

# Poster: The influence of the knowledge level about information security on Anshin factors

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## ABSTRACT

In this research, we investigate users' subjective sense of security, which we call Anshin, the sense of security in Japanese. Our research goal is to create a guideline of providing Anshin about information security for users. In this paper, we report the relationship between users level of knowledge and Anshin factors about information security. We conducted a Web survey with 1030 subjects with our questionnaire. We divided the subjects into two groups of low level of knowledge about information security and high level and analyzed each group. As a result of the analysis, we extracted the similar factors between low knowledge level groups. However, we extracted the difference factors between high knowledge level groups. We showed that Anshin factors were different according to user knowledge levels on information security. Moreover, we showed that the other attributes might affect Anshin factors when user knowledge level is high.

## 1. INTRODUCTION

Anshin is a Japanese term that indicates the sense of security. It is composed of two words, viz. An and Shin. "An" is to ease, and "Shin" is to mind. Anshin literally means to ease one's mind. Traditional research on security has been based on the assumption that users would feel Anshin when provided with secure systems. Sometimes the users would feel Anshin even with an insecure system. In Japan, security threats such as information leaks and phishing attacks are increasing and fewer people feel Anshin at the use of the information technology compared to other countries [1]. According to these surveys, security and Anshin are different concepts, and we need to survey on Anshin. When we survey the Anshin, we must define the attribute of the subjects.

We extracted the Anshin factors and structure about information security from the users without technical knowledge using online shopping [2][3]. However, Anshin is a subjective concept. It is thought that attributes of the users influence Anshin factors. Therefore, we survey the relationship between attributes of the users and Anshin factors about information security. In this paper, we survey the relationship between the knowledge level about information security and Anshin factors in the beginning.

## 2. RELATED WORK

Regarding a sociological viewpoint, Yamagishi [4] gives a distinct definition on Anshin and trust. Anshin is the belief that we have no social uncertainty, whereas trust is needed when we have high social uncertainty. Murakami [5] defines safety as what can be expressed with an objective numerical value in relation to danger, and Anshin as subjective judgment of a user's danger. While security can be assessed quantitatively, Anshin has strong psychological and subjective aspects, so that it is difficult

to assess. One must conduct a survey in the psychological and subjective aspects for the investigation of Anshin. In information security technology, it is important to conduct a survey looking at human aspects.

In western countries, the similar concept of Anshin is "trust," and has been studied in the fields of psychology, philosophy, economics, and sociology. Xiao [6] defines those two parts of trust in the field of e-commerce; there are trust that originates in a user's recognition and trust that originates in a user's emotion. There is also a notion of trust with psychological, subjective aspects, and Lewis, et al. [7] consider the emotional part of trust a major factor and position as irrational. These surveys reported on the subjective factors, however, the surveys do not make it clear enough about subjective factors and models.

## 3. USER SURVEY

We conducted a user survey through a web survey. The survey was conducted on 1030 subjects between 19-81 years of age, on the 22nd and 24th of February, 2011. The number of valid response was 920. 423 out of 920 subjects were male, and 497 were female. We asked subjects to check the security knowledge level of the subjects. As questions about the knowledge, we asked eight questions about security risks and security measures from a survey by Information - technology Promotion Agency, Japan [8] and Nomura Research Institute Secure Technologies [9].

In the analysis, we divided the subjects into two groups of low level of knowledge about information security and high level and analyzed each group. We graded the knowledge level using eight questions. We have calculated the numbers of answer which subjects answered that "I can explain the contents of this security risk" or "I implement this security measures". We defined that these numbers is knowledge point.

We classified it so that the users knowledge point and male-to-female ratio, average age about the same value between the same knowledge level. (Low level 1 : M:90 F:177 A:39.932, Low level 2 : M:96 F:170 A:40.030, High level 1 : M:120 F:74 A:40.319, High level 2 :M:117 F:76 A:40.129) In this research, we conduct two steps. Firstly, we conduct the factor analysis. Secondly, we conduct the comparison between the same level groups.

## 4. FACTOR ANALYSIS

We conducted factor analysis for all groups. Factor analysis with the maximum-likelihood method and the promax rotation derived four factors (low level groups) and five factors (High level groups). We show Anshin factors from all groups in table 1. We identified the following factors:

**Perceived benevolence:** This factor was extracted in low level groups and High level group 1. This is a factor users feel Anshin

when a company responds with benevolence in “the trouble that occurred from the user’s mistake” or “the user’s question”.

**User’s intuition:** This factor was extracted in all groups. This is a factor when users assess Anshin from “instinct” and “experience”.

**Perceived competence and integrity:** This factor was extracted in low level groups. This is a factor the users feel Anshin when the company possesses competence not to let personal information leak out and the company performs personal information management integrity.

**Reputation of the company from a third party:** This factor was extracted in low level groups and High level group 1. This is a factor the user assesses Anshin based on information from a third party.

**Familiarity:** This factor was extracted in High level group 1. This is feeling familiarity for service from past experience or collective impression.

**Confidence in society:** This factor was extracted in High level groups. Mainly, it has feeling confidence in society and trust by user expectation.

**Perceived competence:** This factor was extracted in High level group 2. This is a factor the users feel Anshin when the company possesses competence not to let personal information leak out.

**Compensation:** This factor was extracted in High level group 2. This is a factor users feel Anshin when a company receive compensation in “the trouble that occurred from the user’s mistake”.

**Usability:** This factor was extracted in High level group 2. Especially, it has subjective assessment of the quality of UI. This factor represents not only usability from the viewpoint of information technology but also in terms of online shopping as a whole.

Taible.1 Anshin factors

|  | Low 1 | Low 2 | High 1 | High 2 |
|--|-------|-------|--------|--------|
| Perceived benevolence                        | ○     | ○     | ○      |        |
| User’s intuition                             | ○     | ○     | ○      | ○      |
| Perceived competence and integrity           | ○     | ○     |        |        |
| Reputation of the company from a third party | ○     | ○     | ○      |        |
| Familiarity                                  |       |       | ○      |        |
| Confidence in society                        |       |       | ○      | ○      |
| Perceived competence                         |       |       |        | ○      |
| Compensation                                 |       |       |        | ○      |
| Usability                                    |       |       |        | ○      |

## 5. DISCUSSION

As a result of previous work [3], we showed the possibility that Reputation of the company from a third party factor is Anshin factors for the users without information knowledge. In addition, as a result of this survey, we showed the possibility that reputation of the company from a third party factor is not a Anshin factor for the users of high level of knowledge about information security, because this factor was not included group 2 of high level. Therefore, we found that Anshin factors changed under the influence of the user knowledge level about information security.

From the above, it is thought the user of low level about information security feel Anshin and purchase the products based on information from third party.

It showed that Anshin factors might affect the other attributes except the knowledge about the information security when user

knowledge level is high, because Anshin factors were different between high level group 1 and high level group 2. For example, it is reported that the user experience [10] affect trust. Furthermore, in this survey of the man and woman ratio, low level was 34.9% of man, woman 65.1% and high level was man 61.2%, woman 38.8%. Therefore, we will survey the influence of the user experience and gender.

## 6. CONCLUSION

Information security is no longer limited to technical issues but human factor issues such as trust and a sense of security are required by the user. In this paper, we reported the results from our analysis on the relations between Anshin factors about information security and knowledge level about information security. We showed that Anshin factors were different according to the user’s technical knowledge level. Furthermore, we showed that might the other attributes affect Anshin factors when user knowledge level is high. As the future work, we shall survey the relationship between other user attributes and Anshin factors. We will create a guideline of providing Anshin about information security for users.

## 7. REFERENCES

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