NEXTY ELECTRONICS WORLD

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NEXTY Electronics Corporation

Our software business – Software and Service with trust and quality cultivated from automotive embedded software/ -

NEXTY Electronics aims to be a world-class trading company through its size, valued technologies, qualities, and functions. We are introducing embedded software development functions specialized in automotive systems, as one of our strengths, and also one of the main features of our company. Currently, we have 900 software engineers in total, consisting of 600 in offshore development, and 300 in core partner companies. We will increase this number up to 2,500 software engineers including core partner companies within a few years. With advanced software development capabilities and response capabilities as our strength, we will propose contract-based software development utilizing internal, external and overseas engineers, and also solutions to solve customer's challenges.

Embedded solution Division
Takamichi Kono (Executive Officer)

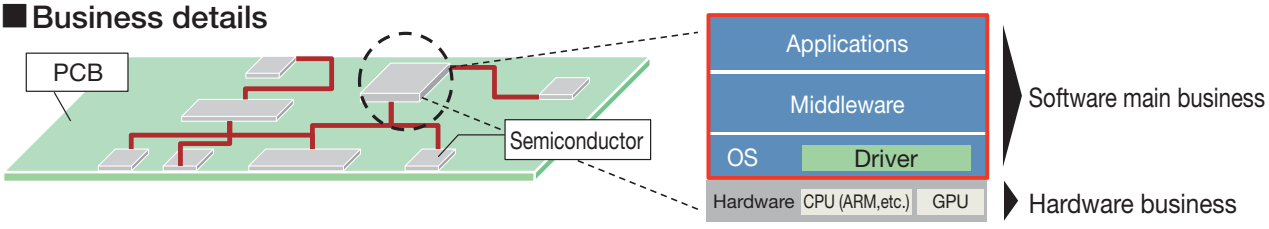
First word

We entered the automotive embedded software business in earnest in 2002, then established the standardization organization JASPAR in 2004, a development base in Thailand in 2005, and another development base in Dalian in 2009. Beyond the boundaries of traditional trading companies, we have tried to strengthen software development capabilities. As a result, for almost 15 years, we have gained our customers trust by accumulating development experience in different automobile applications since entering the software business. Meanwhile, expansion in technology areas and an increase the required development resources is expected relating to automobile technology innovation. At the same time, the importance of software for customer's products and goods will increase more and more.
Therefore, we intend to strengthen our software development capabilities further through investment and capital tie-up as a means to continuously provide high quality software with high added value for our customers.

About software business

Roles	Software Business	Our service
Planning phase	• Marketing research • Prototyping/Evaluation • Partner selection • Planning	• Marketing research/Excavating seeds of new technologies • Prototyping/Evaluation agency/Technical support by utilizing in-house engineers and domestic and overseas development partners • Corporate evaluation/Credit control ability cultivated through years of experience in the automobile industry • New business planning/Scheme construction • Offshore development process construction
Design/ Development phase	• Design • Implementation	• Design support or contracted designs by utilizing in-house engineers and abundant technical partners • Embedded system software development • System construction, progress management, and quality control by project management functioning and/review • Provide and develop software IP
Evaluation and verification phase	• Unit/integration tests • Field operation tests • Reliability evaluation	• Various tests utilizing software engineers of overseas subsidiaries • Various tests utilizing technical partners • Field operation tests utilizing global networks
Mass-production phase	• Manufacturing • Maintenance	• Key management, OTA software provision, and security support

Business details



Our role in NEXTY Electronics

NEXTY Electronics, which has software/hardware and ICT industrial fields, will support customers in a value-added type supply chain system that is next to nothing else.

Supply chain system	Development	Design	Manufacturing	Storage	Logistics	Quality
Functions of NEXTY Electronics	Technical suggestion	Embedded software development	Electronic Manufacturing Service	Warehouses exclusively for electronics parts	Global sales network	TAQS

NEXTY Electronics has full coverage of supply chain system

Software business history

September 2004	Established JASPAR with Toyota Motor Co., Ltd. and Nissan Motor Co., Ltd.
April 2005	Established an automotive software development company in Thailand.
September 2007	Established VeLIO, the limited liability partnership.
November 2008	Established an automotive software development company in China.
April 2011	Established TERAS, the general incorporated association.

Actual experiences of development and evaluation in software business (partially extracted)

Network

- CAN transceiver conformance tests
- Bluetooth connectivity tests
- Smart phone application operation tests
- Automotive network simulation
- CAN based software (development-evaluation)

Body

- Switch/seat related software (development-evaluation)
- Smart key software (development-evaluation)
- Body ECU software (development-evaluation) (C/MBD)
- Meter software (development-evaluation-product evaluation) (C/MBD)
- Power monitoring ECU software (development-evaluation) (C/MBD)

Chassis

- Brake software reconstruction Refactoring/Structural redesign

Safety control

- Prototype development for millimeter wave radar drivers and platforms
- ADAS related application modeling (MBD)
- IPA/BGM software (design-development-evaluation)
- ADAS world driving evaluation operations
- Algorithm tagging operations
- Automatic driving software development
- Server construction/Introduction of super computers

Power train

- Hybrid car related software development
- Hybrid car related application development (MBD)
- Dynamic/static analysis of engine software
- Engine ECU MCU evaluation/consideration

Multimedia

- Navigator/IVI HMI development/Navigation application (development-product evaluation)
- Bluetooth profiling (design-development-evaluation)
- USB/Flash drivers development
- Smart phone application development
- Graphic middleware development
- Services for navigator (construction-development)
- Voice recognition engine API development
- AGL development support

Connected

- OTA software provision/implementation
- TCU (development - evaluation)
- V2X applications and drivers (development-evaluation)
- Engine ECU MCU evaluation/consideration

Our offshore development bases

TOYOTA TSUSHO NEXTY ELECTRONICS

NETH (Bangkok in Thailand)

NEDL (Dalian in China)

Core partner companie | Second partner companies

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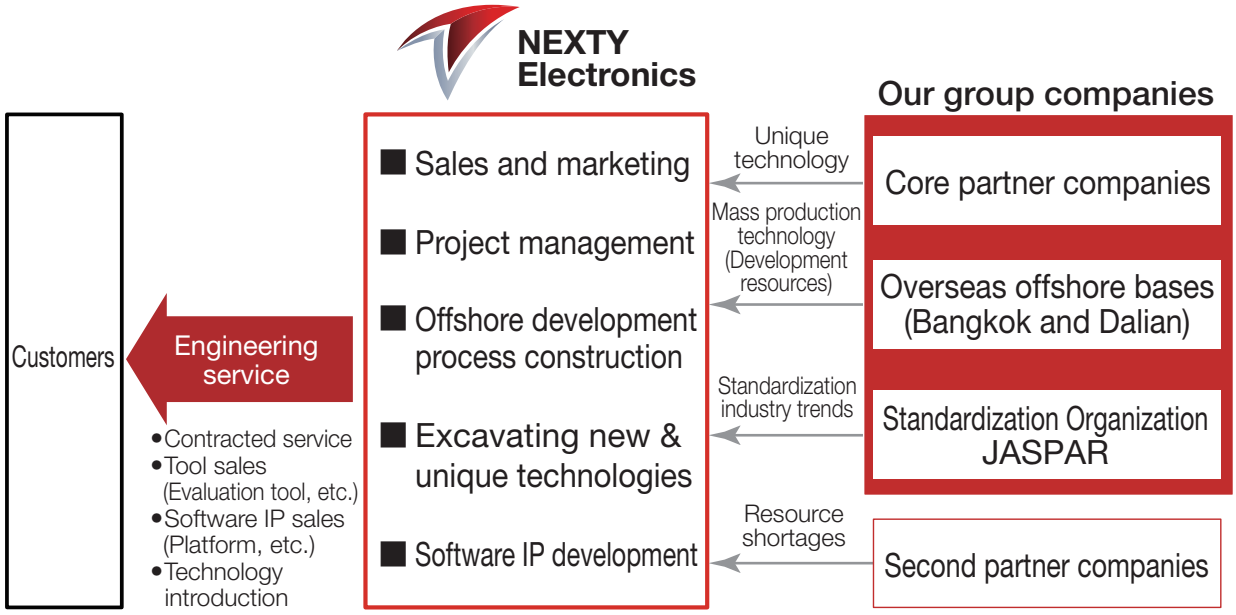
Software Development / Verification

In order to realize customers' businesses, we will propose a high-quality/low-cost development system based on years of experience in the automotive field, we carry out development and verification, and manage promotion of projects.

We fully utilize our abundant operational experience in the automotive field for software development and verification. In addition to in-house software engineers, we have established a system that allows us to collaborate with our overseas subsidiaries with unique technology and mass production technology, as well as over 100 domestic and overseas companies.
Based on these business environments, we undertake proposals, development and verification operations for a software development system that meets customers' needs, starting from development work seeking advanced technology to mass production and verification work that emphasizes cost performance. Besides this, we will manage systems that are more complex and promote projects emphasizing cost.
With a view of five or ten years from now, we will discover companies that possess unique technologies, and strengthen collaborative systems with other companies that can compensate for resources in mass production development and verification. In addition, we aim to further enhance project promotion management systems.

Software business perspective

We will provide optimal and high-quality engineering services to our customers through unique technologies and development resources that are possessed by our group companies and the functions which we have (such as project management) in software development for automotive and industrial fields being large-scale and complex.



Core partner companies

AXE, Inc.	OTSL Inc.	Integration Technology Co., Ltd.
OS / Artificial intelligence	Functional safety/AUTOSAR /Communication	Model-based development (Simulation)
eXmotion Co., Ltd.	Future Technology Laboratories Inc.	C&S group GmbH
Model-based development (Improve specification quality and processes)	Image recognition and image processing	Communication/Standard certification

Overseas offshore utilization

We provide automotive software that satisfies mass production quality, and realize project promotion with overseas business entities as seen in ten years of overseas offshore utilization experiences.

We utilize our overseas bases such as Toyota Tsusho NEXTY Electronics (Thailand) Co., Ltd. (NETH), and Toyota Tsusho NEXTY Electronics (DALIAN) Co., Ltd. (NEDL), and expand embedded software development, verification operations and software BPO (Business Process Outsourcing). While they are overseas operations, they are realizing high quality that our customers demand through smooth communication in Japanese language and the know-how to ensure project promotion.
In the future, as a further increase in installation and utilization technology for automotive electronic control systems is expected, we will develop human resources for model-based development, strengthen the development capabilities of image processing software for automatic driving, and develop the automotive platform.

NETH focuses on developing and evaluating power trains/EVs/body systems, and NEDL focuses on developing and evaluating cockpits (navigation/meters)/ body systems. In addition, there are dozens of model-based engineers, and we will continue to develop them.

■ Toyota Tsusho NEXTY Electronics Thailand (NETH)

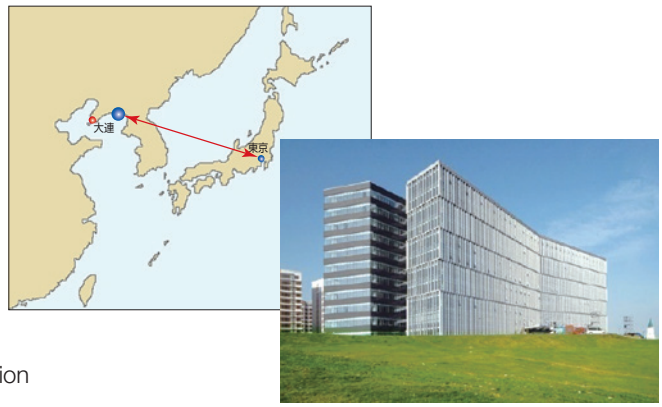
NETH adopts Thai software engineers, trains them in programming languages, development methods and quality improvements required for automotive electronic control embedded software, and develops personnel to contract automotive software development. They will promote and expand software development for automotive control systems, and contribute to the development of embedded software industry in Thailand.

Abbreviation: NETH
Location: Thailand (Bangkok) (30 minutes by car from Bangkok International Airport)
Foundation: April 29, 2005
Capital: 32,000 (Thousand Baht)
NEXTY Electronics Corporation 51%
Toyota Tsusho Corporation 39%
Toyota Tsusho (Thailand) Co., Ltd. 10%
Business description: Automotive related embedded software development
Automotive electronics device sales
Contents distribution business for telematics and automobiles
Number of employees: 244 (Expatriate staff 3, Local staff 241)
Strong field: Power train/EV related development and evaluation
Body development and Evaluation
Model-based development

■ Toyota Tsusho NEXTY Electronics (Dalian) Co., Ltd. (NEDL)

NEDL contracts to develop automotive related embedded system software and testing. Amongst the different types of software, they especially develop software related automotive multimedia, instrument panel systems such as meters, and wired/wireless in-vehicle out-vehicle communication related software as well as localized software. They are aiming to become the number one automotive related software development company in China.

Abbreviation: NEDL
Location: Fourth Floor West Side, No.7. Hui Xian Yuan,
Hi-tech Industrial Zone, Dalian
(30 minutes by car from Dalian city area)
Foundation: November 5, 2008
Capital: 195 (million Yen)
(100% owned by NEXTY Electronics Corporation)
Business description:
Automotive related embedded software development
Testing operation contracts
Number of employees: 166
Strong field: Multimedia and meter development and evaluation
Body development and evaluation
BPO (Business Process Outsourcing)
Model-based development



Access in convenient locations, around two hours by airplane, there are 72 flights per week between Japan and Dalian where the time difference is only one hour.

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Automotive network (LAN) consultation/verification

Based on experience gained in the automotive field with accumulated technologies and know-how, we contribute to the speedup and reliability of communications for new services including autonomous driving.

Based on high trust from major auto-manufacturers, suppliers, and semiconductor vendors, we provide several specification developments relating to high quality automotive LANs, conformance test services for specific OEMs, analysis services via simulation at the time of vehicle wiring arrangement design and various consulting services that accompany them.
In developing the automotive LAN standardization specifications, we have established a business alliance with C&S Group GmbH, which is the one and only third-party certification authority in the world certified by CAN/CAN-FD/LIN/FlexRay/Ethernet standardization organizations, so we can provide a high quality service.
In the future, as automotive communication functions are improving more and more, we will promote the activities to support our customers to introduce next generation automotive communication (CAN-FD) or Ethernet.

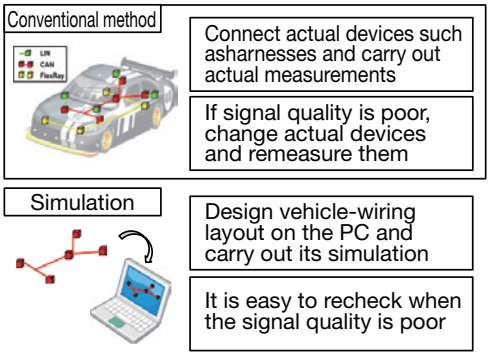
Automotive communication solution provisions
We provide services related to certification tests, wiring arrangements in communication, consulting and next generation automotive communication businesses.

(Conformance tests) Certification tests

The third-party certification authority certified by standardization organizations and specified OEMs executes conformance tests and issues designated certificates.

■ Main target standards
- CAN: GIFT/ICT, specified OEM physical layer standards
- Ethernet: OPEN Alliance
- LIN: LIN consortium

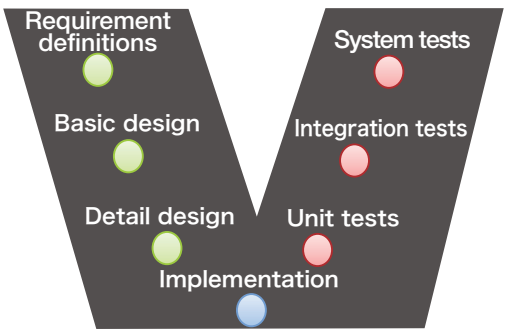
Vehicle wiring layout simulation



Conventionally we checked the quality of the com-munication signals by connecting actual devices and measuring their actual communication signals, however, the same thing by virtual simulation has now been realized and this contributes to improved design and verification efficiency for the layout of in-vehicle wiring.

■ Main services
- Vehicle wiring layout guideline development
- Simulation agency service
- Simulation automation tool sales

Various consulting services



We provide technical support for designing and verification specification development, and test system construction when new communication methods are introduced, etc. We can also support existing communications.

■ Main services
- Development for communication function specifications and evaluation specifications
- Communication architecture reconstruction
- Test system development

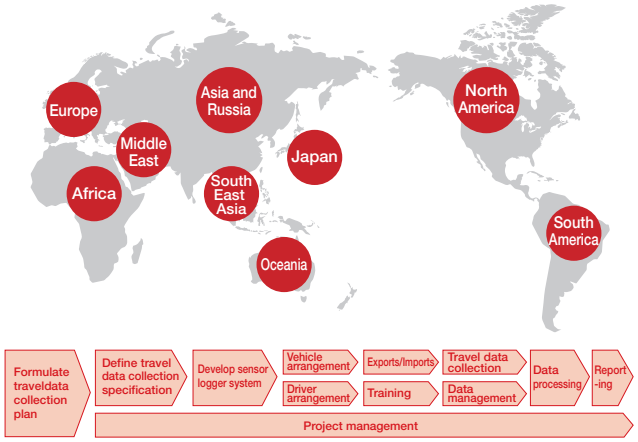
Data collection and analysis

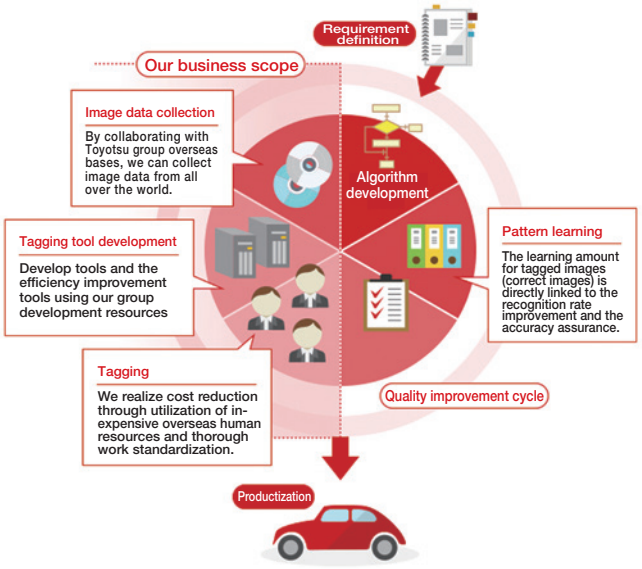
Due to the spread of autonomous driving and ADAS systems, demand for automotive data collection and analysis is expected to increase and cost reduction is also expected to be required. In order to respond in kind, we will support our customers by promoting sharing of each customer's data, reducing costs and reducing delivery lead-time.

Detailing our activities, we support everything from vehicle arrangement, equip installation to the data collection as well as collecting travel data using our global network. We also propose data storage and management methods suitable for customers' purposes. Furthermore, we will realize cost reduction and resource allocation optimization based on the various recognition objects such as vehicles, pedestrians, white lines and signs and tagging methods (segmentation etc.).

Image data collection

We collect and evaluate data within the actual environment.



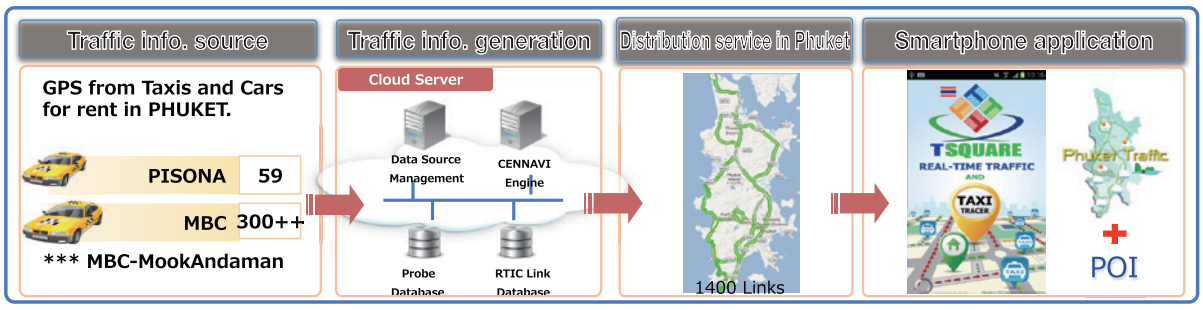


Tagging and tool development

Contracted work and BPO (Business Process Outsourcing) tagging/annotation/labeling services
We support correct value data creation and database arrangement work in ADAS (image/millimeter-wave radar//LIDAR) development.

Contents distribution business for telematics and automobiles

Traffic congestion in Thailand will never ease.
In order to improve on this, we construct models that collect, process, and distribute traffic information consistently.



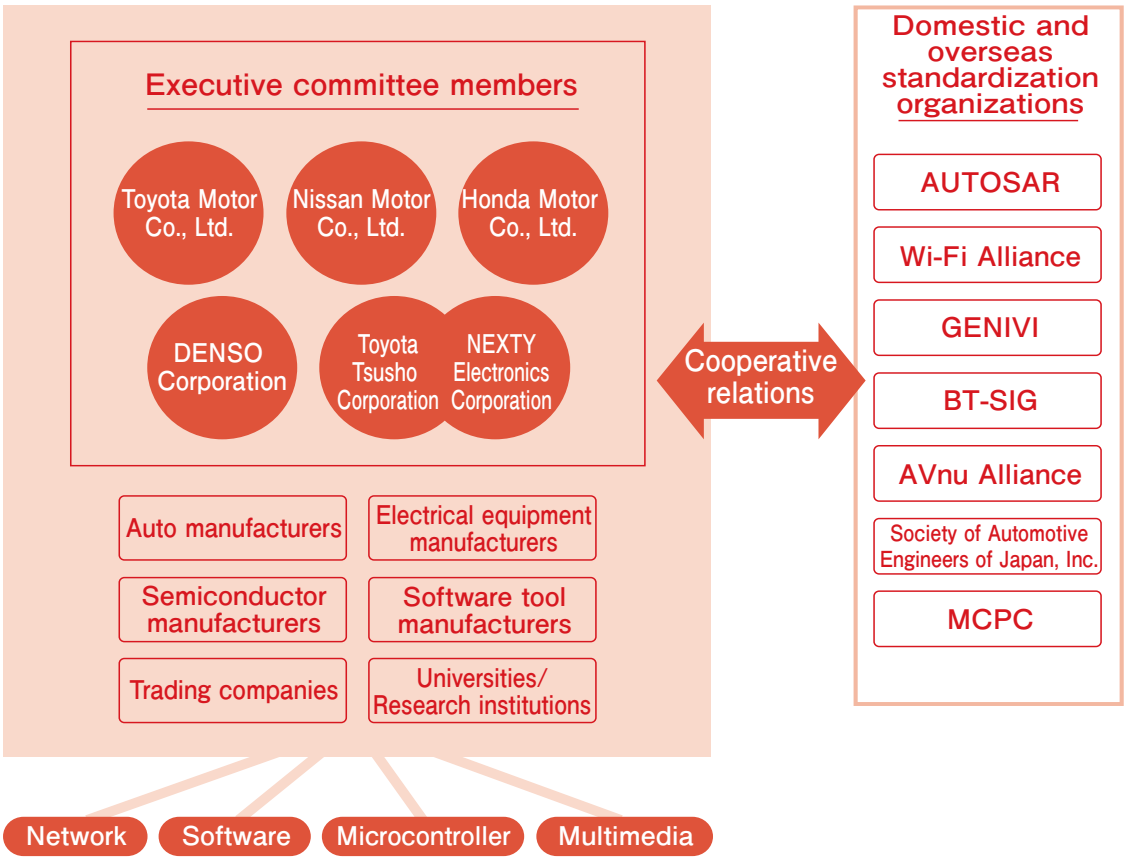
General incorporated association JASPAR

Engineers from various industries of auto-manufacturers, suppliers, semiconductor manufacturers, and embedded software manufacturers are participating in this association to promote standardization in automotive LAN, software, microcontrollers and information system areas together in collaboration with overseas and domestic related organizations.

General incorporated association JASPAR (Japan Automotive Software Platform and Architecture) is a standardization organization founded in September 2004 aiming to standardize the software and networks for advanced and complicated automotive electronic control systems, and to enhance development efficiency and secure high reliability through common use. As an executive committee member, we have participated in this association since its establishment. We are currently serving as the secretariat as a group member of the Toyota Tsusho Corporation executive committee, and support the smooth activities through management of meetings and events, management of funds and information, public relations work, etc.

Engineers from member companies in various areas related to car electronics such as auto manufacturers, suppliers, semiconductor manufacturers, embedded software manufacturers, etc. participate in JASPAR to promote standardization activities. These include automotive LAN, software, microcontrollers and information system areas in collaboration with relevant domestic and overseas organizations. Currently, we have established nine working groups to examine in technical fields such as automotive information security, functional safety, automotive LAN, multimedia, etc. and each participating member expands with active discussion. We will aim to establish a standardization technology to solve common problems in the future car electronics field with the keywords "utilization on the spot" and "utilization worldwide" in anticipation of the arrival of the approaching autonomous driving age and the spread of advanced driving support systems.

■JASPAR membership structure and their action fields



■JASPAR's mission/vision

Solve common problems for future car electronics technologies by standardization and promote their distribution.

- Software, communication, and technology development supporting automobile advanced technologies.
- Common infrastructure development.
- Challenging world standards.

→

- International contribution
- Standardization
- Development efficiency improvement

Inquiry/Embedded solution Division JASPAR group info@jaspar.jp TEL.03-4306-8555

Topics

A software development joint venture company was established in Thailand with Denso Corporation
Toyota Tsusho DENSO Electronics (Thailand) Co., Ltd

Outline of Toyota Tsusho DENSO Electronics (Thailand) Co., Ltd

Location:	Bangkok, Thailand
Business details:	Development and design of software for automotive engine ECUs
Capital:	20 million Baht (About 70 million Yen)
Number of employees:	About 30 (FY 2016)
Foundation:	November 2016

Toyota Tsusho DENSO Electronics (Thailand) Co., Ltd. (hereinafter referred to as TDET), is a joint venture between Toyota Tsusho NEXTY Electronics (Thailand) Co., Ltd. (hereinafter referred to as NETH) and DENSO Corporation that started its operation in Bangkok, Thailand on 4th November 2016. TDET develops software for engine ECUs (Electronic Control Units). The development scale has been enlarged with the advance of power train control in recent years, where improvement of development efficiency has been a challenge in engine ECU software development.
TDET develops software consistently using models in all processes from control development, design, to verification in software development. In addition, they standardize software for the development of various ECUs, aiming to improve efficiency and speed up development.

Solutions for challenges

Solutions for challenges - NEXTY Electronics resolves each customers' problems -

We are having trouble because the cost and resources in software development are insufficient.

We can construct processes offshore.
Based on experience in establishing offshore bases in Thailand and China, we minimize the risk of offshore development and promote contracted development therein.

We are having trouble with model-based development.

We have resources that can handle all processes from requirement maintenance in various domains, control/plant/implementation, model creation, MILS environment construction, through to verification work in model-based development.

We are having trouble with image processing and recognition.

We provide not only CAN and LIN but also next generation communication CAN-FD and Ethernet related consultations, and construction of certification and communication tests as well as test environments.

We are having trouble because the resources in OS porting is insufficient.

We can port operating systems and carry out performance evaluation.
We have engineers who are familiar with basic programs such as operating systems mainly through our core partners. Therefore, we can port programs to other hardware environments and evaluate them.

Does NEXTY Corporation support vehicle field operation tests?

Yes, we support running tests in various countries around the world.

Please tell us about the inter-ECU communication for vehicles.

We provide not only CAN and LIN but also next generation communication CAN-FD and Ethernet related consultations, and construction of certification and communication tests as well as test environments.

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Be the Next Bridge to the Future