

'Artificial Intelligence' Acceptability in Online Dispute Resolution: A Comparison Study of Korean Age Groups

Yongkyun Chung*

The worldwide diffusion of COVID-19 contributes to electronic commerce all over the world. The proliferation of high volume and small value electronic commerce naturally has combined artificial intelligence with online dispute resolution (ODR). This paper investigates the age effect on Artificial Intelligence acceptability in online dispute resolution and its empirical findings are as follows. First, seven measures out of the nine employed in this case study shows a coherent dynamic pattern over the age spectrum. In other words, the total samples are a heterogenous group rather than a homogeneous one. Second, medium answer occupies a non-negligible portion across answers from nine research questions. It seems to indicate that a considerable portion of Korean respondents are hesitant to make a choice on artificial intelligence at this juncture. Third, all of the respondents agree that the introduction of AI to the dispute resolution could contribute to the hastening of the dispute resolution process. Fourth, most of the respondents agree that artificial intelligence might have the cognitive ability but not the sympathetic or affective ability to handle the electronic commerce disputes.

Key Words : artificial intelligence, e-commerce, heterogenous pattern

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* Chair Professor, Department of International Trade and Business, Kangwon National University, Korea

I . Introduction

The worldwide diffusion of COVID 19 contributes to electronic commerce all over the world. Most of the people chooses the online channel in the purchase of commodities, instead of offline channel, in order to avoid the danger of infection. The proliferation of 'high volume and small value' electronic commerce has encouraged to design online dispute resolution in consumer disputes(Cortes, 2010; Rule et al, 2010; Duca et al, 2012; Cortes and Rosa, 2013; Raymond, 2014; Tan, 2019). Practically speaking, when consumers seek redress for a goods or services they purchased for \$100 in a cross-border e-commerce transaction, it is unrealistic to assume that they will cross borders and enter a foreign court to have their claims resolved(Rule et al, 2010). One caveat of online dispute resolution is that online dispute resolution is less trustworthy, since face to face communication is absent in the process of negotiation of buying and selling behaviors. Loutocky(2016) argues that only 18% of consumers in the EU have used the Internet to purchase a product abroad in 2014, before the advent of COVID 19. The main reason is that they do not feel confident in online shopping. Media richness theory(MRT) argues that face to face communication conveys profound messages relative to other communication medias. According to Kishi(2008), video conference and face to face communication has high level of media richness, but email and fax has the low level of media richness. In nutshell, most of scholars admit the innate weakness of online dispute resolution.

Nevertheless, there has been continuing efforts to introduce technology to dispute resolution in a deep sense. The application of artificial intelligence to dispute resolution is not new. Bruno Latour(1991; 1999) and others already argued that human being and things coexist, since human beings are not separable from things such as computer and smart phone in everyday life. The proliferation of 'high volume and small value' electronic commerce naturally take into consideration of the technical feasibility of artificial intelligence as a neutral, or problem solver in the framework of online dispute resolution(Lodder and Thiessen, 2003; Lodder and Zeleznikow, 2005; Carneiro et al, 2014; Zeleznikow, 2017). In other words, literature of artificial intelligence in ODR only investigates the supply side of artificial intelligence in online dispute resolution.

Remaining questions are whether most of consumers accept artificial intelligence as

an effective problem-solver in small value and high frequency e-commerce disputes. Arbitrator acceptability literature already investigated the characteristics of arbitrator such as age, gender, and education (Briggs and Anderson, 1980; Bemmels, 1990; Houghton and Elkin, 2013). In this connection, Prensky (2001) argued that consumers are not homogeneous, since young college students are digital natives, while older adults who did not receive formal education of information, communication technology (ICT) are digital immigrants. The purpose of this study is to vindicate the age effect on acceptability of artificial intelligence based on diverse kinds of age spectrum, in the framework of online dispute resolution.

II. Literature Review

The emergence of online dispute resolution is concomitant to the rise of cross-border electronic commerce. The motivation of establishment of global redress system for cross-border electronic commerce disputes is the sharp increase of the volume of e-commerce in 21st century. At the same time, most of value of disputes belongs to small value. Accordingly it is not rational for consumers to visit national court for dispute resolution. In recent times a couple of researchers including Cortes (2010), Rule et al (2010), Duca et al (2012), Cortes and Rosa (2013), Raymond (2014), and Tan (2019) suggest a building global ODR system in order to handle cross-border e-commerce disputes.

The limitation of global redress system for cross-border electronic commerce disputes is twofold, although there has been a lot of efforts of online consumer disputes. First, it is difficult for humane neutrals to deal with too many cases originated from all over the world, since the characteristics of transaction in electronic commerce are high volume. Second, it is hard for human neutrals to maintain fairness in dealing with the diversity of consumers all over the world, in terms of age, gender, race, education, and nationality in an efficient way. That is the main reason why artificial intelligence is taken into consideration in online dispute resolution. In line with this, Lodder and Thiessen (2003), Lodder and Zeleznikow (2005), Carneiro et al (2014) and Zeleznikow (2017) investigate a diverse kinds of artificial intelligence into dispute resolution. They consider

the pros and cons of decision support system, Expert system, Case Based Reasoning(CBR), and Legal Ontologies. In recent times, Mania(2015) discusses online dispute resolution in the perspective of the future of justice. Pandit(2019) examines artificial intelligence's impact on the nature of the legal profession. Sourdin(2019) vindicate the relationship between artificial Intelligence and judicial decision making. Tan(2019) shows the case of online dispute resolution for small civil claims in Victoria. In summary, previous research has focused on the supply side of the problem, technical feasibility of the introduction of artificial intelligence in online dispute resolution.

One of unsolved problem is originated from the demand side of artificial intelligence in online dispute resolution. Does consumers accept artificial intelligence as a neutral or problem solver in online dispute resolution? Previous literature of arbitrator acceptability has dealt with this kind of problem for a couple of decades. The earlier model of arbitrator acceptability investigates whether the characteristics of arbitrators are important factors for arbitrator selection. These include age, gender, education, and experience in employment arbitration. Results are mixed. Briggs and Anderson(1980) supports the positive relationship between the background of arbitrators and arbitrator acceptability. Bemmels(1990) does not support the relationship between them. The second generation model has tried to construct the theoretical model to explain the arbitrator acceptability(Posthuma and Dworkin, 2000; Houghton and Elkin, 2013; Chung and Ha, 2016). They test the validity of antecedents of arbitrator acceptability such as experience, expertise, and procedural justice.

Nowadays, in relation with artificial intelligence acceptability, the importance of age spectrum of consumers is highlighted, since consumers are expected to show different in online dispute resolution. According to Prensky(2001), Kennedy etl al(2008), and Benett and Maton(2010), behaviors of digital natives are different from those of digital immigrants. Digital natives receive inputs while they growing up, thus the functioning of their brains are most likely to be different as they think differently from digital immigrants. In view of the fact that artificial intelligence is an offspring of computer age, digital natives are expected to show a familiar attitude toward artificial intelligence. Digital native literature shows the possibility that digital natives are willing to accept artificial intelligence as neutral and digital immigrants are hesitant to accept artificial intelligence as neutral in online dispute resolution.

III. Research Design and Methodology

1. Research Design

A main motive of this study is that there might be differences of perceptions between age groups. In particular between college student and adult who belong to 40 to 50 years old. The main reason of this is that most of college student belongs to digital natives and adult age groups such as 40-50 years old belong to digital immigrants. According to Prensky's original paper and concomitant researchers point out that there are many differences in behavior between digital natives and digital immigrants. Literature emphasized the role of information, communication technology(ICT). Most of digital natives have no difficulty to use information technology embodied product such as smart phone, notebook computer etc. In contrast, digital immigrants have a difficulty to use information technology embodied product. We conjecture that digital natives and digital immigrants show differences in behavior. Accordingly, the main hypothesis of this research is that digital natives and digital immigrants show differences in the perception of the role of artificial intelligence in dispute resolution in cyber space.

We select six criteria to discern the differences and similarities between college students and adult age groups on the role of artificial intelligence in dealing with e-commerce disputes: validity, trust, competence, speed, cost-saving, and expertise.

Acceptability

RQ1: Does Artificial Intelligence help to resolve disputes in small value online transaction?

RQ2: Are you willing to accept artificial Intelligence as a decision maker in small value cross-border electronic commerce disputes?

Acceptability is a key variable in arbitrator acceptability literature. The traditional model of the arbitrator acceptability investigates whether the characteristics of arbitrators are important factors for arbitrator selection-these include age gender education and experience(Briggs and Anderson, 1980; Bemmels, 1990). Furthermore, a couple of scholars constructs the theoretical model to explain arbitrator

acceptability(Posthuma and Dworkin, 2000; Houghton and Elkin, 2013; Chung and Ha, 2016). On acceptability, we examine whether respondents perceive artificial agent as a valid agent in resolving e-commerce disputes. As a matter of fact, it is difficult for disputants to accept artificial intelligence as a decision maker in disputes.

Trust

RQ3: Is Artificial Intelligence software effective to resolve cross-border e-commerce disputes?

On trust, we mean that it is necessary for disputants to give a trust to artificial intelligence software in order to solve the problem using artificial intelligence. According to relationship marketing literature such as Morgan and Hunt(1994), trust is an essential ingredient of human buyer and seller relationship. Furthermore, Jarvenpaar et al(2000) finds that trust is an important antecedent of consumer behavior in internet shopping mall. Their empirical findings suggest that human-computer interaction is possible as shown by human-computer interaction(HCI) literature. Accordingly, we conjecture that trust is likely to be an important ingredient for disputants to rely on artificial intelligence in ODR. Accordingly, we presume that human being has to provide a sense of trust to artificial intelligence agent.

Competence

RQ4: Does Artificial Intelligence have the cognitive competence to understand the contents of cross-border e-commerce disputes?

RQ5: Does Artificial Intelligence have the affective competence to understand the contents of cross-border e-commerce disputes?

RQ6: Does Artificial Intelligence have the sympathetic competence to understand the contents of cross-border e-commerce disputes?

In arbitrator acceptability literature, competence is one of the key ingredients to influence the decision making of arbitrator acceptability on the part of disputants. In this study, we divide competence into two parts: cognitive and affective competence followed by Chung(2009) and Ha et al(2016). According to Marvin Minsky(1985), a

founder of artificial intelligence, human mind is a society that is consisted of many organizations. Neuroscience and neuro-marketing literature already found that human beings decide to purchase commodities using affective side of mental process and justifies her purchase using cognitive side of mental process in a market(Hans-Georg, 2008). In a human society, artificial intelligence was introduced less than a hundred years ago. It is quite difficult for human beings to accept artificial intelligence as a colleague in affective basis. Because artificial intelligence is an invisible software and has no physical entity. We presume that consumers will have different perceptions depending on cognitive or affective sides.

Speed

RQ7: Does Artificial Intelligence has rapidity in solving the e-commerce disputes?

Most of literature of Alternative Dispute Resolution(ADR) emphasizes the speed as an important ingredient in selecting avenue out of diverse kinds of menus of alternative dispute resolution. Arbitration literature stipulates that the main advantage of arbitration is speed as compared to litigation(Caper and LaRocco, 2008). However, empirical findings are mixed. For example, Chung and Ha(2014) finds that Korean traders do not think that arbitration is speedy. In response to complain of high cost of arbitration, Gluck(2012) argues that modern new arbitration is different from early day's arbitration, reflecting the fact that most of cases are complex and entails a huge amount of money. Unlike offline ADR, ODR may revive the wisdom of speed in dispute resolution, since online framework itself does guarantee speed compared to offline environment. Legg(2017) tells that much of ODR's popularity in Europe and elsewhere stems from it speed.

Cost-Saving

RQ8: Is Artificial Intelligence the cost-saving technology in solving the small value cross-border e-commerce disputes?

Most of literature of Alternative Dispute Resolution(ADR) emphasizes the cost-saving variable as an important ingredient in selecting avenue out of diverse kinds of menus

of alternative dispute resolution. For example, Hedeem(2012) argues that the costs and delay of litigation in judicial system contributed to the emergence of multi-door courthouse. Sachs(2004) also shows that the costs of arbitration is not negligible. Chung and Ha(2016)'s empirical findings show that perceived cost of arbitration influences the arbitrator acceptability. Zeleznikow(2017) noticed that the growing rise in the number of litigants who represent themselves in court and asked the need of cost-saving technology for the dispute resolution. Legg(2017) also suggests that affordability will be central to whether ODR provides value and is used. Accordingly, we presume that cost factor is an important ingredient of accepting artificial intelligence as a problem-solver.

Expertise

RQ9: Is Artificial Intelligence mediator professional in solving the e-commerce disputes?

RQ10: Does artificial intelligence(AI) mediator have the expertise in solving the e-commerce disputes?

Arbitrator acceptability literature includes expertise as an effective ingredient to select an arbitrator. The use of persons with technical expertise as arbitrators is needed as that person offers the best chance of parties' respective positions(Meason and Smith, 1991). Chung and Ha(2016) include practical expertise as well as legal expertise into their model. On expertise of artificial intelligence as a neutral, we mean that artificial intelligence has the knowledge on the contents of disputes in a particular field. For example, artificial intelligence has a knowledge that is sufficient to provide a solution set for a particular category of commodities. Media reported that Watson, a famous artificial intelligence, made by IBM was adopted as a supporting staff and has successfully supported medical doctors to detect a cancer in medical hospitals all over the world.

2. Research Methods

This study builds the research design based on literature review and implements case studies based on survey methods. Traditionally, social sciences prefer empirical

researches based on hypothesis testing methods. On the other hand, however, a new area such as the application of artificial intelligence on dispute resolution is situated in the elementary stage of research. Accordingly, it is difficult to extract hypothesis for the testing. Yin(2003) suggests that a case study approach using the questionnaire is an effective complementary methodology, in those situations. For the collection of reliable data, we choose to ask to the online survey company for data collection, instead of collecting data for myself. We collect the data from a Online Survey Company, Macromill Embrane, in September 2019, since Macromill Embrane is one of widely known online survey companies in South Korea. The total number of data is three hundred. Author asked Macromill Embrane to implement survey using questionnaires that is made by author. We also ask Macromill Embrane to collect data in three different age groups: college student group and adult groups who are decomposed into 40-49 age group and 50-59 age group. Total number of youngest age group that belongs to 20-29 years old is 120. Total number of middle age group that belongs to 40-49 years old is 92. Total number of old age group that belongs to 50-59 years old is 88.

IV. Empirical Results

1. Acceptability

On the acceptability of artificial Intelligence, all respondents show positive attitudes toward artificial intelligence for resolving disputes in small value online transaction across various age groups. As shown by Table 1, most of respondents respond that they agree to the view that artificial intelligence can help to resolve disputes in small value online transaction, irrespective of age groups. One noticeable fact is that the youngest age group occupies highest frequency in the "strongly agree" section. It indicates that digital natives strongly accept artificial intelligence as a neutral in dispute resolution, compared to other age groups.

<Table 1> Acceptability1

Age	Strongly disagree	Do not agree	Medium	Agree	Strongly agree	Sum
20-29	0.8	11.7	20.0	56.7	10.8	100
40-49	0	16.3	35.9	45.7	2.1	100
50-59	0	10.2	34.1	55.7	0	100

On the other hand, in case of the other measure of acceptability, respondents show a little bit different attitudes. Highest frequency of respondents choose "medium" attitude in accepting artificial intelligence as a decision maker of disputes, instead of human being, although a considerable portion of respondents show positive attitude toward the role of artificial intelligence as a decision maker of disputes. RQ2 directly questions respondent's willingness to accept artificial Intelligence as a decision maker in small value cross-border electronic commerce disputes. It indicates that non-negligible portion of respondents has hesitant attitude on the choice of artificial intelligence as a neutral in dispute resolution.

<Table 2> Acceptability2

Age	Strongly disagree	Do not agree	Medium	Agree	Strongly agree	Sum
20-29	0	15.0	41.7	35.0	8.3	100
40-49	2.2	22.8	44.6	27.2	3.2	100
50-59	2.3	15.9	40.9	39.8	1.1	100

2. Trust

The highest rate of respondents chooses "medium" out of 5-item measures across all age groups. It indicates that most of people in our sample are hesitant to make a decision whether artificial Intelligence software is effective to cross-border e-commerce disputes across age groups. One remarkable fact is that the youngest age group who belongs to 20-29 years old occupies the highest frequency in the "strongly agree"

section among age groups. It seems to indicate that digital natives are likely to trust the artificial intelligence, compared to remaining age groups.

<Table 3> Trust

Age	Strongly disagree	Do not agree	Medium	Agree	Strongly agree	Sum
20-29	0	11.7	45.0	35.0	8.3	100
40-49	0	14.1	56.5	27.2	2.2	100
50-59	0	13.6	46.6	39.8	0	100

3. Competence

We utilize two criteria to examine respondent's perception on competence of artificial intelligence. One is the cognitive competence, and the other affective competence. Let's turn to the first criterion of competence of artificial intelligence, cognitive competence. As shown by table 4, the highest rate of respondents choose medium out of 5-item measures. It indicates that most of people are hesitant to make a decision whether artificial intelligence has a cognitive competence to understand the contents of cross-border e-commerce disputes. A recurrent fact is that the youngest age group also occupies the highest frequency in the "strongly agree" section among all age groups. It indicates that digital natives are likely to think that the artificial intelligence has the cognitive competence, compared to remaining age groups.

<Table 4> Cognitive Competence

Age	Strongly disagree	Do not agree	Medium	Agree	Strongly agree	Sum
20-29	0.8	18.3	39.2	35.8	5.9	100
40-49	1.1	21.7	46.7	26.1	4.4	100
50-59	0	15.9	43.2	38.6	2.3	100

In case of affective ability of artificial intelligence, the highest rate of respondents chooses "medium" measure out of 5-item measures in 40-49 and 50-59 age groups,

compared to 20-29 age groups. It indicates that a little bit older people are hesitant to make a decision whether artificial intelligence has affective ability to understand the contents of cross-border e-commerce disputes. One striking fact is that all age groups tend to cling to conservative attitude. In other words, most of respondents do not choose "strongly agree" item out of five items. Even the youngest age group also does not choose "strongly agree" measure.

<Table 5> Affective Competence

Age	Strongly disagree	Do not agree	Medium	Agree	Strongly agree	Sum
20-29	13.3	42.5	29.2	15.0	0	100
40-49	7.6	36.9	42.4	12.0	1.1	100
50-59	6.8	28.4	47.7	17.1	0	100

Furthermore, we examine whether respondents perceive AI as having empathetic competence. It is noticeable that the majority of respondents of youngest age group answered definite negative answer that is similar to previous results of affective measure. On the other hand, however, 40-49 and 50-59 aged groups tend to choose medium answer. It indicates that they are hesitant to give an answer. These findings seems to indicate that digital natives have a definite demarcation line of perception between cognitive and affective competence of artificial intelligence in their minds. A tentative hypothesis is that human beings show more generous attitude toward their environment as they become older. Those findings show digital native hypothesis are not simple one. Rather they have more delicate dynamic structure.

<Table 6> Sympathetic Competence

Age	Strongly disagree	Do not agree	Medium	Agree	Strongly agree	Sum
20-29	12.5	42.5	29.2	15.0	0.8	100
40-49	6.5	33.7	42.4	16.3	1.1	100
50-59	4.6	28.4	43.2	22.7	1.1	100

4. Speed

Literature of alternative dispute resolution(ADR) has showed that ADR is superior to litigation, since mediation or arbitration is speedier than litigation in solving the e-commerce disputes. We asked whether you think that artificial intelligence can guarantee the speed of procedures. All age groups across three age spectrums are congenial to the viewpoint of rapid procedure by artificial intelligence. Table 7 shows that respondents from all age groups agree the speed of dispute of e-commerce disputes. It implies that the design of ODR platform using artificial intelligence emphasizes the function that guarantee the speedy resolution.

<Table 7> Speed

Age	Strongly disagree	Do not agree	Medium	Agree	Strongly agree	Sum
20-29	0	2.5	23.3	56.7	17.5	100
40-49	1.1	6.5	42.4	44.6	5.4	100
50-59	0	9.1	36.4	51.1	3.4	100

5. Cost-Saving

On cost-saving, we asked whether artificial Intelligence is the cost-saving technology in solving the small value cross-border e-commerce disputes. The youngest age group and 50-59 age group show positive attitude on the cost-saving properties of artificial intelligence, except of 40-49 age group. One noticeable fact is that the youngest age group of 20-29 years old occupies the highest frequency in the "strongly agree" section, compared to adult groups in case of cost-saving measure as well as speed measure. These findings seem to indicate that youngest generation or digital natives are prone to emphasize the functional aspect of life such as cost and speed compared to older age groups.

<Table 8> Cost-Saving

Age	Strongly disagree	Do not agree	Medium	Agree	Strongly agree	Sum
20-29	1.7	17.5	30.0	36.7	14.1	100
40-49	2.2	11.9	45.7	32.6	7.6	100
50-59	0	14.8	30.7	50.0	4.5	100

6. Expertise

We asked whether artificial Intelligence mediator is professional in solving the e-commerce disputes. Except of 40-49 age group, both 20-29 and 50-59 age groups agree with the view that artificial intelligence neutral is professional in solving the e-commerce disputes. In addition, the pattern of strongly agree item shows that 20-29 age group has the highest frequency. Secondly, 40-49 age group occupies the second group, and finally, 50-59 age group show 2.3% out of total sample.

<Table 9> Expertise

Age	Strongly disagree	Do not agree	Medium	Agree	Strongly agree	Sum
20-29	1.7	12.6	37.0	39.5	9.2	100
40-49	2.2	8.7	51.1	33.7	4.3	100
50-59	0	13.6	35.2	48.9	2.3	100

V. Discussion and Conclusion

With the worldwide diffusion of COVID-19 virus, most of the people chooses the online channel in the purchase of commodities, instead of offline channel. One of the main hindrance factors to the growth of e-commerce is that dispute resolution is less trustworthy, since face to face communication is absent in the process of negotiation of

buying and selling behaviors in electronic commerce. Artificial intelligence may contribute to the lessening the disputes among parties in online shopping mall, since artificial intelligence guarantee the speed and cost-saving in dispute resolution.

Our empirical findings are as follows. First, seven measures out of nine measures employed in this study shows a coherent dynamic pattern over the age spectrum. In other words, seven measures show that young age group occupies the highest frequency and 40-50 age group occupies the second high frequency group and the oldest group occupies the lowest position in case of very likely item. It means that 20 age group, 40-49 age group and 50-59 age group tend to be independent with each other. In other words total sample are heterogenous group rather than homogeneous group.

Second, medium answer occupies a non-negligible portion across answers from nine research questions. It seems to indicate that a considerable portion of Korean respondents are hesitant to make a choice on artificial intelligence as a neutral in dispute resolution at this juncture. Third, most of respondents agrees that the introduction of AI to dispute resolution might contribute to speed up the dispute resolution process. Fourth, most of respondents agree that artificial intelligence(AI) might have the cognitive competence, but, AI does not have the sympathetic or affective competence to handle the electronic commerce disputes. Fifth, in case of cost-saving aspect, our findings suggest that respondents show positive attitudes in general, although, pattern of 40-49 group is different from other age groups.

Generally speaking, our findings show that the youngest age group, so called digital natives show coherent attitudes that they seem to be sympathetic attitude toward artificial intelligence neutral in online dispute resolution, consistently, Its implication is that it is possible to design and construct the ODR platform augmented with artificial intelligence in the future. On the other hand, online redress system is not perfect in dealing with consumer disputes in online context. First of all, it is inevitable for ODR platform to store the consumer's information(Rule et al 2010). Accordingly, privacy of consumer is likely to be in danger(Raymond, 2014). Furthermore, it is hard for artificial intelligence to deal with cultural dimensions. These problems are to be settled in advance.

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