

APPLYING SERVICE RECOVERY FRAMEWORK TO THE PERSONAL INFORMATION BREACH CONTEXT: AN EMPIRICAL EXAMINATION

Completed Research Paper

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Abstract

Growing personal information breaches (PIB) have been serious social problems worldwide because personal information includes monetary values and carries the risk of being randomly misused and abused. PIB should clearly be considered a type of service failure, although it may not cause tangible direct damages to customers, since it is extremely difficult to predict where and how the breached personal information will be used. In this vein, this study applies service recovery framework to the PIB context and seeks answers to the following research questions: (1) How does each service recovery effort affect perceived justice in a PIB context? (2) What are the relationships between justice and customers' emotional or behavioral responses? The survey data of 253 respondents who experienced PIB were analyzed. Research findings show that compensation, prompt handling, and explanation increase perception of justice. Perceived justice decreases negative emotions and negative WOM; and consequently, negative emotions increase negative WOM and third-party action. As the first attempt to apply service recovery framework to the PIB, this study provides important implications in theoretical and practical perspectives.

Keywords: Personal information breach(PIB), service failure, recovery efforts, perceived justice, negative emotions, negative WOM, third-party action

Introduction

The recent ubiquitous, smartphone-based environment has changed our lives in many ways. The technological improvement made possible entirely new business models, people have benefited from those services. However, in order to register and use such services, customers should provide various types of their personal information to the service providers. This information sometimes includes very sensitive one; therefore, it carries the risk of being randomly misused and abused, increasing the necessity of proper protections strategies (Lee et al. 2011). Because personal information have monetary values and can be abused and illegally traded, various fraud and crimes, such as spam mailing and phishing, are increasing. Consequently, the number of personal information breaches (PIB) by internal employees or hackers is also increasing worldwide.

There have been many current examples of PIB including the breach of 100 million Sony customers' personal information due to hacking in April, 2011 (Acohido 2011). More recently, LinkedIn, the US-based leading social network site for business professionals, posted on their company blog that it had a data breach in June, 2012 (Finkle et al. 2012). Also in Korea, for example, many large-scale personal information breach accidents occurred in 2011 at

financial companies, web portal sites, and online game companies. A recent survey conducted by the Korean Consumer Agency revealed that 95% of consumers had experienced personal information breach in the past year (Kim et al. 2011).

PIB (a.k.a. data breach, security breach) should be regarded as a serious crisis that may deteriorate the relationship between a company and the public (Moon et al. 2009) because, in case of PIB, not only are the company's customers harmed, but it also hurts the company's reputation and can cause financial losses resulting from class lawsuits. To prevent PIB, active investment in security technology is important; however, in addition, more attention should be paid to proper service recovery methods in response to intentional data spills or hacking, which is always likely to happen. That is, service failures can be conceptualized as any unfavorable events happening between service providers and customers. In this vein, PIB to an unwanted third party should clearly be considered a type of service failure.

There have been several studies on the financial effects of data breaches (Cavusoglu 2004; Garg 2003), relevant policies and laws (Lee et al. 2011; (Romanosky et al. 2011b), and one taking a corporate risk management approach (Moon et al. 2009; Gupta et al. 2011). However, there are very few studies that have considered PIB as a service failure or that have examined companies' service recovery efforts after a breach, along with customers' cognitive, emotional, and behavioral responses toward them. Thus, this study aims to make a contribution to the field of information systems privacy by being the first to apply a research framework regarding service failure and recovery, which have been extensively studied in the service marketing area (e.g. Liao 2007; Smith et al. 1999) to the PIB context.

The research questions of this study are as follows: (1) How does each service recovery effort affect perceived justice in a PIB context? (2) What are the relationships between perceived justice and customers' emotional or behavioral responses? The research model was generated adapting service recovery framework to fit the PIB context.

In the remaining part of the paper, first, the definition of PIB and justice theory are reviewed. Next, service recovery framework as the conceptual framework is introduced. Then, the research model and hypotheses are presented. Following this, the research methodology of the study is described. Finally, the findings of the study along with theoretical and practical implications are discussed.

Conceptual Background

Personal Information Breach as a Service Failure

Companies have an obligation to actively protect personal information because they have been entrusted by personal information providers with the rights to a series of relevant processes, from issuing and managing information to discarding such data (Lee et al. 2011). Accordingly, breach of personal information that the customer does not want made public should be considered a crucial form of a service failure, even when the case is not directly related to the outcomes of the core service or does not cause material, tangible damage. Good services assume that customers' satisfaction depends on not only the core (sufficient) services but also the secondary (necessary) services; for example, when one use a banking service in an offline bank, personal safety in and around the bank should be guaranteed although it is not recognized as a bank's primary service. In case of that your car is stolen at the bank parking lot while you are served at the bank, regardless of your satisfaction on primary services, your bank fails to deliver the expected service level in sum. PIB resembles this kind of service failure at the prerequisite service level. PIB can be even more serious due to the large numbers of victims.

In their study of service failure and recovery in an online retailing environment, Holloway and Beatty (2003) classified online service failure into six categories in order of frequency—shipping, website design, payment, security, product quality, and customer service problems. As such, they indicate that security problems related to PIB and frauds are the fourth most frequent type of service failure. A leakage of personal information is a particularly crucial form of service process failure because it involves personally identifiable information (PII) such as social security numbers, banking and credit information, and online account information, such as user IDs and passwords.

Service failures are closely associated with service recovery processes. Thus, previous studies have been done with a focus on various interrelationships between service recovery efforts and cognitive aspects (e.g. perceived justice), affective aspects (e.g. positive/negative feelings, trust, and loyalty), and behavioral aspects (e.g. repurchase intention and negative word of mouth) of service failure. Mainly informed by resource exchange theory (Brinberg et al. 1983),

mental accounting theory (Thaler 1985), and justice theory (Tax et al. 1998), the service recovery framework was generated by Smith et al. (1999; 2002); that is, when service failure occurred, the company’s service recovery efforts recognized by customers as resource exchanges reduce the negative effect of a service failure by increasing customers’ perceived justice through mental accounting.

Major previous studies include those conducted in the contexts of hotels, restaurants, or banks in the field of service marketing (e.g. Chebat et al. 2005; DeWitt et al. 2008; Gelbrich 2010; Liao 2007; Schoefer 2005; Schoefer et al. 2008; Smith et al. 1999; Smith et al. 2002). With the recent development of a variety of information technologies, studies of service failure have been carried out in new research contexts, such as online shopping (Cho 2008; Turel et al. 2008), complaints about cellular-phone services (del Río-Lanza 2009), and organizational internal IS service (Carr 2007; Najjar et al. 2010).

Justice Theory

Perceived justice is generally defined as “a set of perceptions of fairness within an examined social system” (Colquitt et al. 2001). There are numerous views on the sub-dimensions of justice, but it is generally considered to consist of procedural justice, distributive justice, and interactional justice (Smith et al. 1999). As online information service environments have recently been popularized, interactional justice is usually divided into interpersonal justice, such as politeness and respect displayed during service delivery, and informational justice, which is focused on the explanations about the processes and results (Colquitt et al. 2001; Colquitt et al. 2011; Turel et al. 2008). Perceived justice has been used as a key construct in previous studies about service failures and service recovery efforts in many different contexts. Some examples of such studies are about internal IS service recovery (Najjar et al. 2010), e-customer service (complaining) (Turel et al. 2008), broadband Internet service (Liao 2007), retail banking (Chebat et al. 2005), and restaurant and hotel (Smith et al. 1999; Smith et al. 2002). In research about service failure/recovery, the antecedents of justice are mainly service recovery efforts (Liao 2007; Smith et al. 2002; Smith et al. 1999), and the dependents variables include service recovery satisfaction (del Río-Lanza 2009; Weun et al. 2004; Wirtz et al. 2004), positive/negative emotions (Chebat et al. 2005; del Río-Lanza 2009; DeWitt et al. 2008; Schoefer et al. 2008; Smith et al. 2002; Weiss et al. 1999), behavioral responses such as negative word-of-mouth (WOM), third-party action, and repurchase intention (Schoefer et al. 2008), and trust (DeWitt et al. 2008).

The company’s level of justice, as shown during the service failure handling process, is an important determinant of service recovery. In PIB contexts, in particular, perceived justice is expected to play a more significant role for the following reasons. First, there are few chances that customers will reuse the service unless they are satisfied with the service recovery process in terms of ‘justice’ because their personal information remains under the management of the company as long as they do not exit from the service. Second, considering that most current PIB cases are taken place in online services, it is more likely that users who have perceived ‘injustice’ will actively engage in spreading negative WOM through social network systems (SNS) or promote third-party actions through online communities than in cases of offline services.

Conceptual Framework

Considering the concepts and theories discussed thus far, we developed service recovery framework in the PIB context as shown in “Figure 1”; when a service failure occurs, a company’s service recovery efforts have positive effects on its customers’ perceived justice, and perceived justice in turn plays a role in reducing negative emotions and negative behaviors. Finally, emotional responses also affect behavioral outcomes.

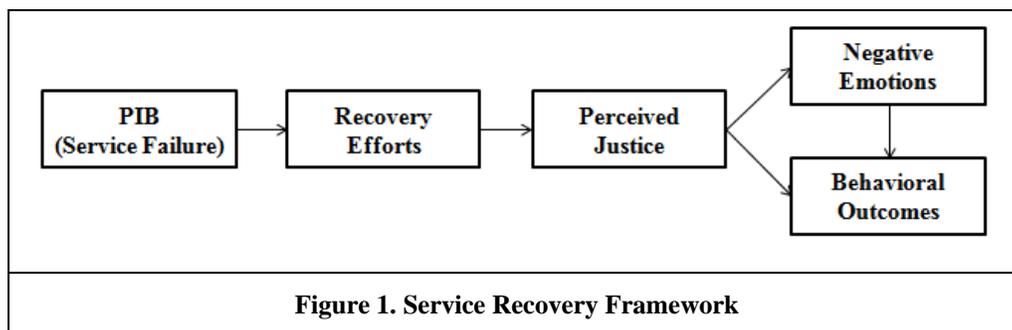


Figure 1. Service Recovery Framework

Research Model and Hypotheses

Based on the conceptual framework and extensive reviews of related literatures, the research model was generated as “Figure 2”. As service recovery efforts, compensation, prompt handling, apology, and explanation are considered. Perceived justice is measured as the second-order reflective construct in this study. Negative emotions, negative WOM, and third-party action are included in the model as customer responses.

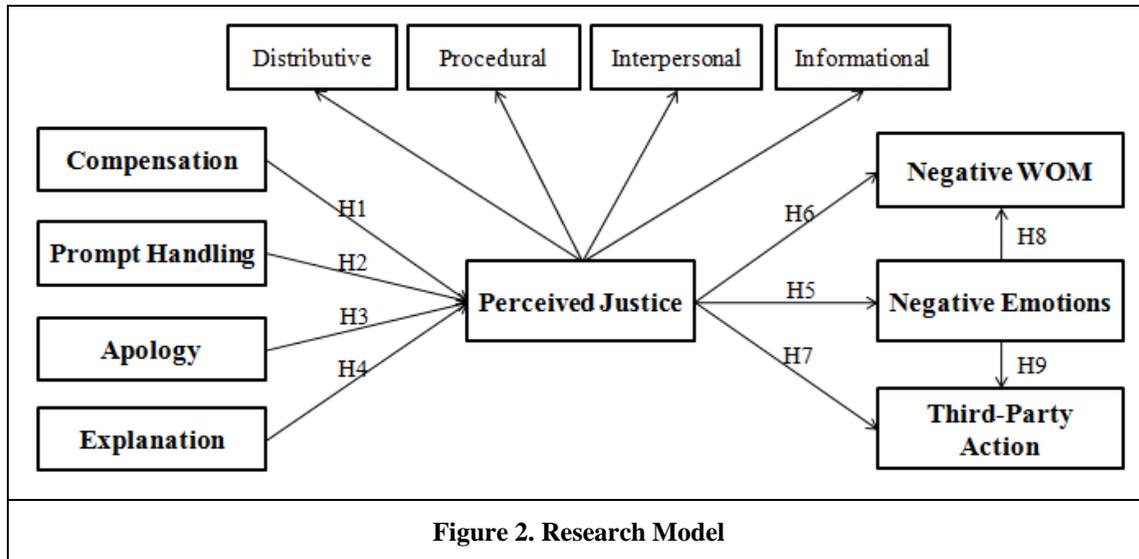


Figure 2. Research Model

Service Recovery Efforts and Perceived Justice

Service recovery efforts positively influence customers’ perceived justice. Among previous studies on this relationship, Smith et al. (1999) suggested compensation, response speed, apology, and initiation as the independent variables of perceived justice, and Liao (2007) identified problem solving, being courteous, and providing an explanation as the independent variables. Wirtz and Mattila (2004) considered compensation, speed of recovery, and apology. In this study, initiation, one of the recovery attributes in Smith et al.’s (1999) original framework, is excluded because it does not apply to the PIB case. Customers typically cannot notice about breaches of their personal information before the company admits and notifies the accident. Furthermore, many countries have responded by adopting data breach disclosure laws that require firms to notify victims if their personal information has been lost or stolen (Lee et al. 2011; Romanosky et al. 2011b); hence, PIB recovery efforts are almost always organization-initiated.

Compensation

Compensating customers is one of effective service recovery strategies, and it leads to favorable customer responses (Grewal et al. 2008). Parasuraman et al. (2005) suggested compensation, as well as responsiveness and contact, is an important service recovery attribute in the online context. Tangible compensation, such as discount, free merchandise, refund, coupons, affects perceived justice (Mattila 2006; Smith et al. 2002); especially, it is related to distributive dimension of justice (Wirtz et al. 2004);(Smith et al. 1999).

In Korea, a local district court ordered the company to compensate its user whose personal information was leaked for the customers’ psychological damage although actual tangible loss did not occur (Heo 2009). Therefore, it should be empirically tested if compensation for the loss of personal information increases the perception of justice like in other previous studies about service recovery. Thus, we hypothesize:

H1: Compensation for PIB is positively related to perceived justice.

Prompt Handling

Prompt handling refers to service providers' response without delay when service failures occur (Liao 2007). Response speed increases customer perceptions of justice; especially, it is closely related to procedural justice (Chebat et al. 2005; Smith et al. 1999; Wirtz et al. 2004). On the other hand, tardy responses result in perceived injustice as it represents the company's fault and stalling (Conlon et al. 1996).

When Sony reported their PIB incident, more serious was the fact that the company notified the victims about the incident six days later. The company's slow response and truth concealment aroused its customers' anger; and consequently, numerous lawsuits are currently in progress (Acohido 2011). Therefore, we propose the following:

H2: Prompt Handling of PIB is positively related to perceived justice.

Apology

Apology is a communication way to convey politeness, empathy, and concern to customers who experienced service failure (Smith et al. 1999); it can enhance customer's positive perception and evaluation (Najjar et al. 2010). Making an apology implies that the company admits responsibility for the service failure (Goodwin et al. 1992); hence, it performs a key role to mitigate the potential conflict between the service providers and the customers experienced service failures (Hui et al. 2001).

Previous studies about justice revealed that why making an apology important for recovering from service failures; it is a kind of rewards for the customer's unpleasant experience and inconvenience in emotional perspectives (Liao 2007). Considering this relationship, we hypothesize:

H3: Apology for PIB is positively related to perceived justice.

Explanation

In order to recover from service failure effectively, not only is instrumental support (e.g. compensation) and emotional support (e.g. apology) important, but also information support, such as explanation, should be also considered (Gelbrich 2010). Through explanation, customers can understand what kinds of failure happened, why they occurred, and how it will be handled in the future (Conlon et al. 1996), (Najjar et al. 2010). In this study, retrospective explanation about the reason of PIB, prospective explanation about the future plan for dealing with PIB (Gelbrich 2010; Mattila 2006), and the explanations about what kinds of personal information are breached will be considered. We suggest the following hypothesis:

H4: Explanation about PIB is positively related to perceived justice.

Customer Responses

Negative Emotions

Service failures tend to elicit angry and vengeful feelings (Strizhakova et al. 2012). Negative emotions regarding the experience of service failures can be diverse according to the type of experience and individual differences. Smith et al. (2002) analyzed subjects' verbal protocol, and gained five categories of negative emotions provoked by service failures which are anger, discontent, disappointment, self-pity, and anxiety.

Emotional responses, especially negative emotions, have been frequently studied as an outcome of perceived justice since Weiss et al. (1999) emphasized the importance of emotional aspects in justice research. Representative studies include del Rio-Lanza's (2009), DeWitt et al.'s (2008), Chebat's (2005), Schoefer and Ennew's (2005), and Schoefer's (2008), and they suggested negative causal relationships between perceived justice and negative emotions about service failures and/or the service recovery. Thus, we hypothesize:

H5: Perceived justice decreases negative emotions.

Behavioral Outcomes

A company's service recovery efforts are aimed at reducing negative emotions and ultimately preventing customer exit and reducing negative behaviors such as negative WOM or third-party actions.

Negative WOM has been regarded as an important behavioral dimension of service recovery's outcome in previous literatures (Strizhakova et al. 2012; Van Vaerenbergh et al. 2012). The growth of the ubiquitous IS environment and SNS has enhanced the influence of negative WOM, and its spreads through Facebook, Twitter, and blogs, in particular, may have great effects on a company's reputation. In other words, a company's inappropriate responses to PIB can lead to customers' negative feelings, and it may influence a potential customer who was not a direct victim of the PIB, leading to a negative view of the corporation and negative WOM.

Some customers who have unpleasant feelings with the company's service failures owing to inappropriate recovery efforts may attempt third-party actions such as lawsuits and accusations (Schoefer et al. 2008). Hence, hundreds of suits against firms for the unauthorized disclosure of personal information have been brought (Romanosky et al. 2011a). In Korea, some PIB victims are seeking collective actions by forming a virtual community to file lawsuits. Furthermore, thanks to the advancement of the Internet, plaintiffs can easily be recruited by lawyers as victims in cases of PIB, so the number of plaintiffs involved in the lawsuit and the amount of compensation that may be shouldered by the company can increase geometrically (Heo 2009). Such class lawsuits are likely to bring great losses in terms of time and cost and negatively influence the company's reputation. Based on these points, the following hypotheses have been established:

H6: Perceived justice decreases negative WOM.

H7: Perceived justice decreases third-party action.

H8: Negative emotions increase negative WOM.

H9: Negative emotions increase third-party action.

Research Design

Instrumentation

The research constructs used in this study were measured using survey item scales confirmed reliability and validity in previous studies. Some of the measurement items were modified to fit the PIB context, if needed, and were translated from English to Korean. "Table 1" shows survey items and their sources. All the variables were measured using a Likert 7-point scale.

Construct	Operational Definition	Survey Items	References
Compensation	The degree to which the company compensates customers for the PIB	1. The company compensated me for the PIB. 2. It compensated me when my personal information was spilt. 3. It gave me tangible rewards for the leakage of my personal information. (1=strongly disagree; 7=strongly agree)	(Parasuraman et al. 2005)
Prompt Handling	The degree to which the company responds quickly to the PIB	1. The company reacted promptly to the PIB. 2. It quickly attended to the problem. 3. It responded to the case promptly. (1=strongly disagree; 7=strongly agree)	(Liao 2007)
Apology	The degree to which the company apologizes and confesses responsibility for the PIB	1. The company made an apology to me for what had happened. 2. It apologized for the inconvenience the PIB had brought to me. 3. It expressed regret for the PIB happened. (1=strongly disagree; 7=strongly agree)	(Liao 2007)
Explanation	The degree to which the company explains what happened, why the PIB happened, and how it will be dealt with	1. The company disclosed exactly which personal information has been leaked. 2. The company explained in detail why the PIB occurred. 3. The company explained in detail how it will	(Liao 2007) <i>Modified</i>

			deal with the PIB in the future. (1=strongly disagree; 7=strongly agree)	
Perceived Justice	Distributive Justice	Perceived justice involving resource allocation and the perceived outcome of PIB recovery	1. The outcome I received was fair. 2. I did not get what I deserved. (R)* 3. In resolving the problem, the company gave me what I needed. 4. The outcome I received was not right. (R)* (1=strongly disagree; 7=strongly agree) *: These two items were excluded due to the low factor loadings.	(Smith et al. 1999)
	Procedural Justice	Perceived justice involving the means by which decisions are made and conflicts are resolved during PIB recovery	1. I think the PIB was resolved in the right way. 2. I think the company has good policies practices for dealing with the PIB. 3. Despite the trouble caused by the problem, the firm was able to respond adequately. 4. The firm proved flexible in solving the PIB. (1=strongly disagree; 7=strongly agree)	(del Río-Lanza 2009) <i>Excluded the item related to prompt handling</i>
	Inter-personal Justice	Perceived justice involving the manner in which information is exchanged and outcomes are communicated during PIB recovery	1. Has the company treated you in a polite manner? 2. Has the company treated you with dignity? 3. Has the company treated you with respect? (1=to a very small extent; 7=to a very large extent)	(Colquitt et al. 2011)
	Informational Justice	Perceived justice involving justification and truthfulness of information offered during PIB recovery	1. Has the company been candid when communicating with you? 2. Has the company seemed to tailor communications to customers' specific needs? 3. Has the company opened all the information to the public? (1=to a very small extent; 7=to a very large extent)	(Colquitt et al. 2011) <i>Modified & Excluded the items related to detailed explanation</i>
Negative Emotions	The degree to which the respondent feels negatively about the PIB after PIB recovery	Please indicate to what extent you felt this way toward the PIB after the service recovery efforts. 1. Angry 2. Annoyed 3. Anxious 4. Upset (1=not at all; 7=extremely)	(Schoefer et al. 2008)	
Negative WOM	The degree to which the respondent intend to communicate concerning the PIB that denigrates the company and/or its services	1. It is likely that I will tell others about the negative experience I had. 2. It is likely that I will warn friends and relatives not to use the service of this company. 3. It is likely that I complain to friends and relatives about this company. (1=strongly disagree; 7=strongly agree)	(Schoefer et al. 2008)	
Third-Party Action	The degree to which the respondent intend to report to consumer agencies and/or media about the PIB, and file a	1. It is likely that I will report my complaint to a consumer agency. 2. It is likely that I will complain to a consumer agency and ask them to make the company take	(Schoefer et al. 2008)	

	lawsuit against the company	care of my problem. 3. It is likely that I will contact a newspaper or the television about my experience. 4. It is likely that I will take legal action against the company. (1=strongly disagree; 7=strongly agree)	
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Data Collection and Sample Characteristics

In this study, survey method was used, and respondents are composed of people who actually experienced PIB more than once within a year. Through the survey method, external validity of research can be enhanced by collecting actual service failure experiences (Gelbrich 2010). Especially, a scenario-based, role-playing experiment may lower participants' emotional involvement (Chebat et al. 2005); therefore, it is not appropriate for testing our research model.

The sample frame is panels from an online research company known as Panel Insight (<http://www.esurvey.kr/>). A recent IS (information systems) study conducted in the individual level addressed that using panels in data collection provides greater control providing a nationally representative sample as opposed to a random convenience sampling (Ayyagari et al. 2011). The online survey was conducted over a period of six days, from April 5 to 10, 2012.

Whether respondents actually experienced PIB was determined in the form of a prescreening question using an online panel company's sample, so that only victims of PIB could participate in the survey. And they are requested to specify their most impressive PIB experience and the company name, and answer the survey based on that PIB experience and the recovery efforts done by the company. Finally, data of 253 respondents were used in the analysis; the sample characteristics are in "Table 2".

Attributes		Frequency	Percentage
Gender	Male	114	45%
	Female	139	55%
Age	20-29	86	34%
	30-39	88	35%
	Over 40	79	31%
Breach Experiences	Once	24	10%
	Twice	77	30%
	Three Times	74	29%
	More than Four	78	31%
Action	No actions	20	8%
	PW change and continuous use	184	73%
	Exit	39	15%
	Others	10	4%

Data Analysis and Results

Measurement Model Validation

We used SmartPLS 2.0 (Ringle et al 2005) for confirmatory factor analyses and path analysis. In structural equation modeling using PLS method, convergent validity is evaluated by factor loadings and AVE (average variance extracted), and construct reliability depends on composite reliability (Chin 1998). Generally, if factor loadings and AVE are higher than 0.5, and composite reliability are higher than 0.7, convergent validity and internal consistency are confirmed (Gefen et al. 2000). Discriminant validity is assessed by whether each of item-latent construct loadings should be higher than cross-loadings, and the square root of AVE of each construct should be higher than correlation coefficients with other variables (Chin 1998; Gefen et al. 2000).

Reliability and Validity of Perceived Justice

Perceived justice was set as a reflective second-order construct composed of four first-order factors, which are distributive, procedural, interpersonal, and informational justice, in this study. Before assessing reliability and validity of second-order construct, those of first-order factors should be validated using the same evaluation criteria above mentioned. The two items of distributive justice using reverse scales were excluded owing to the low factor loadings in the earlier stage. The final results are shown in “Appendix 1” and “Appendix 2”. Some of the cross-loadings and correlations coefficients are relatively high; however, it provides the empirical support for the second-order construct because reflective constructs assume high correlations between sub-dimensions.

Reliability and Validity of Final Measurement Model

We estimated the second-order construct, perceived justice, using the repeated indicator approach (Wetzels et al. 2009). To compose a second-order construct, latent variable scores of first-order factors are used as indicators of a higher-order construct (Chin 1998; Wilson & Henseler, 2007).

The convergent validity of final measurement model was assessed as shown in “Appendix 3”, and descriptive statistics, reliability, and discriminant validity test was done like “Table 3”. And all of them met the ideal evaluation criteria. However, some of the correlation coefficients between service recovery efforts constructs were higher than 0.70; therefore, multicollinearity test was executed. The linear regression analysis was done with compensation, prompt handling, apology, and explanation as independent variables, and perceived justice as dependent variables. As a result of the test, all the variance inflation factors (VIF) showed the value less than 3.32, and every condition index was less than 11.95. This indicates that multicollinearity does not exist among the constructs according to Mason and Perreault’s rule (1991) which claims multicollinearity exists when VIF greater than 10, and condition indices greater than 30.

	Mean	S.D.	C.R.	Comp	PH	Apo	Exp	Jus	NE	nWOM	Third
Comp	1.96	1.49	0.976	0.965							
PH	3.20	1.66	0.957	0.540	0.938						
Apo	3.93	1.67	0.964	0.361	0.752	0.948					
Exp	3.32	1.63	0.960	0.478	0.755	0.793	0.942				
Jus	2.67	1.28	0.946	0.663	0.642	0.573	0.644	0.903			
NE	5.80	1.16	0.931	-0.266	-0.217	-0.228	-0.260	-0.435	0.879		
nWOM	5.14	1.35	0.954	-0.235	-0.219	-0.202	-0.266	-0.388	0.441	0.934	
Third	3.73	1.51	0.940	0.113	-0.091	-0.173	-0.133	-0.076	0.189	0.554	0.892
AVE				0.930	0.881	0.898	0.888	0.815	0.773	0.873	0.797

(Note: Comp=compensation, PH=prompt handling, Apo=apology, Exp=explanation, Jus=justice, NE=negative emotions, nWOM=negative WOM, Third=third-party action, S.D.=Standard Deviation, C.R.=composite reliability, Diagonals are the square roots of AVE)

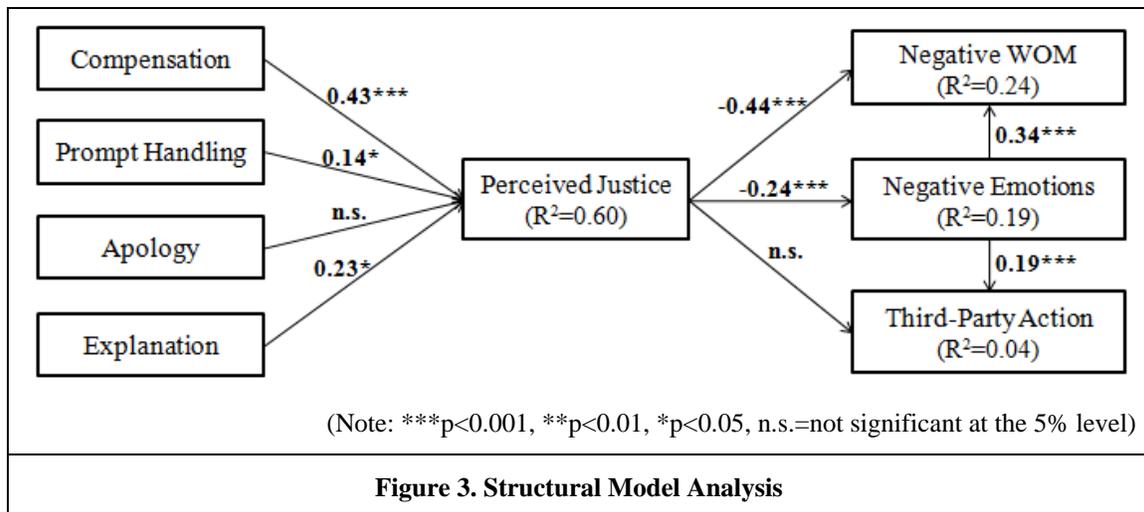
Hypotheses Testing

PLS uses bootstrapping method to test the significance of path coefficients. In this study, 500 sub-samples were created to test the suggested hypotheses, and the results are summarized as shown in “Table 4” and “Figure 2”.

As a result of hypotheses testing, all the suggested hypotheses, except for H3 (apology→justice) and H7 (justice→third-party action), are supported ($p < 0.05$). Among service recovery efforts, compensation (H1), prompt handling (H2), and explanation (H4) are proved significant antecedents of perceived justice. Perceived justice significantly decreases negative emotions (H5) and negative WOM (H6); and also, negative emotions significantly increase negative WOM (H8) and third-party action (H9).

The statistical power of endogenous variables is generally measured with the variance explained by the model (R^2 values), at least 0.10 as the reference value, in PLS because PLS method does not provide model fit indices (Chin 1998; Falk et al. 1992). The R^2 values of the criterion variables in this study were 0.60 for perceived justice, 0.19 for negative emotions, and 0.24 for negative WOM; however, the model accounts for only 4 percent of the variance in third-party action. This may be caused by the fact that third-party action got influenced by only negative emotions and showed insignificant relationship with perceived justice which is a key construct of the suggested structural model.

	Path	Path Coefficients	t-value	p-value	Result
H1	Compensation → Justice	0.432	7.054	0.000	Support
H2	Prompt Handling → Justice	0.136	2.035	0.043	Support
H3	Apology → Justice	0.132	1.609	0.109	Reject
H4	Explanation → Justice	0.230	2.317	0.021	Support
H5	Justice → Negative Emotions	-0.435	8.661	0.000	Support
H6	Justice → Negative WOM	-0.242	3.386	0.001	Support
H7	Justice → Third-Party Action	0.008	0.085	0.932	Reject
H8	Negative Emotions → Negative WOM	0.335	4.674	0.000	Support
H9	Negative Emotions → Third-Party Action	0.192	3.469	0.001	Support



Discussion

Research Findings

The research findings can be summarized as follows: First, a company should make sincere efforts to recover the damaged company-customer relationship by compensating them properly, handling the problem rapidly, and providing detailed explanation when the PIB occurs. Through these recovery efforts, the victims of PIB perceive that they get treated fairly, and their relationship with the company can be restored despite the service failure. Surprisingly, however, making an apology does not have a significant effect on perceived justice. This means that apology may not play an important role in PIB cases comparing with offline, face-to-face situations because the PIB

notice implies one-way, many-to-one communication. Apology is an emotional reward for the service failure of which operationalization is related to the words, 'apology' and 'regrets', while the other three factors are reflecting more rational aspects. Therefore, we can find out that apology as an emotional recovery effort is not an important determinant of perceived justice in the PIB context; instead, the customers want more tangible and rational rewards.

Second, perceived justice relieves customers' negative emotions due to PIB. If customers are treated in a justifiable way in terms of distribution, procedure, interpersonal relationships, and information, their angry, annoyed, anxious, and upset feelings caused by PIB can be weakened. Perceived justice also affects the behavioral outcome, negative WOM. That is, customers do not tend to share their negative experience with their acquaintances if they think that the company's response is justifiable.

Third, negative emotions increase both of the behavioral responses, negative WOM and third-party action. Particularly, PIB victims' negative emotions can make them do third-party action, such as class lawsuits, although perceived justice does not directly reduce third-party action. We can assume that third-party action is more associated with emotional aspects (negative emotions) than cognitive assessment (perceived justice) in the PIB context. That is, perceived justice evaluated based on cognitive assessment could directly affect negative emotions and negative WOM; however, it could only decrease third-party action through the mediating role of negative emotions in the PIB context. This result is opposite to Schoefer and Diamantopoulos's study (2008), which proved third-party action is a cognition-driven, less immediate behavior based on well-considered decisions, so the relationship between justice and third-party action is not mediated by emotions. We assume that third-party action may not involve well-considered cognitive decision-making any more in the current online environment that makes reporting to related agency or media and class lawsuits much easier.

Theoretical Contribution

As the first attempt to apply service recovery framework to the PIB, this study provides important theoretical contributions. It firstly views PIB as a type of service failures occurring in the service delivery stage, and suggests a research model based on in-depth literature reviews of service failure and recovery processes which have been studied in the fields of service marketing and applied psychology.

Justice theory is expected to be very suitable to explain service recovery processes in this research context because PIB is closely related to the company's 'fair' treatment of customers' personal information, and vengeful actions like negative WOM and third-party action are much easier in the current ubiquitous IS environment. Thus, the results of this study are expected to make theoretical contributions in various research areas, including information privacy, justice theory, and service marketing.

Practical Implications

With increased corporate social responsibility and ethical duties, higher-level response strategies beyond primary service recovery efforts to prevent customers' negative behavior and exit are necessary to enhance corporate image in the long run. Along with the recent emergence of PIB as a serious social issue, relevant regulations for reinforcing the responsibility of companies, and protecting consumers are being tightened. Nevertheless, developments in security technology or privacy-related regulations and laws are not enough to perfectly prevent PIB incidents. Therefore, practical implications need to be provided by determining the interrelationships between companies' efforts to restore their relationships with customers, customers' perceived justice, and behavioral intention.

Considering the research findings, companies' candid and sincere reactions to the PIB help to form long-term amicable customer relationships by raising perceptions of justice. Most of all, it should be reported to the public promptly as soon as the PIB detected. And the PIB notice must include detailed and exact explanation about the type of breached personal information, the reason why PIB occurred, and how the incident will be dealt with.

Especially, compensation to the PIB is required for successful service recovery. Compensation does not always mean monetary rewards; if the PIB victims who got moderate compensations, such as discounts, coupons, or other benefits, perceive the tangible rewards they received are fair and justifiable, it can minimize many negative results.

Last, but not least, third-party action must be prevented actively as it can cause tremendous financial losses to the company. According to this study, third-party action is directly generated by negative emotions; therefore, the companies should focus on the best follow-up services to appease one's negative feelings after the PIB.

Limitation of the Study

There are some limitations of this study. First, this study adopted a recall-based survey method enhancing external validity. On the other hand, experimental methods have strengths in terms of internal validity by minimizing memory loss and rationalization tendencies which are weaknesses of survey methods (Smith et al. 1999). In future study, scenario-based experimental design or multi-methods can be applied to achieve both external and internal validity.

Second, the severity of service failure has been studied as an important moderator in previous service recovery studies (e.g. Smith et al. 1999; Weun et al. 2004). The kind of PIB may be considered as a moderating variable in further studies; for example, whether there are general information breaches or sensitive information breaches.

Concluding Remarks

In conclusion, the current research firstly attempted to apply service recovery framework to the PIB context, and empirically tested it. Research findings successfully supported the rationale why PIB can be considered as a serious service failure and generated many theoretical and managerial implications. We encourage future research about PIB based on the result of this initial study.

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Appendix

Appendix 1. Factor Loading and Cross-Loadings of Each Dimension of Perceived Justice				
	Distributive Justice	Procedural Justice	Interpersonal Jus	Informational Jus
dis_jus1	0.935	0.746	0.641	0.617
dis_jus3	0.935	0.706	0.666	0.642
pro_jus1	0.715	0.938	0.671	0.666
pro_jus2	0.752	0.956	0.724	0.689
pro_jus3	0.751	0.955	0.723	0.704
pro_jus4	0.723	0.940	0.769	0.755
inter_jus1	0.511	0.607	0.880	0.717
inter_jus2	0.711	0.752	0.959	0.847
inter_jus3	0.715	0.765	0.958	0.853
inf_jus1	0.633	0.718	0.835	0.960
inf_jus2	0.674	0.744	0.850	0.966
inf_jus3	0.619	0.665	0.798	0.939

Appendix 2. Reliability and Validity of First-Order Factors of Perceived Justice					
	Construct Reliability	Distributive Justice	Procedural Justice	Interpersonal Justice	Informational Justice
Dis_Jus	0.93	0.93			
Pro_Jus	0.97	0.78	0.95		
Inter_Jus	0.95	0.70	0.76	0.93	
Info_Jus	0.97	0.67	0.74	0.87	0.95
AVE		0.87	0.90	0.87	0.90

(Note: Diagonals are the square roots of AVE)

Appendix 3. Factor Loading and Cross-Loadings of Research Constructs								
	Compensation	Prompt Handling	Apology	Explanation	Perceived Justice	Negative Emotions	Negative WOM	Third-Party Action
comp1	0.961	0.534	0.359	0.467	0.630	-0.251	-0.223	0.053
comp2	0.970	0.523	0.357	0.464	0.655	-0.267	-0.236	0.129
comp3	0.964	0.505	0.328	0.453	0.633	-0.251	-0.220	0.144
ph1	0.511	0.944	0.671	0.679	0.578	-0.185	-0.164	-0.077
ph2	0.473	0.954	0.723	0.721	0.622	-0.212	-0.207	-0.096
ph3	0.536	0.917	0.722	0.724	0.607	-0.212	-0.243	-0.082
apo1	0.299	0.719	0.937	0.725	0.503	-0.191	-0.148	-0.161
apo2	0.380	0.708	0.946	0.770	0.575	-0.239	-0.237	-0.157
apo3	0.342	0.714	0.961	0.757	0.546	-0.215	-0.184	-0.174
exp1	0.409	0.693	0.777	0.936	0.601	-0.208	-0.217	-0.120
exp2	0.459	0.739	0.741	0.959	0.608	-0.251	-0.250	-0.136
exp3	0.483	0.702	0.723	0.931	0.612	-0.274	-0.284	-0.121
Lat_Dis	0.690	0.466	0.387	0.481	0.872	-0.429	-0.363	-0.011
Lat_Pro	0.522	0.654	0.582	0.659	0.908	-0.352	-0.329	-0.096
Lat_Inter	0.549	0.618	0.619	0.639	0.922	-0.392	-0.364	-0.127
Lat_Infor	0.633	0.583	0.480	0.549	0.909	-0.396	-0.344	-0.038
ne1	-0.256	-0.241	-0.257	-0.286	-0.432	0.916	0.448	0.188
ne2	-0.265	-0.116	-0.103	-0.167	-0.385	0.877	0.358	0.100
ne3	-0.152	-0.158	-0.180	-0.178	-0.321	0.834	0.355	0.194
ne4	-0.253	-0.234	-0.248	-0.267	-0.381	0.888	0.378	0.179
nwom1	-0.333	-0.244	-0.213	-0.265	-0.454	0.458	0.937	0.427
nwom2	-0.124	-0.179	-0.210	-0.260	-0.305	0.391	0.927	0.601
nwom3	-0.168	-0.178	-0.135	-0.215	-0.300	0.372	0.939	0.554
third1	0.058	-0.081	-0.141	-0.125	-0.117	0.234	0.608	0.935
third2	0.077	-0.122	-0.190	-0.147	-0.101	0.174	0.552	0.942
third3	0.180	-0.077	-0.178	-0.123	0.006	0.088	0.337	0.866
third4	0.187	-0.022	-0.117	-0.062	0.037	0.093	0.318	0.822