April 10, 2023

NEXTY Electronics Corporation

NEXTY to Use its moderix® Model Distribution Platform for R&D in NEDO Project "Mechanisms to Ensure Safety and Reliability when Linking Complex Systems"

Toyota Tsusho Group's electronics trading company, NEXTY Electronics Corporation (Head Office: Minato-ku, Tokyo; President: Yasuhiro Kakihara; hereinafter referred to as “NEXTY Electronics”), has been commissioned by the Ritsumeikan Trust ("Ritsumeikan") to conduct research and development on a "cross-organizational simulation platform for realizing labor-saving safety and reliability assessments for SoS[*1] (hereinafter, "this initiative")" in the "Project to Develop Digital Infrastructures for Industrial DX and Conduct R&D on Mechanisms to Ensure Safety and Reliability when Linking Complex Systems," a project in which the New Energy and Industrial Technology Development Organization (NEDO) issued an open submission request and chose Ritsumeikan as the successful tenderer.

1. Background

Japan has been promoting digital transformation with the goal of establishing free, open, safe, and secure data distribution in order to raise industrial competitiveness in anticipation of the realization of Society 5.0. By interconnecting systems, the promotion of DX is expected to establish mechanisms that enhance mutual value. However, in environments where multiple and diverse autonomous mobile robots[*2], such as drones and service robots, operate simultaneously, widely disparate systems are interconnected in a complex manner. Therefore, governance based on existing uniformly applied regulatory systems alone is not sufficient to address the unique challenges of SoS, including the "difficulty in predicting accidents," "difficulty in identifying causes," and "the existence of multiple causes." Furthermore, because SoS systems are updated frequently, AI-based decisions are becoming increasingly common, and system safety and reliability assessments are expected to be extensive and frequent, it will be critical to develop less labor-intensive methods.

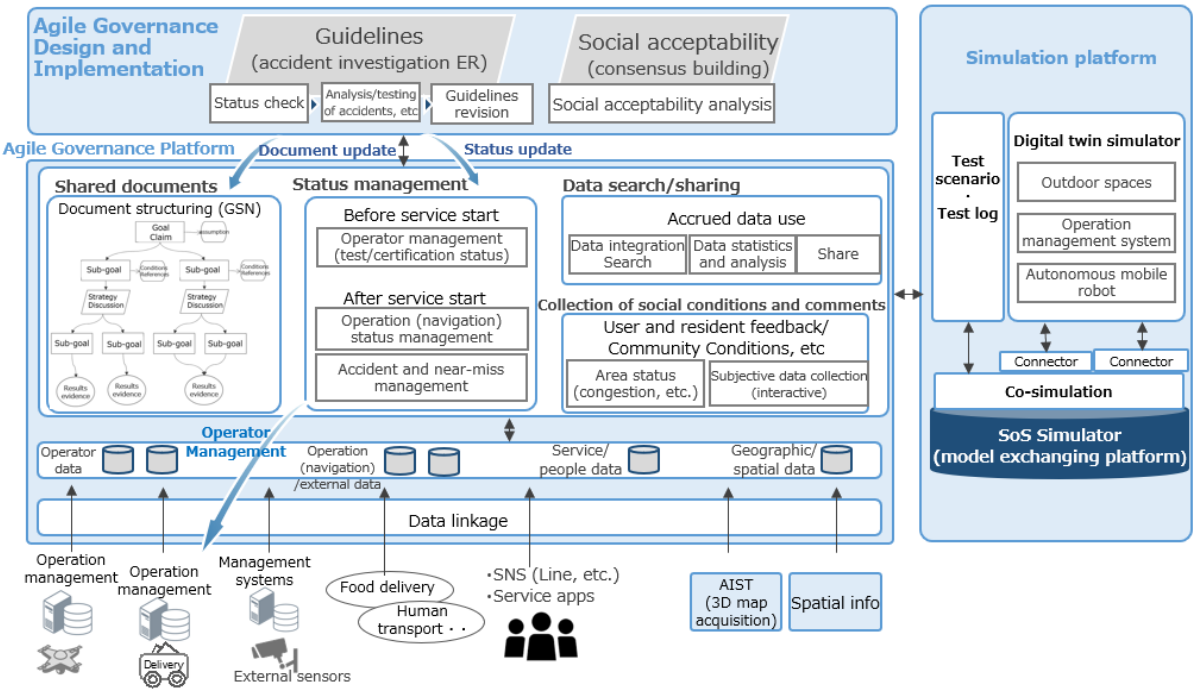
2. Overview of this Initiative

Based on the "Report on Autonomous Mobile Robot Architecture Design[*3]" prepared by DADC[*4], this initiative will use Ritsumeikan University's Osaka Ibaraki Campus (OIC), a place where students, faculty, staff, and local residents circulate and interact, as a living laboratory to investigate the causes of autonomous mobile robot-related near-misses in real time and consider measures to prevent recurrence while also verifying how effectively agile governance[*5] is able to restore conditions, and identifying issues. Through this, we will explore ways to foster social acceptability and develop digital infrastructure and governance approaches through (1) and (2) below.

(1) Build a cross-organizational agile governance platform that collects, manages, and shares SoS operational data and incorporates social acceptability
(2) Build a cross-organizational simulation platform that realizes labor savings in SoS safety and reliability assessments

In implementing above goal (2) of this initiative, NEXTY Electronics will develop the prototype and conduct demonstration testing on a cross-organizational co-simulation technology that connects simulators of multiple robots and different control systems. The demonstration testing will utilize an internally-developed model distribution platform ("moderix®"[*6]). Through demonstration testing, we hope to achieve early development of a simulator that realizes SoS and steady social implementation of a system that ensures safety and reliability in SoS.

【Agile Governance Overview】



Implementation period	FY2022 - FY2024
R&D items	(1) A cross-organizational "agile governance platform" that collects, manages, and shares SoS operational data, and incorporates social acceptability [Ritsumeikan, Softbank Corp.] (1)-A:Agile governance platform (1)-B: SoS operation guidelines (1)-C: "Digital co-creation technology" that fosters social acceptability (2) A cross-organizational "simulation platform" that realizes labor savings in SoS safety and reliability assessments [Ritsumeikan, NEXTY Electronics]

*1 SoS: An abbreviation for "System of Systems." It is an entire system composed of multiple systems whose diverse operations are intricately interconnected and rapidly updated.

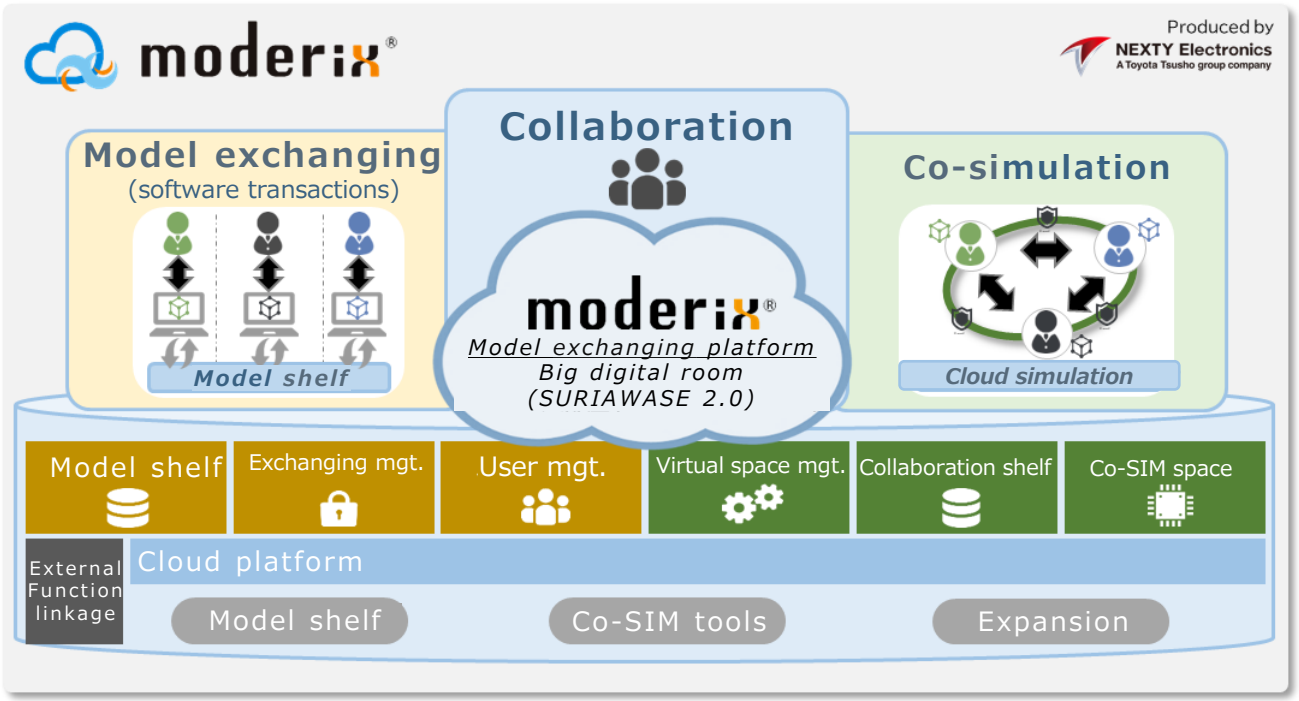
*2 Autonomous mobile robot (AMR): Refers to any type of mobility technology capable of autonomous movement, including drones, service robots, and self-driving cars.

*3 Report on Autonomous Mobile Robot Architecture Design: A report that investigates efforts to create abundance while addressing social issues through the use of autonomous mobile robots and digital technology. The report proposes an architecture that should be pursued by society as a whole.
https://www.digital.go.jp/assets/contents/node/basic_page/field_ref_resources/9f4e70e2-2335-4181-8293-258c12549d31/78a5c260/20220927_policies_mobility_report_02.pdf (Japanese only)

*4 DADC (Digital Architecture Design Center): An organization that promotes the development of mechanisms and systems that enable the coordination and sharing of data required to realize Society 5.0. (ultra-smart society). https://www.ipa.go.jp/en/about/org/dadc/index.html

*5 Agile Governance: Governance is defined as "the design and operation of mechanisms (technical, institutional, organizational, etc.) for achieving certain shared goals among stakeholders." Agile governance consists of three elements: (1) Subject: Multi-stakeholder; (2) Process: Agile; and (3) Structure: Multi-layer. (Source: Report on Autonomous Mobile Robot Architecture (Draft), 2022, METI DADC)

*6 moderix®: A cloud service that enables multiple companies to share digital design documents with the goal of improving software design efficiency in the automotive industry, connecting them in a virtual space and enabling integrated testing. “moderix“ is a registered trademark (No.6606602) of NEXTY Electronics.
https://moderix.com (Japanese only, English website under preparation)



【Company Overview】
■About NEXTY Electronics

Company: NEXTY Electronics Corporation
Location: Shinagawa Front Building, 2-3-13, Konan, Minato-ku, Tokyo

NEXTY Electronics is one of the core members of the Toyota Tsusho Group's electronics business and boasts top-of-class scale in the automotive electronics sector. With its core strengths of technology and products, NEXTY Electronics meets customer and global needs in a broad range of areas and provides solutions to the challenges faced by society. It achieves this by actively adapting the autonomous driving, connected, and other leading-edge technologies it has cultivated in the automotive electronics sector for use in other industries. It offers optimum solutions that transcend regions and business sectors by leveraging the Toyota Tsusho Group's global network.

Visit the link below for more information.
NEXTY Electronics website: https://www.nexty-ele.com/english/

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