systems, corporate well-being and prospects, corporate size, salaries, promotions, relationships with colleagues, training, and employee engagement (Cui, 2003; Ling et al., 2005; Liu et al., 2006; Wang et al., 2001; Ye et al., 2005; Zhang et al., 2003). These company and work factors are essential for ensuring that companies are able to control themselves. Even if the size of a company is small, a good salary or positive well-being can affect turnover intention indirectly via job satisfaction. For example, according to Han and Cho (2014), salary, reward, job stability, job content, work environment, work time, the possibility of individual development, communication, relationship, and welfare affect turnover intention by impacting job satisfaction. In other words, job satisfaction is related to employee motivation, performance, and turnover intention, and so increasing employee job satisfaction is crucial to maintaining a company's competitive advantage (Koh and Boo, 2001).

Accordingly, many studies have identified factors

affecting job satisfaction using survey methods (Chiu and Francesco, 2003; Han and Jekel, 2011; Huang and Su, 2016; Tongchaiprasit and Ariyabuddhiphongs, 2016). However, the use of surveys is affected by the problem of social desirability bias. People do not want to reveal their opinions regarding companies in detail due to concerns that their answers to the survey contents may harm them (DeMaio, 1984). In addition, since only information regarding the variables set by the researcher can be collected and since the population must be inferred from a small number of samples, representation error may occur (Coughlan et al., 2009).

Recently, information sharing among users has been conducted actively online due to the advancement of information and communication technology and social media (Morosan and DeFranco, 2016). Accordingly, many former and current employees freely write reviews regarding the company's strengths and weaknesses on job search sites such as glassdoor.com and indeed.com in the US or saramin.co.kr, jobkorea.co.kr, and jobplanet.co.kr in Korea. Since such information is guaranteed to be anonymous, it is likely to represent honest and specific information provided by an employee who has worked for the company; accordingly, it can minimize the problem of social desirability bias (Evans and Mathur, 2018). As such, the job search site provides not only an honest evaluation of the company by current and former employees but also various other sorts of information such as company ratings, salaries by industry and job type, and interview questions; therefore, job seekers seek the necessary information from the company reviews provided by job search sites. In addition, according to previous studies, job seekers trust the reviews and ratings posted on job search sites by organization members who worked for the company more than information provided

directly by the company (Lakin, 2015).

Job search sites can facilitate the collection of vast amounts of both structured and unstructured data from current and former employees via web crawling. Accordingly, research using review data written by organizational members and collected via web crawling has been conducted with respect to job search sites (Dabirian et al., 2017; Green et al., 2019; Huang et al., 2015; Moro et al., 2021). However, although the factors related to job satisfaction differ between former and current employees and across industries, most previous studies have faced the limitation that they have analyzed job satisfaction factors only for employees working in specific industries. Therefore, in this study, to analyze the differences in job satisfaction between current and former employees by industry, the reviews of strengths and weaknesses, employment status (former employee vs. current employee), and job satisfaction ratings associated with companies in 9 industries were collected from Jobplanet, a job search site. Subsequently, topics were extracted using Latent Dirichlet Allocation (LDA) analysis of the reviews of strengths and weaknesses. Finally, the factors affecting the job satisfaction of current and former employees by industry were analyzed.

II. Research Background

2.1. Job Satisfaction

The definition of job satisfaction varies across previous studies. Alderfer (1968) defined job satisfaction as the degree to which the actual compensation exceeds the level that is recognized as justifiable. Osborn et al. (1972) defined job satisfaction as the degree to which an individual feels positively or negatively

disposed towards various job-related aspects such as job tasks, work conditions, and peer relationships. In addition, Locke (1976) defined this term as the pleasure and positive emotional state that result from one's job or work experience. Hunt et al. (2003) defined it as a passionate or passive attitude toward the business that is expressed in terms of social, environmental, and emotional responses. Combining these previous studies, job satisfaction can be defined as positive emotions and satisfaction related to an individual's job.

Job satisfaction is a significant factor in human resource management because it affects not only employee turnover intention but also company performance (Brough and Frame, 2004; Jalagat, 2016; Samad, 2006). Accordingly, various studies using corporate review data have been conducted to investigate job satisfaction. Huang et al. (2016) used more than 100,000 corporate reviews written on the job search site Glassdoor from 2008 to 2012 to identify the relationship between employee satisfaction and corporate value, with a particular focus on family businesses. Luo et al. (2016) identified the factors that employees consider to be important when evaluating employers by collecting reviews of the companies with the highest and lowest ratings on Glassdoor; a total of seven factors were derived using IBM Watson. Dabirian et al. (2017) collected reviews written by organizational members on Glassdoor and classified these reviews according to 9 job satisfaction factors and keywords that had been shown in previous studies to indicate the effect of job satisfaction on corporate performance. Jung and Suh (2019) revealed factors affecting job satisfaction via text mining of 204,629 reviews of 4,347 companies across 10 industries from 2014 to 2017. In addition, these authors measured the emotions associated with and the importance of each factor associated with job satisfaction

in the order of industry, company, group, and time.

Therefore, most previous studies using review data have identified job satisfaction factors by reference to corporate reviews of overseas job search sites. However, since the corporate environment differs across countries, the factors that affect employee job satisfaction also vary. Therefore, in this study, after collecting reviews written by former and current employees working in 9 industries on Jobplanet, a domestic job search site, text mining was conducted to extract topics and to explore the topics that affect job satisfaction.

2.2. Topic Modeling

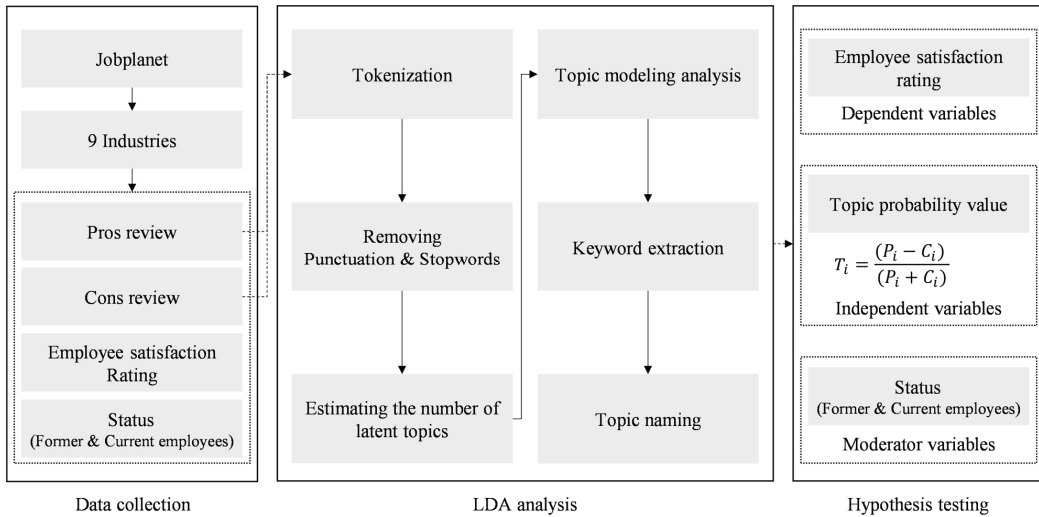
Topic modeling is a text mining technique, and the method most commonly used for such modeling is Latent Dirichlet allocation (LDA) (Jelodar et al., 2019). LDA is an unsupervised learning algorithm that finds hidden topics in a set of words or documents and groups similar topics together (Blei, 2012). Therefore, LDA is a method of extracting a topic from a corpus consisting of several documents. If LDA is used, the document's topic can be determined without prior information regarding the document. In addition, LDA is widely used to extract and analyze core topics from text documents in various fields, such as online shopping mall reviews, SNS posts, and news. Jia et al. (2018) compared and analyzed the topic keywords produced by LDA analysis concerning each review after collecting both real and fake customer reviews of restaurants on Yelp.com. Thereby, a model that can classify fake reviews was proposed. Yiran et al. (2019) applied LDA to iPhone reviews sold on Amazon.com to extract six topics and analyze users' preferences using subject-specific sentiment analysis. Mutanga and Abayomi (2022) collected articles related to COVID-19 on Twitter,

extracted 10 topics, and identified the impact of these topics on citizens' attitudes, perceptions, and economic activity. Sutherland and Kiatkawsin (2020) extracted 43 topics from Airbnb reviews using LDA analysis to understand the determinants of guests' experiences.

Therefore, following these previous studies, this study used corporate reviews written by former and current employees on Jobplanet to conduct topic modeling using LDA. Accordingly, the topics that affect job satisfaction are identified.

III. Method

The purpose of this study is to explore topics that affect job satisfaction drawn from Jobplanet's review data and to identify differences between current and former employees in terms of the topics that affect job satisfaction. The research procedure used to achieve this objective consists of the three steps of data collection, LDA analysis, and hypothesis testing, as shown in <Figure 1>. During the data collection stage, we collect positive and negative reviews and job satisfaction ratings written by former and current employees working 9 industries from the Jobplanet website using a web crawling technique. The collected review data undergo preprocessing, such as tokenizing sentences and removing meaningless words and stopwords. During the LDA analysis stage, the number of topics is estimated, keywords for each topic are derived, and topic names are identified. During the final stage, the relationship between the extracted review topic and job satisfaction and the difference in the job satisfaction factors associated with former and current employees are identified. In particular, multigroup analysis is conducted to analyze the differences in job sat-



<Figure 1> Research Framework

isfaction between former and current employees.

3.1. Data Collection

In the first step, information is collected from Jobplanet (<http://www.jobplanet.com>), as shown in <Figure 2> Jobplanet is the largest job search site in Korea, and it provides positive and negative reviews

and job satisfaction ratings for companies. This study collects job satisfaction ratings (on a 5-point scale), positive and negative reviews, and employment status (former employee vs. current employee) across 9 industries, including IT web communication, construction, education, media design, service, distribution, trade transport, banking, pharmaceutical medical welfare, and chemical manufacturing, from

<Figure 2> Data Collection Example

2014 to 2021.

3.2. LDA Process

During the second stage, after preprocessing the collected text for the purpose of this study, topic modeling is conducted using LDA analysis. During the text preprocessing stage, tokenization is performed, and special symbols, English characters, numbers, punctuation marks, and stopwords are removed. Furthermore, nouns, adjectives, and verbs with two or more letters are extracted from the review. Subsequently, the optimal number of topics for topic analysis is estimated by reference to the coherence score. Finally, topic names are assigned from the keywords derived for each topic.

3.3. Hypothesis Testing

During the third step, topics that affect job satisfaction are explored. In line with the study conducted by Jung and Suh (2019), this study uses the topic's sentiment score (T_i) by using the topic probability values of positive reviews (P_i) and the topic probability values of negative reviews (C_i) as independent variables in the LDA analysis. The topic's sentiment score is computed as shown in Equation (1).

$$T_i = \frac{(P_i - C_i)}{(P_i + C_i)} \quad (1)$$

In Equation (1), T_i indicates the sentiment of the i th topic with a value between -1 and 1. The value

of T_i indicates a positive sentiment when it is closer to 1 and a negative sentiment when it is closer to -1. In addition, P_i is the probability value of the i th positive review topic, and C_i is the probability value of the i th negative review topic. The sentiment score of the topic is used as an independent variable, employment status (former employees vs. current employees) is used as a moderator variable, job satisfaction ratings are taken to constitute a dependent variable, and path analysis and multigroup analysis are conducted.

IV. Results

4.1. Data Overview

We collected the job satisfaction ratings and reviews provided by former and current employees working in the 9 industries related to IT web communication, construction, education, media design, service, distribution, trade transport, banking, pharmaceutical, medical welfare, and chemical manufacturing from 2014 to 2021 on the job search site Jobplanet. In addition, these reviews are designed to indicate the company's positive and negative aspects. Therefore, to identify the topics that affect job satisfaction, we used only reviews that contained both positive and negative evaluations. The descriptive statistics of the datasets are summarized in <Table 1>. The number of reviews and ratings for former employees was 299,566 and 170,049 for current employees, for a total of 470,615 reviews and ratings.

<Table 1> Descriptive Statistics of the Datasets for 9 Industries

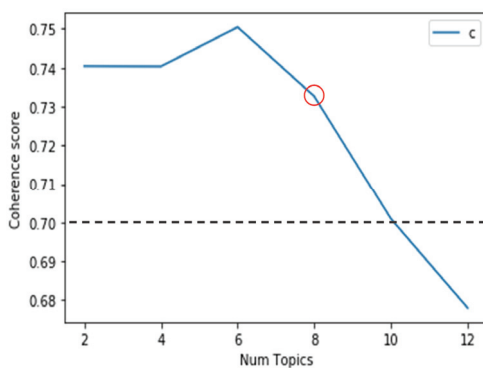
	Former Employee	Current Employee	Total
Rating & reviews	299,566	170,049	470,615

Accordingly, former employees write reviews more freely than current employees.

4.2. LDA Results

To conduct LDA analysis, the researcher must establish the number of topics in advance. In this study, the coherence score was used for this purpose. The coherence score is a metric used to measure a topic's consistency; as the value of this score increases, each topic calculated by LDA analysis is composed of more semantically similar words (Newman et al., 2010). In general, the number of relevant topics is significant when the coherence score is 0.7 or higher (Xu et al., 2018). In this study, we limited the number of topics to between 4 and 10 with a coherence score of 0.7 or more to determine the optimal number of topics, as shown in <Figure 3>. Therefore, we simulated numbers ranging from 4 to 10 sequentially. Subsequently, we selected the number of topics in which no keywords overlapped to the greatest extent possible. In this study, we relied on the intertopic distance map provided by the gensim library of Python and set the number of topics to 8.

<Table 2> shows 8 topics that were derived by conducting LDA analysis on positive and negative reviews collected from Jobplanet as well as 20 corresponding keywords. Subsequently, we gave these topics names that took into account previous studies and keywords related to the topic in question (Antoncic and Antoncic, 2011; Galup et al., 2008; Lund, 2003; Macky and Boxall, 2008; Spector, 1985). Topic 1 is composed of words that are related to the attendance control system and refers to work items such as the time that employees require to travel to and from work as well as their annual leave. Topic 2 is composed of words that are related to performance management and refers to the process by which organizational members exhibit the expected performance by making continuous effort. Topic 3 pertains to organizational culture and refers to the atmosphere or culture that is formed by the interactions among members. Topic 4 consists of words that are related to organizational flexibility, i.e., the degree to which corporate managers implement administrative rules that demonstrate the need to exert control over members and the degree to which these rules cause the behavior of executive members to be rigid. Topic 5 refers to situations



(a) Coherence Score by Number of Topics



(b) Intertopic Distance Map

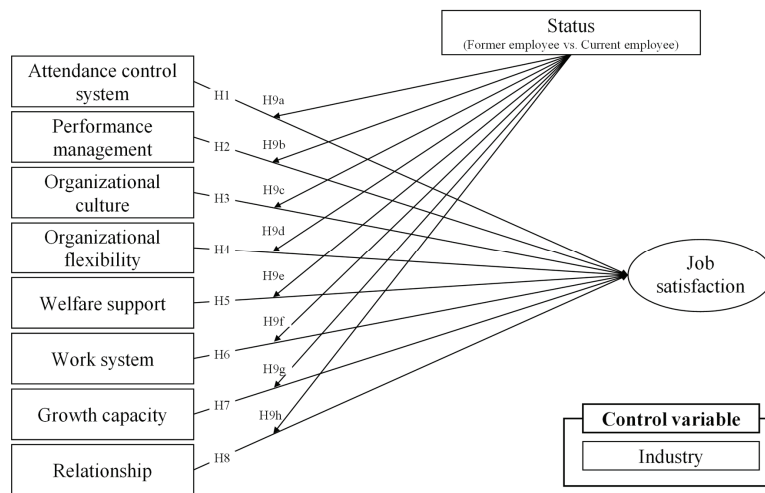
<Figure 3> Finding the Optimal Number of Topics

<Table 2> LDA Results

Topic 1. Attendance Control system	Topic 2. Performance Management	Topic 3. Organizational Culture	Topic 4. Organizational Flexibility	Topic 5. Welfare Support	Topic 6. Work System	Topic 7. Growth Capacity	Topic 8. Relationship
Hour	Annual income	Culture	Army	Welfare	Work	Resignation	Person
Overtime work	Work	Atmosphere	Management	Working	Hierarchy	Business	Executive
Leave work	Personnel	Department	Work	System	Department	Employee	Employee
Sense	Welfare	Salary	Monthly pay	Employee	System	Business	Contract
Go to work	Level	Work	Pay	Environment	Person	Future	Promotion
Job	Promotion	Company	Structure	Head office	Development	Development	Scene
Annual leave	Company	Person	Working	Location	Learn	Sales	Permanent
Weekend	Hierarchy	Verticality	Working time	Country	Factory	Person	Situation
Work	Evaluation	Organization	Unreasonable	Commute	Education	Personnel	Manager
Department	Employee	Employee	Area	Uncomfortable	New recruit	Performance	Stress
Produce	Salary	Efficiency	Occurrence	Salary	Process	Improvement	Overtime
Pay	Turnover	Night shift	Small businesses	Surroundings	Union	Pressure	Clerical position
Rest	Major company	Structure	New recruit	Long-term	Skill	Company	Engineer
Busy	Ability	Pressure	Report	Benefit	Business trip	Possibilities	Recruitment
Assistant manager	Responsibility	Condescending	Line	Office	Product	Growth	Joining a company
Meeting	Performance	Boss	Fit	Facility	Simple	Boss	Endure
Superiors	System	Dining together	Public enterprise	Seoul	Career	Human resource	Customer
Vacation	Scale	Office	Section chief	Event	Management	Chairman	Discrimination
Rotation	Position	Mind	Extra Work	Restaurant	Repetition	Staff	Limit
Person	Change	Young	Policy	Street	Job	Investment	Management

in which the company takes the lead in providing welfare support and material or mental services to its employees. Topic 6 is related to the work system and refers to the characteristics of work and processing methods used to maintain the consistency and quality of work. Topic 7 is related to growth capability and indicates the future development potential of a company. Topic 8 pertains to relationships and indicates effortless social relationships among organ-

izational members or customers or relationships formed in other contexts. Therefore, LDA analysis was conducted to investigate the positive and negative reviews written by current and former employees to derive a total of 8 factors: attendance control system, performance management, organizational culture, organizational flexibility, welfare support, work system, growth capability, and relationships.



<Figure 4> Research Model

V. Research Model and Hypothesis Development

The topics derived from the LDA analysis of the positive and negative reviews are used to understand the factors that affect job satisfaction and the differences between former and current employees. Therefore, the research model employed in this study is shown in <Figure 4>.

An attendance control system refers to work details such as hours and annual leave (Cheon and Park, 2010). Employees experience job stress due to excessive work and difficulties with time management, and the resulting job dissatisfaction ultimately affects employee turnover (Calitz et al., 2014). In other words, such long working hours increase work intensity, and this work intensity soon leads to job dissatisfaction of workers (Dong et al., 2021). On the other hand, the analysis found that a flexible working system, in which working hours can be adjusted freely, improves the company's productivity by increasing employees' satisfaction and degree of immersion in their jobs (Halpern, 2005; Posseriede

and Plantenga, 2014). Voluntary commutes and a flexible work system reduce employee fatigue and stress and improve job satisfaction (Almer and Kaplan, 2002). Therefore, to improve the job satisfaction of employees, a system that allows for the flexible adjustment of working hours is necessary. In particular, the analysis found that employees working at smaller companies prefer to work remotely or from home rather than in-house (Casuneanu et al., 2019). Therefore, in this study, the following hypothesis is proposed:

H1: The attendance control system has a significant effect on job satisfaction.

Performance management refers to the task of creating the results that organizational members expect by exerting continuous effort, such as by offering promotions and salary increases (Ammons, 1995). A company can improve the job satisfaction of its employees by using various performance management systems to share the excess resources obtained through organizational performance with employees

(Judge et al., 2001; Riketta, 2008; Wright et al., 2005). Employees' feelings regarding the fairness of these compensation systems or performance management procedures and their evaluations thereof affect job satisfaction (Demir et al., 2017; Lambert et al., 2020; Saadati et al., 2016). Therefore, it can be hypothesized that improving the fairness and extent of the performance management system may improve employees' job satisfaction.

H2: Performance management has a significant effect on job satisfaction.

Organizational culture refers to the atmosphere and culture that are formed by interactions among employees (Denison, 1992). When the organizational atmosphere is flexible and communication is smooth, the job satisfaction of the corporate members is high (Belias and Koustelios, 2014; Tsai, 2011). On the other hand, when a competitive atmosphere is created, employees' job satisfaction decreases (Bellou, 2010). In addition, the lower the degree of connection between the organizational culture preferred by the individual employee and the current organizational culture, the higher the employee's levels of job dissatisfaction and burnout (Belias and Koustelios, 2014). Therefore, the influence of organizational culture on job satisfaction may differ depending on the type of corporate culture (Schein, 2010). Therefore, in this study, the following hypothesis is proposed:

H3: Organizational culture has a significant effect on job satisfaction.

Organizational flexibility refers to the degree to which organizational managers establish organizational rules that are in accordance with the need to exert control over their members and the degree

to which these rules cause the behavior of organizational members to become rigid (Jeffrey Hill et al., 2008). A rigid organizational structure in which the organization is authoritative, and compliance is enforced by organizational rules reduces employee job satisfaction (Oldham and Hackman, 1981; Zeitz, 1984). On the other hand, participatory decision-making by employees and the delegation of authority to the employees improves their job satisfaction (Miller and Monge, 1986; Thomas and Dunkerley, 1999). Therefore, in this study, the following hypothesis is proposed:

H4: Organizational flexibility has a significant effect on job satisfaction.

Welfare support indicates that a company provides its employees with financial or psychological services (Watkins, 1950). The higher the employees' level of satisfaction with welfare support, the higher their overall satisfaction with their compensation. This situation causes the employees to have positive perceptions of their jobs (Baughman et al., 2003). In addition, it has been found that the turnover rate of employees who are satisfied with the welfare benefits provided by their companies is low (Rusbult and Farrell, 1983), and the more diverse types of welfare systems are offered, the higher employees' job satisfaction (Uppal, 2005). Therefore, in this study, the following hypothesis is proposed:

H5: Welfare support has a significant effect on job satisfaction.

The work system refers to work characteristics and processing methods that are used to maintain work consistency and quality (Curtis et al., 1992). Depending on the job characteristics, this factor can

improve employees' job satisfaction and performance (Sims Jr et al., 1976). According to Djamilah and Surenggono (2021), job characteristics positively affect job satisfaction, i.e., job satisfaction improves when employees have high levels of satisfaction with their work. The system and characteristics associated with these tasks account for the most significant percentage of job satisfaction (Chao, 2008). However, if the level of work is excessive, this situation causes job ambiguity, thus decreasing the job satisfaction of employees (Bedeian et al., 1991). Therefore, in this study, the following hypothesis is proposed:

H6: The work system has a significant effect on job satisfaction.

Growth capability refers to the future development potential of a company (Kazanjian and Drazin, 1989). Previous studies have shown that corporate development and sustainability have positive effects on organizational trust (Penrose, 2009). Trust in such an organization can ensure the company's stable operation and increase employee satisfaction (Tan and Tan, 2000). In addition, organizational trust creates a sense of unity within the organization and has a positive effect on reducing employee turnover (Hansen et al., 2011). Therefore, in this study, the following hypothesis is proposed:

H7: Growth capability has a significant effect on job satisfaction.

A relationship refers to an amicable social relationship between employees or the relationship that would otherwise form (Griffeth et al., 2000; Price and Mueller, 1986). According to Roethlisberger and Dickson (2003), when employees' attitudes toward their treatment by their bosses are favorable, employ-

ees' job satisfaction, conscientiousness, and loyalty increase. In addition, the smoother the relationships among colleagues are, the better employees' efficacy and job satisfaction (Bernarto et al., 2020; Jung and Shin, 2015; Raziq and Maulabakhsh, 2015). In an organization in which coworkers do not have amicable relationships, employees' job dissatisfaction may increase, and conflicts among coworkers may emerge (Haynie and Shepherd, 2011; Opsahl et al., 2016; Park et al., 2016). Therefore, in this study, the following hypothesis is proposed:

H8: Relationships have a significant effect on job satisfaction.

An employee who has been a member of an organization and provided with a monetary reward but who has subsequently quit his or her role as a member of the organization can be defined as an ex-employee (Mobley et al., 1979). This process entails quitting one's current job or job or moving to a different job. Previous research has focused mainly on employee turnover intentions (Hess, 2012; Khapova et al., 2007; Lim and Parker, 2020; McGinley and Martinez, 2018). However, although employee turnover intentions can predict actual turnover behavior, these intentions often do not translate into actual conduct (Ajzen, 1991). Therefore, it is difficult to view intention and behavior as the same since the intention to change does not necessarily lead to turnover. Therefore, in this study, the following hypotheses are proposed:

H9a: The effect of attendance control system factors on job satisfaction varies depending on employment status (former employee vs. current employee).

H9b: The effect of performance management factors

on job satisfaction varies depending on employment status (former employee vs. current employee).

H9c: The effect of organizational culture factors on job satisfaction varies depending on employment status (former employee vs. current employee).

H9d: The effect of organizational flexibility factors on job satisfaction varies depending on employment status (former employee vs. current employee).

H9e: The effect of welfare support factors on job satisfaction varies depending on employment status (former employee vs. current employee).

H9f: The effect of work system factors on job satisfaction varies depending on employment status (former employee vs. current employee).

H9g: The effect of growth capability factors on job satisfaction varies depending on employment status (former employee vs. current employee).

H9h: The effect of relational factors on job satisfaction varies depending on employment status (former employee vs. current employee).

VI. Hypothesis Testing

6.1. All Industries

This study conducted path analysis to explore the factors affecting job satisfaction, and the analysis results for all industries controlled by industry are shown in <Table 3>. Organizational culture ($\beta = 0.009$, $p < 0.001$), welfare support ($\beta = 0.038$, p

<Table 3> Path Analysis Result for Job Satisfaction (All Industries)

Path	B	β	S.E.
ref.: IT web communication			
Construction → Job satisfaction	-0.017*	-0.003*	0.008
Education → Job satisfaction	-0.195***	-0.039***	0.008
Media design → Job satisfaction	-0.147***	-0.036***	0.007
Service → Job Satisfaction	-0.125***	-0.036***	0.006
Trade transport → Job satisfaction	-0.088***	-0.027***	0.006
Banking → Job satisfaction	0.180***	0.044***	0.007
Pharmaceutical medical welfare → Job satisfaction	-0.193***	-0.044***	0.007
Manufacturing chemistry → Job satisfaction	0.063***	0.024***	0.005
Attendance control system → Job satisfaction	-0.181***	-0.098***	0.003
Performance management → Job satisfaction	-0.034***	-0.018***	0.003
Organizational culture → Job satisfaction	0.016***	0.009***	0.003
Organizational flexibility → Job satisfaction	-0.020***	-0.011***	0.003
Welfare support → Job satisfaction	0.067***	0.038***	0.003
Work system → Job satisfaction	0.023***	0.013***	0.003
Growth capacity → Job satisfaction	0.091***	0.053***	0.003
Relationship → Job satisfaction	0.037***	0.021***	0.003

Note: *** $p < 0.001$, * $p < 0.05$

< 0.001), work system ($\beta = 0.013, p < 0.001$), growth capacity ($\beta = 0.053, p < 0.001$) and relationships ($\beta = 0.021, p < 0.001$) had significant positive effects on job satisfaction, whereas attendance control system ($\beta = -0.098, p < 0.001$), performance management ($\beta = -0.018, p < 0.001$) and organizational flexibility ($\beta = -0.011, p < 0.001$) had significant negative effects on job satisfaction. Therefore, H1, H2, H3, H4, H5, H6, H7 and H8 were accepted.

<Table 4> shows the results of the examination of differences according to employment status. For both former and current employees, welfare support (former employees: $\beta = 0.038, p < 0.001$, current employees: $\beta = 0.039, p < 0.001$), work system (former employees: $\beta = 0.011, p < 0.001$, current employees:

$\beta = 0.018, p < 0.001$), growth capacity (former employee: $\beta = 0.057, p < 0.001$, current employee: $\beta = 0.037, p < 0.001$) and relationships (former employee: $\beta = 0.019, p < 0.001$, current employee: $\beta = 0.28, p < 0.001$) were found to have positive effects on job satisfaction. On the other hand, attendance control system (former employees: $\beta = -0.093, p < 0.001$, current employees: $\beta = -0.102, p < 0.001$), performance management (former employees: $\beta = -0.017, p < 0.001$, current employees: $\beta = -0.022$), $p < 0.001$) and organizational flexibility (former employees: $\beta = -0.005, p < 0.001$, current employees: $\beta = -0.020, p < 0.001$) had negative effects on job satisfaction. In addition, organizational culture ($\beta = 0.019, p < 0.001$) showed that had a significant

<Table 4> Results of Multi-group Path Analysis for Job Satisfaction (All Industries)

Path	Former Employee			Current Employee			Critical Ratios for differences
	B	β	S.E.	B	β	S.E.	
ref.: IT web communication							
Construction → Job satisfaction	-0.033**	-0.006**	0.011	0.006	0.001	0.013	-2.292*
Education → Job satisfaction	-0.217***	-0.046***	0.010	-0.002	0.000	0.015	-12.005***
Media design → Job satisfaction	-0.116***	-0.031***	0.008	-0.081***	-0.017***	0.013	-2.343*
Service → Job Satisfaction	-0.046***	-0.014***	0.008	-0.194***	-0.047***	0.012	10.657***
Trade transport → Job satisfaction	-0.037***	-0.012***	0.007	-0.128***	-0.038***	0.010	7.251***
Banking → Job satisfaction	0.194***	0.047***	0.009	0.174***	0.043***	0.011	1.377
Pharmaceutical medical welfare → Job satisfaction	-0.217***	-0.048***	0.01	-0.151***	-0.036***	0.012	-4.382***
Manufacturing chemistry → Job satisfaction	0.123***	0.044***	0.007	-0.040***	-0.016***	0.008	15.179***
Attendance control system → Job satisfaction	-0.170***	-0.093***	0.003	-0.186***	-0.102***	0.004	2.992**
Performance management → Job satisfaction	-0.032***	-0.017***	0.003	-0.04***	-0.022***	0.004	1.372
Organizational culture → Job satisfaction	0.001	0.001	0.003	0.034***	0.019***	0.004	-5.939***
Organizational flexibility → Job satisfaction	-0.009*	-0.005*	0.003	-0.038***	-0.020***	0.004	5.133***
Welfare support → Job satisfaction	0.067***	0.038***	0.003	0.067***	0.039***	0.004	-0.055
Work system → Job satisfaction	0.020***	0.011***	0.003	0.032***	0.018***	0.005	-2.082*
Growth capacity → Job satisfaction	0.097***	0.057***	0.003	0.063***	0.037***	0.004	5.935***
Relationship → Job satisfaction	0.034***	0.019***	0.003	0.050***	0.028***	0.005	-2.675**

Note: *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

positive effect on job satisfaction only for current employees.

As a result of examining the path difference between former and current employees, all factors with the exceptions of performance management and welfare support were significant. In other words, with respect to the difference in paths between former and current employees, attendance control system and organizational flexibility had more significant negative effects on job satisfaction for current employees than for former employees. Growth capacity had a more significant effect on job satisfaction for the group of all employees than for the group of current employees. This effect was positive. On the other hand, organizational culture, work system, and relationships had more significant positive effects for current employees than for former employees. Therefore, H9-1, H9-3, H9-4, H9-6, H9-7 and H9-8 were accepted.

To understand the reason for these results, we examine the reviews of strengths and weaknesses regarding each topic in the industry as follows. First, the contents of the reviews of the merits of the attendance control system mainly focus on the lack of fixed working hours, the possibility of voluntary commuting, and the free use of annual leave. The ease of commuting can be ensured by providing a shuttle bus for commuters. On the other hand, according to the contents of the review, the time to leave work was not observed correctly due to the necessity of quick meals or breaks as well as many night shifts. In addition, employees feel dissatisfied with the inconvenience of commuting to and from work due to insufficient transportation facilities near the company.

Second, regarding the contents of the reviews pertaining to the merits of performance management, the reviews focused on steadily rising salaries or high-

er pay than other companies. In addition, a lack of discrimination against women, the provision of equal opportunities for promotion, and the fairness of the personnel evaluation system are relevant factors. On the other hand, the contents of the negative reviews focus on personnel evaluation systems that are largely irrational and low salaries compared to the amount and intensity of work. In addition, looking at the reviews, The salary is high, however it can be observed that the workload is correspondingly heavy or the intensity is high. Therefore, as the salary is higher, the workload also increases, and this increase in workload can cause workers to feel burdened. This burden can be said to cause job dissatisfaction among workers. However, these results do not have sufficient theoretical background, so they need to be examined in depth in future research.

Third, with respect to the contents of the reviews that highlighted the merits of the organizational culture, the reviews focused on atmospheres that were more accessible than those of other companies and satisfaction with the fact that the companies do not care about the views of others. Finally, negative reviews included content such as the necessity of considering the boss's attention due to a conservative atmosphere and being forced to participate in dinner parties.

Fourth, considering the contents of the positive reviews of organizational flexibility, relevant factors included the ability to express one's opinions freely and evident respect for employees' opinions from representatives or management. In addition, according to positive reviews, the hierarchy is not strict and seems to be considerate of new employees. In the negative reviews, a hierarchical order is clear, which establishes a rigid organizational system that prioritizes authority. In addition, due to unreasonable behavior such as forced overtime or instructions to

work after commuting hours, members of the organization voluntarily decide to leave the company, which causes the organization to become rigid.

Fifth, regarding the contents of the reviews concerning the merits of welfare support, these reviews focused on high salaries and benefits compared to the industry in general or to other companies with respect to various welfare facilities and benefits; the data mainly included positive perceptions of the welfare system. On the other hand, in the negative reviews, the focus is on the lack of many or diverse welfare benefits for members of the organization.

Sixth, regarding the positive reviews of the work system, although each department of the company exhibits certain differences, the process is defined clearly so that the organization's members can systematically perform their work. In this context, it can be seen that the process is systematic, so that new employees can also perform their tasks skillfully. In addition, the existence of many opportunities to encounter various tasks is confirmed, and the pressure of work is less than that encountered in other companies or in the industry in general. According to the contents of the negative reviews, the process used to complete work changes frequently or responsibility is avoided in many cases. In addition, in this context, it is evident that there is a shortage of the workforce necessary to perform the work, and many people feel stressed or resign voluntarily due to work pressure and workload.

Seventh, considering the contents of the reviews concerning the merits of growth capacity, these reviews focus on the stable operation of the company and its high potential for development. In addition, sales performance is stable, there is no pressure to perform, and there is a high degree of willingness to make efforts to improve the areas that are lacking in the company's development. On the other hand,

the main content of the negative reviews focus on situations in which a company is in the red or sales are small compared to other companies, severe sales pressure, and unnecessary meetings. In addition, companies that receive such reviews are conservative and do not reflect employees' opinions for improvement, which seems to hinder the growth or development of the company.

Eighth, with respect to the contents of the reviews concerning the merits of relationships, these reviews focus on the efforts that are made to motivate the employees, the generally low age of the organization's members, and the development of a cooperative atmosphere. In addition, in this context, there are many opportunities for accessible communication with superiors and to establish close and straightforward relationships among members of the organization. According to the negative reviews, communication is not conducted smoothly because the boss or management is authoritative and does not value the opinions of the organization's members. In addition, in this context, hierarchical relationships are strict, and it talented members of the organization exhibit high turnover intentions.

6.2. Individual Industry

<Table 5> shows the path analysis results concerning job satisfaction in individual industries. First, we found the attendance control system to have a negative effect on job satisfaction across all 9 industries. Overall, the organization's members feel dissatisfied with the attendance control systems and methods currently implemented by the company. In other words, these results can be interpreted as indicating that satisfaction with the attendance control system is not sufficient. Considering the overall contents of these reviews, the contents mainly pertain

to the accessibility of transportation facilities near the company, working hours, and annual leave usage. Voluntary commuting and working hours have a positive effect on the job satisfaction of organizational members (Halpern, 2005). Transportation facilities and means are closely related to commuting time when commuting to and from work (DeSalvo and Huq, 2005). In addition, when employees are given the discretion to adjust their workplace or hours voluntarily according to the circumstances, they feel satisfied with their job; as more discretion is given, job satisfaction increases proportionally (Baltes et al., 1999). However, the standardized traditional working time system does not take into account the differences among individual members of the organization, resulting in inefficiencies in work performance due to the requirement to spend time sitting down even after one's work has been completed (Liechty and Anderson, 2007). The results of this study suggest that companies should improve their attendance control system by granting organizational members more discretion and by taking measures to activate the voluntary use of annual leave and implement flexible working systems.

Second, these results show performance management to have a negative effect on job satisfaction in 7 industries, with the exceptions of media design and pharmaceutical medical welfare. Overall, organizations' members feel dissatisfied with their company's performance management method. In other words, they are not satisfied with their company's performance management. The overall contents associated with this factor show that the company's personnel evaluation and promotion systems are irrational or unfair, the salary level and rate of increase are low, and the method in which salaries are determined is unreasonable. Satisfaction with the promotion of organizational members is determined by

whether the promotion decision process and procedures are reasonable and fair (Greenberg, 1987; Rutte and Messick, 1995). In addition, if the personnel evaluation system ensures fairness, even if the result of an employee's evaluation is negative, members of the organization feel satisfaction with the organization or job (Folger and Konovsky, 1989). Therefore, this study suggests that it is necessary to ensure fairness in the personnel evaluation and promotion decision process and to exhibit a standard that allows organizational members to accept their performance evaluation results.

Third, we found the organizational culture to have a positive effect on job satisfaction in the IT web communication, media design, service, pharmaceutical medical welfare, and chemical manufacturing industries. Overall, the organizations' members feel satisfied with the corporate culture. Considering the contents associated with this factor, a culture of mutual respect can be formed in a free atmosphere without consciousness of the gazes of others. Considering the fact that more than 90% of Jobplanet subscribers are in their 20s or 30s, these results can also be viewed as related to the characteristics of millennials, who exhibit strongly individualistic tendencies (Joshi et al., 2011). In addition, the organizational culture of a company has a tremendous influence on job satisfaction as well as organizational commitment (Chow et al., 2002). These research results suggest that to increase job satisfaction with organizational culture, it is necessary to create an atmosphere of consideration and respect for organizational members and to establish an autonomous and active organizational culture.

Fourth, we found organizational flexibility to have a positive effect on job satisfaction in the education and media design industries. Overall, the organizations' members are satisfied with the organiza-

tional flexibility factor of their company. In other words, the organizational structure is not rigid and exhibits a horizontal and flexible structure, and the members of the organization feel satisfied with this organizational structure. On the other hand, we found that organizational flexibility had a negative effect on job satisfaction in the IT web communication, construction, banking finance, and chemical manufacturing industries. Overall, the organizations' members feel dissatisfied with the organizational flexibility factors of their current company. The organizational structure is a hierarchical and vertical structure, and organizational members feel dissatisfied with this organizational structure. Therefore, the analysis of organizational flexibility indicated different results depending on the industry in question. A reason for this discrepancy is that various external factors, such as the type of industry, the nature of work in the industry, and the associated environment, affect job satisfaction in different ways (Burns and Stalker, 1961). In addition, in a vertical organizational structure that is authoritative and enforces compliance with rules within the organization, the job satisfaction of organizational members decreases (Oldham and Hackman, 1981; Zeitz, 1984). Therefore, this study suggests that it is necessary to improve the organization to ensure that all authority for organizational management is not concentrated in the top manager and that the opinions of lower-level members of the organization are reflected when making decisions.

Fifth, welfare support was found to have a positive effect on job satisfaction in all 9 industries. Overall, the organizations' members feel satisfied with their company's welfare support method. Considering the overall content related to this context, the salary provided is higher than that provided by other companies, as are various welfare benefits. Support for such welfare or salaries is the price of labor for organiza-

tional members and is an essential factor that affects economic activities directly (Bryson et al., 2007). In addition, if organizational members are not provided with adequate compensation compared to their workload or labor, this situation can negatively affect their job attitudes and emotions, resulting in overall job dissatisfaction (De Jonge et al., 2000; van Vegchel et al., 2005). These findings suggest that it is necessary to consider the design process and strategic selection of a welfare and benefits system that is suitable for the characteristics of a company or industry before introducing a welfare and benefits system.

Sixth, we found the work system to have a positive effect on job satisfaction in the IT web communication, media design, service industry, distribution trade transportation, banking finance industry, and chemical manufacturing industries. Therefore, employees in these industries are satisfied with the system. Taking into account the overall content associated with this dimension, because the process for work is straightforward and uncomplicated, work can be performed systematically. In particular, in the service industry, education and training are an ongoing progress, and this process is systematic, which enables new employees to perform their tasks proficiently. Therefore, when organizational members perceive that the contents of education and training are practical, they can apply the skills and knowledge they develop more appropriately in practice (Alliger et al., 1997; Bramley, 1991). In addition, it there are many opportunities to accomplish various tasks, and the work pressure is lower than other companies in the same industry. This result agrees with the conclusions of Hackman and Lawler (1971), who suggested that job diversity has a positive effect on job satisfaction. The results of this study show that executives are interested in the importance of education and training for organizational members

and the relationship between such education and training and employees' jobs. Therefore, these results suggest that it is necessary to specifically systematize the process of work while continuously providing feedback concerning the results of job performance.

Seventh, growth capability factors were found to have a positive effect on job satisfaction in all 9 industries. Overall, the organizations' members are satisfied with the current growth capability of their company. Considering this point in general, the company is recognized as having high potential for future growth by members of the organization by way of improving sales or conducting various forms of businesses. In addition, there is a certain degree of willingness to improve the areas that are currently

lacking in the company's development potential. This vision of the company's growth and development potential has a positive effect on the job satisfaction and attitudes toward job performance exhibited by organizational members (Testa, 1999). Therefore, in this study, the goal and vision pursued by the company are maintained so that members are able to exhibit empathy; for this purpose, the results of this study suggest that companies should take various actions to meet employees' expectations regarding the company's future value by improving the deficient parts of the company.

Eighth, relationships have a positive effect on job satisfaction in all industries other than the banking and finance industry, and relationships among mem-

<Table 5> Path Analysis Results for Job Satisfaction (Individual Industry)

	IT Web Communication	Construction	Education	Media Design	Service
Attendance control system → Job satisfaction	-0.120**	-0.083***	-0.127***	-0.116***	-0.08***
Performance management → Job satisfaction	-0.009*	-0.037***	-0.022***	-0.007	-0.019***
Organizational culture → Job satisfaction	0.014***	-0.008	0.006	0.011*	0.009*
Organizational flexibility → Job satisfaction	-0.012***	-0.02**	0.015*	0.019***	-0.004
Welfare support → Job satisfaction	0.042***	0.036***	0.025***	0.061***	0.045***
Work system → Job satisfaction	0.017***	-0.003	-0.005	0.026***	0.02***
Growth capacity → Job satisfaction	0.043***	0.079***	0.059***	0.048***	0.045***
Relationship → Job satisfaction	0.026***	0.015*	0.055***	0.029***	0.03***
	Trade Transport	Banking	Pharmaceutical Medical Welfare	Manufacturing Chemistry	
Attendance control system → Job satisfaction	-0.078***	-0.092***	-0.097***		-0.098***
Performance management → Job satisfaction	-0.013***	-0.017***	-0.008		-0.030***
Organizational culture → Job satisfaction	0.007	0.006	0.011***		0.009**
Organizational flexibility → Job satisfaction	-0.002	-0.027***	0.008		-0.032***
Welfare support → Job satisfaction	0.028***	0.021***	0.051***		0.036***
Work system → Job satisfaction	0.013**	0.024***	0.007		0.007***
Growth capacity → Job satisfaction	0.051***	0.054***	0.053***		0.060*
Relationship → Job satisfaction	0.022***	0.000	0.024***		0.008*

Note: ***p < 0.001, **p < 0.01, * p < 0.05

bers of the organization are generally satisfactory. With respect to the contents of this dimension as a whole, the members of the organization largely communicate freely with each other, there are many opportunities to develop close relationships, and these relationships are straightforward. Human relationships with superiors, colleagues, subordinates and customers are related to job satisfaction (Schmit and Allscheid, 1995); if these relationships are not straightforward, they may constitute a stress factor for organizational members (Perrow, 1967). In addition, workers in the service industry often experience stress in customer service relationships (Morris and Feldman, 1996; Schaubroeck and Jones, 2000). The results of this study suggest that companies must create an environment in which employees can establish interpersonal relationships to improve the job satisfaction of organizational members. To this end, it is necessary to create an environment in which desirable relationships emerge between members of the organization and customers who use the service or an environment in which organizational members can improve mutual awareness and develop straightforward human relationships.

<Table 6> shows the results of examining the differences in these factors according to employment status across industries. We found the attendance control system to have a negative effect on job satisfaction for both former and current employees in 9 industries. In particular, in the case of IT web communication, the effect of the attendance control system on job satisfaction was more significant for former employees than for current employees. Nevertheless, there were no differences between former and current employees in other industries. Performance management had a negative effect on both former and current employees in the construction, service, banking finance, and chemical

manufacturing industries. In the construction industry, the effect of gender management on job satisfaction was more significant for former employees than for current employees. In the case of organizational culture, status as a former employee was insignificant to job satisfaction in all industries. For current employees, organizational culture had a positive effect on job satisfaction in five industries, with the exceptions of the construction, banking, medical, pharmaceutical, and welfare industries. Organizational flexibility had a negative effect on job satisfaction for both former and current employees in the IT web communication, banking finance, and chemical manufacturing industries, and there were no differences between current and former employees in the IT web communication and chemical manufacturing industries. However, in the banking and finance industry, organizational flexibility had a more significant effect on job satisfaction for former employees than for current employees. Welfare support had a positive effect on job satisfaction in 7 industries, with the exceptions of the construction and distribution, trade, and transportation industries. In the case of media design, welfare support had a more significant effect on job satisfaction for former employees than for current employees. However, in the case of the IT web communication, education, service, banking, finance, pharmaceutical medical welfare, and chemical manufacturing industries, there were no differences between former and current employees. Work systems had a positive effect on job satisfaction for both former and current employees in the IT web communication, media design, and service industries; there were no differences between the former and current employees. Growth capacity had a positive effect on job satisfaction for both former and current employees in 8 industries, with education being the exception. In particular,

<Table 6> Results of Multi-group Path Analysis for Job Satisfaction (Individual Industry)

	Attendance Control System → Job Satisfaction			Performance Management → Job Satisfaction			Organizational Culture → Job Satisfaction			Organizational Flexibility → Job Satisfaction		
	Former employee	Current employee	Critical ratios for differences	Former employee	Current employee	Critical ratios for differences	Former employee	Current employee	Critical ratios for differences	Former employee	Current employee	Critical ratios for differences
IT web communication	-0.108***	-0.128***	2.318*	-0.016**	-0.003	-1.718	0.006	0.022***	-2.063*	-0.01*	-0.014*	0.577
Construction	-0.08***	-0.081***	-0.204	-0.025**	-0.054***	2.047*	-0.014	-0.004	-0.77	-0.007	-0.037***	2.231*
Education	-0.118***	-0.128***	0.998	-0.010	-0.056***	3.346***	-0.006	0.026*	-2.262*	0.018*	0.006	0.840
Media design	-0.113***	-0.115***	-0.059	-0.006	-0.014	0.657	0.003	0.024*	-1.863	0.019***	0.015	0.419
Service	-0.076***	-0.087***	1.314	-0.015**	-0.029***	1.488	0.003	0.028**	-2.608**	-0.001	-0.010	0.890
Trade transport	-0.073***	-0.085***	1.564	-0.016***	-0.011	-0.635	0.000	0.017*	-2.02	0.000	-0.007	0.872
Banking	-0.088***	-0.094***	0.438	-0.015*	-0.021**	0.515	-0.001	0.014	-1.462	-0.015*	-0.044***	2.759**
Pharmaceutical medical welfare	-0.089**	-0.102***	1.308	-0.013	-0.004	-0.861	0.006	0.016	-0.856	0.015*	-0.004	1.605
Manufacturing chemistry	-0.095**	-0.099***	0.464	-0.03***	-0.029***	-0.206	-0.001	0.02***	-3.291**	-0.028***	-0.036***	1.305
	Welfare support → Job satisfaction			Work System → Job satisfaction			Growth Capacity → Job satisfaction			Relationship → Job satisfaction		
	Former employee	Current employee	Critical ratios for differences	Former employee	Current employee	Critical ratios for differences	Former employee	Current employee	Critical ratios for differences	Former employee	Current employee	Critical ratios for differences
IT web communication	0.037***	0.048***	-1.249	0.017***	0.017**	0.067	0.052***	0.018**	4.081***	0.027***	0.027***	0.063
Construction	0.023	0.056***	-2.304*	-0.005	0.005	-0.671	0.058***	0.084***	1.985*	0.005	0.036	-2.220*
Education	0.023**	0.037**	-1.050	-0.001	-0.007	0.161	0.078**	0.006	4.439***	0.053***	0.064***	-0.797
Media design	0.069***	0.046***	2.096*	0.023***	0.040***	-1.381	0.037***	0.058***	-1.664	0.021***	0.062***	-3.446***
Service	0.045***	0.048***	-0.367	0.020***	0.023*	-0.344	0.046***	0.038***	0.545	0.028***	0.046***	-1.839
Trade transport	0.035***	0.013	2.565**	0.004	0.030***	-2.904**	0.047***	0.046***	0.095	0.028***	0.016*	1.242
Banking	0.016*	0.028***	-1.021	0.010	0.048***	-3.383***	0.067***	0.030***	3.278**	-0.004	0.012	-1.371
Pharmaceutical medical welfare	0.048***	0.059***	-1.893	0.010	0.007	0.250	0.050***	0.040***	0.754	0.029***	0.027**	0.119
Manufacturing chemistry	0.037***	0.037***	0.159	0.008	0.007	0.194	0.070***	0.041***	4.573***	0.001	0.02***	-2.996**

Note: *** p < 0.001, **p < 0.01, * p < 0.05

in the IT web communication, construction, banking, and chemical industries, the effect of growth capability on job satisfaction was more significant for former employees than for current employees. Finally, the relationships had a positive effect on job satisfaction for both former and current employees in five industries, with the exceptions of the construction, banking, and chemical manufacturing industries. In the case of media design, current employees exhibited a more significant effect relationship with job satisfaction than former employees, and there were no differences between former and current employees in the IT web communication, education, service, distribution, trade and transportation, and pharmaceutical medical welfare industries.

VII. Conclusion

Although the job satisfaction factors associated with former and current employees differ across different industries or countries, most previous studies have exhibited certain limitations with respect to analyzing job satisfaction factors for employees in specific industries. Therefore, this study analyzed the differences in job satisfaction between current and former employees across industries. We collected 470,615 positive and negative reviews, employment status (former employees vs. current employees), and job satisfaction ratings from Jobplanet's domestic job search site from 2014 to 2021 for 9 industries. Subsequently, topics were extracted using LDA analysis, and topics affecting job satisfaction were identified using path analysis. The results of this analysis are summarized as follows. Overall, organizational culture, welfare support, work system, growth capability, and relationships had significantly positive effects

on job satisfaction regardless of industry. On the other hand, attendance control systems, performance management, and organization had significantly negative effects on job satisfaction. In addition, with respect to the determinants of job satisfaction according to employment status, we found that welfare support, work system, growth capacity, and relationships had positive effects on job satisfaction for both former and current employees. In contrast, we found that attendance control systems, performance management, and organizational flexibility have negative effects on job satisfaction. In addition, organizational culture had a significantly positive effect on job satisfaction only for current employees. With respect to the path differences between former and current employees, attendance control systems and organizational flexibility have more significant negative effects on job satisfaction for current employees than for former employees. Growth capacity has a more significant positive effect on job satisfaction for the group of all employees than for that of current employees. On the other hand, we found that organizational culture, work system, and relationships have more significant positive effect for current employees than for former employees.

The theoretical implications of this study are as follows. First, this study utilized web crawling techniques to collect big data from job portal websites. Then through the LDA, job satisfaction topics were derived. Therefore, this study analyzed employees' job satisfaction based on HR data available online. The importance of this method is in suggesting ways to incorporate HR data into Information Systems (IS) research. Therefore, by exploring the interaction between the IS field and the HR domain, this study expanded the scope of IS research, it is anticipated that this will contribute to broader application areas. Second, in the past, the factors affecting the job sat-

isfaction of organizational members have mainly been identified using the survey method. However, the survey method can only collect information regarding variables that are set by the researcher in advance. Because there is a limit beyond which it is difficult to secure a large amount of data, a representative error problem may emerge. This study is meaningful because it collected approximately 470,000 data points from Jobplanet, a job search site, and analyzed them across 9 industries to compensate for these limitations. Third, recent research has explored the use of employment platforms like LinkedIn. However, these existing studies have limitations, either utilizing only quantitative or qualitative data or focusing on specific industries. In contrast, this study uniquely analyzes both quantitative and qualitative data across nine different industries. The data employed in this study represents a comprehensive collection of opinions from employees across diverse industries and companies, rather than reviews specific to certain industries or companies. This approach addresses the limitations, enhancing the reliability of the research results. Additionally, while prior studies analyzed extensive big data to understand job satisfaction, they did not validate hypotheses. In this study, hypotheses were formulated and tested, examining whether hypotheses validated through surveys in traditional HR research hold true in big data analysis. Furthermore, preceding research predominantly emphasized factors contributing to satisfaction rather than dissatisfaction. In contrast, this study holds significance in its comprehensive examination of both satisfaction and dissatisfaction aspects related to job factors.

The practical implications of this study are as follows. First, based on the results of this study, companies can recognize the importance of the job satisfaction of organizational members. Companies can

thus improve the job satisfaction of corporate members by implementing educational programs or facilitating internal communication for this purpose. Second, Recently, there has been a noticeable trend where numerous employees increasingly participate in sharing information about their workplaces on employment-related online communities. The acquisition and analysis of data posted on these online platforms require the utilization of information technology and systems. Accordingly, the present study employed web crawling to gather HR data from employment portal sites. Subsequently, utilizing LDA, the study extracted topics related to job satisfaction, a critical consideration for employees, and examined how it influences overall job satisfaction across different industries. Therefore, based on the data and analytical methods of this study, establishing an automated system for the periodic analysis of job satisfaction factors deemed significant by employees could serve as a compelling example, demonstrating the potential application of information system technology in the field of human resource management. Third, as the number of job-related community users increases exponentially due to the development of information and communication technology, various types of information are emerging. In this study, significant results were derived by collecting and analyzing a large amount of information drawn from these job search sites. This fact suggests that companies must systematically analyze and improve job satisfaction by collecting review information written by current and former employees on job search sites or SNSs.

However, despite these implications, this study also faces the following limitations. First, in this study, only the overall rating, pros and cons reviews were used for analysis. However, Job Planet also provides information on detailed ratings (promotion oppor-

tunities and possibilities, welfare and salary, work-life balance, company culture, and management) that can help determine employees' job satisfaction. Therefore, it is expected that more sophisticated analysis will be possible in the future if these detailed ratings are taken into consideration. Second, we used data from 2014 to 2021 in this study. Nevertheless, the effects of events that occurred during a specific period of time were not considered because the analysis did not distinguish among such periods. For example, it did not identify any changes that occurred in the job satisfaction of organizational members due to the financial crisis or to COVID-19. Third, in this study, companies were classified and analyzed

by industry. Nevertheless, in the future, it is necessary to organize and analyze companies by considering various conditions other than the industry in which they operate, such as the sizes and sales of such companies. Fourth, the process of topic analysis involved the researcher's subjective judgment. In addition, by limiting the number of topics that were obtained from the vast amount of review data, it is possible that various topics were mixed in one review. Therefore, in the future, it is necessary to conduct additional verification by adding to this investigation knowledge and theoretical background concerning the relevant field.

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