Best Engine

Vol. 10

Special Feature 1

The Role CTC Should Fulfill in this Age of the New Normal

The New Answer

Ichiro Tsuge
President and CEO
ITOCHU Techno-Solutions Corporation

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Fellow
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Cover Illustration by
Miki Mohri

Beginning with this issue, Best Engine will put a new face on its cover.
This cover illustration expresses our desire to connect state-of-the-art technology and people to co-create an even richer future.

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The Four Seasons of IT

84 Hours

Forgive me for talking about summer when winter is fast approaching, but in the past, I had always taken a week off right after the mid-summer Bon festival as my summer vacation. Truth be told, it is actually close to late summer by that time. So, this year, I decided to take the last week of July – which is normally right after the end of the rainy season – as my summer vacation and enjoy the height of the season. This year, however, it rained the whole time, making my summer vacation one that the governor of Tokyo would have been proud of amid the pandemic – I stayed at home the whole time.

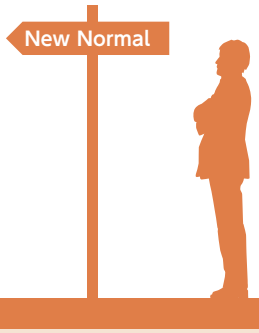
It was on the very last day of my vacation that the Meteorological Agency announced the end of this year's rainy season. We had entered August by then, which turned out to be one of record heat. The September that followed saw many strong typhoons approach Japan. It was, without a doubt, a summer of abnormal weather. And, while I had hoped that the summer heat and humidity would slow down the novel coronavirus, it continued to spread.

Now that we are in an age where we must live with the COVID-19 pandemic, businesses are having to decide what the new normal will be after the virus came into our lives. How can companies adapt to this new environment, where changes took place so quickly, as if someone had fast-forwarded the clock? It is a difficult challenge, but I am speaking here of companies. When it comes to the "new normal" for we individuals who work for companies, the situation is very different.

Now that the pandemic has forced us to place voluntary restraints on "non-essential, non-urgent" activities, many people are starting to realize just how important such activities are to our lives. I passed age 60 some time ago, and many others my age are at a loss, angry and frustrated with no one to blame but the pandemic. We have been saving money so that we could soon enjoy the non-essential, non-urgent activities of life, like going on overseas trips and indulging in gourmet meals.

In March, I did a bit of calculation. With the items on my schedule that were certain to be cancelled, and the commuting time that would probably no longer be required, how many hours were being erased and will become a blank gap in my schedule? The answer was 84 hours per month.

When I realized just how much spare time would be created, I decided on that very day that I might as well belatedly start doing some studying and acquire some qualifications that I had thought was only a dream. After all, they say that we are never too old to learn. Of course, some might say that I am too old to cut the mustard, but I thought that it would be a good, even if subtle, personal challenge under the "new normal" state that we are in. I cannot help wondering, though, if my head, which is filled with trivia and distractions, is starting to forget something important to make room in my brain to learn new things.



Satoshi Kikuchi

Chairman
ITOCHU Techno-Solutions Corporation

Special Feature 1

The Role CTC Should Fulfill in this Age of the New Normal

The New

As an unprecedented pandemic threatens the world, many people have been forced to change their thinking about their work styles or the work itself. Where should CTC head, and how should the company contribute to a society facing this age of the New Normal? Ichiro Tsuge, the new president and CEO of CTC, who assumed his post in June this year, and CTC Fellow Hidetoshi Satomi discuss the present and future of CTC amid the coronavirus pandemic.

Coverage and text by Yuki Kondo

Greetings Upon My Appointment

I assumed the post as president and CEO of CTC in June 2020. Before that, I was president and CEO of BELLSYSTEM24 Holdings, Inc., which is a CTC partner. In my previous post, I was engaged in such efforts as the decentralization and streamlining of work through the use of information technology. Here, at CTC, I would like to further develop the IT technologies that the company has nurtured over many years as well as pursue the creation of a uniqueness that will further highlight CTC's originality.

As expressed in the CTC Group slogan, "Challenging Tomorrow's Changes," CTC has a culture of launching challenges. I will work as a cheerleader, so to say, of employees, give undivided attention to those working on-site, and back each employee in the challenges that they make. I will also do my best to ensure that CTC will be a company that will continue to contribute to its clients and society in many ways. I look forward to your support.

Ichiro Tsuge
President and CEO, ITOCHU Techno-Solutions Corporation

Answer

Ichiro Tsuge

President and CEO
ITOCHU Techno-Solutions Corporation

Hidetoshi Satomi

Fellow
ITOCHU Techno-Solutions Corporation

Ichiro Tsuge

President and CEO
ITOCHU Techno-Solutions Corporation

Graduated from Keio University and joined ITOCHU Corporation in 1980. After serving in such positions as SVP & General Manager, Chemicals, Forest Products & General Merchandise, ITOCHU International Inc. and Executive Officer, Forest Products & General Merchandise Division, ITOCHU Corporation, was appointed Representative Director, President and CEO, BELLSYSTEM24 Holdings, Inc. in 2016. In current position as President and CEO of CTC since June 2020.

CTC in the Coronavirus Pandemic

——You were appointed president in the midst of the coronavirus pandemic. What kind of a mindset did you have at the time when you commenced your duties?

Ichiro Tsuge: Since the pandemic had spread around the world, I knew that I had to prepare myself to do what could be done. On the other hand, from the time that I assumed my post, I was also of the mindset that I would soundly carry out two themes that had already existed in Japan: productivity enhancement and work style reform. Of utmost importance in relation to those themes is how one thinks about business. Put another way, it is about the role of information technology. Many different things can now be achieved through the utilization of IT. Even so, there are many matters in the world that are still inconvenient. I hope that we can decrease those inconveniences through the power of IT. In the sense of decreasing Muda (needlessness), Stress, and Mottainai (waste), I refer to it as "Challenging MSM."

——Mr. Satomi, how do you see circumstances within the company amid the coronavirus pandemic?

Hidetoshi Satomi: As a general rule, CTC adopted telecommuting from April. While it wasn't necessarily easy, when seen as a whole, I feel that it turned into a great opportunity for changing internal work styles. As each person began preparing an environment for working from home, everyone started thinking about things like how IT could be utilized, and what kind of problems might arise. I am confident that the experience will prove to be a big strength for us as we provide support to our clients, who are the end users. In other words, in our provision of an IT environment, there are things that we are starting to see anew by working ourselves within such an environment. I would like us to make use of the realizations we are obtaining through this experience, and lead them to future business.

CTC's Undertakings

——Can you tell us about some specific undertakings CTC is engaging in amid the coronavirus pandemic?

H. Satomi: The coronavirus pandemic broadly revealed that IT could be utilized in many different ways. For example, we started providing Social Distancing Simulation software as a solution for use by commercial and public facilities, factories, and others to support operations that maintain social distancing. We also began offering a temperature detection AI device for use at company reception desks and entrances of logistics facilities to screen for people with fevers. Our lineup also includes services that support telecommuting, and related security measures. These technologies, however, were not completely new. They were an extension of the efforts that we had been undertaking from even before the pandemic, like IoT, work style reform, and digital transformation (DX).

I. Tsuge: Circumstances are changing from hour to hour. Work styles have also changed significantly as compared to last year. However, I don't think that we're at a stage yet where we can evaluate anything. I think we will have to find, on a timely basis, solutions to the challenges that will still arise in society, and continue moving forward. We will also need to keep an eye out for the impact that a new way of working will have in the future. While we are seeing some benefits of telecommuting, it's also true that there are fewer

Hidetoshi Satomi

Fellow
ITOCHU Techno-Solutions Corporation

Joined ITOCHU Techno-Solutions in 1988. Involved in the development and construction of large-scale systems for data communication networks from the early days of the mobile Internet. Contributed to the widespread adoption and expansion of Internet use in Japan. Has been supporting CTC's technology strategies and innovation as fellow. In current position since April 2018.

opportunities for things to be created through in-person relationships and communication. What kind of an impact will that have going forward?

I mentioned earlier that I'm trying to get rid of Muda (needlessness) and make things leaner. However, there are things that looked needless but actually weren't. New ideas sometimes come out of seemingly idle chatter. Video conferencing isn't really conducive to discussing anything other than a fixed agenda. There's not much free conversations that take place. We need to see what kind of an impact that has.

H. Satomi: I agree. There are some people who are good at communicating online, and others who find it difficult. You see a clear distinction during online meetings between those who express their opinions and those who don't speak up at all. What happens, then, is that the opinions of people with louder voices tend to be adopted. Of course, that happens during in-person meetings, too. But when you are meeting in person, there's a lot that is expressed through nonverbal communication – facial expressions or the atmosphere. I think that makes it easy to incorporate a variety of ideas. That kind of issue found in online communication can't be resolved easily using existing information technology. On the other hand, you could say that it's helping us discover issues for us to address next.

What Is Needed in the Age of the New Normal?

——Now that we are in the Age of the New Normal, what is it that a company that provides IT solutions needs to be aware of?

I. Tsuge: When I think about the technology that is needed in the Age of the New Normal, I think, on the one hand, that there are technologies that have to be newly developed, such as the aforementioned AI technology for smoother online communication. On the other hand, I think that perhaps most things can probably be actually resolved by combining existing technologies.

CTC is already moving ahead with undertakings in various fields. Among them, I think Digital transformation (DX), Cloud computing, and 5G mobile networks will become key going forward. I've taken the first letters from each to call it DC5. Because of the coronavirus pandemic, there is no doubt that the speed of DX will accelerate, and it will progress even faster in all areas. At the same time, the IoT Age will shift into high gear, and the amount of data traffic will increase explosively. Amid such circumstances, cloud computing will develop even further. Things should become quite interesting. What's more, CTC has developed good business relationships with major telecommunication carriers. As such, I believe that we will be able to contribute to clients in various fields, including information communications.

Meanwhile, the strengthening of our own security measures and the provision of high-quality security services to clients have also become extremely important.

What will become important is how we will integrate the technologies developed in these areas and give them effective form. I think that the business design element will become more important than the technologies themselves. We will continue to pursue IT that will lead to Challenging MSM even in the Age of the New Normal.

H. Satomi: You could say the same thing about the solutions that we are providing amid the coronavirus pandemic. Of importance is not the individual solutions but rather the narrative to communicate to clients – that a combination of this and that solution will be convenient for the operations carried out by a company. What's needed when doing so is, of course,

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communication with the client. We need to think about what we can specifically propose from our portfolio based on an understanding of the circumstances of a client company, the characteristics specific to their company, and what it is that they're looking for. What's more, we need to keep thinking of what additional items we could develop to make them happy. These things are more important than anything else. Right now, we have to carry out that communication online. Because of that, I feel that we need to think even more seriously about communications and make efforts.

I. Tsuge: It can't be helped that some people are good at online communication, while others are not. However, it would be a shame if, because of the different skill levels, the situation becomes advantageous only to those who are good at online communications. We live in an age with so many different tools. That's why we should think flexibly. People who are good at video conferencing can exhibit their strengths in such situations. Meanwhile, people who are better at communicating through e-mails or text messaging can do it that way. The important thing is that each person finds a method that suits them. Problems like this have nothing to do with the coronavirus pandemic. These are things that should be discussed when thinking about telecommuting in relation to work style reform. Issues like that, which got left behind in a sense, inevitably came into sharp relief due to the coronavirus pandemic/ There is now a pressing need to find solutions. This is probably the first time that people are being forced to reform their work styles on a global scale. As a result of these forced reforms, an opportunity has arisen for people to think about what it is that they are good at, how companies should operate, and so on.

The Coronavirus Pandemic Is an Opportunity to Take a New Step

——Finally, please tell us your thoughts on the direction that CTC should take going forward.

H. Satomi: As I said earlier, the coronavirus pandemic experience has resulted in many realizations for us. We saw the importance of thinking about IT from the user's perspective as well as challenges related to communication.

On the other hand, as a life in which we stay at home continues, there is a need for each person to think, even more than before, about managing the state of their health.

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You could say that many companies, including us and our clients, are faced with the same challenge. For example, should we monitor the health of employees by having them wear wrist bands with vital sign sensors, and tell them when it' s appropriate that it' s about time they went on a walk? Or is it better, depending on the person, to create days when they need to come into the office and encourage them to come out?

We would like to create a mechanism inhouse that enables things like that using IoT, and then, on that basis, think about what we need to do to deliver such mechanisms to end users. Experiences like that should lead to the creation of new solutions.

The coronavirus pandemic is creating opportunities to think about various things. I feel that consciously leveraging that is what CTC needs to do right now.

I. Tsuge: Yes, the coronavirus pandemic is indeed an opportunity for us to take new steps. While it has its share of various difficulties, I would like us to proactively launch new challenges as the CTC Group and make proposals to our clients.

CTC will be celebrating its 50th anniversary in 2022. Over the past half century, we have continued to explore the possibilities of IT while responding to the changes of the times. My thoughts are on the pursuit of our originality as CTC so that we can increase strengths that are clearly recognized as being distinctive of CTC. This would make it possible for us to present such distinctive solutions, which are beneficial to our clients.

H. Satomi: I feel that engineers need to be more playful. We should not be caught up in our past ways of doing things so that we can boost our perspectives and sensitivity to new ideas. I want us to think freely, find things that we find interesting, and try new things. I want each of us to have that kind of awareness and open up new paths.

I. Tsuge: My desire is that we remember anew our Group philosophy – "Leveraging IT' s potential to change the future for the Global Good" – at this time The achievement of this is our ultimate mission as a company. We have to keep attempting this before we talk about how we will raise our profits. I believe that the enhancement of our productivity and work style reform will all move in a good direction as a result. I hope that everyone will keep an eye on the world that we will pioneer going forward.

Special Feature 2

Assisting Efforts to Contain the Spread of Infectious Disease

CTC Solutions in the Age of the New Normal

Solutions for commercial and public facilities, and factories

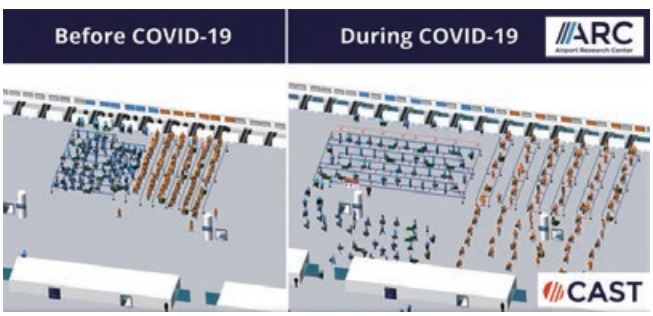
Simulations and Consulting for Facilities Operations with Social Distancing in Mind

Enabling Cluster Countermeasures and Smooth Facility Operations

Facilities used by large numbers of people need to enact social distancing measures (cluster countermeasures) to maintain physical separation between individuals as a means to prevent the spread of infectious disease. Since facilities will likely have to deal with capacity restrictions on the number of people they can accommodate, this is leading to new problems such as people spending more time than expected waiting in line. To address this, we run simulations to explore how efficiently social distancing can be integrated into the operations of these facilities, such as how much the operations will have to change for social distancing compared to before, and whether new reception counters will be needed to ensure physical spacing.

To start with, we simulate real world movements on computers, and consider ways to manage operations when each of the conditions changed. The results of the simulations are quantitatively verifiable, so they facilitate logical decision making after weighing various circumstances. Since the simulations also visualize the effects that would occur if social distancing were put in place, the simulated measures are that much more persuasive. This makes it possible to prevent problems such as unanticipated waiting time in lines and increases in crowd density.

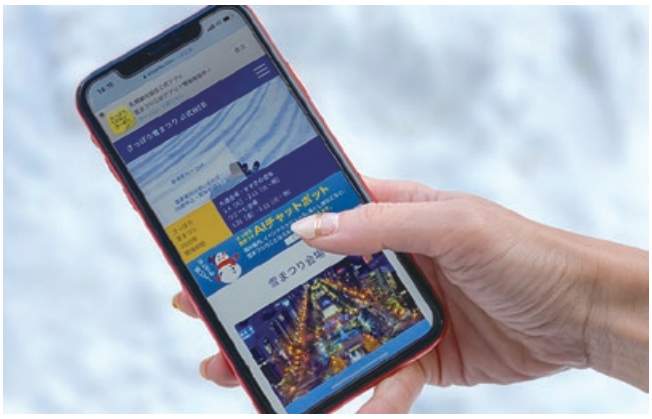
Simulated case of social distancing measures



Arrangement before the spread of COVID-19

After measures to contain COVID-19

Interactive AI Chatbot Service SmartRobot



Test version of the AI chatbot in three languages, Japanese, English, and Chinese, provided at the 71st Sapporo Snow Festival

Boosting Efficiency and Customer Satisfaction with Natural Conversational Communication

With less work now being done face-to-face, chatbots are attracting attention as an effective means of communication that improves the operational efficiency of call centers and customer support.

SmartRobot is an interactive AI services platform that integrates functions such as natural language analysis and knowledge retrieval. Chatbot is one of the services that this platform provides. Virtual Customer Assistant (VCA) reduces labor cost and improves customer satisfaction by automating responses to customer inquiries. Equipped with Natural Language Processing (NLP) capability and knowledge retrieval functions, it applied machine learning to conversation records including text and audio to more accurately understand what was said and communicate more naturally.

SmartRobot links to social media applications such as Facebook Messenger and LINE as well as corporate systems such as Salesforce and Microsoft 365. It is compatible with digital signage, humanoid robots, and various other devices to allow for flexible customization according to the usage application.

In the age of the new normal, measures to prevent the spread of COVID-19 are part of our daily lives. At CTC, we support business continuity with a wide variety of solutions that support remote communication, enable secure and enjoyable telecommuting, and more. Leveraging the power of IT, we help solve problems and boost productivity.

AI Devices for Body Temperature Detection

Screening for Elevated Temperatures Using AI Body Temperature Detection Devices with Facial Recognition

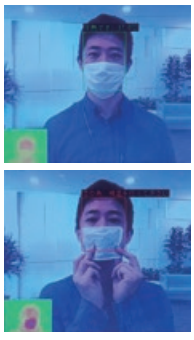
More facilities are now checking body temperature upon entry in order to ensure the safety of those inside. CTC and Idein have jointly developed an AI body temperature detection device equipped with AI facial recognition and surface temperature measurement technologies. This device can be stationed by company reception desks and at the entrances and exits of logistics facilities to screen people who might have elevated temperatures.

When visitors stand still in front of the device for around one or two seconds, it employs contactless surface temperature measurement to detect their body temperatures, then visualizes their body temperatures on a monitor with thermal imaging.

The device can be customized to send its detection data including its physical location and image data of the people it has scanned to cloud-based management systems. When installed in locations without security personnel present, it can still provide information on those it screens via email or other communications methods.

Installing the device does not require any large-scale construction work, and it can quickly detect possible elevated temperatures at a relatively low cost. Offering advantages in terms of both convenience and cost, this AI device is helping to contain the spread of infectious disease.

Stand roughly 50 cm in front of the device and be still for around one or two seconds. The device takes a contactless measurement of your body's surface temperature.



1. Body temperature can be measured while wearing a mask. 2. Prompts those with potentially elevated body temperature to use a thermometer.

AR Solution Atheer

Remote Instruction through Augmented Reality (AR) to Solve Problems On-Site

Augmented Reality (AR) is a technology that enables quick access the information users need through devices such as smart glasses. Designed for enterprise use, Atheer provides a variety of services for communication between Internet-connected workplaces and back offices via AR-based Software as a Service (SaaS) provided on the cloud.

When wearing smart glasses that support Atheer, operators at worksites and experts in back offices can share screens and communicate with each other as if they were in the same room. Users can provide guidance and call attention by annotating on the screen, making it useful for a wide variety of usage applications from construction and manufacturing to development, operating devices, and even human resources development.

With the ability to smoothly share content such as documents, video, and audio, Atheer makes it easy to support operations remotely without experts having to make the trip – even at long distances that are hard to travel, or between multiple countries.

Operator at worksite

Wearing smart glasses, share screens with experts in remote locations and communicate with them.

Expert

Security for Remote Work

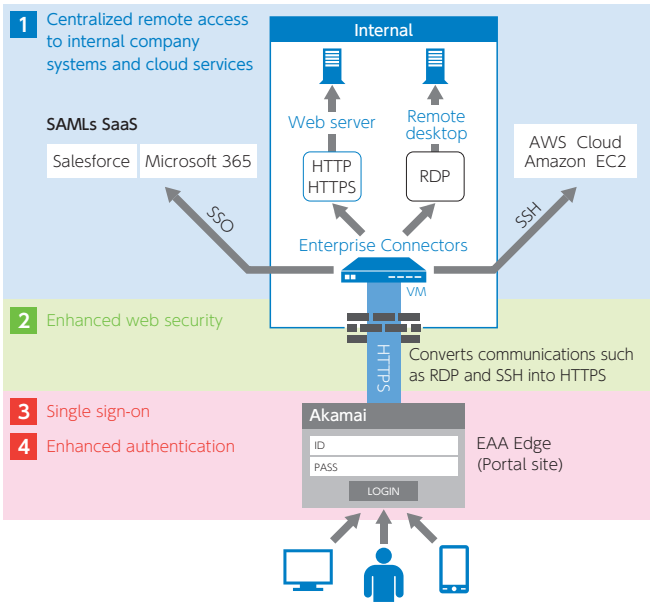
Cloud-based Remote Access Solution Akamai EAA*

Proper Authentication and Minimized Access Permissions for Every User, Device, and Location

Access to internal company systems used to be managed by defining boundaries between internal and external, and allocating permission to individual computers and users. As the cloud and mobile devices have proliferated and workplaces have diversified in recent years, the boundary between internal and external has faded. Shared use of cloud services has become more common as a place to store companies' internal information, and for collaboration with clients and customers.

Akamai EAA* is a cloud-based remote access solution that incorporates the concept of zero trust security, which considers access from every user, device, and location to be a potential threat. This security solution made for the cloud era enables centralized control over access to internal systems and cloud services exclusively by validation and authentication on users' Internet browsers.

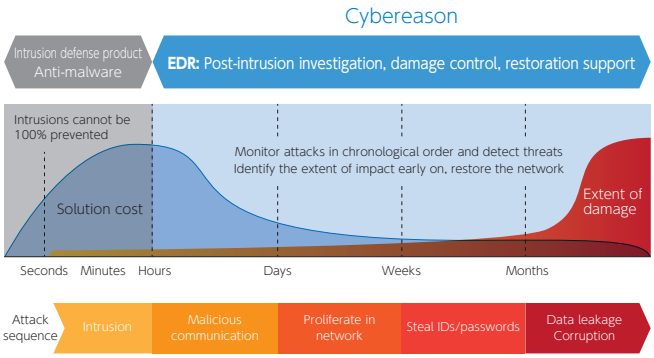
Features of Akamai EAA*



* Akamai EAA: Akamai Enterprise Application Access

Endpoint Security Solution Cybereason EDR

Security solution to control damage after intrusions occur



Constantly Monitors Endpoints to Quickly Detect Attacks and Control Damage

Cyberattacks are currently on the rise, taking advantage of the fact that so many companies are utilizing remote work. As a result, security to protect corporate networks from attacks has become a pressing concern.

To address this problem CTC offers Cybereason EDR (Endpoint Detection and Response), which constantly monitors all devices (endpoints) in corporate networks to ensure that no activities that could be considered threats are occurring. Its threat analysis system on the cloud leverages AI with behavioral analysis to perform highly detailed analysis that assesses the status of the network in real-time.

If a threat happens to be detected, a visual representation of the attack's process is displayed on the threat analysis system's management interface. Quickly knowing the complete story of the attack makes it possible to identify the extent of the impact early on, minimize the damage and restore the network.

Attacks to corporate networks are expected to increase even more. Cybereason EDR effectively defends networks by narrowing its monitoring targets to those endpoints that are more vulnerable. Improve your business continuity and boost your defenses against shutdowns.

Solutions for Remote Work

Cloud-based Digital Signature Service DocuSign

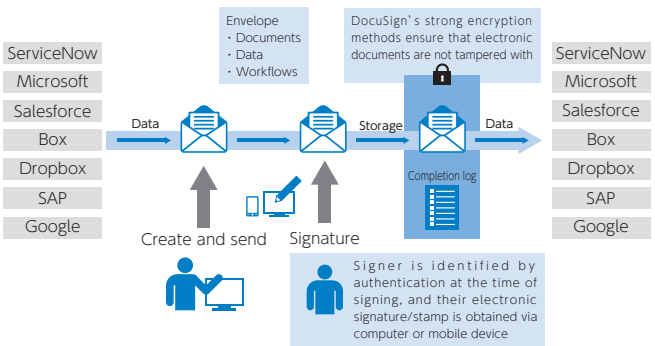
Digitalize Documents and Signatures to Work More Efficiently and Remotely

More people are working remotely in order to prevent the spread of infectious disease, and Japan's conventional business practice of stamps and seals has become an issue once more. Demand for electronic signatures is now growing as more companies now are creating environments to be able to give approvals and sign agreements online.

DocuSign electronic signature service exchanges documents to be signed, facilitates the signing and stamping of these documents on the cloud, and is linked with authentication that verifies the identity of signers logged in to the cloud service. Just upload documents to the DocuSign server and configure the flow of the approvals, and the documents can be signed from anywhere in the world via web browsers and an app for smart devices.

Agreements on electronic documents are exempt from stamp tax and can save both time and cost in the process leading up to their conclusion. CTC offers comprehensive support from service implementation to maintenance, including linking DocuSign to existing systems such as customer management and contract document management systems. Through linkage with the Box file sharing cloud service, the entire process from discussions over contract terms and revisions to agreements concluded with electronic signatures can be made paperless.

Illustration of DocuSign



Workspace Chat Tool Tocaro

Tocaro improves communication between team members through every type of device, helping to boost productivity

Smooth Information Sharing while Working Remotely, with Strong Security and Extensive Functionality

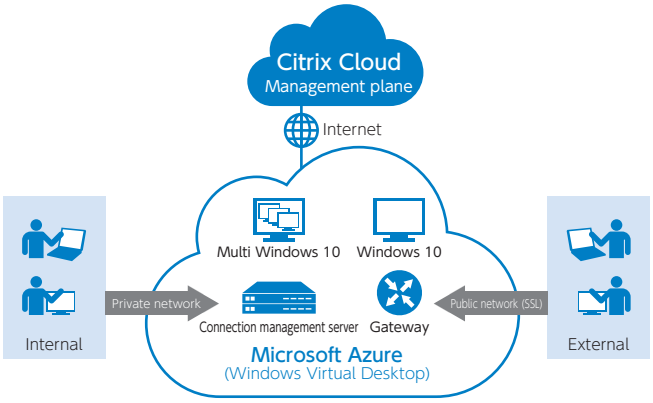
Tocaro is a workspace chat tool already chosen by over 2,000 companies and public agencies, with strong enough security to be implemented even at public offices and financial institutions.

In addition to Group Chat and Video Calling which make communication between employees smoother while working remotely, Tocaro is loaded with functions that raise individual and team productivity. These include its Project Management function that quantifies tasks in teams, the Workflow function which makes approvals and confirmations more efficient, and the Work Board function which shows each team member the work they're in charge of.

Since Tocaro is a service provided on the cloud, it requires no dedicated equipment. It can create new environments in short periods of time and support the sharing of information between all types of devices from computers to smartphones. Utilizing data centers with high levels of security and reliability and utilizing multiple dispersed locations, Tocaro also protects customers' important information.

Cloud-based VDI
Citrix Cloud for Windows Virtual Desktop

Citrix Cloud for Windows Virtual Desktop: How it works



Secure, User-Friendly Desktop Environment for Working Remotely

Citrix Cloud for Windows Virtual Desktop is a solution provided by CTC which combines Citrix Cloud with Windows Virtual Desktop for secure remote work environments that are even safer and more user-friendly. When used together with Windows 10 and Microsoft 365, cloud-based VDI service Windows Virtual Desktop is easy to use and manage, while not adding any additional cost if used with existing Microsoft licenses, offering benefits in terms of both management and cost.

Citrix Cloud for Windows Virtual Desktop makes it possible to establish security protocols, monitor security and fine-tune performance in virtual desktop operating environments on the cloud from the convenient Citrix Cloud console, which includes management functions. Since it is not affected by bandwidth, its operations continuously feel quick and nimble.

Before CTC started providing Citrix Cloud for Windows Virtual Desktop to customers we overhauled all of our in-house VDI environments with this solution. Based on the knowledge gained from this, we comprehensively support the establishment of VDI environments and provide secure, easy-to-use remote work environments.

Mobile Network Service
CTC Business Mobile

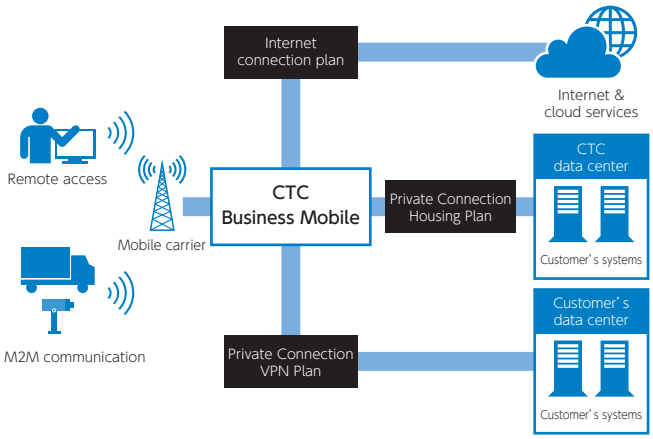
Remote Work Made Simpler and More Secure with a Mobile Connection that Does Not Need VPN

CTC Business Mobile combines a diverse range of services and solutions for various types of mobile communications, from external remote access and cloud usage to M2M and more, all flexibly tailored to our customers' needs.

Remote access with conventional VPN presented a number of issues. There were cumbersome operations with every connection, high performance routers had to be set up, and mobile devices connected to the internet presented risk. These problems were solved by the Private Connection Housing Plan and Private Connection VPN Plan, which enabled simple yet secure access. Since CTC provides secure connection between mobile devices and client systems, users can securely connect to their company intranet simply by logging in to a laptop containing a SIM.

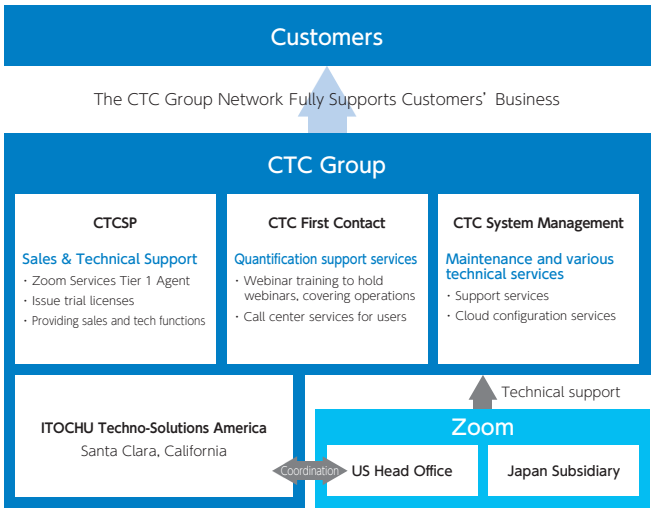
With a variety of billing plans available catered to different usage formats, you can choose the optimal plan according to your number of users and traffic level. Make your mobile communications more secure, convenient, and inexpensive with CTC Business Mobile.

CTC Business Mobile: Connections



Online Video Conferencing Solution Zoom

CTC Group Zoom Organizational Chart



Full Support for Immediate Implementation of Zoom, the Gold Standard in Online Video Conferencing

Along with the rapid spread of remote work and working from home, more companies are implementing video conferencing systems. CTCSP began offering and supporting Zoom in 2019. Based on experience gained since then, we have been compiling information about our customers' issues and have translated these into a variety of services.

For customers who purchase Zoom but cannot take the time for setup to start using it, we offer Zoom Quick Start Implementation Support. We also provide post-implementation Zoom Training Services to educate everyone in your company on how to effectively use it. Additionally we offer the Webinar Streaming Support package that includes methods on how to utilize Webinars to hold seminars, events, training sessions, and other larger meetings through the Zoom system, as well as event preparations and support up until streaming starts.

In addition to Zoom sales we provide all the services you need to utilize its functions to the fullest, and we help to establish and improve remote work environments.

Life Science

Enterprise Search System Sinequa

High-Accuracy AI Searches Vast Internal and External Data, Reducing Search Time to Obtain Information and Drive Drug Discovery Research

Enterprise search system Sinequa unifies all internal and external systems and makes it possible to search all platforms of the organization (consolidates search, full-text search). Unify multiple data sources and search them all at once with this enterprise search-based cognitive search engine.

Sinequa's technology combines machine learning with natural language processing (NLP) of several languages to classify and analyze relevant text and information, then present the results to the user. Equipped with a library of over 200 connectors capable of accessing external systems, it can smoothly connect to multiple internal and external systems throughout the organization, from file servers to cloud storage, internal portals, and business applications.

Sinequa's AI infers the information that the user wants from analogy, makes suggestion, and conducts high-precision searches that would not be possible only through full-text searches. This dramatically reduces time spent searching before arriving at the desired information. Sinequa is also equipped with an abundance of visualization features that make it easy to gain new knowledge.

Example of a Sinequa search results screen

Screens can be configured according to user needs and preferences. Search results are displayed in various interfaces to facilitate acquisition of information.

This issue's theme is...

【 Edge Computing 】

"In the age to come, we will migrate to a hybrid of cloud and edge."
In contexts such as these, we are increasingly seeing the term "edge computing."
Many of us might know that it generally means computing and calculating data from a location close to the computer or device, without sending it to the cloud.
However, we might not know the more specific meaning, or the actual benefits it provides.
What exactly does edge computing do for us, and how might it change our future?

Text by Yuki Kondo

The Future Is at the Edge

At the Microsoft Government Leaders Summit attended by leaders from government and the IT industry in Washington DC in October 2019, Microsoft CEO Satya Nadella said the following.

"The future of computing could actually be at the edge."

Thanks to advancements in IoT technology, there are expected to be as many as 50 billion devices connected to networks in the year 2030. Considering that there are currently one billion Windows machines and a few billion smartphones in use throughout the world, that number is nothing short of astounding. Nadella meant to say that with so many connected devices expected in the future, edge computing will be playing a much larger role. So then, what exactly is edge computing?

From the Center to the Edge

Currently many of the various devices, sensors, smartphones, and other endpoints connected to networks are sending data to servers on the cloud at intervals. After the data undergoes various types of computing and calculations, the necessary results are subsequently returned. This is the typical flow of data. When saving data, it is likely already common to use a service such as Dropbox to place it on the cloud rather than saving it in the computer being used.

This usage of the cloud has become more prevalent in recent years, and the fact that users no longer need their own computer resources to compute and save data has greatly changed our concept of computers. However, since IoT technology has advanced and many different types of devices now connect to networks, the situation has changed. Data traffic in networks has grown explosively, while more devices are now emphasizing real-time. Thus, the idea that we need a new form of computing other than cloud has emerged. In other words, people now recognize there is a problem with the current cloud-centered networks in that they have become overburdened by vast amounts of data traffic, and that communication between endpoints and the cloud may be quick but is still taking some time.

Thus, the concept of edge computing emerged. Rather than sending data to the cloud, edge computing processes and calculates data from a location close to the endpoint – which is to say, the edge of the network. Edge computing has thus been gaining traction as a complementary means of solving problems in the cloud.

Advantages of Edge Computing

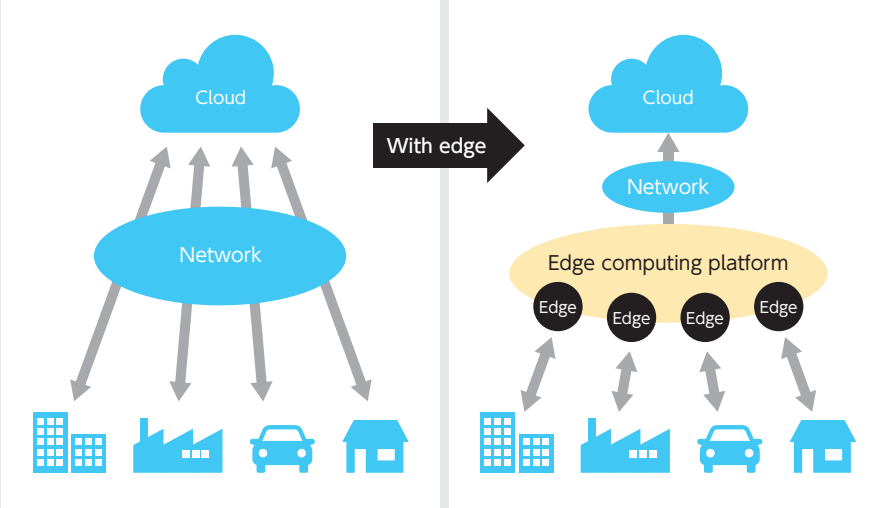
Edge computing offers three main advantages.

1. Reduces amounts of data flow
2. Reduces latency and helps prevent slowdowns
3. Enhances security

First off, if there are 50 billion devices connected to networks and data is constantly flowing to and from the cloud, data congestion is expected to occur and interrupt the normal functioning of networks. If edge computing can compute most of this data from a location close to the source, it will likely reduce the load on networks and keep them stable. This will also lead to lower communication costs for users.

It also takes time for data to flow to and from the cloud, but this can be made faster by using an edge close to the source. The time difference may not appear to be much, but when multiple machines are performing complicated

Illustration How cloud and edge computing work



tasks synchronously at high precision, the smallest delay could result in a major problem. For autonomous driving, a delay of a few milliseconds could be the difference between life and death.

The third point is that eliminating the need to send data to the cloud is preferable because it keeps that data from being exposed externally, reducing the security risk. Even with edge computing systems are often complex, particularly when large numbers of IoT devices are connected to the edge, so it is important to have proper security measures in place. However, the fact that data is not flowing to and from the cloud offers a significant advantage in terms of security.

Computing in Real-Time at the Edge

If you think about it, cloud computing has only been in mainstream use for the last ten years or so. Before that, data was normally computed within the source itself or in a nearby server. Wouldn't edge computing then just be a return to the old way of doing things? It might appear that way to some people, but it is not the same.

Around the year 2000, companies began to shift away from having internally operated servers and computing and calculating data on their own. This was brought about by the arrival of high-capacity broadband, which made it possible to outsource the computing of data to external data facilities. This trend gained momentum, and as cloud computing became generally accepted companies began to refer to the conventional format of computing data at in-house facilities as "on premises" in order to distinguish it from the cloud.

Edge computing in its current form actually does bear some resemblance to on premises. The difference is that on premises had to perform all the data computations on site, while edge computing does not. Specifically, the edge performs the computing that must be done in real-time, while computing that requires large-scale coordination is performed on the cloud. Dividing the computing tasks between the edge and the cloud in this arrangement makes it possible to seek out the most efficient computing method. This is the biggest advantage of edge computing, which significantly differentiates it from on premises.

At the gathering in Washington mentioned above, Microsoft's Nadella said the following. "This is not going to be about either edge or cloud. It's going to be the two technologies working in tandem. Now, all this is being driven by the new tech paradigm that we describe as the intelligent cloud and the intelligent edge." From the age of on premises to the golden age of the cloud, we are now entering the new age of leveraging the respective strengths of both the edge and the cloud.

AI Evolution through Edge

Going back to the quote from Nadella at the beginning of this article, "The future of computing could actually be at the edge," the focal point of the future he mentions is AI. After the vast amount of data generated by 50 billion devices is computed in the edge, it is aggregated in the cloud to be learned by AI. Subsequently, AI will make leaps forward that are incomparable with anything that has happened before, changing the world dramatically.

Just how much will AI evolve, and how much will the world change as a result? This evolution is likely to accelerate even more through the spread of edge computing.

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Leveraging Digital for the New Normal in the US

Wataru Matsumoto
Director, Business Development
ITOCHU Techno-Solutions America, Inc.

Studies advanced technologies and DX efforts in North America, and introduces Japan to the latest trends.

Virtual event through Moot

The COVID-19 Pandemic and Changing Work Styles

As the COVID-19 pandemic continues with no end in sight, people all over the world are seeking out new lifestyles and new work styles. The state of California issued a Shelter-in-Place Order on March 16, and nearly all Silicon Valley companies instituted work from home policies starting the next day. After roughly a month under the stay-at-home order, economic activity began gradually picking up again on April 20. Remote work reached a peak and has since been decreasing, but the "stay home" and work from home situation in Silicon Valley has continued. Major IT companies have taken a cautious stance, expecting work from home to continue until around the summer of 2021, while monitoring developments with vaccines to determine when exactly to reopen their offices.

Services Attracting Interest in the New Normal

Online shopping is a contactless way to buy things while avoiding crowds, but Amazon is now appealing to shoppers to purchase only the things they need. When products are purchased online, it is taking quite a few days to actually deliver them. In response, curbside pickup service has been gaining in popularity. Drive your car to places where you did your shopping beforehand, and the store employees will load your preordered items into your car. This service has already been available for several years, but user numbers have skyrocketed due to the COVID-19 pandemic. As a result, brick-and-mortar retailers such as Walmart and Target have reported positive earnings in their financial statements. Expectations are now increasing for the further evolution of curbside pickup-related technology.

Many people remain unaccustomed to working from home every day despite having IT environments in place. As the situation drags on, "online meeting fatigue" often comes up as a topic of conversation. People have pointed out constantly being connected online, lack of non-verbal communication, and being self-conscious about constantly seeing their own face on-screen in online drinking sessions, as sources of stress.

Pragli is a service that helps teams communicate more easily. Create your own avatar and set up a virtual environment that is just like working in an actual office. Visually indicate when you are in a meeting, in the break room, and when you are available for others to talk to you. In addition to bringing team members together to hold meetings at the predetermined times, Pragli also encourages casual communication whenever it is mutually agreeable. This is one example of technology being able to recreate the small talk and interpersonal relationships that were taken for granted in the office.

Moot is a startup that offers a platform for holding virtual events. Personally I have organized and participated in quite a few online events, and I strongly feel that they do not end up being memorable. Going forward, I think there will be increasingly more events that utilize avatars and virtual space. Virtual space technology can produce the feeling of 'really being there' along with correlated memories of 'what you heard there.' Setting up a virtual event takes time, so I think the mainstream practice will be to utilize these two services according to the purpose, with Pragli for in-house communication and Moot for events with external parties.

Expectations are running high for investments to overcome problems in the post COVID-19 world, and technologies to solve related problems. With the entire planet facing the threat of COVID-19, the frequently heard lament that "It works in the US but is not accepted in Japan" might become a thing of the past. Please look forward my next article as I continue reporting from Silicon Valley on technologies that relieve stress and make life more convenient in the age of the new normal.

News Pickup

Here is information on solutions and services
featured in CTC news releases.

AI / Simulation

CTC Launches a Supply Chain Optimization Tool with AI

CTC has begun providing a supply chain optimization solution with AI mainly for the manufacturing and logistics industries to address various optimization needs such as optimal placement of distribution centers and reducing waste loss. Combining AI-powered demand forecasting with simulation and mathematical optimization technologies, this tool identifies problematic issues in supply chains from order volume to inventory and production levels, deliveries, placement of logistics centers, waste volume and more, then drives ongoing improvements according to the company's objectives. We plan to add even more functions, including the use of IoT technologies.

AI / Cloud / Security

CTCS Releases a Cloud-Based Behavioral Analysis Solution with AI

System operations support and IT outsourcing services provider CTC System Management (CTCS) now offers Internal Risk Intelligence, a cloud-based behavioral analysis solution provided by Eltes which prevents leakage of company data and strengthens internal controls. This cloud service uses AI to analyze past data such as computer usage times and frequencies to determine the most suitable behavior. Product implementation support, maintenance, and operations support services are also provided.

Cloud / Operations & Maintenance

CTC Bolsters its Cloud Business in Capital Alliance with Megazone Corporation

CTC has entered into a capital and business alliance agreement with Megazone Corporation and will be providing cloud solutions from Megazone, which make multi-cloud usage more efficient. Megazone and CTC are both recognized as AWS Premier Consulting Partners. CTC is also working with Megazone on utilizing new technologies and developing new services, with the determination to help global companies centered in Japan and Asia make better use of the cloud to optimize costs, reduce workload, and more.

Security / Human Resources Development

Security Business Collaboration with Hitachi Systems

CTC and Hitachi Systems have launched a collaboration to bolster their services lineups and grow business in the field of security. The collaboration will include shared use of Security Operation Center (SOC) operations platforms, mutual utilization of each other's services, and human resources development for security personnel. Going forward, CTC and Hitachi Systems will be building better preparedness against cyberattacks which are expected to become even harder to combat, while improving their services and helping customers solve problems in security.

R&D / Innovation

Six Companies from Different Industries Establish Bird Initiative to Accelerate New Business Creation

CTC, NEC, Obayashi, Japan Industrial Partners, Japan Investment Adviser, and IPC Fund 1 operated by UTokyo Innovation Platform have jointly established a new company called Bird Initiative.
This new company aims to promote a new research and development framework called Co-Creative R&D through which challenges and technologies are pooled between industry, government, and academia. Bird Initiative will do business in digital technology-related R&D and commissioned research, consulting, investment, and more.

Innovation / Cloud

Takada and CTC Establish Joint Logistics Venture TriValue

Takada and CTC have established a joint logistics venture company called TriValue, which operates as a main contractor for large home furnishings deliveries, providing logistics services including deliveries and warehousing for furniture manufacturers and retailers. TriValue uses a comprehensive logistics platform for shippers, consumers, and delivery operators to visualize possible delivery dates and delivery status and optimize delivery routes as well as the loading of shipments. This improves business efficiency for shippers, while offering better convenience to consumers. With cooperative deliveries, TriValue helps solve problems for delivery operators while also reducing impact on the environment.

Please visit the following for further details.

https://www.ctc-g.co.jp/news/

The Essence of Golf Clubs, as Seen in the Relationship Between the R&A and the Old Course

The St. Andrews Links possess a history and tradition that cannot be ignored when speaking of golf. As the "home of golf," it is almost a holy spot for many golfers around the world, and is a place where many yearn to play. One of the golf clubs of the St. Andrews Links is the R&A. With "Royal" as part of its name, it is a club that leads global golf.

The R&A stands for the Royal and Ancient Golf Club of St. Andrews. It also serves a role as the U.K. golf association, and above all, it is golf's highest authority responsible for the administration of the Rules of Golf. Its headquarters are housed in the building behind the first tee of the Old Course, which also serves as the Clubhouse.

Even so, the Old Course is not integrated with the R&A. In fact, the R&A is but one of the many clubs that have playing privileges on the course. It purchases tee times from the Fife Council (administrator of the town of St. Andrews) on a priority basis. It is the Fife Council that owns the Old Course, which is operated by the St. Andrews Links Trust. The Trust operates a total of seven public golf courses including the Old Course, Jubilee Course, New Course, Eden Course, and The Castle Course. The Trust also operates 13 golf clubs (three of which are women-only clubs), including the R&A.

The R&A Was Founded Ten Years After the World's Oldest Golf Club

Having a golf club that is separate from the golf course becomes obvious when you look at the history of the world's oldest golf club, The Honourable Company of Edinburgh Golfers. At the time of its founding in 1744, the club members played at Leith Links, a public course. However, as the number of members increased and Leith Links became overcrowded, they moved to Musselburgh, then later, on to Muirfield where the clubhouse is currently located. The R&A was founded in 1754, ten years after the world's oldest gold club. While the R&A has been based at St. Andrews Old Course for 266 years, there has been recent talk of the R&A owning its own golf course. Rather than making it a private course, it seems that they would like to use it as an experiment to create a blueprint of a course of the future that can be appealing to golfers and provide enjoyment.

Looking at the green from the 18th hole teeing ground, with Hole 1 running parallel (on left) and sharing an undulating fairway with the 18th; in front is the magnificent R&A Clubhouse that has been the stage for countless drama

Members play golf for medals and trophies, and numerous other events, such as parties, are held at the Autumn Meeting, with trophies from Club tournaments and other memorabilia exhibited inside the clubhouse

The Club Is Maintained Not by Regulations But by Customs

I was invited to become a member of the R&A in 1990. I later heard that it was because my volunteer work as a referee at World Amateur Team Championships had been highly recognized. While there had been several magnificent Japanese R&A members before then, there were none during the 1990s, and the R&A had apparently wanted a Japanese individual to join. The only condition to becoming a member of the R&A golf club is to contribute to the development and promotion of the sport. That is why there are no membership rules or language, such as that on how members should behave. These clubs in the UK have their beginnings as a natural gathering of individuals who share values, and they continue to exist as the values are passed down as tradition. In other words, such clubs are maintained by customs, not by regulations.

Currently with 12 Japanese Members, the R&A Intends to Increase the Number of Such Members

The R&A currently has about 2,000 members around the world. There are 12 Japanese members. An invitation by an existing R&A member is required to become a new member. The annual dues are 450 pounds (about ¥70,000 – ¥80,000), and there are no other obligations in particular. Many people seem to participate in the Autumn Meeting, which is held for 20 days in September. At this festive event, members play golf for medals and other prizes using five courses of the Links. I participated last year with a new member that I had invited to join. With pro golfer Hinako Shibuno claiming the Women's British Open title, everyone was abuzz, and we had a wonderful time.

Footage of Ms. Shibuno was shown on a big screen at the party following the business meeting, and the venue was filled with a hurricane of applause for the Smiling Cinderella. In his address, Ian Pattinson, Chairman of the R&A, spoke of how overjoyed he was with the long-awaited birth of a Japanese champion, which was met by the applause of the 600 members present. The R&A holds great sympathy toward Japan, a country that follows the U.K. and the United States as a golf giant, and it seems they were very pleased with the birth of a Japanese champion. They say they would like to increase the number of Japanese members by another 20 individuals or so.

The Old Course Has a Position Beyond Human Understanding

The St. Andrews Links is said to have been created by the Almighty. Of its 18 holes, only 4 holes have their own greens. Players are met by fairways that retain their natural undulations and are scattered with deep pot bunkers. This is neither a course that requires high-level strategies nor discussions of the wonders of its design. The St. Andrews Old Course is a course like no other, where, by playing, golfers can experience the origins of the sport.

Taizo Kawata

Chairman, Japanese Society of Golf Course Architects
President, T&K Incorporated

Born in 1944 in Tokyo. After studying abroad at The Ohio State University, graduated in 1967 from Rikkyo University's Department of Law. His career includes the design of 23 golf courses and the remodeling of 29 golf courses. Has also served as a referee at major golf tournaments, including the British Open and the U.S. Open.

Message from Hikari Fujita

a Female Professional Golfer Supported by CTC

Not Even the COVID-19 Pandemic Will Get in the Way of Improving My Swing!

There is still no end in sight for the end of the novel coronavirus infections, and golf tours are being cut back this season.

I did not want the pandemic to get in the way of making challenges, so this year, I started efforts to improve my golf swing under the tutelage of a swing coach.

I have Aha! Moments every time I listen to my coach's lecture, and I am understanding what eye-opening experiences are like. I practice golf every day so that I can acquire what I am learning right now and implement them in actual competition.

Because there is only a limited number of competitions available this year, the number of opportunities is also limited. That is why I tell myself that when I am able to compete, I will cherish each one and make sure that I will do my best. There is not much time left until the end of this season, but I hope to make it a fruitful year.

I look forward to your continued support!

Hikari Fujita - born 1994. Started playing golf from age 3 with her father as her teacher. Passed the JLPGA pro test in 2013. First win as a pro was the JLPGA Kaga Electronics Rookies Cup. Achieved her long-sought win in a regular tournament in 2015.

The 2050 CTC Environmental Declaration

Eliminating All Business Activity CO_2 Emissions by 2050

Aiming to eliminate all CO_2 emissions through its business activities by 2050, CTC has formulated the 2050 CTC Environmental Declaration on medium- to long-term environmental targets. In addition to reducing the amount of environmental resources used by CTC, the Group is engaged in various initiatives to achieve a sustainable future with its clients and society through CTC business activities.

CTC has formulated the 2050 CTC Environmental Declaration based on CTC's mission of "leveraging IT's potential to change the future for the Global Good." The aim of these environmental targets is to keep CTC's businesses in harmony with the global environment through the mitigation of, and adaptation to, climate change; the effective use of resources; conservation of biodiversity; and other initiatives. It includes the promotion of energy conservation through cutting-edge technology, such as IoT and artificial intelligence, the creation of innovation utilizing information technology, the utilization of renewable energy, and the use of non-fossil fuel energy certificates and renewable energy certificates. The target is to eliminate all CO_2 emissions by 2050.

Initiative Toward a Sustainable Future: Data Center that Reduces CO_2 Emissions

Ever since opening the Yokohama Computer Center in 1988, CTC has been upgrading and expanding its services to meet client needs and respond to the advancement of IT. Today, CTC operates six data centers at four locations in Japan. The data centers account for roughly 90% of total CO_2 emissions by the CTC Group. The power consumed by one server rack is said to be roughly 10 times the electricity used by an average home. We believe that keeping our clients' systems at the data centers that have efficient power consumption will help the whole of society to meet its environmental needs. What is more, CTC data centers promote the adoption of facilities that lead to energy conservation as well as greening within their grounds.

Initiative Toward a Sustainable Future: Open Compute Project (OCP) for System Energy Conservation

The OCP was advocated and launched by Facebook of the US in 2011. The objective of the OCP is to make optimal hardware the standard at large-scale data centers as well as promote open-source hardware. System construction with OCP specification hardware enables low power consumption and low costs. In fact, power consumption can be reduced by 30% as compared to conventional systems, leading to the reduction of environmental load. In 2014, CTC became the first certified provider of OCP solutions. Today, as the only OCP solution provider in Japan, CTC promotes related product sales and system construction.

Advantages of the OCP

1. Power conservation through dedicated rack specifications with high power conversion efficiency
2. Operating cost reduction through good maintenance operability
3. Space saving

The Wiwynn OCP server is a product with a simple structure. Parts can be replaced without the use of screw drivers and other tools.

Initiative Toward a Sustainable Future: Support for the Effective Utilization of Renewable Energy

CTC has been involved in development in the field of renewable energy for more than 25 years in relation to weather forecasting and output prediction in wind and other power generation. E-PLSM, an in-house, cloud-based integrated IoT service provided by CTC, collects and analyzes massive amounts of data, including those concerning power generation and demand forecasting as well as facility-related information. The service enables power generation forecasting and failure prognosis of devices. It supports efficient energy utilization by power generation operators and private enterprises.

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Best Engine

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