ABSTRACT

Public Perceptions and Governance of Risks of Autonomous Systems: A Singapore Perspective
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With the fourth industrial revolution, the proliferation of autonomous systems has become a major technological trend. Autonomous systems use artificial intelligence (AI) and operate without human intervention. Examples of autonomous systems include driverless cars, autonomous drones, exoskeletons, lethal autonomous weapons, unmanned aircrafts etc. High-income countries such as Netherlands, Singapore, Norway, United States, Finland, United Kingdom, Germany, and Japan have already planned for adoption of these systems. These systems are used/intended to be used in several sectors such as transportation, agriculture, defence, healthcare, manufacturing, and space exploration. They have significant benefits like economising time and cost, and increasing efficiency in delivery of public services. However, they also have ethical, social, and legal risks. For instance, the loss of employment due to their operation has been a widely discussed implication of the adoption of autonomous systems.

While there has been a discussion of the benefits and risks of specific autonomous systems, more needs to be known about the public perceptions of the risks of these systems. Reactions of the public, especially about novel technologies, can help policymakers to understand the publics perspectives and needs better and help involve them in decision-making for governance and regulation of autonomous systems. Singapore ranked first in the Government Artificial Intelligence Readiness index in 2019 and has been one of the forerunners in development of AI-related systems. Given the suitability of Singapore as a case, the study will address two key research questions: How do people perceive the risk of the adoption of autonomous systems? What are the factors that influence the adoption of autonomous systems by the public in Singapore?

In this study, we extend the Unified Technology Adoption and Use Theory by introducing the role of government. The direct determinants of the perceptions of autonomous systems would be performance expectancy, effort expectancy, social influence, fear or dread of the systems, facilitating conditions, trust in the government and technology, knowledge and familiarity, and personal inclination towards using technology. Age, gender, experience, and voluntariness of use are moderating factors. An online survey of 500 respondents is carried out by constructing measures for the variables and to analyse the survey, structural equation modelling in used for measuring the relationship between the variables and latent constructs. The study will contribute to the literature on governance of novel technologies and risk perception of autonomous systems.