네트워크 기반에서 가축 유행병 위기 완화를 위한 개념 모델 표준화

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Service Model Standardization of Risk Mitigation on Livestock Pandemic based on Network

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요약

본 논문에서는 최근 스마트농업의 중요한 이슈로 떠오르고 있는 스마트 축산분야의 가축 유행병 서비스 표준 모델을 제시한다. 네트워크를 이용하여 전 세계적으로 유행하는 가축 전염병 질병 리스크를 파악해서 서비스 유저들에게 관련 모델을 제공하여 실질적으로 가축 소유자들에게 경제적인 이득을 제공하고 궁극적으로 국가 농축산업 경제에도 도움 될 수 있을 것으로 판단된다.

ICT와 접목하여 제시되는 가축전염병 서비스 표준모델과 가축 전염병 위기완화 표준모델 공유 방법은 향후 국내 및 국제 농축산업 분야에 표준에 적용하려고 지속적 연구가 진행될 예정이다.

ABSTRACT

In this paper, we present a standard conceptual model of livestock epidemic service in the field of smart livestock, w hich is emerging as an important issue in smart agriculture.

By using the network to identify the global livestock epidemic disease risk and provide relevant models to service use rs, it is expected that it will actually provide economic benefits to livestock owners and ultimately help the national lives tock industry economy.

In order to apply the standard livestock epidemic service standard model and the livestock infectious disease crisis mit igation standard model sharing method that is presented in conjunction with ICT to the standards in the domestic and int ernational agricultural and livestock industries in the future, continuous research will be carried out.

키워드

Keywords— Risk mitigation service, Livestock pandemic, Risk mitigation ,Conceptual model

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1. Introduction

It is required to effectively prevent infectious diseases occurring in wild birds, wild animals and livestock by utilizing the modernized advance network, and to effectively treat the future, current and post situation. As the 5G and IoT network deployment, massive machine-type terminals especially in the verticals collect massive data which enables the digital transformation of vertical outside and inside, such as the agriculture, logistics, transportation, healthcare, environment, supply chain finance, .etc.

It is not only valuable directly for the service provider who collect, aggregate and analyse the data, but also for the upstream data consumers which reuse the data for derivative business, e.g. the environment data (e.g. temperature and wind speed) for agricultural insurance, the driving behavior data of vehicles for second-hand transaction, the transportation traffic data for AI algorithm training, .etc.

The importance of the data raises the concern to the data integrity and the trust anchor. Animal epidemics, which occur regularly every year, are needed standardization to prevent economic losses worldwide and a great crisis in securing food resources.

For the prevention of such livestock infectious diseases, it is more problematic because it is handled manually and there is no standardization procedure until now. It is required to effectively prevent infectious diseases occurring in wild birds, wild animals and livestock by utilizing the modernized advance network, and to effectively treat the future, current and post situation.

2. Concept of risk mitigation service

Animal epidemics, which occur regularly every year, are causing economic losses worldwide and a great crisis in securing food resources.

For the prevention of such livestock infectious diseases, it is more problematic because it is handled manually and there is no standardization procedure until now. It is required to effectively prevent infectious diseases occurring in wild birds, wild animals and livestock by utilizing the modernized advance network, and to effectively treat the future, current and post situation.

Risk mitigation service refers to all aspects of the risk mitigation processes which are intended to reduce the impact of risks and develops mitigation processes, as part of the service, based on data.

In the conceptual diagram shown in Figure 1,

risk events are detected by analysing risk data obtained from service areas owned by farm owners or enterprises, i.e. risk sufferers via communication networks.

Risk mitigation service providers then classify the risk types and assess the impacts due to the detected risks.

The risk status will be delivered based on the risk types and impact levels to the relevant parties, i.e. risk mitigators that are responsible to cope with risks such as disaster prevention headquarters or local officers to prevent the dispersion of risks. The results after these risk mitigation actions have been performed will ultimately be delivered to the service users (risk mitigators and risk sufferers).

A reference architecture based on this concept will be described in the next clause.

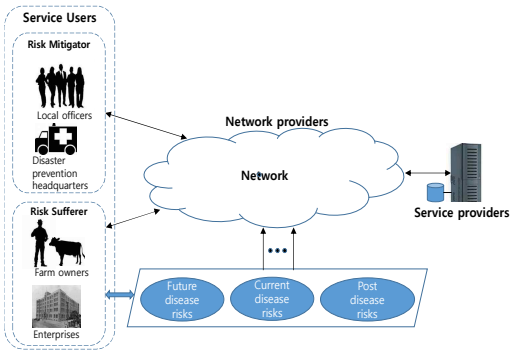

Figure 1. Conceptual diagram of risk mitigation service

3. Reference model for risk mitigation

Risk mitigation service should be effective to reduce risks in relation to rescue, evacuation, safety confirmation and life sustainability.

There could be a consideration of risk types with associated levels of risk possibilities.

Therefore, risk types need to be identified, and for each risk type several levels of risk possibilities may be required to be distinguished. Service providers should provide risk message boards, risk notices, risk mitigation guidance, and safety confirmation and message broadcast capabilities for risk indication to users.

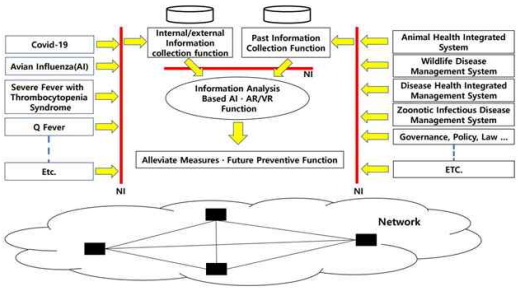

Figure 2. Reference model of risk mitigation service

In the Reference model shown in Figure 2.

4. Risk mitigation action Function

Livestock diseases can severely harm animal health as well as human health,

and also have adverse economic impacts through their effects on producer incomes, markets, trade, and consumers.

Especially, foot and mouth disease is considered to be the most economically devastating livestock disease in the world, and represents a worst-case scenario for livestock diseases because of the variety of spaces involved, rapid spread, and difficulty in controlling outbreaks.

Immediate notification is necessary because of its rapid and substantial impact on the international trade of animals and animal products.

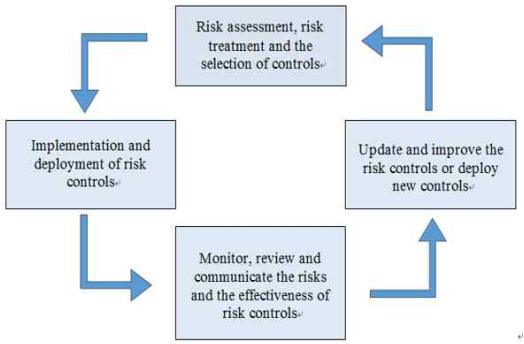

Figure 3. Risk mitigation action function

5. Conclusion

A survey on the standardized points around service model for of risk mitigation on livestock pandemic based on networks is given in this paper.

The standardization work for risk mitigation on livestock pandemic based on networks is just at the beginning stage in ITU-T meetings.

More studies on each point are required to finish the works including amendments and enhancements such as service requirements and service scenarios need to be explored for this standardization.

These standardization activities are expected to contribute to the global usages of risk mitigation on livestock pandemic situation.

These features enable service providers to provide information about various risk mitigation services needs from service users and provide advice on livestock pandemic situation such as risk mitigation monitoring, risk mitigation action, and all of information in response to requests for services from service users.

More interests are expected to attain the successful results that ultimately contribute to innovate in lifestyle.

This service model is required to derive necessary service features that support these missions.

Therefore, it is proposed in this paper for the future standardization.

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