

A Conceptual Design of Chat-bot Service System for Improving Risk Communication and Public Acceptance on Nuclear

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1. INTRODUCTION

People has respected the dramatic contribution of nuclear to energy that is dramatically efficient and fundamentally different from carbon-based paradigm of energy. Public had been remained confident to the nuclear in spite of some trial experiences in the early stage of the nuclear power utilization. Nowadays the belief on the safety becomes doubtful to public especially after Fukushima and other accidents. Many nuclear facilities in Korea are also suffering from a strong reluctances and various challenges though there are competitive world level nuclear options and advanced implementation plans for safety including post-Fukushima action items. Public is almost refusing to hear and discuss the reality of nuclear safety since the new government proclaimed a plan of prolonged de-nuclearization. Most of the risk communications on nuclear have been broken down with a few minor mistakes in managerial practices without any technical issue(2019 Kim).

However new emerging technologies such as AI, chat-bot, etc as well as continuous technical efforts on safety may provide a new potential to get over this hardship of risk communication and public acceptance in Korea. This paper is a preliminary study on the development of a chat-bot service system of nuclear safety. It has a purpose to get a rather robust foundations to enhance the risk communications and establish the public acceptance on nuclear, especially, between KAERI and people living near KAERI. It includes an needs analysis and a conceptual design of interaction/experience scenarios for a chat-bot based information service to the public.

2. NEEDS ANALYSIS AND PRELIMINARY REQUIREMENTS FOR RISK COMMUNICATION

Two kinds of needs analysis were conducted to figure out the conceptual design of supporting

service for risk communication. One is about how to service the risk communications between KAERI and public interest groups near KAERI. The other is technical considerations to facilitate the risk communications with the current emerging technologies. Following figure may show the overall scope and basic approach to this project.



Fig.1 Overview of Public Risk Communication Service

Several prior works on the needs analysis are conducted based on general surveys and FGI (focused group interview) with interest groups. Following a few findings can be summarized after the prior study.

Firstly, the essential items for nuclear safety management to public can be specified by nuclear engineering, and explicitly described in regulations by NSSC. However the pre-defined set of information on nuclear safety could not be enough to public, since public needs to get confidence both on safety of object setups and on the operating authorities. These may go beyond the objective factual data on radiational materials and contaminations, and may need to expand the needs analysis to many plausible scenarios. The scenarios may describe more realistic experience on safety.

Secondly, risk communications for public acceptance may be strongly dependent upon the way of interactions rather than the factual data and information in general. The interactions also should include and devoted to the various experiences of interest groups. Many recent emerging technologies such as AI/Chat-bot could enhance the interactions in practice if carefully developed with prior enough to meet the needs.

3. CONCEPTUAL DESIGN OF CHAT-BOT SERVICE SYSTEM

The following scheme shows a service system for the management of public acceptance. A living-lab type infrastructure may be indispensable for the foundation to enhance the risk communication.



Fig.2 Risk Communication based on Living-Lab

The correct and factual data about the nuclear facility should be provided at first to interest groups. However the understanding could be varied according to their interests and concerns if any (1992 Wickens). The priority of information may change dramatically when any event occurs. Considerations from the perspective of behavioral science (or behavioral economics) should be included to the presentation of the information (2011, Kahneman). It may include the types of situational scenarios and interactions as well as the critical items and their formats/layouts to be provided.

Applications on smart-phone would provide not only a flexible base for this kind of public service, but also a better interaction for getting big data about the users' expectations and behaviors. Especially the chat-bot could provide the best interactive means for the risk communications. Figure 3 may show the conceptual interactivity and its technical scope of interaction design.

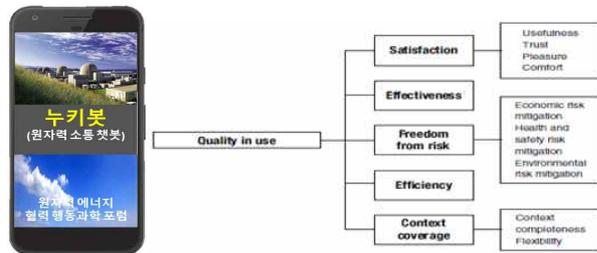


Fig.3. NUKEY-BOT and Scope of Interactivity for Risk Communication

Figure 4 and 5 may show a scheme of the risk communication service among interest groups and a data processing infrastructure system as a back-bone. And a business model is planned by Figure 6.

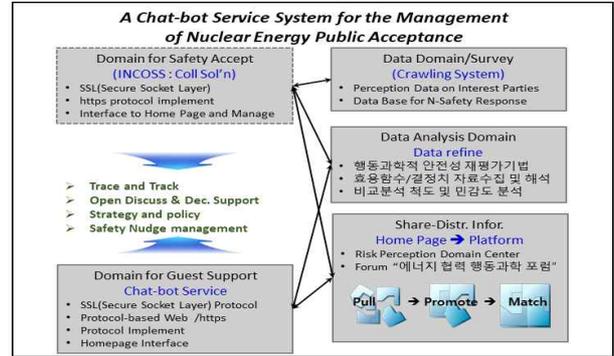


Fig.4 A Service Scheme for Chat-bot based Interaction for Risk Communications

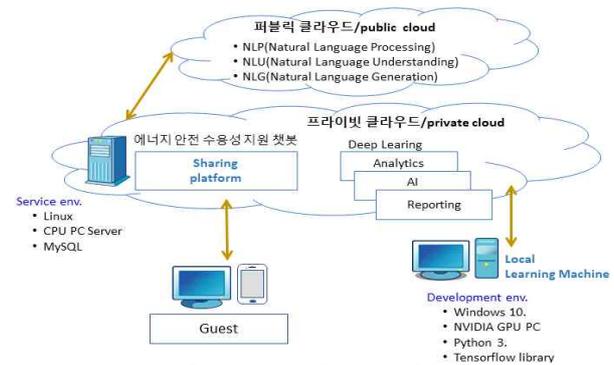


Fig.5 A Scheme for Chat-bot Service Infra

Item	Target System for Business	1 st Platform: 실증 데이터 수집 플랫폼 생태계 조성	2 nd Platform: 기반 구축	3 rd Platform: 활성화
Pull	'수용성 관리 지원 챗봇 운영관리 플랫폼'의 플랫폼과 참여자 '협업 Intra-Net' 구축(협업조직문화 기반의 그룹웨어/워크플로우, 콘텐츠 관리, 지식경영 정보시스템 기능 구현)	플랫폼 참여 그룹/기관 등의 지식 구조화 협업 지원 및 이용자 관점의 콘텐츠 관리 중심	플랫폼과 관련된 콘텐츠 및 지식 경영상태 중심	새로운 '가지 창출' 활동 지원
Promote	원자력 수용성과 관련된 의사결정 반영을 지원하기 위한 관리시스템 서비스 제공(에너지 안전 수용성 관리를 위한 실증 데이터 수집, 분석, 리포팅 요구 서비스 체계 및 체계 구축)	AI 적용 데이터 및 빅데이터 생성 관점 중심 활동	AI 적용을 통한 "신뢰성 체크" 관점의 서비스 제공	에너지 안전 수용성 제고를 위한 단일 One-Stop 서비스 체계 제공
Match	원자력 수용성 관련 리빙랩 운영 서비스 제공(제안 구축(데이터 그룹과 수요그룹, 공공그룹 간, 수요그룹의 공급그룹 전이 등 '가지 매칭'을 통한 플랫폼 활성화)	에너지 안전 수용성 관리 정책 수립을 위한 실증 데이터 수집, 분석 지원 관점 중심	에너지 안전 수용성 관리 정책 실행 관점 중심	에너지 안전 수용성 관리를 위한 다양한 서비스

Fig.6 A Scheme for Chat-bot Service Infra

4. CONCLUSIONS

The paper describes a preliminary study for the risk communication system and a conceptual design utilizing smart-phone app and AI/chat-bot. It can be incorporated further especially in case of big data techniques.

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