

DOCOMO R&D Open House 2016



No	Title	Abstract
【A-01】	Detection of meal types by sensors	This technology detects the type of meals, using acceleration/angular velocity sensors embedded in the Smart Watch on the user's dominant hand.
【A-02】	Shopping support in consideration of the situation and state of the user - Auto-recommendation of products fitted to you-	This technology facilitates a shopping experience by detecting the user's context (the situation, the state) through asking questions and recommending products fitted to the context by using machine learning.
【A-03】	Agent that predicts behavior -Proactive and considerate smartphone-	The smartphone knows your habitual spots, schedule and favorite things because you always wear it. This is an agent which will support you in the most suitable timing and be able to get along with you.
【A-04】	Repl-AI - A platform which can make a Chat Bot in GUI -	Repl-AI is a platform for easily making a "Chat Bot," using an auto dialogue program. This will be useful for a primary response from customer support or customer service on the EC site!
【A-05】	Estimation of speaker attributes and intentions from dialogue	This technology estimates not only the text of utterance content but also the speaker's attributes (gender, adult or child) and detects interrogatory sentences in dialogue and respond to you with more understanding of your intention.
【A-06】	Integrated platform for speech and natural dialogue processing	This is an integrated platform for speech and natural dialogue processing.
【A-07】	Music interactive agent speaker	This speaker is a musical dialogue(session) agent that can recognize instrumental sounds by using chord recognition and auto-play technology.
【A-08】	FAQ systems over a dialogue platform	This system enables you to create FAQ bots easily that lead you to an answer with interactive Q&A.
【A-09】	Multilingual Q&A and automatic document summarize system	This system returns higher quality answers for objective and subjective questions (expecting feedback of personal impression). And this quickly classifies a large volume of documents and automatically generates a summary by using classification technology and extended reply automatic creation technology.
【A-10】	Correct translation of jargon terms on the internet -Enabling machine translation of casual Chinese slang on SNS sites-	This machine translates Chinese slang on SNS sites into natural Chinese expressions. This system is intended to be utilized in a wide range of applications, such as analysis/confirmation of comments and request for Japanese products and services from China on SNS sites and confirmation of words-of-mouth sightseeing information in China.
【A-11】	Tegaki Hon'yaku (Handwriting translation application) -Translates your handwriting immediately! Real-time communication!-	Tegaki Hon'yaku is an application dedicated to helping overseas visitors to Japan. This application translates the words and messages written on the tablet and smartphone. It also provides capabilities to draw pictures and paste photos, facilitating communication in various scenes in which verbal communication is difficult.
【A-12】	Translation assist application (Add-in for Office®)	This is a translation application add-in for Microsoft® Office. We will demonstrate the application.
【A-13】	Dialogue data operating system	This system consists of various tools that accumulate translation data efficiently, check the quality of interpretation, and operate and search the translation corpus (e.g. Konnichiwa(Japanese)⇔Good Afternoon(English)) that will be used for the creation of machine translation models.
【A-14】	Keyword translation application	This translation application supports communication with customers from overseas. This application is able to catch the drift of conversation based on words and facilitate inter-cultural communication by extracting "keywords" from the conversation and translating them.
【A-15】	Interview translation application	This translation application supports communication with customers from overseas. It is able to translate conversation smoothly using an exclusive handy microphone with a switch to start translation.

【B-01】	Maternity logging	This research focuses on diseases and changes in physical conditions related to pregnancy as an initial target. Analysis of big data is conducted for data that comprises three elements: genome information, biological substances in the blood, and daily healthcare data of pregnant women. This research is part of ongoing efforts for disease prevention and early detection.
【B-02】	Acetone analyzer and its applications in healthcare management.	This is a healthcare KIOSK that enables self-check of more than 14 items (e.g. dysbolism). During demonstration, visitors will be given an opportunity to measure their skin gas emitted from the bottom of the foot for health check on a trial basis.
【C-01】	Evolution and application of Mobile Spatial Statistics	The research and development of Mobile Spatial Statistics is going on regarding the statistics on migration of population, foreign visitor population, domestic tourism, real-time demographic, etc. Real-time population migration forecast will be introduced as one of real-time demographic applications.
【C-02】	Automated photo rearrangement utilizing smart phone data -Multiple analysis of the object, text, date and time, and location-	This service automatically arranges an enormous number of images in the smartphone according to their location, scene, etc. and enables you to find out the photo that you want to see immediately.
【C-03】	Image recognition technology	We will introduce two technologies that promptly recognize the subject (e.g. the object, scene). One is Specific Object Recognition, which identifies an object based on its patterns. The other is Generic Object Recognition, which classifies an obscure object not identifiable from its pattern or appearance.
【C-04】	A challenge to achieving advanced service management with efficient actions for fault recovery	We are promoting studies on efficient actions for fault recovery from the viewpoints of 3 phases: detection, analysis, and recovery. The overview of our challenge and elemental technologies used (e.g. automated classify technology for text logs, work flow visualization technology) will be introduced.
【C-05】	Online customer reception (ec concier, Agent-Aily) -Hospitality on EC sites just as real shops-	This is a solution to enable internet shops (EC sites) to offer hospitality to customers as if they were real shops while online commerce transactions proceed. This solution contributes to improving the purchase and continuation rates among EC site visitors.
【C-06】	Technology to estimate the facilities visited by customers	This is an engine and technology to estimate the customer's profile (e.g. hobby, taste and demographic information) from the facilities or shops they have visited based on GPS logs on the smartphone. This technology would be used for personalization and marketing analysis of services.
【C-07】	Technology to retrieve information on facilities	This is a search engine that can look for target facilities based on vague questions. It displays an appropriate ranking of facilities as a result of interpreting the name of locations in search keywords and adding weight to the information of facilities based on their popularity levels.
【C-08】	Geofencing platform	This is a geofencing platform to detect the entries to & exits from the boundary of geofence and utilize and accumulate the check-in data. Also the platform offers functions for analysis and visualization of information and population migration linked with the GPS information.
【C-09】	Tracking data analysis and prediction technology -Behavior recognition and prediction from the tracking data by deep learning-	This is a study to estimate the means of mobility of a person and predict the destination from the tracking data on the smartphone. The aim is to advance the personal assist service and realize the prediction and control of population migration.

【D-01】	DOCOMO Private cloud	Operating and managing a private cloud in the company realizes more security, enhanced support and affordability than a public cloud. We will demonstrate the private cloud and a reference model - automatic network structure setup currently under development-
【D-02】	DOCOMO Cloud Package/Cost Visualizer	The "DOCOMO Cloud Package," which contains system construction, operative know-how in consideration of security, and a cost analysis tool called "Cost Visualizer." DOCOMO has developed this overall package based on our experience of using a public cloud.
【E-01】	Device Web API	We are developing the "Device Web API," which enables the use of various devices only based on a standard Web technology. We established the "Device WebAPI Consortium", which has helped a large number of companies utilize various solutions.
【E-02】	Linking xService -Introduction of service examples by utilizing Linking-	We will demonstrate a new value created through collaboration between our service and IoT: a voice notification service offered by the Voice-agent Application "Shabette Concier" .
【E-03】	Smart parking	This is a reservation parking lot system which can solve the difficulty of finding a parking space while driving. We provide an application for reservation and online settlement for parking lots for drivers and a cost-effective vehicle detection sensor for parking facility owners.
【E-04】	Watching service system in Kobe city (Verification project)	This is a system for child watching service using BLE (Bluetooth Low Energy) tags. When a child having a BLE tag passes a detection point, this system reports GPS location information to parents. 41 companies have joined this verification project.
【E-05】	"39"(Thank you) Meister contract service for IoT device development	We undertake any IoT devices from design to production. We also offer consultation in all steps (e.g. Capital investment, technology for mass-production, radio regulatory, and package), which is necessary for commodification. We have provided service for a large number of customers from ventures to big companies.
【E-06】	Communication partner "Kokokuma" -Communication robot for the elderly-	This stuffed bear named Kokokuma with an built-in LTE module can connect elderly people with their children and grandchildren over the "voice" without the need for Wi-Fi or Bluetooth connection and even when the elderly cannot handle a mobile phone.
【E-07】	Cellular x drone Verification project - Action for the early realization of the drone business -	This study for the utilization of the cell-phone in the sky was started to meet the surging need for airframe control and picture transmission utilizing a drone in a wide area. We are pushing forward experiments to verify the most suitable operation of the whole network in terms of the influence on communication quality in the sky and ground cell-phone use.
【E-08】	Cellular drone prototype -Drone with LTE network for a new wider world-	You can control a drone by using the cellular network (LTE) even though you are outside of the range of direct control.
【E-09】	DOCOMO drone lab. - Expansion of the DOCOMO authorized external testing laboratory to drones -	We are planning to establish an environment that will enable drone manufactures to have their drones tested for LTE- communication compliance.
【E-10】	IoT Gateway for LPWA - Revitalization of Japanese agriculture using agriculture-IoT -	This is a prototype IoT Gateway for unlicensed "LPWA," which realizes low power consumption and wide area communication for IoT solutions in agriculture.
【E-11】	Power consumption verification project for low-end LTE UE Category modems -End-to-end verification project using multiple modems and an LTE base station simulator	This is a project to verify the performance of Cat.1, Cat.1 +eDRX (extended discontinuous reception, expanded intervals of intermittent reception) and lower power consumption performance of Cat.M1, using multiple modems and a base station simulator.
【E-12】	Program for IOT (Interoperability Test) with DOCOMO network - for the purpose of M2M/IoT device expansion -	This is a DOCOMO IOT (Interoperability Test) program to enable visitors to use M2M/IoT devices safely by confirming their device connection in advance.
【F】	Co-creation R&D workshop	We will introduce a lot of innovative challenge cases in the idea creation phase regardless of field or domain. You will see an overflow of free ideas and enthusiasm of individual persons.

【G-01】	VR real-time transfer - Realization of "Anywhere Door" over VR -	This system aims to enable people to enjoy VR pictures anywhere with a HMD by transmitting 4K pictures taken from a 360 degrees camera in real time over LTE.
【G-02】	Kirari! for Mobile - Technology for multiple layers of floating images -	This is a technology that can display floating images using a smartphone or a tablet easily. You can enjoy watching an interactive 3D model or an idol singer dancing on the personal stage on your palm.
【G-03】	The unjust prevention technology applying face recognition. - Detecting the spoof and support for online invigilation -	This is a technology to prevent fraudulent acts (e.g. spoofing), applying a face recognition technology and constantly monitoring the user from a camera such as one on the PC.
【G-04】	Sensor technologies for a new UI	Three technologies for headphones, depth cameras and touch sensors and an ubiquitous/wearable computing UI utilizing the sensor technologies.
【G-05】	Work assist by smart glasses	This is a new application to enable an unskilled worker to work safely and efficiently by providing assistance to the glasses the worker wears from a sensor and a remote skilled worker and offering a UI for the assist operation.
【G-06】	Enabling HMD to have a wide angle of view easily	This is a technology to realize a wide angle of view and high-definition images for a Head-Mounted Display (HMD) by using different powers of lens for the central field of vision and peripheral vision, respectively.
【G-07】	Biological information collection system enabled by only wearing hitoe® wearable sensors,	This is a biological information collection system which acts as a sensor that captures bio signals (e.g. long time heart rates) and enables athletes' team members to monitor their current condition only through a special garment hitoe® wearable sensors that they wear.
【G-08】	Terahertz wireless technology - Super-high-speed wireless communication circuit technology for 100 Gbit/s realization -	Terahertz wireless technology is expected to realize the transmission speed of more than 100 Gbit/s, creating an increased need for super-high-speed wireless communication circuit technology. We will report the results of data transmission service simulation for wireless communication circuits of 20 Gbit/s operating on the 300GHz band.
【G-09】	Entrance Device - Ambient IoT device -	Any home has "an entrance." This is a place usually we pass without paying much attention to and everyone in the family uses every day. Installation of this ambient IoT device in the entrance hall makes our everyday life convenient.
【G-10】	Concept device using a flexible display and a new UX (user experience)	This is a device which can change the display size flexibly and will be coming in the near future. With the flexible display, this concept device embodies a device of the future, which will bring about a new UX (User Experience).
【G-11】	Avatar robot "sidekick" -A communication tool in the IoT era always snuggling up to you -	"Sidekick (tentative name)" is a simple and affordable avatar robot. It acts as the other self of the person you are talking to and offers an experience as if the actual person were talking next to you. It evolves to your "fellow," making your life more fulfilling.
【G-12】	PSIM Suite -Licensing a portable SIM technology -	It is a "Portable SIM (PSIM)"you can use whenever you need by selecting the line you want to use. This is not a DOCOMO exclusive technology but offered for licensing as the "PSIM Suite". Portal site: http://portablesim.idc.nttdocomo.co.jp/
【G-13】	Mieru Denwa -Comfortable communication without anxiety about "inaudible"-	This is a communication assistance service for a hearing-impaired person that combines Speech Recognition Technology and network technology. This service converts the speech of the person talking to you over the smartphone to text and show it on the phone screen. You can use this service regardless of the phone model.
【G-14】	Annotation tool -Navigation for correct operation on the display-	This application assists user operation by displaying user support information the PC or tablet. This application can be installed without modifying existing applications or changing the environment of terminals.
【G-15】	Phone conversation memo application -This application enables you to take notes of an important conversation without a memo pad or a pen-	This application enables you to convert speech to text at a timing you specify during a conversation and display and save it on your smartphone.
【G-16】	Experience a force illusion -Buru-Navi-	This application realizes an innovative communication that makes you feel as if you were actually pulled. We plan to demonstrate a driving simulation game and the latest version of Buru-Navi4. We hope you will enjoy experiencing a mysterious sense of attraction in the booth.

【H-01】	Methodology to create a mobile coverage by millimeter wave band communication -Only bending the cable makes a mobile coverage-	This is a methodology to create a mobile coverage by a simple action - only bending the cable - for millimeter wave communication, which is considered to be used for 5G.
【H-02】	Actions for Advanced C-RAN(Centralized Radio Access Network)	These are our actions to realize prompt and efficient deployment of premium 4G(LTE Advanced) and its future enhancements.
【H-03】	Optical transmission technology to support the mobile network -Toward a realization of a low cost mobile network-	This is a technology to reduce the volume of optical transmission. This will enable us to cut down the costs for optical fibers that accommodate base stations in future mobile network and to realize high speed and high-capacity telecommunication.
【H-04】	Network functions virtualization(NFV) -World's first NFV technology for Multi-vendor EPC Software-	We have developed the world's first network function virtualization (NFV) technology that can run Evolved Packet Core (EPC) software from multiple vendors to enhance connectivity in high-volume areas. We deployed the technology in the network in March, 2016.
【H-05】	Fault-tolerant network -Development of a free function available for anyone for fault recovery -	Open source software(OSS) is a free software provided based on the open source concept. Customer communication will be maintained by this fault-tolerant feature even in case of a fault.
【H-06】	Promotion of green smart electric power technology in the era of electric deregulation	This is a green base station that is resilient in disasters and eco-friendly. We've already deployed it in the whole country. This equipment provides two features. One is the weather forecast and power controlling feature, which contributes to efficient power usage. The other is the anti-disaster feature to make base stations more disaster resistant.
【H-07】	Radio usage for safety and security -Investigation of influence of wireless LAN radio wave interference on electric medical equipment-	We are continuing our investigation of influence (interference) of radio waves on electric medical equipment so that people can securely use wireless equipment (e.g. mobile phone) in medical facilities such as hospitals. This investigation report includes not only the results of investigation of radio waves from a conventional mobile phone but also those from wireless LAN.
【H-08】	Technology for evaluating multi band propagation -Moving toward the radio access network with high reliability and low latency -	High reliability and low latency are necessary for next generation transportation systems. This is an evaluation technology for radio propagation at the intersection to realize the radio interface protocols that achieve the desired level of communication quality, parameters for radio equipment, and design suitable for installation locations.
【H-09】	Multi band antenna for M2M modules -Assigning plenty of bands to one antenna-	We will introduce our research and business solution for Multi band antenna for M2M(Machine-to-Machine) modules that enables a single antenna to support both licensed bands and unlicensed bands (Wi-Fi).
【H-10】	Wide-band, high- capacity IoT and M2M radio repeating system using LTE -Sharing of one LTE link to accommodate plenty of IoT/ M2M terminals -	Connection of a private radio repeater system using the 920MHz band to the LTE network enables a single LTE link to support plenty of IoT/M2M terminals, allowing management of various applications for agriculture and social infrastructure.
【H-11】	Wideband beam forming technology using phase control -Controlling (Sub) high- frequency millimeter wave signals by low spectrum band signals-	This is a local phase controlling technology that we are proposing as an analog beam forming methodology. This technology is applicable to ultra-wideband (Sub) Millimeter-wave signals as well.
【H-12】	Power Amplifier Technology for massive MIMO -Base station doesn't miss the terminal once it aims at -	This is a power amplifier technology for small base stations using antennas with massive antenna elements (Massive MIMO) for 5G to minimize the equipment size and weight and to generate stable beams.
【H-13】	Evolution of the core network toward 5G -The future realized by End-to-End slicing -	We will introduce 5G radio access technology and non-cellular radio access technology necessary for evolving future mobile networks, our vision of End-to-End slicing to be realized by future transmission technology, and future service examples.
【H-14】	Coordination between a Mobile network and wireless LAN	Our research predicts a quality of wireless LAN based on radio access information via mobile network and optimizes to control the channel assignment and terminal attachment, that realize double capacity of the mobile communications system which included wireless LAN.

【I-01】	Next generation mobile communication system, 5G	We will introduce DOCOMO's research activities and future views on 5G that DOCOMO is promoting toward the goal of practical use of 5G.
【I-02】	DOCOMO's actions for service creation in 5G era	We will introduce DOCOMO's actions aimed at generating new services and creating new values of 5G era by collaborating with partner companies of various fields.
【I-03】	5G radio propagation	This is a standardization promotion activity to analyze the radio propagation characteristics in high frequency bands and specify the channel model for the 5G system evaluation.
【I-04】	5G radio access transmission experiment	Ericsson and DOCOMO are jointly experimenting new 5G radio access technologies including Multi beam-forming technologies using massive antenna arrays.
【I-05】	Ultra-high-density distributed antenna coordinated control technology	Fujitsu and DOCOMO are jointly developing an ultra-high-density distributed antenna coordinated control technology, which realizes high capacity by coordinated scheduling for super dense base stations using RRH.
【I-06】	Experiment for 5G radio access technology	Huawei and DOCOMO are jointly conducting field trials in a large-scale multi-user environment for mobile broadband, IoT, which is expected to spread explosively in the near future, and 5G radio access technology for Ultra-reliable, low-latency communications (URLLC).
【I-07】	Experimentation for 5G multiband transmission	Intel and DOCOMO are jointly working on transmission experiments on toward a realization of 5G (next generation mobile communication) terminals in 2020.
【I-08】	Radio propagation in the 60GHz spectrum band	Keysight Technologies and DOCOMO are jointly examining propagation models for high- frequency wideband in the 60GHz spectrum band.
【I-09】	High SHF band ultra-high-speed Massive MIMO	MITSUBISHI and DOCOMO are jointly experimenting multi beam-forming technologies using massive antenna arrays to utilize high SHF band ultra-high-speed Massive MIMO and to achieve ultra-high data rate transmission for realizing 5G.
【I-10】	5GHz bands Massive MIMO	NEC and DOCOMO are jointly developing and experimenting 5G experimental equipment which realizes full digital massive MIMO in Low SHF bands (4.7GHz, 5.6GHz spectrum bands).
【I-11】	Low SHF bands Massive MIMO transmission technology	NOKIA and DOCOMO are jointly developing and experimenting 5G experimental equipment which realizes ultra-high-speed transmission and low latency of less than 1ms in Low SHF bands (4.7GHz, 5.6GHz spectrum bands).
【I-12】	Super-wideband millimeter wave wireless communication	NOKIA and DOCOMO are jointly developing 5G experimental equipment using a super-wide 1GHz band in the 70 GHz spectrum band and experimenting beam tracking transmission.
【I-13】	Wireless network controlling technology	Panasonic and DOCOMO are jointly developing an efficient cell selection technology in the 5G world in which various frequencies and radio access technologies will coexist.
【I-14】	Development of 5G New Radio platform -For 5G terminal realization compliant to 3GPP standards-	Qualcomm and DOCOMO are jointly developing and experimenting a 5G NR prototype system compliant to 3GPP standards for 5G New Radio(NR) Access Technology.
【I-15】	Frequency dependence of radio propagation for millimeter wave bands	Rohde & Schwarz and DOCOMO are jointly examining a propagation model for high- frequency wide bands in the 40GHz spectrum band and 60 spectrum band.
【I-16】	Experiments on 5G super-wideband radio transmission	For 5G realization, Samsung and DOCOMO are jointly experimenting super-wideband radio transmission using hybrid beamforming and beam tracking technologies in the 28GHz spectrum band.