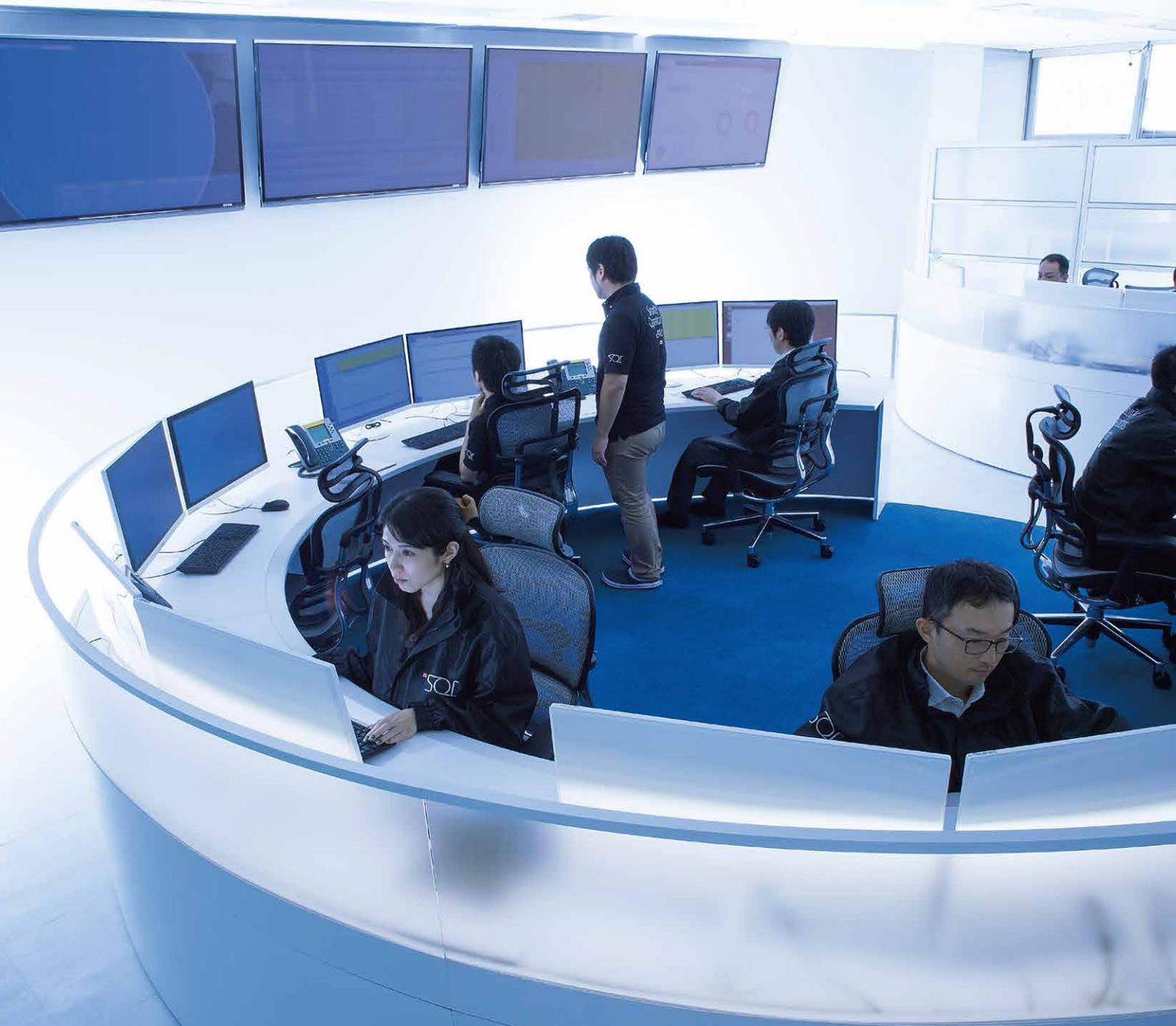


# Best Engine

Vol. 2



Special Feature

## Security “Enables” Business

# Best Engine

Vol. 2



Cover photo by  
Masataka Nakano

The CTC Security Operation Center (CTC-SOC) monitors the state of clients' security equipment 24 hours a day, 7 days a week and 365 days a year.

## CONTENTS

---

- 3** The Four Seasons of IT      Satoshi Kikuchi  
**My Own Words**      President and Chief Executive Officer
- 
- 4** **Special Feature**  
**Security “Enables” Business**
- 12** Supporting Clients by Both Preventing and Responding to Security Incidents  
**CTC’s CSIRT Establishment and Operation Support Services**
- 
- 14** Technical Report  
**The Role of the Systems Integrator Who Supports a Robot Utilization Society**
- 16** Case Study  
**Promoting Service Innovation and Greater Cost Competitiveness through Construction of an OCP-compliant Big Data Infrastructure**  
Yahoo Japan Corporation
- 
- 19** Delivering the Latest Information  
**News Pickup**
- 20** Golf Digest Editorial—Practical Golf Theory for Mental Toughness  
**Positive Thinking Begets Success**  
Nobuo Serizawa, Professional Golfer
- 22** IT as Seen Through Numbers—IT Insight  
**“200,000 yen”** The amount given each month to selected participants of a pilot study in the U.S.
- 23** Information
-



## My Own Words

In the previous issue, I touched upon the topic of searching for ways to get sound sleep on a plane. For a recent business trip to the U.S., I downloaded some “Good Sleeping Music” tunes, which were supposed to make people feel surprisingly drowsy and help them sleep well. I tried listening to them on the plane. I am not sure if it had an effect, but it did console me. I think I got off the plane feeling unusually cheerful after a flight.

Speaking of sleepiness, speeches can be more sleep-inducing than music at times. Remember getting bored and nodding off while listening to your boss sing his own praises or during the drone of speeches at a friend’s wedding reception? Perhaps it is because the Japanese have traditionally considered reticence a virtue—there seem to be many people who consider themselves to be awkward public speakers.

Whose name comes to mind when you think of the skilled speechmakers of our generation? I think of U.S. President Barack Obama. His “Yes, We Can!” and “Change we can believe in” messages that were given during his presidential campaign as well as the speech he gave during his recent visit to Hiroshima moved people’s hearts.

As a company president, I often must prepare speeches and words of greetings. In fact, I am writing a “message from the president” about strengthening our diversity initiatives and promoting the participation of women. Sometimes, the secretariat provides me with a draft, but the drafts are nothing more than something that I use as reference. It is important that I think on my own and use words that I come up with. The thoughts, which start off somewhat fuzzy, become clearer and sharper as I make many revisions. There are many times when my mind is made up as a result of writing. Writing to our employees is not easy, as I would like to use my own words to convey my message to employees of different ranks and positions.

Ten years have passed since ITOCHU Techno-Science and CRC Solutions merged to become ITOCHU Techno-Solutions (CTC). This is perfect timing for us to set off into a new stage. We will strengthen CTC’s diversity to ensure that our employees will continue personal growth while facing the same direction—and this, so that we can continue providing our clients with careful, better services. It will not be long before the message that I am writing to our employees is finished.

**Satoshi Kikuchi**

President and Chief Executive Officer  
ITOCHU Techno-Solutions Corporation



Special  
Feature

# Security “Enables” Business

In this age of the digital revolution, when there is an integration of business and IT technologies, companies must also transform their understanding of cybersecurity. As attacks and threats continue to rise, how should they approach measures to be taken against cybersecurity risks? Here is a dialogue between two keypersons at the forefront of the cybersecurity business.



# Riotaro Okada

President, Asterisk Research Inc.  
OWASP Japan Chapter Leader

Special  Dialogue

# Nagaki Fujioka

Executive Officer  
General Manager  
Cloud & Security Services Business Division  
IT Services Business Group  
ITOCHU Techno-Solutions Corporation



### Riotaro Okada

Operates his business under the “Enabling Security” mission. Also serves as an instructor and/or advisor at companies, universities and government agencies. Open activities include his role as an organizer of the Web Application Security Forum (WASForum) Hardening Project, and OWASP Japan Chapter Leader.

— Mr. Okada, the key concept at your company, Asterisk Research, is “enabling security.” Can you explain its meaning?

#### Cybersecurity Is Not About Safety—It Is About Having Command of the Air

**R. Okada:** Cybersecurity started to become a topic of discussion at Japanese companies in the late 1990s when business use of the Internet began. Ever since then, as the utilization of information technologies becomes even further embedded in business activities, interest in security has been escalating at an accelerating pace.

At the same time, however, the more one tries to implement solid security measures, the more indispensable it becomes to set up certain restrictions on IT utilization—these, to avoid risks. Furthermore, proportionate costs and time-consuming work must be carried out. Perhaps because of this, when people think about “cybersecurity,” they tend to

think of it as something that hinders the speeding-up of business activities. In other words, something that “disables.”

The occurrence of numerous cybersecurity incidents in recent years at vulnerable companies, and the massive damage that has been inflicted on businesses clearly show that it is wrong to think of cybersecurity as something that “disables.” For companies to utilize IT and promote their business at full throttle, security risks, which can inhibit, must be controlled. In other words, the message we are communicating at Asterisk Research is that cybersecurity that “enables” business must be realized. That is the thinking behind our concept of “enabling security.”

**N. Fujioka:** Indeed, people have thought of cybersecurity as being somewhat passive since it is related to defense. But, in your thinking, cybersecurity must be something that will actively support business acceleration. When I speak to American businesspersons, I see that they look at cybersecurity in the way you just described. That seems to be an area in which circumstances still differ between the United States and Japan.

**R. Okada:** I believe that in the background of this misunderstanding is that the English word “security” was translated using the Japanese word for safety.

The Japanese economy was originally driven by the manufacturing industry. There, “safety” was understood as a product posing no danger to customers when they use or consume a product and was emphasized. Today, security implies something very different from that kind of safety, and the current meaning must be recognized.

Whether it is recognized or not, we can’t be optimistic about current circumstances for they are bleak. In fact, cybersecurity can be likened to a country having command of the air.

# Security

## Nagaki Fujioka

Has been involved in the software and hardware technologies, sales and marketing areas since joining CTC. Supported product sales by supervising CTC's business contact points with various manufacturers. Currently the executive officer responsible for CTC's cloud and computer security services, and is working to expand CTC services.



When there is a growing risk of something with a destructive impact flying in from overseas, a country does whatever it can to allow its peoples living within the territory to live peacefully. Replace the image of the airspace that is being protected in such scenarios with cyberspace. For a company to secure a “territory” in which it can freely carry out its business activities—and this in a space that is overrun with threats on its services, such as direct attacks and malware infiltration—it cannot remain defenseless. It is also evident that taking uniform countermeasures that are the same as other companies is meaningless. It will only be to the advantage of cyberattackers since it would boost the success rates of similar attacks.

Seeing that there is a difference in direct understanding that was caused by the language spoken shows us that it is dangerous to think of the difference between Japanese and American companies in their attitude toward cybersecurity (passive vs. proactive) as simply being something cultural.

### No Longer an Age in Which the Information Systems Division Handles Cybersecurity All on Its Own

— As damage from targeted attacks, ransomware and other cyberattacks increases today, what kind of a stance should companies take in regards to protecting themselves?

**R. Okada:** I want to emphasize that cybersecurity is a business enabler. In that sense, strengthening a company's security is an issue that requires management involvement. It is no longer something that should be left to be handled by a company's information systems division. Companies must understand that cybersecurity is related to the life or death of

a business, and it must be positioned as a matter of major importance for their board of directors.

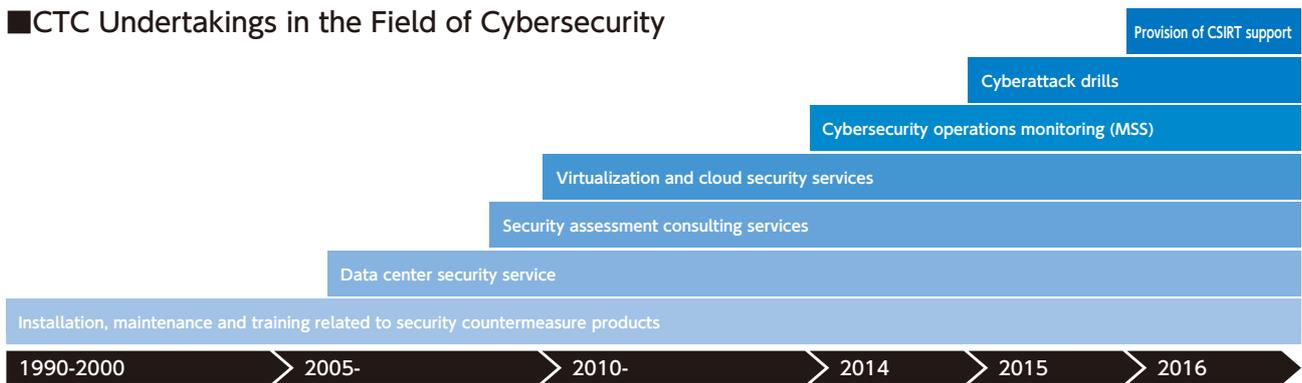
At the WASForum\*1 (Web Application Security Forum) where I serve as director, we hold the Hardening Project every year. It is a security competition where engineers compete in teams to comprehensively “harden” a vulnerable EC site that has been placed in a virtual network environment. Participating teams must establish an appropriate structure for carrying out the risk management and operation of the EC site's services; deal with a cyberattack security incident while correcting the vulnerability; collaborate with customers and government agencies as needed; and harden the soft spots in a business in relation to cybersecurity. The aim of this initiative is to promote the study of hands-on security technology that protects businesses as well as unearth and recognize the engineers and others involved.

#### \*1 WASForum (Web Application Security Forum)

A voluntary non-profit organization launched in 2004. Its purpose is the research of issues related to web application security, the sharing of information for boosting security, and the provision of educational activities on appropriate countermeasures and construction means.



## ■ CTC Undertakings in the Field of Cybersecurity



A wide range of people from industry, government and academia have participated in the Hardening Project so far. Recently, there has been an increase in participation by non-engineers as well. It includes people involved in corporate legal affairs or marketing. I want to continue appealing the value of having a broad range of individuals involved in the provision of IT services, including those at the frontlines, and ensuring that everyone develops solid literacy in regards to cybersecurity so that the whole organization works as one on security.

**N. Fujioka:** Of course, from the perspective of ramping up security, it goes without saying that under the leadership of the information systems division, superior products and services must be adopted, and countermeasures improved and expanded. A recent trend, in particular, is the strengthening of post-incident measures that assume the occurrence of invasions and other breaches of cybersecurity. Behind this trend is the appearance of a flood of new type of threats.

Companies are also setting up in-house computer security incident response teams (CSIRT)\*2. This is becoming more common because companies are eyeing the possibility of encountering new threats. However, should a security incident arise, all those concerned must become involved in the response. This means not only the information systems division but also those in management as well as legal affairs

and corporate communications. The company must go immediately into a state of cyberwar readiness.

As you say, the issue of cybersecurity must be a company-wide issue. People with security literacy should be installed and nurtured at related divisions before anything happens.

### A Family of CTC Services Provide Comprehensive Coverage of the Security Lifecycle

— How is CTC providing support for the cybersecurity measures that today's businesses need? Please include some background information, including past undertakings.

**N. Fujioka:** CTC began the sale of firewall and antivirus products as well as the provision of maintenance services in the 1990s during the dawn of the Internet age. From 2000, our service menu lineup continually expanded in step with the rapid expansion of information technology and network use by companies. We met client needs through security services for data centers; security assessment services as represented by vulnerability assessment; cybersecurity consulting services; cloud-based cybersecurity services that can deal with virtual environments; and other services.

In 2014, we opened the CTC Security Operation Center (CTC-SOC). It carries out manned monitoring of the state of

#### \*2 CSIRT (Computer Security Incident Response Team)

A generic term for an organization that responds to and deals with cybersecurity-related incidents. Companies that have a CSIRT, which is dedicated to minimizing damage by responding swiftly to detected security incidents, are on the rise as cyberattacks become more advanced and sophisticated.

our clients’ security equipment 24 hours a day and 365 days a year. We launched the CTC Managed Security Service (CTC-MSS), which centrally carries out emergency response, changes equipment settings and operations, in partnership with BAE Systems—a global leader in cyber defense. For those clients who are establishing the CSIRT (computer security incident response team) mentioned earlier, we commenced CSIRT Establishment and Operation Support Services in July 2016. These services provide assistance for the establishment and operation of a CSIRT by leveraging the experience and expertise CTC accumulated through years of providing cybersecurity services. In October, we launched the sale of Tanium, which enables the visualization of threats posed on endpoints.

So, as you can see, CTC has a full lineup of services that provide comprehensive cybersecurity. It offers an exhaustive coverage of the security lifecycle—from analysis and evaluation of the current state of a client’s cybersecurity to the adoption of measures, monitoring of security, and support for CSIRT operations.

**R. Okada:** CTC participates in our Hardening Project and not only provides technology but also shares valuable expertise for hardening business security. CTC continually keeps a watchful eye on the fundamental needs of companies, government agencies and others participating in this event. The insight gained is later incorporated into the CTC service menu, such as in the training offered as part of CSIRT support. I think that is wonderful.

### “Secure by Design”—a Key to System Deployment and Security Measure Adoption

— One last question—can you tell us what companies should keep in mind in regards to cybersecurity measures, and the direction that should be aimed for?

**R. Okada:** A company needs to keep the perspective of the security lifecycle. One of the areas that requires focus is

“secure by design”<sup>\*3</sup> (also known as security by design) in which security is incorporated at each stage of planning, design and deployment. This is also clearly outlined in the Japanese government’s Cybersecurity Strategy<sup>\*4</sup>.

Among the business-use web applications that are operated in-house by companies, there is a large number of applications that are vulnerable to SQL injection<sup>\*5</sup> and other attacks that can cause great damage. In other words, “secure by design” had not been implemented because the system integrator who oversaw the system or the vendor of the adopted package had unwarranted belief that the in-house environment was safe and secure. No matter how much suspicious traffic is monitored at the network boundary, it is useless if the applications within the in-house system being protected contain vulnerabilities.

It is true that systems are being constructed at a significantly faster speed through the use, for example, of open source modules. The other side of that coin is that it is now easier for applications with many vulnerabilities to be churned out. What is more, as functional requirements, turnaround time and costs are given top priority, matters such as the process of constructing and keeping up secure applications, and skills for implementing security measures are being overlooked.

Therefore, the concept of “secure by design” must be built into each of the stages—application requirement definition, design, deployment and operation. Instead of thinking of security as being something separate from an application, it should be incorporated into the process.

If you think about the dispersed styles that systems will take going forward—this includes clouds and IoT—there will probably be increased situations in which the web application programming interfaces (APIs) and data of other companies are utilized. In such circumstances, it will be essential that security is not an add-on. The risks of such web services must be scrutinized and controlled in line with the secure by design concept. The concept of “DevSecOps”<sup>\*6</sup>, which includes security as part of the development and

#### \*3 Secure by Design

In this concept, ensuring cybersecurity is included from the planning and design stage of a system. It is a departure from situations in which security is seen as a non-functional requirement and tends to be postponed or become an add-on, with only convenience being pursued. The concept makes cybersecurity a shared, quality-related value that needs to be secured.

#### \*4 Cybersecurity Strategy (Cabinet Office) (Cabinet decision, September 4, 2015)

Clearly promotes the idea of “Security by Design” as well as the need for related parties to be accountable for and to recognize it as a shared value.  
<http://www.nisc.go.jp/eng/pdf/cs-strategy-en.pdf>

#### \*5 SQL injection

A common method of attacking web applications. It hits inadequate response to hardening the interface between a web application and a database. SQL injection attacks enable the execution of a variety of fraudulent commands, such as those to modify data or to obtain information from the database.



operations cycle, has also appeared. OWASP\*<sup>7</sup> has useful guidelines in relation to concrete steps that can be taken.

Corporate users who will adopt application packages or services will need to be able to make appropriate decisions related to their selection. Instead of looking not only at the functions or brand of the system to be adopted, focus will also have to be placed on whether the package or service includes a process that incorporates security into the design or at the deployment stage, or is fault-resilient.

**N. Fujioka:** I agree. Information technology has become integrated with business activities. You could even say that this is an age in which you cannot have a new business model without the use of IT. Under such circumstances, ideas must be soundly deployed as an IT service, faster than ever before.

When doing so, how can security be appropriately incorporated into applications and systems? In response to such needs, CTC will, as a cybersecurity services provider and system integrator, continue to strengthen the provision of security that enables clients' businesses.

As the history of cybersecurity progressed, the motivation for the attacks, objectives and targets have changed greatly. However, one thing remains unchanged—weaknesses, that is, vulnerabilities are targeted.

CTC supports its clients so that they can respond to vulnerabilities that are hidden in systems, organizations and operations. CTC will further expand the possibilities of information technology through "secure by design," combining its expertise in cybersecurity with comprehensive strengths as a system integrator with many years of experience.

<sup>\*6</sup> **DevSecOps**

A method of development (Dev) and operations (Ops) that incorporates security (Sec) in the process of function development. The information security division collaborates closely with the development and operations units in this method, as compared to DevOps, which is close collaboration between the development and operations units.

<sup>\*7</sup> **OWASP (Open Web Application Security Project)**

A global, open community with the objective of resolving application security-related issues. OWASP Top 10 are guidelines related to application security risk countermeasures. It is the most used reference for web application security. OWASP is administrated by the OWASP Foundation, which came online in 2001, becoming a not-for-profit charitable organization in the United States on April 21, 2004. It currently hosts more than 120 projects, and has more than 200 chapters around the world.

## Supporting Clients by Both Preventing and Responding to Security Incidents

# CTC’s CSIRT Establishment and Operation Support Services

Cybersecurity threats continue to become increasingly sophisticated and diverse. More and more companies and organizations are setting up computer security incident response teams (CSIRT) in response. A CSIRT is a specialized organization that minimizes damage by making prompt response to security incidents when they arise.

Here is a look at CTC’s CSIRT Establishment and Operation Support Service, which offers comprehensive support, from the launch of a CSIRT to its operation.

### Measures That Assume the Occurrence of Computer Security Incidents

While corporate activities become increasingly dependent on the utilization of IT technologies, targeted attacks and other cyberthreats on information security are also on the rise. In addition to the prevention of computer security incidents, such as through the adoption of security products used through the conventional system, it is now also becoming important to respond smoothly and effectively to a security

incident once it has arisen. CSIRT is the organization that plays a comprehensive role in preventing and responding to such security incidents. Its primary tasks are as follows.

#### <Prevention>

- (1) Ramp up a system to deal with vulnerabilities
- (2) Collect information on cyberthreats and vulnerabilities
- (3) Carry out educational activities on computer security within an organization or company

#### <Response>

- (4) Serve as the central contact point in relation to the occurrence of computer security incidents, including cooperation with external parties in regards to the sharing of related information
- (5) Classify the security incident and assess the priority of response, and consider and determine the method of response
- (6) Minimize the damage and implement preventive measures

Diagram 1

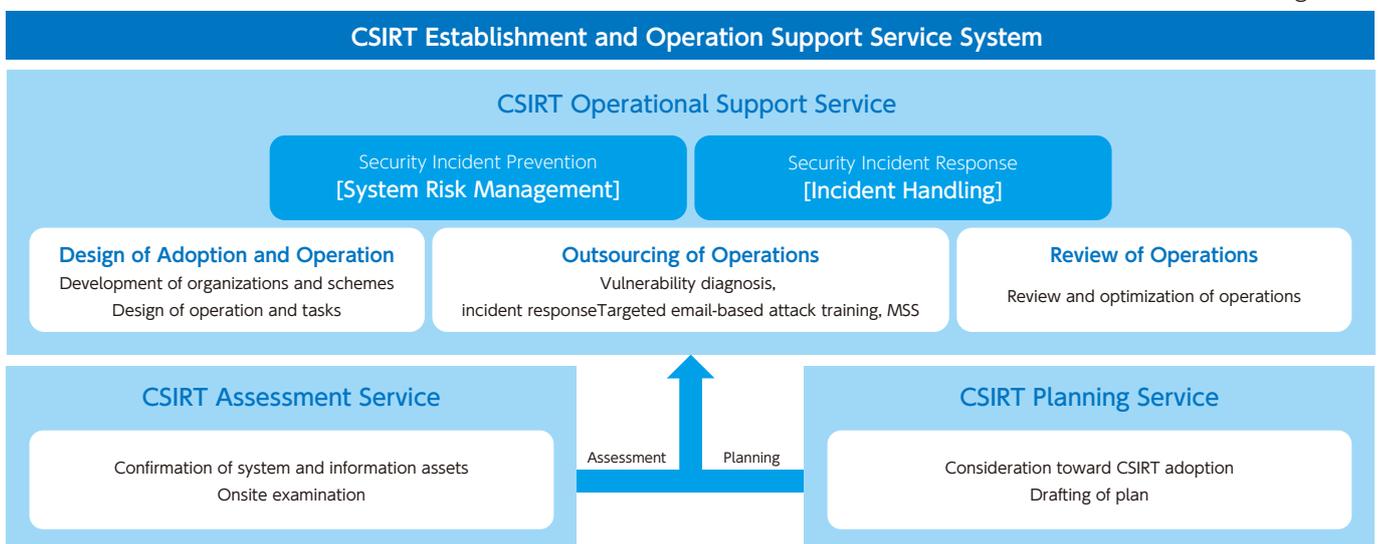
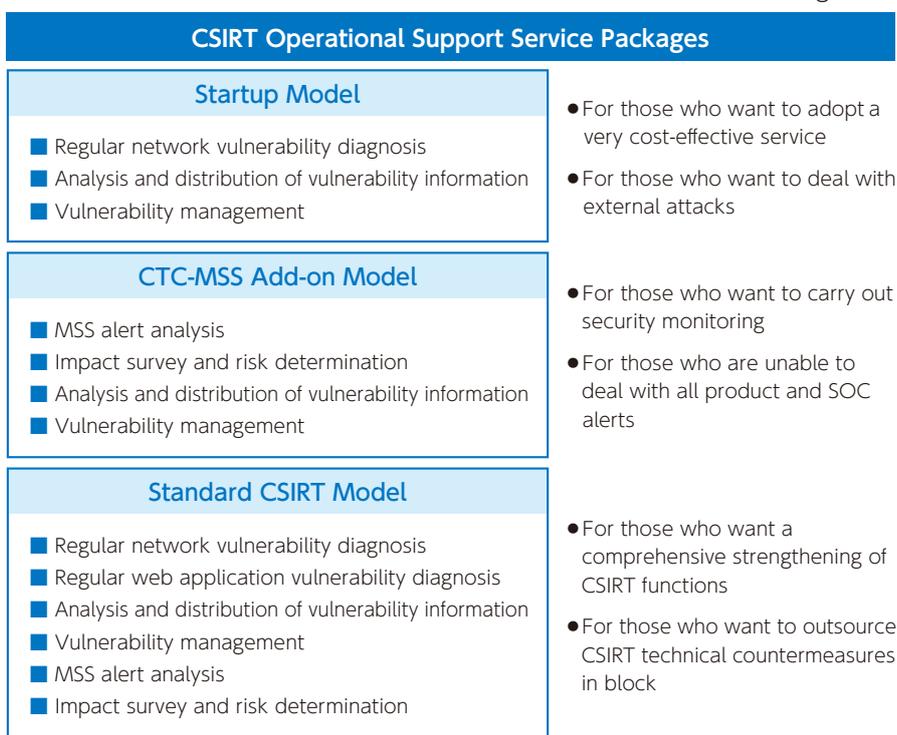


Diagram 2



**Preparation of a Service That Provides Comprehensive Support for CSIRT Activities**

The CSIRT Establishment and Operation Support Services launched by CTC is based on expertise accumulated through years of experience in the provision of computer security services. It offers comprehensive support, from the launch of a CSIRT to its operation. The services consist of the CSIRT Assessment Service that evaluates actual conditions related to computer security; the CSIRT Planning Service that assists the formulation of CSIRT-related plans; and the CSIRT Operational Support Service, carried out by CTC engineers on behalf of clients. (See Diagram 1)

The CSIRT Assessment Service evaluates the current state of a client's computer security. Onsite inventory-taking and examination are made of the client's system and information assets. This makes a client's computer security risks visible, and CTC proposes necessary countermeasures.

The CSIRT Planning Service provides support for formulating a requirements

definition toward the adoption of a CSIRT, considering tasks, formulating a concrete annual plan for CSIRT operation, and calculating required costs.

**CSIRT Operational Support Service**

The CSIRT Operational Support Service assists clients in terms of both the prevention of computer security incidents and the implementation of response in case incidents should occur. The services are provided in line with the primary tasks of the CSIRT. Optimal combinations of more than 20 submenus are created in accordance with needs and actual circumstances.

In terms of prevention, CTC offers the following kinds of service submenus: the ramping-up of systems based on a review of the security design and system vulnerability diagnosis; computer security educational activities for the

organization (e.g., the collection, analysis and distribution of the latest security threat information); and the maintenance and improvement of security levels through the revision of security rules and implementation of training related to targeted email-based attacks.

In terms of response, the menu of support includes the examination and analysis of security incidents in conjunction with the CTC-SOC, which carries out the remote monitoring of system security. Based on this, assessments are made on whether response is required, the extent impacted by damage is determined, support is provided for early recovery, and consideration is made of measures to prevent recurrence.

There are also pre-packaged service menus, from small CSIRT launches to comprehensive outsourcing, according to items commonly requested by clients. (See Diagram 2)

## The Role of the Systems Integrator Who Supports a Robot Utilization Society

The utilization of robots is one of the pillars of the “Fourth Industrial Revolution” alongside artificial intelligence (AI) and IoT, and their use by companies is now coming under the spotlight. This is a report on the background and challenges toward the arrival of a “robot utilization society.”



Masahiro Matsuzaki (on left)  
Hiroto Takahira (on right)

Innovation and R&D Division  
ITOCHU Techno-Solutions Corporation

### The Spotlight on Non-Industrial Robots

The use of non-industrial robots (service robots), such as humanoid robots and interactive “communication robots,” at shops and other commercial facilities to streamline operations or improve customer services is coming under the spotlight. In the background is concern over a possible manpower shortage in countries like Japan where there are dwindling birth rates and an aging population. There are estimates that a manpower shortage will become especially pronounced in fields such as healthcare and nursing care.

Japan has been ahead of other countries in terms of becoming an aged society. There are expectations toward the application of Japanese measures in response to the aging population in other countries, such as in China and Singapore. What is more, Japan experiences many natural disasters, especially earthquakes. The idea of utilizing robots in countermeasures against natural calamities has therefore also become widespread.

### Arrival of a Robot Boom

The harboring of expectations toward the utilization of robots in the fields

mentioned above is nothing new. The problem was, there were virtually no robots for practical use. Reasons included battery-related issues. For example, they were too heavy to be supported by a robot chassis, or the batteries drained too fast making the robots unsuitable for use over long hours. Other reasons included the costliness and large size of materials and parts.

In recent years, information terminals (such as smartphones) and computers are being made smaller and smaller, and energy-efficiency has been boosted, including batteries. With their proliferation, the manufacturing costs of the parts used in robots are also decreasing. Innovations continue, changing robots from the once highly expensive items that they were when they first appeared, to things that are more accessible. Robot use is also gradually spreading to households. Examples include robotic vacuum cleaners and robot toys. We are sure to see even greater opportunities to encounter robots in our daily lives.

### AI and IoT—Two Technologies that Boost Robot Performance

The advent of the third artificial

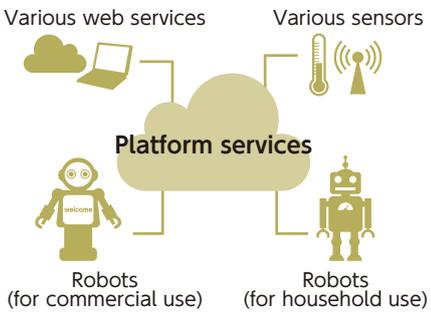
intelligence (AI) boom is stimulating even more changes in relation to robots. “Self-contained robots” that teach themselves and perform tasks are appearing. The capabilities of the robot itself are being enhanced through the utilization of “deep learning,” which boosts the ability of AIs to learn about its surrounding circumstances or enhances the precision of image, voice and other types of recognition. Higher levels of processing are becoming possible.

High-speed Internet connections, the spread of cloud services, and the rise of IoT (Internet of Things) technology—in which “things” are connected to other “things” through networks—are also enabling robots to perform even more advanced tasks. Robots, which had originally moved singularly, are now also capable of mutually-coordinated movement. They can also link up to various web services, such as cloud services, and function as a part of various systems.

### Challenges Related to Services Utilizing Robots

Robotic technology generally consists of multiple elemental technologies, such as the following\*.

## ■CTC's Robot Management Platform

<p><b>Feature 1</b> Can be linked with robots, web services, sensors, etc.</p>	<p><b>Feature 2</b> Offers a scenario development screen that can be intuitively operated for the preparation of a scenario for manipulating robots</p>	<p><b>Feature 3</b> Can be used to manage robot operation and analyze server operations logs</p>
 <p>Various web services</p> <p>Various sensors</p> <p>Platform services</p> <p>Robots (for commercial use)</p> <p>Robots (for household use)</p>	 <p>Scenario development screen</p>	 <p>Operation management screen</p> <p>Log analysis screen</p>

- Artificial intelligence
- Sensing and recognition technologies
- Mechanical, drive and control technologies
- Operating system and middleware technologies
- Communications technology
- Safety and security assessment technology, standards

However, there are many challenges other than elemental technologies to realize services that are provided using robots.

### ❶ The Price of Robots

Prices are falling, but even so, when the price of the robot is combined with its maintenance and telecommunication expenses, most service robots cost between hundreds of thousands and several million yen. For this reason, it is currently difficult to achieve cost-effectiveness with just robots.

### ❷ Development Environments that Differ from Robot to Robot

The development environment (e.g., programming language and operating system platform) differs from robot to robot. Providing robotic services that require the use of several different robots working in conjunction with each other

necessitates learning many different development methods.

### ❸ Operation and Maintenance

Service robots still generally operate somewhat erratically as compared with industrial robots. A mechanism that detects the occurrence of trouble and failures in relation to the robots in use and enables swift response is indispensable for the provision of quality-ensured robotic services. However, such mechanisms and structures are not yet sufficiently in place.

### CTC's Robot Management Platform

Coherent response—from the development and operation of services utilizing robots to the management of various robots and improvement of services—is required to solve these challenges. This is none other than the role to be played by a systems integrator.

CTC is engaged in the development of a robot management platform for the provision of robotic services that link various robots, web services and sensors. CTC would like to make the development of services that utilize robot easier by using a uniform user interface to define the basic movements of robots (such as “talk,” “listen” and “obtain information from the web”) regardless of the type of

robot or its manufacturer.

CTC also opened RoBo-LAB. Intended for clients who are considering the actual adoption of robotic services, RoBo-LAB serves as the place for joint-creation with clients. Through the RoBo-Lab, CTC will consider the utilization of robots with the client and carry out verifications.

### Arrival of a Robot Utilization Society

After the third industrial revolution, also known as the IT revolution, Japan came to be known as a superpower in regards to industrial robots used in the field of industry. The nation possessed leading technological capabilities and top numbers of industrial robots in operation. Towards the coming fourth industrial revolution, the Japanese government has declared its intent to make Japan a global leader in terms of non-industrial robots. AI and IoT technologies as well as the effective utilization of robots are being discussed. We will likely see the emergence of robotics utilization methods that no one has before imagined.

Although a little more time will be required for the full-scale spread of service robots, CTC will continue to work with clients toward the advent of a “robot utilization society.”

## Promoting Service Innovation and Greater Cost Competitiveness through Construction of an OCP-compliant Big Data Infrastructure

Yahoo Japan Corporation

Company Name: Yahoo Japan Corporation

Headquarters: Kioi Tower Tokyo Garden Terrace Kioicho 1-3 Kioicho Chiyoda-ku, Tokyo

Founded: January 31, 1996

Capital: 8,388 million yen (as of June 30, 2016)

Number of Employees: 5,830 (as of June 30, 2016)

Website: <http://www.yahoo.co.jp/>

Yahoo Japan Corporation (“Yahoo Japan Corp.”) operates Yahoo! JAPAN, which was the first Japanese commercial Web search engine. With the proliferation of smartphones in the nation, traffic on the site continues to grow steadily. The company, which this year celebrated the 20th anniversary of its founding, announced UPDATE JAPAN, its new guiding vision. The policy described within is to create an even stronger management base while bringing about innovations in its existing businesses. Its advertising-, e-commerce- and financial and payment-related services will serve as pillars.

As part of this undertaking, the data center owned by YJ America, Inc. (Yahoo Japan Corp.’s Stateside subsidiary), is accelerating the promotion of big data utilization. As a partner, CTC Group company ITOCHU Techno-Solutions America, Inc. (“CTC America”) is supporting the generation of innovation at Yahoo Japan Corp. by proposing a big data infrastructure that conforms to Open Compute Project (OCP) specifications.

### Operating Costs of the Data Center Have Swelled Due to the Surge in Transactions and Data Volume

Yahoo! JAPAN provides over 100 Internet-based services, and it attracts nearly 70 billion page views per month. The utilization of the massive amounts of data that can be obtained from Yahoo! JAPAN and leading it to the generation of innovations in its existing businesses or the creation of new businesses is an important business challenge for Yahoo Japan Corp. It already adopted Hadoop early on. The middleware enables the storage and analysis of massive data sets through distributed processing technology. This changed big data into useful and actionable information, and Yahoo Japan Corp. has been utilizing such information in improving its services, such as through the recommendation function, and in development. However, with such things as the proliferation of smartphones as the backdrop, the amount of transactions and data volume have been increasing at an accelerated pace. The cost of

implementing system expansions and measures to curb continually-increasing electricity costs at its existing data centers in Japan became too big. As a countermeasure, Yahoo Japan Corp. embarked on a plan to create a new base in the U.S. that incorporates the latest mechanisms.

### Completion of an OCP-Compliant Big Data Infrastructure that Achieves Both Scalability and Low Power Consumption

Norifumi Matsuya, Executive VP of YJ America (Yahoo Japan Corp.’s Stateside subsidiary) in charge of Yahoo Japan Corp.’s overall infrastructure, said, “Our aim is to be among the top in the world. Although there were various constraints, I told CTC America that I wanted to aim for that if we’re going to do this at all.”

CTC America first crossed paths with Mr. Matsuya in March 2015 and learned that Yahoo Japan Corp. was reforming its infrastructure. It then proposed that issues could be resolved by creating a big data infrastructure that conformed to Open



## Norifumi Matsuya

Executive Vice President  
YJ America, Inc.

Compute Project (OCP) specifications. Procuring equipment without going through specific vendors had already become mainstream among American business operators who required web-scale infrastructure, hyperscale computing and other large-scale infrastructure, such as those for processing big data. OCP is a community of engineers that subscribes to this trend. It was launched in 2011 by Facebook with the objective of promoting open-source development of servers and other hardware designs as well as their specifications. OCP now has more than 150 corporate members around the world. They include hardware vendors such as Intel and IBM, and software vendors like Microsoft and VMware.

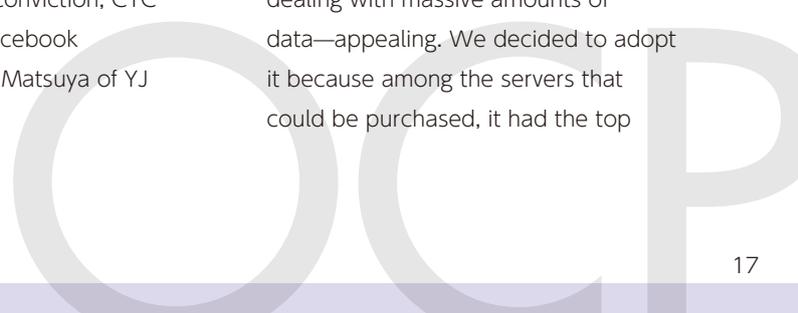
Following participation in a Facebook-hosted hardware hackathon, etc., CTC America was certified by the Open Compute Project Foundation (organization running the OCP) as an OCP solution provider. CTC America had already launched OCP-related activities, from the sale of



Assembled OCP server awaiting shipment

solutions to design, construction, setup and maintenance. Adoption of OCP technologies would allow companies to aim for the realization of next-generation data centers—that is, low-energy consuming, scalable computing environments—at a low cost. With this firm conviction, CTC America visited a Facebook datacenter with Mr. Matsuya of YJ America.

Mr. Matsuya said, “It is an infrastructure that will allow the storage and analysis of the big data being collected, and one for creating new services. I found the simple structure and the ability to scale out the system—which allow flexibility in dealing with massive amounts of data—appealing. We decided to adopt it because among the servers that could be purchased, it had the top



# Case Study



This case study also appeared on October 19 (Wed.) in the morning edition of the Nihon Keizai Shimbun newspaper.

operational track-record in the world.”

He considered the adoption of OCP technology with the help of CTC America, jointly carrying out hardware procurement to system setup and pre-operation quality verification. The result was the creation of a Hadoop infrastructure, which consisted of 1,200 servers and 120 petabytes of storage, that enabled the efficient processing of big data.

## A Desire to Move Forward Together and in the Same Direction as Business Partners

Against a backdrop of the explosive proliferation of the Internet, Yahoo Japan Corp. has continued to make great strides by adopting “problem-solving engine” as its slogan. In other words, to be an engine for solving societal issues using the power of IT. By realizing a Hadoop infrastructure that conforms to OCP standards, Yahoo Japan Corp. is now capable of carrying out even higher-efficiency-processing of massive amounts of big data. At the same time, a reduction of IT-costs was also

achieved. The expertise it gained through this recent project is also being utilized to strengthen its systems in Japan.

In addition to assisting the preparation of an OCP-compliant Hadoop infrastructure, CTC America also provided support for building YJ America’s infrastructure management environment. The environment utilizes OpenStack (open-source cloud management software) and Kubernetes (container management software). With OCP as the starting point, CTC America will also continue to provide thorough support in the application layer utilizing state-of-the-art technologies.

Mr. Matsuya said, “We chose CTC America as our Stateside partner because we felt that they would approach our challenges with the same mindset as us. With the extensive expertise and strong global networks possessed by CTC, we look forward to continuing to move forward together with CTC as business partners.”



The OCP-compliant product at the Technical Solution Center, CTC’s general verification facility



# News Pickup

Here is information on solutions and services, selected from CTC news releases, that are in the limelight.

## Cloud Services

### One-stop Call Center Services, from Establishment to Operation

CTC has added another service that is based on its alliance with BELLSYSTEM24. Named eBellCloud, it is a cloud-based service for the establishment and operation of call centers. Along with BELLSYSTEM24's call center operation services that can deal with large-scale, urgent requests, this new one-stop service includes the establishment and operation of a high-quality call center. It will lead to even greater operational efficiency when combined with our service for system construction or that utilizes moving images.

## IoT

### IoT Service that Displays the State of Toilet Occupancy

CTC has developed an IoT service that utilizes sensors that are set up on bathroom stalls for real-time confirmation of the state of toilet occupancy. Toilet vacancy or occupancy is determined based on whether a door is open or closed, and the result is displayed online. The sensor has a built-in solar panel and wireless transmission, and it can be adopted for use even in small offices. Going forward, CTC will further enrich its IoT services intended for office use, such as the conference room vacancy management as well as attendance management.

## Robots

### Research Facility for the Business Utilization of Robots

CTC opened RoBo-LAB, a research facility that will carry out demonstrations and confirmations of various robots and their functions as well as develop robot applications. A management platform enables the intuitive operation of robots and coordination between sensors and the world wide web, making it possible to carry out verifications that simulate use at various locations, such as shops and commercial facilities. RoBo-LAB is located within CTC's Technical Solution Center, which is the company's general verification facility, and linkage with a client's existing system can also be confirmed.

## Systems Operation and Maintenance

### Service that Prevents System Failures and Delays

CTC Technology has launched Avail-ProE, a service that detects the warning signs of a system failure and prevents performance degradation and failures. It combines the monitoring of the status of various hardware with the monitoring of network and application performance, and detects even the smallest of warning signs of possible future failures. Highly experienced engineers then step in to identify the cause. CTC Technology will work to further sophisticate the service and contribute to stable systems operation.

## Security

### Real-time Visualization of PCs, Servers and other Endpoints

CTC commenced the provision of a security solution in collaboration with Tanium of the U.S. It controls PCs, servers and other endpoints by making them visible in real-time. An original information transmission method makes it possible to visualize damage and other circumstances, such as invalid processes and the state of patch application, for every endpoint, whether they number in the hundreds of thousands or millions. This is done within 15 seconds, enabling swift response to be made remotely. Combined with a sandbox solution, which can handle unknown cyberattacks, it will realize strong defenses even against targeted attacks.

## IoT

### Verification Service Intended for Large-scale Use of IoT

CTC has opened IoT Digital LAB, a verification facility for IoT utilization. It can handle large-scale demonstrations and verification, from the collection of data from several tens of thousands of sensors to the processing and analysis of data. IoT Digital LAB is capable of handling various IoT-utilization scenarios, including temperature regulation and equipment failure prevention. With the IoT Digital Lab at the core, total support will be provided, from the generation of ideas to the construction and operation of IoT systems.

Please visit the following for further details.

<http://www.ctc-g.co.jp/news/>



## Golf Digest Editorial Practical Golf Theory for Mental Toughness

(With the cooperation of Team Serizawa Golf Academy)

## Nobuo Serizawa

Born 1959; age 56. A lifetime record of five Japan Golf Tour wins, including the Japan PGA Match-Play Championship (1996). One Japan PGA Senior Tour win marked since becoming eligible. Currently heads Team Serizawa, which he formed with professional golfers Hiroyuki Fujita and Katsumasa Miyamoto. Opened a golf academy at the Daihakone Country Club. Has many fans and followers and is known for his easy-to-understand golf lessons.

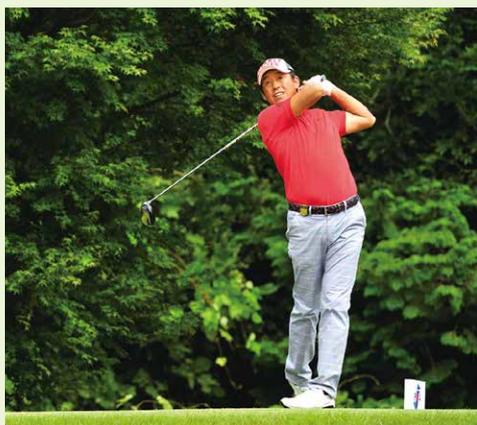


# Positive Thinking Begets Success

Professional golfer Nobuo Serizawa says that golfers have a better chance of hitting a good shot from the teeing ground if they envision where they want to hit the ball to, instead of where they do not want it to go. In other words, positive thinking is better able to lead us to success than negative thinking. Why is this so?

### Doubt and Insecurity Prevents the Smooth Movement of Your Body and Makes Good Shots Difficult

The minds of people who are or will become good golfers are, for the most part, filled with positive thinking. When addressing and about to take a swing at a golf ball, let's say there are two kinds of people: those who think, "Okay, I'll hit the ball smack into the middle of the fairway," and those who think "What if I slice the ball and it goes into the wooded-area on the right?". In my experience, the former type of person—those who think positively—has an outstandingly better chance of success. Doubts and insecurity about making a bad shot—or negative thinking—gets in the way of the flow of our physical movement, and it can end up triggering a bad shot. On the other hand, if success and a great shot is envisioned, their bodies will move smoothly, making a good shot more likely to happen. This is a method that can be used outside of golf, too. Envision success in various business scenes. If your anxiety or doubts become greater than your confidence in relation to the task in front of you, it



will not be easy to exhibit your normal capabilities.

### Major Wins Achieved through Positive Thinking

I have experienced good results on numerous occasions by switching from a negative mindset to positive thinking.

For example, in the 1996 Japan PGA Match-Play Championship, I played the final against Brandt Jobe of the United States. Since it was in Japan, a lot of the people in the gallery rooted for me. That helped me to think positively, and it resulted in my win.

Luck is a big element of golf match plays, so my attitude up to and including the semi-finals had been

somewhat negative. I had a feeling of resignation that it could not be helped if I lost. I remember that I felt differently during the final match. The cheering for me made me feel positive throughout, and I felt that I would be able to win. It also helped that it rained that day. It made it difficult for long hitter Brandt Jobe to increase his distance as per usual.

### The Words of a Senior Colleague Transformed Psychological Complexes into a Weapon

Meanwhile, a few words from a senior colleague changed my mindset completely at the 2000 Token Corporation Cup. As a professional golfer, I am not a particularly long hitter. That means that the longer a hole, the smaller the club number that I must use to make my second and later shots. That creates disadvantages for me.

When I was moaning about this, Mr. Sugihara (the late professional golfer Teruo Sugihara; was not a long hitter but was known for the accuracy of his shots; achieved a total of 28 Japan Golf Tour wins) said to me, "You're

luckier than me. Even if it's a long hole, you can still reach the green if you use a 3-wood spoon." That moment, I realized that regardless of what number club I need to use to hit my second shot, it is all the same once I get the ball on the green. It made me feel that I could still be competitive even if I was left behind by 50 yards after the tee shot. In fact, it would probably bother the other player somewhat if I got on the green before him from farther away.

That shifted my mindset, and I felt that I was playing offensive golf, and that in turn led to my win. I think it is a good example of how your performance can change depending on your mindset.

### **Risk Management Is Indispensable as Backup for Your Confidence**

One thing that you should make sure to avoid is confusing "positive thinking" with "recklessness." Professional golfers normally only choose to make shots that have at least an 80% chance of success. Amateur golfers often make the mistake when they are out on the course of trying to make a shot that they have never even practiced before. They end up making a bad shot and get themselves into a lot of trouble.

No matter how much you have practiced, golfers feel pressure when they are out on the course and cannot do something over again. Positive thinking is giving yourself a boost under such circumstances by telling yourself that you can make that practiced shot. Thinking that you can do something successfully when you have never even tried or practiced it before is nothing other than sheer recklessness.

Something else is that pro golfers check things out carefully during their practice rounds. They find the places on a hole that they should never hit a

ball to. For the approach, they check for those places on the green from which they would never succeed in getting the ball close to the hole. During the actual game, the strategy is to avoid such locations at all cost. In other words, it is because risks are eliminated to the maximum extent possible that bold shots can be chosen, and birdies or even better attempted.

### **Even Difficult Tasks Can Be Enjoyable If You Have a Positive Attitude**

When I look back on my career as a pro golfer, I think I have always maintained the positive attitude that things will work out somehow. As a trainee, I thought I would find another job if I could not get my PGA of Japan qualifications and become a pro golfer by the time I was 25 years old. But, with that said, I think my feeling that I would probably succeed was greater than my feeling that I might not qualify. In the end, I passed the test when I was 22. I married right after I turned 24, and won a PGA of Japan supported tournament (what is now known as a challenge tournament) when I was 26. That seeded me the following year, and I achieved my first Japan Golf Tour win when I was 27 (1987 Nikkei Cup Torakichi Nakamura Memorial). Things went pretty smoothly for me even after I became a pro golfer, and I really enjoyed the game. When I was 45, a shoulder injury prevented me from playing golf the way I wanted, and I had it pretty rough for a few years. However, from around the time that I started to play in the PGA of Japan senior tour and marked my first win (2010 Fuji Film Senior Championship), I began enjoying golf again. I still enjoy playing. I think I will probably keep on playing as a pro golfer so long as I continue to enjoy golf.

## **Message from Hikari Fujita,** a Female Professional Golfer Supported by CTC

We are smack in the middle of the season. Are you enjoying playing golf? The LPGA of Japan Tour is approaching the end of the season, and I am making my final push for the 2016 season.

Today, the topic is golf club settings. Since around this summer, I switched my 5-iron for a 9-wood, so my irons start from a number 6. I looked into a club that would allow me to gain some distance even from a rough but still enable the ball to stop, and the 9-wood seemed the most appropriate for me. Not too many amateur players use a number 9 fairway wood, but perhaps it is worth trying some time.

Whether it is the 9-wood or a different golf club, I recommend that you select a fairway wood or utility club that suits you the most as a shortcut to better scores. The key is that you choose a club that is easy to swing and allows you to achieve long distance even when you are feeling tired toward the end of the round. Having one golf club in your bag that you can swing with ease and with your regular rhythm should work out well, even during those moments when you might tense up.

Why not take another look at your club setting and find one that works best for you so that you can aim to boost your score to a new personal best?



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.



**Yu Miyaji**  
Asahi Shimbun  
San Francisco Bureau Chief

Joined The Asahi Shimbun in 2000. Set up the San Francisco Bureau in April 2014. Assumed current position after working at the Kagoshima and Yamaguchi general bureaus and as an editorial staff member of The Asahi Shimbun Globe. Has an ongoing column called "Frontier 2.0," which introduces Silicon Valley realities, in The Asahi Shimbun (digital edition: <http://www.asahi.com/>). A recent publication is Sirikon Barei de Okiteiru Hontou no Koto (True things happening in the Silicon Valley) (Issued in August 2016 by Asahi Shimbun Publications Inc.).

This issue's number is...

# 200,000 yen

The amount given each month to selected participants of a pilot study in the U.S.

What would you think if someone told you that they would give you 200,000 yen a month for a year with no strings attached? Many of you might get suspicious before you even started thinking about what to spend it on. After all, it sounds too good to be true. Actually, it is a real pilot program being planned in Oakland, California—a city located across the bay from San Francisco.

Y Combinator ("YC"), a Silicon Valley seed-accelerator and business incubator, is running this experiment as well as providing the funding. YC is one of the hot top accelerators that invest in as well as provide a variety of other support and advice to startups. Among the 1,000 or so companies that YC has invested in, Dropbox and Airbnb are just two examples of those that grew into huge companies.

Why is YC doing this pilot study? According to Y Combinator's Matt Krisiloff, who is involved in the study, the objective is to see how labor and the quality of life change when people have a baseline of safety.

With the influx of IT companies, rents have soared in San Francisco and Silicon Valley, which stretches to its south. A society with a huge income disparity is arising. While 30% of households in Silicon Valley have an income above 150,000 dollars (about 15 million yen), about 20% earn less than 35,000 dollars (about 3.5 million yen). The middle-income group is shrinking, and about 30% cannot live without public assistance. It also has America's third highest number of the

homeless. Matt Krisiloff added that anyone living in this area lives side-by-side with the risk of losing his or her job or home. That is why consideration has been given on how the affluence brought on by IT can be distributed fairly.

About 100 people of various races, occupations and incomes will be selected randomly to receive between 1,500 and 2,000 dollars (about 150,000 to 200,000 yen) each month. The money can be used however they like, whether it is as living expenses, to pay for vocational training or for going on trips, and it can even be set aside in a savings account for future use. The amount of money paid out will later be reduced and the number of recipients will be expanded to 1,000 people for a study that will take place over the course of five years. The results of the study on how people's behaviors change if they are secured a basic income will be provided to local governments and others for use in their consideration of social welfare.

There are countries where similar initiatives have been implemented or considered under names such as "basic income" and "negative income tax." However, many have met with setbacks when issues arose in terms of the securement of funds or in regards to fairness. Y Combinator is going to give this a try using its own money.

Can the power of IT, which created an affluent population, also be used to do away with the income gap? There is a lot of attention being focused on this pilot study by YC.

## Principal Group Companies

Japan

### **CTC Technology Corporation (CTCT)**

Kurita Kudan Building, 11-5, Fujimi 1-chome, Chiyoda-ku, Tokyo  
<http://www.ctct.co.jp/>

### **CTC System Management Corporation (CTCS)**

Sanban-cho Tokyu Building, 8-1, Sanban-cho, Chiyoda-ku, Tokyo  
<http://www.ctcs.co.jp/>

### **CTCSP Corporation (CTCSP)**

Komazawa Nakamura Building, 16-7, Komazawa 1-chome, Setagaya-ku, Tokyo  
<http://www.ctc-g.co.jp/~ctcsp/>

### **CTC Life Science Corporation (CTCLS)**

Higashigotanda Square, 10-2, Higashigotanda 2-chome, Shinagawa-ku, Tokyo  
<http://www.ctcls.co.jp/>

### **CTC Facilities Corporation (CTCF)**

1-2, Ninomaru, Tsuzuki-ku, Yokohama  
<http://www.ctcf.net/>

### **CTC Business Service Corporation (CTCBS)**

Kasumigaseki Building, 2-5, Kasumigaseki 3-chome, Chiyoda-ku, Tokyo  
<http://www.ctc-g.co.jp/~CTC-BS/>

### **CTC First Contact Corporation (CTCFC)**

Komazawa Nakamura Building, 16-7, Komazawa 1-chome, Setagaya-ku, Tokyo  
<http://www.firstcontact.co.jp/>

### **Asahi Business Solutions Corp.**

Asahi Beer Azumabashi Building, 23-1, Azumabashi 1-chome, Sumida-ku, Tokyo  
<http://www.n-ais.co.jp/>

### **Hinari Corporation**

Kasumigaseki Building, 2-5, Kasumigaseki 3-chome, Chiyoda-ku, Tokyo  
<http://www.ctc-g.co.jp/hinari/>

Overseas

### **ITOCHU Techno-Solutions America, Inc.**

3945 Freedom Circle, Suite 640  
Santa Clara, CA 95054 U.S.A  
<http://www.ctc-america.com/>

### **CTC Global Sdn. Bhd.**

Level 10 Tower A, Plaza 33  
No.1, Jalan Kemajuan, Seksyen 13  
46100 Petaling Jaya  
Selangor Darul Ehsan, Malaysia  
<http://www.ctc-g.com.my/>

### **CTC Global Pte. Ltd.**

#02-01 Sime Darby Business Center  
315 Alexandra Road  
Singapore 159944  
<http://www.ctc-g.com.sg/>

---

# Best Engine

Vol. 2, Published October 2016

Publisher: Corporate Communications Dept., ITOCHU Techno-Solutions Corporation  
Kasumigaseki Building, 2-5, Kasumigaseki 3-chome, Chiyoda-ku, Tokyo 100-6080 JAPAN

\*The company, product and service names in this publication are the trademark or registered trademark of the respective companies.

\*Unauthorized reuse or copying of the articles and photographs contained in this publication is prohibited.

\*The external contributions and remarks contained in this publication do not necessarily reflect the opinions of CTC.

**CTC**

▶ *Challenging Tomorrow's Changes*