



Taiwan Network Information Center

Stakeholder Survey 2020

Organizer : Taiwan Network Information Center

Implementer : InsightXplorer Ltd.

Contents

Chapter I.	Study Overview.....	2
I.	Online Survey	2
II.	In-depth Interviews	3
Chapter II.	Operational Overview	5
Chapter III.	Domain Name Registrar	7
I.	Smooth Communications and Interactions, Provided Complete Support	8
II.	High Service Usage Rate, Passionate Participation in Events....	8
III.	Working on Marketing and Educating to Activate Business and Increase Market Share	9
IV.	Complete Service Adjustment and Planning, Smooth Conversion Connects with International Trends.....	11
V.	Expect More Active Development, Solicit Opinions and Make Corrections	12
Chapter IV.	Domain Name Registrant	14
I.	Summary of Implementation	14
II.	Service Usage Rate	15
III.	Satisfaction of the Primary Services	17
IV.	Evaluation of the Overall Satisfaction and Value Perceptions...	19
V.	Influence from “.tw/.台灣” Policy Adjustment.....	21
VI.	Business Development Needs and Supports.....	22
VII.	Participation in Events and Expectations and Preferences.....	24
VIII.	Information Service	24
IX.	Expectations and Recommendations	26
Chapter V.	IP members.....	29
I.	Summary of Implementation	29
II.	Evaluation of the Overall Satisfaction and Value Perceptions...	32
III.	Evaluation of Service Value Perceptions	36

IV.	Formulation of IP Allocation Policies and Satisfaction	37
V.	Service Challenges and Difficulties in IPv4 Scarcity	38
VI.	IPv6 Provisioning and Preparation.....	40
VII.	Participation in Events	42
VIII.	RPKI Services.....	43
IX.	Strategy for Charges.....	45
X.	Expectations and Recommendations	46

Chapter VI. Subscribers of TWCERT/CC E-Newsletter 48

I.	Summary of Implementation	48
II.	Service Awareness and Usage Rate	49
III.	Service Helpfulness and Reasons	50
IV.	Overall Satisfaction and Trust.....	53
V.	Cybersecurity Threats and Problems in Taiwan.....	56
VI.	Expectations and Preferences for Training Courses.....	57
VII.	Information Service.....	57
VIII.	Expectations and Recommendations	58

Chapter VII. Taiwan CERT/CSIRT Alliance 60

I.	Affirmed Information Sharing, Expecting Fast and In-depth Contents	61
II.	Simple and Convenient Introductions with Progress Report Notification Added	62
III.	Cultivate Awareness for Active Notification and Provide Incentives to Collect Information.....	63
IV.	Great Response from Events and Educational Training, Expecting More Events and Case-sharing.....	64
V.	Good Use of Third-party Roles to Increase Exchanges and Interactions in the Industry.....	65

Chapter VIII. Government Agencies 67

I.	Clear Organizational Positioning, Looking into Future Planning	68
II.	Continue to Increase Popularity at Home and Abroad	69
III.	Increase Corporate Visibility with Practical Needs.....	70
IV.	Develop Strategic Partners, Including Personal Promotion	71

Chapter IX. International Organization Stakeholders..... 73

I.	Current Organization Status and Partnership	74
II.	Recommendation on Key Development Fields	75



III.	Future Positioning and Expectations of the Organization	76
Chapter X.	Recommendations	79

Chapter I. Study Overview



Chapter I. Study Overview

I. Online Survey

- A third-party provider supplied access to the online survey instrument
- SurveyMonkey
- The survey period: From August 3, 2020 to September 7, 2020

Stakeholder	Sample Requirements	Email Sent	Email Opened	Email Open Rate	Email Replies	Valid Email Amount	Click-through Rate
Domain Name Registrant	Registrants who registered the .tw/.台灣 domain name in the past year, excluding those who registered Chinese domain names	59,244	17,104	28.9%	2,747	1,534	2.6%
Chinese Domain Name Registrant	Registrants who registered the .tw/.台灣 domain name in the past year, <i>i.e.</i> , Registrants who were affected by the new policy	1,534	600	39.1%	146	91	5.9%
IP Members	-	316	163	51.6%	79	57	18.0%
TWCERT/CC Newsletter Subscribers	Newsletter subscribers	4,312	2,078	48.2%	731	566	13.1%

II. In-depth Interviews

- The interview period: From August 28, 2020 to September 24, 2020

Stakeholder	Sample Requirements	Number of Interviewees
Domain Name Registrar	-	5
Taiwan CERT/CSIRT Alliance	-	4
Relevant Government Agencies	Points of contact with frequent operational engagement	3
ICANN and APNIC	International organizations responsible for administering internet resources	2

Chapter II. Operational Overview



Chapter II. Operational Overview

The Taiwan Network Information Center (TWNIC) is in charge of the domestic coordination of domain name registration and IP address distribution and to promote network-related businesses and share network information domestically and abroad. This year (2020) is the second year that the Taiwan Computer Emergency Response Team and the Coordination Center (TWCERT/CC) have been operated by TWNIC, and this year, TWNIC can better establish brand positioning and provide multi-party services with the skills inventoried in the first year.

The results of the survey showed that stakeholders praised the performances of TWNIC and TWCERT/CC; the stakeholders recognized the trustworthiness and service value of TWNIC and TWCERT/CC the most and their satisfaction on the service quality and technical support provided was also above standards. They felt there were complete communication and support for service interactions, and they approved of the handling of various event forums and publications, regular sharing of practical information and played a good third-party role to promote industrial interactions.

The solid technical foundation and rich support experience of TWNIC along with the services provided by TWCERT/CC, such as information security report and contingencies and information security consultation and sharing etc., improved the foundation and security layout of network services and provided stakeholders of different industries with more complete services and partnerships; it also made the ecological development of the internet society more perfect. International stakeholders mentioned that this is a very practical combination of organizations that follows network trends.

But not only for the sake of the Pacific or also for the sake of the internet much more broadly because the lack of security in one place can and can immediately create security problems elsewhere. So, I think that TWNIC can with TWCERT, as well, for precisely that reason, can really argue for a national and international role in assisting internet development.

TWNIC and TWCERT/CC can both operate independently as well as complement and benefit one another; however, the development strategies and stakeholders and slightly differ between the two. This research summarized the opportunities of the two organizations based on the results of the survey and recommended feedbacks:

1. Diverse interactions: in addition to continuously providing services, try to replace physical events and publications with online events and publications to increase more diverse interaction opportunities under the network environment due to the impact of the epidemic.

2. Technical corporations: continuous technical corporations and technical output can also increase visibility of the brands, including educational training, technology sharing and case sharing, etc.

After TWCERT/CC joined TWNIC for the second year, stakeholders think that this year's positioning and development are clearer after going through task inventory in the first year and they look forward to the future accomplishments as well.

- | *After TWCERT/CC moved to TWNIC, its positioning is clearer; at least it is clearer than in the past year.*
- | *I think that the goals and tasks of CERT are well defined and are in the right directions.*

Even though some of the opportunities of TWCERT/CC are similar to concrete actions, there are high expectations for its technology output, information sharing and education. Stakeholders have even more expectations for its ability to formulate future development strategy plans, increasing its popularity and implementing the integration of private SMEs to provide services and support. Its opportunities are as follows:

1. Development strategy: in addition to following existing business framework to continually increase popularity, more service contents used to integrate private enterprises should also be considered. For example, provide education materials for employee information security literacy that many SMEs lack, provide defense subscription mechanisms for SMEs to join and achieve defensive effects and use concrete actions to accumulate and improve the quality of information security services.

2. Practice sharing: provide domestic information security with actual cases as reference for corporate defense and use strategic corporation to increase the visibility of enterprises, including cooperating with inspection units to perform information security advocacy and service promotion by cutting in with trending online issues such as 5G, IoT (for example, wireless transmission commonly used in office environments such as cloud printers or network printers) or digital transformation, provide enterprises with related recommendations and reference guidelines for network development, increase interaction opportunities with enterprises and establish smooth communication and notification channels.

Chapter III. Domain Name Registrar

Chapter III. Domain Name Registrar

This year, the survey method for domain name Registrars was changed to

one-on-one in-depth interview. There was a total of 5 respondents who were interviewed through phone or video conference, which is the same number of respondents for last year's online survey.

- How satisfied are you with the services and how do you feel about the value of your company/organization's business cooperation and interaction with TWNIC in the past?

I. Smooth Communications and Interactions, Provided Complete Support

Stakeholders all agreed that from their communication and interaction with the TWNIC, not only was support provided, full support was also given for problems and needs that they had. Interactive discussion processes were also retained before new policies were released and they listened to the opinions of Registrars fully.

Our current interactions were quite good; they fully help with any problems that we have whether or not it was technical. We can continue working with them right now.

The service cooperation between us and TWNIC basically has always been in the same field since we started; we've signed domain name distribution officially for many years already. In terms of cooperation, the communications at the various windows have been quite smooth so far and we currently work quite well together.

II. High Service Usage Rate, Passionate Participation in Events

In terms of service usage, stakeholders had high usage rate of educational training and publications provided by TWNIC and they praised the service contents. Not only did they have high attendance in events, they also thought highly of the trend descriptions and communication experiences provided in the events. They also recommended that research reports on Taiwan's domain name user should be continuously provided in the future to help Registrars promote their businesses.

I know that they held many forums and educational training; we go to listen whenever we get the chance. They've put in a lot of

effort on this and I think they should continue to do so.

The publications and community services based on their Center are all pretty great; they continuously provide new knowledge and information because they have information from different companies. They can perform analysis on domain users.

It is a forum in itself and basically has scholars and experts explaining development trends. We've been in the industry for quite some time and it allows some of our old friends to have chances to catch up to exchange market trends, problems and other thoughts.

- Based on the observation of your company/organization, what is the current market situation of Taiwan's ".tw/.台灣" country code top-level domain names? What are some of the difficulties and challenges faced when pushing businesses? What other kinds of help do you wish TWNIC can provide to your company/organization or industries in Taiwan?

III. Working on Marketing and Educating to Activate Business and Increase Market Share

All stakeholders mentioned changes in market demand for domain names; due to the flourishing of social media, SMEs now have lower demands for websites and this also reduced their need to apply for domain names. Therefore, TWNIC needs to do more to make market demands more active, including using preferential marketing to increase registration rate such as discount activity promotions for newly established companies, etc. However, stakeholders also unanimously mentioned that low-price promotions should not be the only consideration; the business mode of Registrars should also be considered. For example, Registrars can be introduced to companies with newly registered domain names to provide follow-up maintenance or management services or use cross-industry integration to increase business opportunities, etc. Some Registrars mentioned service to obtain information security certifications; in the past, the application of domain name and the certification had to be applied from two units, but they both needed similar documents to be submitted. In the future if TWNIC can provide one-stop

service, it can reduce the operating procedures for Registrants and there are opportunities to increase the business income of the Center.

In the past two years, there were many methods launched to allow some companies to apply for domain names almost for free and this eliminates some of the Registrars. For example, there were low-price promotions for domain name applications before, but that didn't provide much help to the domain name market. Assume that my client wants to apply for a domain name and it can be bound with the access certification, this way I wouldn't have to apply with two different units and this will become an extended service where my product business can be bound with domain names.

In addition, the stakeholders also mentioned that besides using preferences to increase registration rates. They also expect TWNIC could work on educating the market on the need for domain names and trying to learn more about the users' needs and considerations, solving the problem of the continuously decreasing demand for domain names.

First, push the concept of Taiwan domain names to corporate users, decision-makers and business owners in Taiwan; perform more promotions and education. Marketing should be more open and don't tell us what you think we can do. Five years ago, they already knew that a bottleneck has been reached for Taiwan users to register .tw; the changes in the market caused business to drop significantly. We told them that tw needs to go international and they wanted to do it but didn't follow through.

- Impact of service adjustment: TWNIC made some policy and system changes to the current “.tw/.台灣” at the beginning of 2020. Do you know the content of the new system? How did the changes affect your company/organization? Are you satisfied with the processes, message notifications, customer service and help provided for the modification of the policy system? Is there anything that could be

improved or strengthened? How will adapting the system interface technology from API to EPP affect your company/organization?

IV. Complete Service Adjustment and Planning, Smooth Conversion Connects with International Trends

TWNIC made some modifications to the policies and systems (hereinafter referred to as new system) to the “.tw/.台灣” domain name at the beginning of 2020; the survey asked stakeholders about how they felt about the pushing of the new system and how they were affected by the changes in interfacing technology. Generally speaking, the stakeholders thought that the adapting process of the new system was quite smooth, the releasing of information was complete and unobstructed discussions were provided to allow Registrars to have sufficient time to prepare for the integration, and successfully integrated the new system technologies.

- | *System conversion did not start this year; every detail was previously discussed and thoughtful discussions were previously held until we finally decided on the direction and policy. We then began and asked the technical department for support and the entire process was quite OK.*
- | *Our company has a larger number of customers so we needed testing first; they provided us with support and the conversion process went quite smoothly.*

Their responses on the impact of the system interface technology changing from API to EPP for the new system were also quite positive. Stakeholders think that the new system is the global standard and the modification this time can help Taiwan connect to international standards; it also helps eliminate the loopholes generated from the coexistence of the two interfaces API and EPP in the past.

- | *Out of the past 20 years, Taiwan used API for 15 years and this was not the international standard. When the new CEO Kenny came to TWNIC, he said that we had to keep up with international standards and that made us slightly relieved. Otherwise in the last 15 years there were two interfaces for our technology, and there were many technical bugs because of the coexistence of two interfaces.*

- Do you have any suggestions for TWNIC? Which directions do you think they should focus on or what businesses do you think they should develop?

V. Expect More Active Development, Solicit Opinions and Make Corrections

Suggestions that domain name Registrars have for TWNIC include two directions; one is that their marketing strategies must be clear and they must actively target the overseas markets and the second is that they should solicit different opinions and make corrections and establish smooth report channels.

- | *First of all, their marketing strategies must be clear. They cannot allow local Registrars in Taiwan be affected in this environment. Their overseas strategies must be clear and they need to resolve the problem of double standards; they will not do well in overseas markets if they don't solve this problem.*
- | *I think that they're not active enough. They didn't mention which markets they will be entering and what promotions they will have. They are lacking these things. Basically, we have to submit proposals to them and then they think this might work. This needs to be changed.*

Finally, they also expressed their support for surveying stakeholders. They think this is a great channel to share experience and communicate with customers or partners and they wish that strategies can be corrected properly based on the feedbacks, including providing smooth communication channels and also providing complaint and feedback channels.

- | *I think suggestions to NIC is quite precious, they put in a lot of effort working on this. We give them feedback on follow-up processes and we hope that they don't just use it to finish reports; I wish that NIC can also actually give us feedback on how they plan to make corrections.*
- | *I didn't see anywhere on their official website where we can submit our complaints on domain names. They should establish a channel for complaints and tell us how it is processed and provide some methods.*

Chapter IV. Domain Name Registrant



Chapter IV. Domain Name Registrant

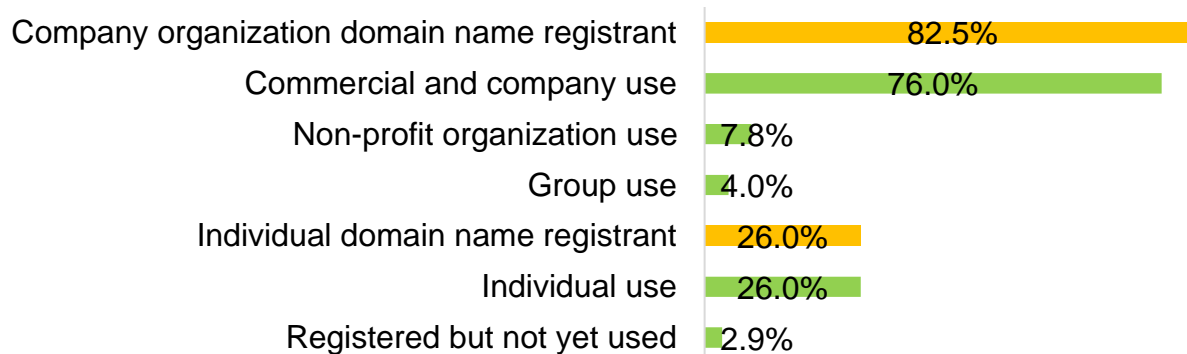
I. Summary of Implementation

The number of registrants surveys who used domain names with TWNIC domain names in the past year recalled was 1,534 surveys. A total of 91 valid samples were collected from the Registrants who registered or used Chinese domain names with Chinese .tw/.台灣 in the past year. Consolidated analysis of domain name Registrants (a + b) totaled 1,625 valid samples where domain name registrants (1) consists of 94.4% and Chinese domain name Registrants (b) consists of 5.6%.

Since the sampling conditions for domain name Registrants in the 2019 stakeholder survey were Registrants who used the TWNIC domain name service in the past year (such as consulting customer service, E-mail, phone or customer service system; Registrants who changed to TWNIC from other Registrars to management domain name or Registrants who changed from TWNIC to other Registrars; Registrants who paid to renew the contract; users who have previously logged in to <https://rs.twNIC.net.tw> domain name registration system) and that the sampling conditions were different, historic tracking and comparison were not performed for the domain name Registrants.

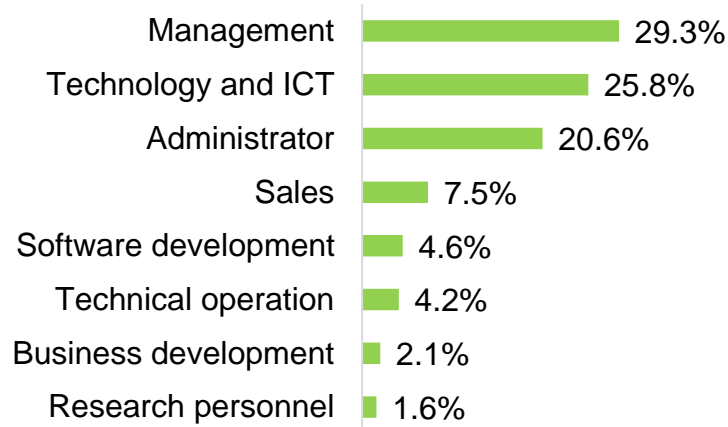
Commercial, company and individual users comprised the majority of domain name registrations. Among the respondents in this survey, if the surveys were filled out by managers or technical personnel, they can effectively reflect the opinions on the uses of services.

Uses of domain name registration n=1625



Source: Online Survey (2020)

Departments n=1625

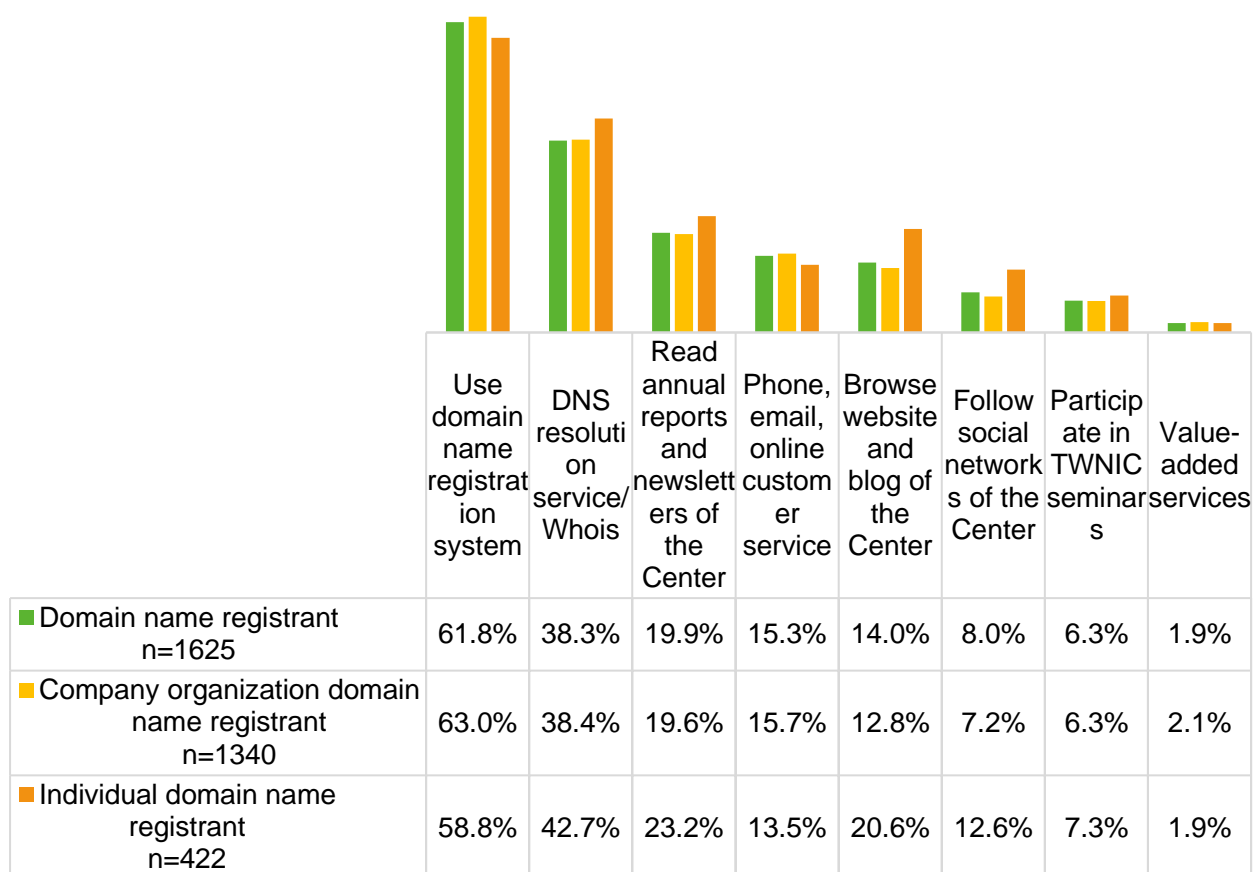


Source: Online Survey (2020)

In this survey, there was a total of 65.4% of “main applicant or decision-maker,” 26.8% of “people who participated in the application or decision-making” and 7.8% who were none of the two. They were able to cover the interactive window and perform surveys for the service usage condition and evaluation that we are trying to understand.

II. Service Usage Rate

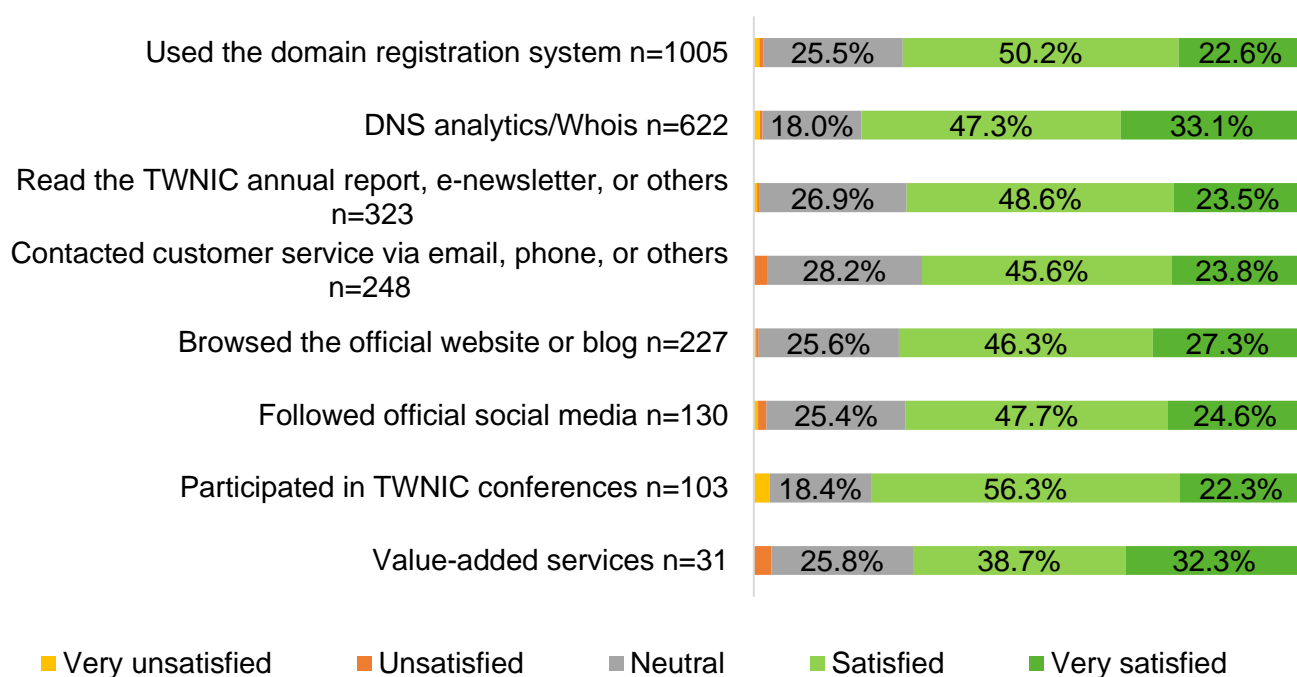
The most frequently used service is the main business “using the domain name registration system” (61.8%); there were no differences between company organization and individual Registrants. The second frequently used service is the “DNS resolution service/Whois” (38.3%) where individual Registrants used it more often; similar to “browsing website and blog of the Center,” they were both used more by individual domain name Registrants. On the other hand, “phone, email and online customer service” were used more by company organization domain name Registrants. These showed that besides services for registration businesses, individual domain name Registrants have more need for information whereas company organization domain name Registrants used communication services more often.



Source: Online Survey (2020)

III. Satisfaction of the Primary Services

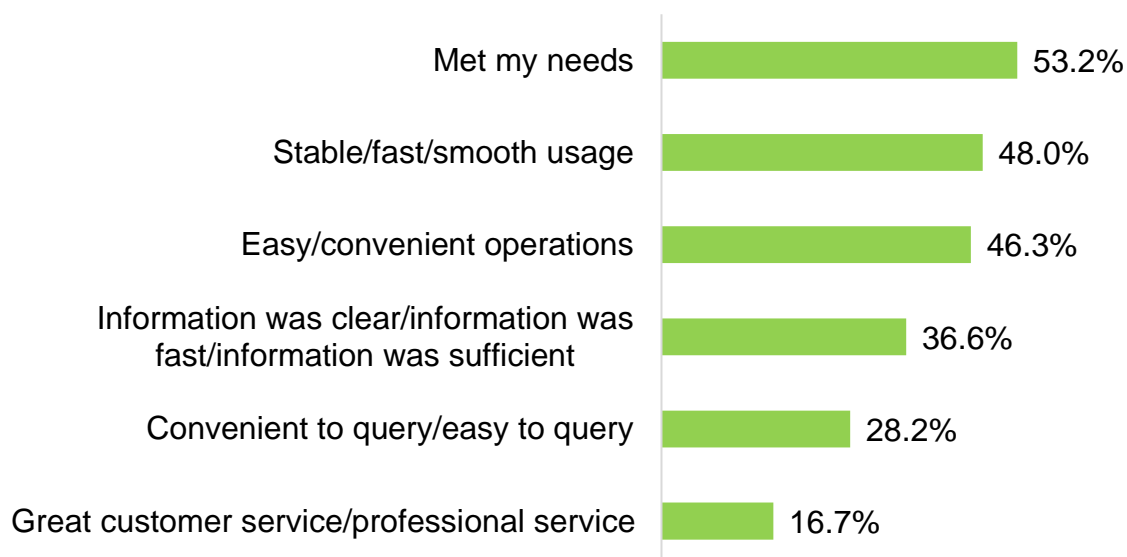
The satisfaction of the “use domain name registration system” with the highest usage rate was 72.8% and this means they either chose satisfied or very satisfied, falling on average performance and that is the mean value of the satisfaction level. The calculation method of the mean value is to sum up the satisfied and very satisfied of the various services and then calculate the mean value from them. The one with the highest satisfaction level was the “DNS resolution service/Whois” at 80.4% and the next highest was the service with the second highest usage “participate in TWNIC seminars;” this had the second highest satisfaction at 78.6%. This shows that even though not many people participated, they were very satisfied with the interactions during the seminars.



Source: Online Survey (2020)

As for the reasons why they were satisfied with the services, “met my needs” was over 50%, “stable/fast/smooth usage” and “easy/convenient operations” were also close to 50%.

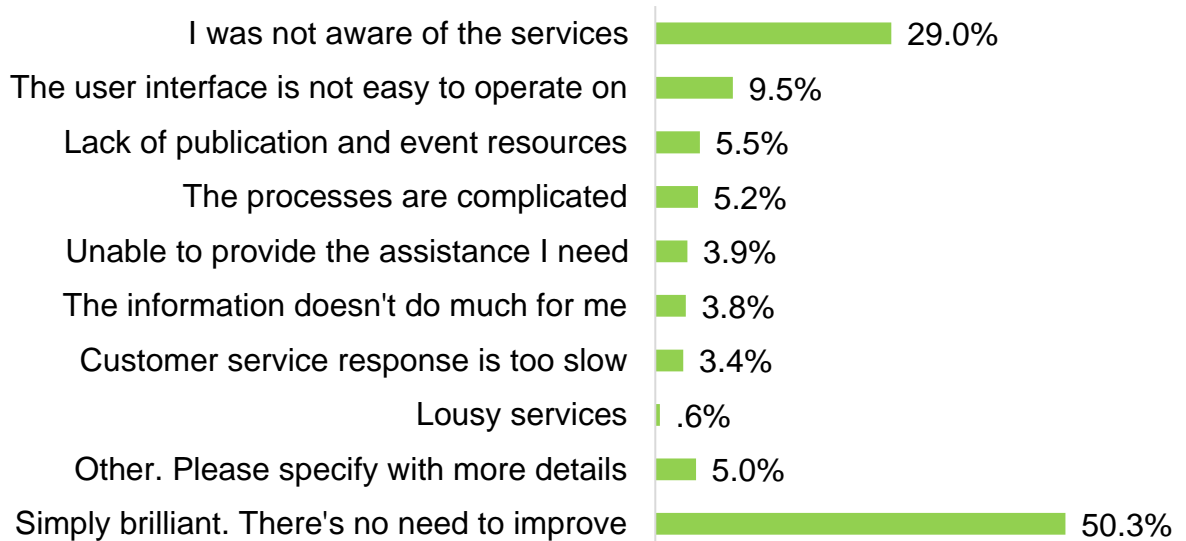
Reasons why the service you used is [great] n=1137



Source: Online Survey (2020)

All domain name Registrants were asked which service experiences could be improved and as many as 50% thought that everything was great right now. Another 30% indicated that they “was not aware of the services” and this means that service contents should be promoted to make people more aware of them. There was another 10% who indicated that the “The user interface is not easy to operate on” and that the user interface could be adjusted to make it more intuitive and improve user experiences.

Service improvement directions n=1625



Source: Online Survey (2020)

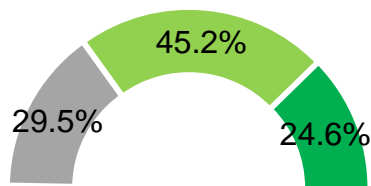
IV. Evaluation of the Overall Satisfaction and Value Perceptions

When it comes to the overall satisfaction evaluation of domain name Registrants to the Center, over half of them gave positive evaluations whether or not it was for “service quality” or “technical support,” including 69.8% who are satisfied with the “service quality” provided by the Center and 64.3% were satisfied with the “technical support.”

Judging from the satisfaction evaluation of “company organization domain name Registrants” and “individual domain name Registrants,” “company organization domain name Registrants” gave higher satisfaction scores.

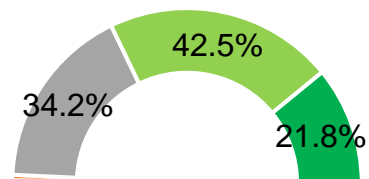
According to the satisfaction level of domain name Registrants (a + b) categorized by the registration system, “domain name Registrants (a)” gave higher satisfaction scores; up to 70.2% of the “domain name Registrants (a)” gave positive evaluations for “service quality.” As for “technical support,” 64.7% of the “domain name Registrants (a)” gave positive scores.

Service quality



■ Very unsatisfied ■ Unsatisfied
■ Neutral ■ Satisfied
■ Very satisfied

Technical support



■ Very unsatisfied ■ Unsatisfied
■ Neutral ■ Satisfied
■ Very satisfied

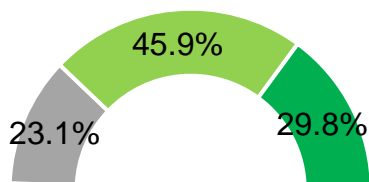
n=1625

Source: Online Survey (2020)

Besides the overall satisfaction level, trust and value experience evaluation indices were also added; 75.8% thought that “I trust TWNIC” and 72.8% agreed that “services provided by TWNIC are valuable to my business.”

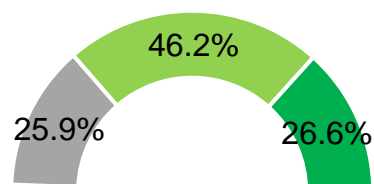
“Company organization domain name Registrants” had better trust and value experiences and they agreed with these more than “individual domain name Registrants.” According to the satisfaction level of domain name Registrants (a + b) categorized by the registration system, “domain name Registrants (a)” also gave higher satisfaction scores similar to the scores for satisfaction.

Trust to TWNIC



■ Totally disagree ■ Disagree
■ Neutral ■ Agree
■ Totally agree

Value of TWNIC service



■ Totally disagree ■ Disagree
■ Neutral ■ Agree
■ Totally agree

n=1625

Source: Online Survey (2020)

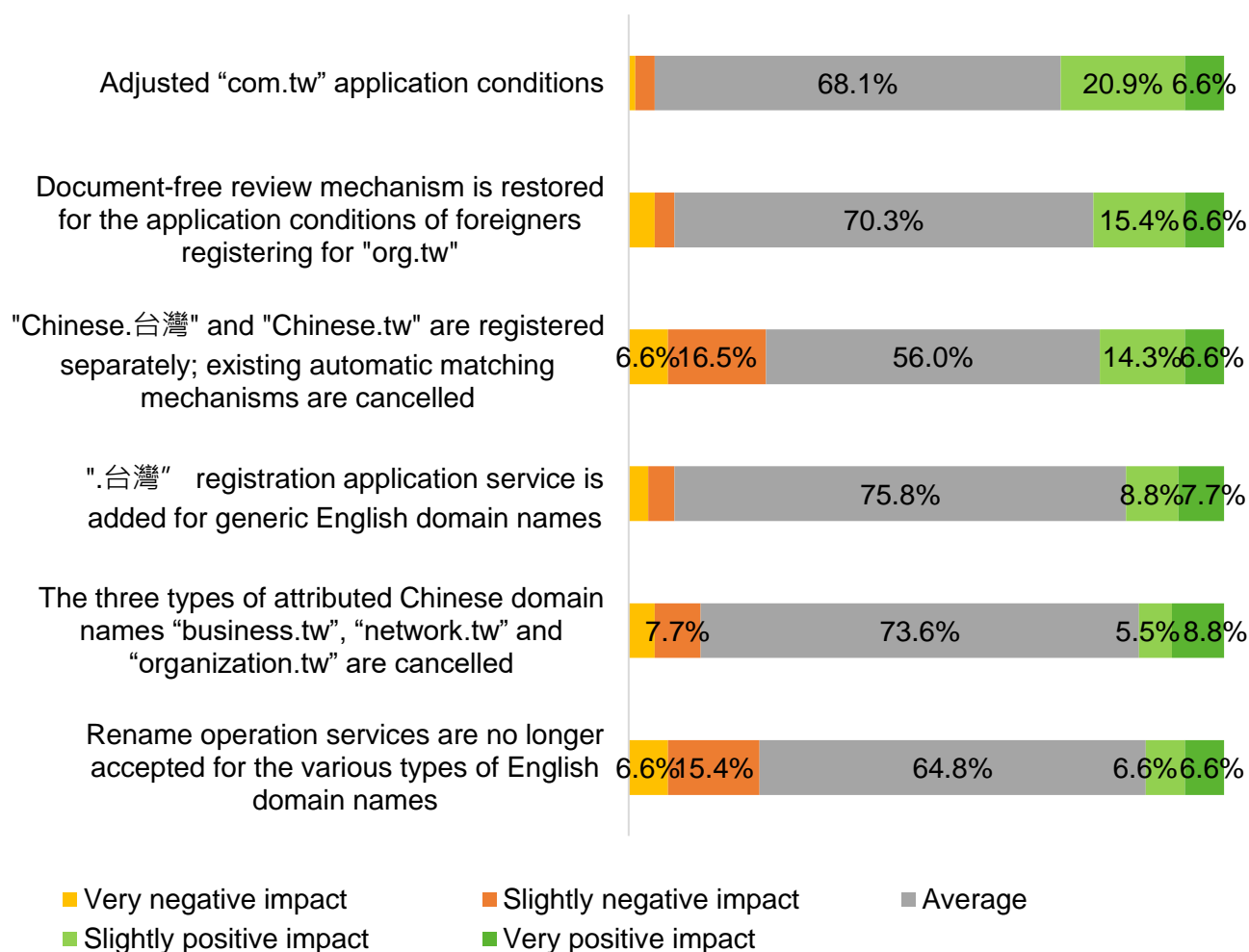
V. Influence from “.tw/.台灣” Policy Adjustment

In 2020, the adjustments made by TWNIC to existing policies for “.tw/.台灣” domain names are listed as follows:

- a. Adjusted “com.tw” application conditions
- b. Document-free review mechanism is restored for the application conditions of foreigners registering for “org.tw”
- c. “Chinese.台灣” and “Chinese.tw” are registered separately; existing automatic matching mechanisms are cancelled
- d. “.台灣” registration application service is added for generic English domain names
- e. The three types of attributed Chinese domain names “business.tw,” “network.tw” and “organization.tw” are cancelled
- f. Rename operation services are no longer accepted for the various types of English domain names

Among the Chinese domain name Registrants, 26.4% know that new policies are applied for the domain name they registered; this shows that Registrants of Chinese domain names have low awareness on the policy adjustments.

Generally speaking, Registrants felt neutral about the impact of policy adjustments on .tw/.台灣 domain name Registrants. Judging from the various items, almost 30% were positive impacts for the adjustment of application conditions for “com.tw.” This policy incorporated more application conditions for legally established and registered users with commercial behaviors to adopt the com.tw type, allowing more units that want to register to be able to apply for com.tw domain names. The second highest positive impact was the application conditions for foreigners to register for “org.tw,” where document-free review mechanisms were restored; this will be more convenient for Registrants. There was over 20% negative impact for “Chinese.台灣” and “Chinese.tw” to be registered separately and cancelling the existing automatic matching mechanisms.



n=91

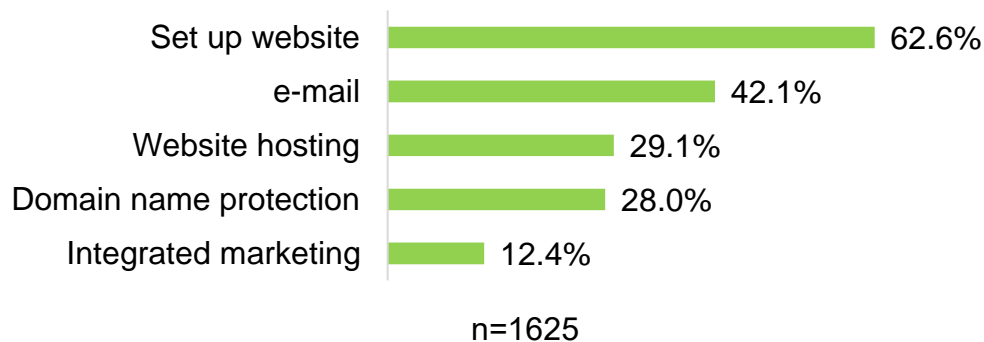
Source: Online Survey (2020)

VI. Business Development Needs and Supports

Judging from the service contents that use ".tw/.台灣 domain names," the service "set up website" has the highest usage rate with a total of 62.6% and next is "e-mail" (42.1%). All other services were less than 40%.

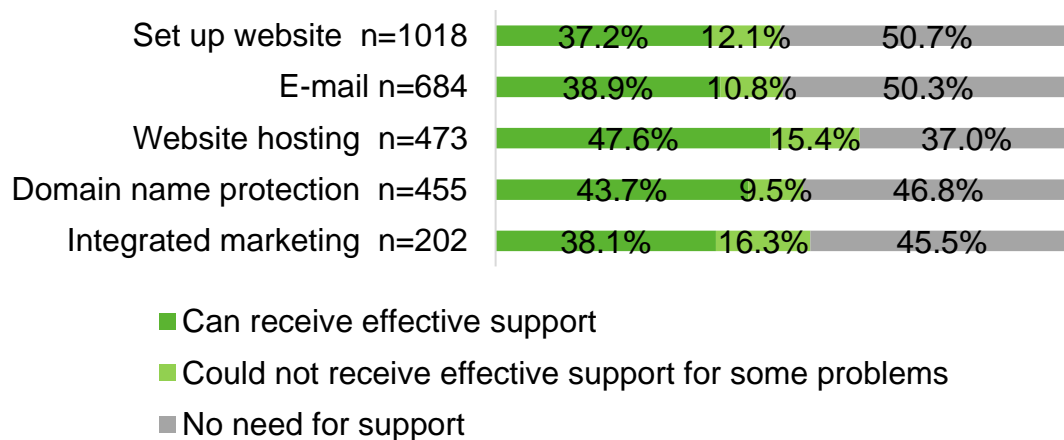
The service contents used by "company organization domain name Registrants" and "individual domain name Registrants" were slightly different. Company organization Registrants had higher usage for the "domain name" service than individual Registrants, and individual domain name Registrants had higher usage for the "set up website" service than company organization domain name Registrants.

According to the domain name Registrants (a + b) categorized by the registration system, “domain name Registrants (a)” had higher usage for the “e-mail” service than “Chinese domain name Registrants (b)”, and “Chinese domain name Registrants (b)” had higher usage for both the “domain name protection” and “integrated marketing” services than “domain name Registrants (a).”



Source: Online Survey (2020)

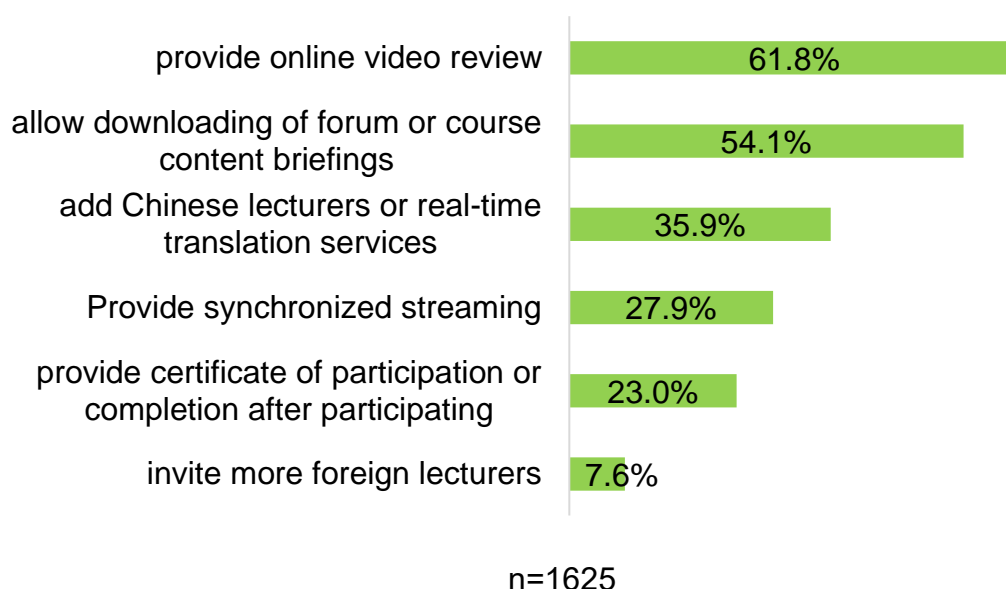
Next, Registrants who used the “.tw/.台灣 domain name” related services were asked about the support, in which the rate they needed support for the two services with the highest usage “set up website” and “e-mail” were lower and the service they needed support for the most was “website hosting.” The rate for “able to receive effective support” (47.6%) was also higher than “were not able to receive effective support for some problems;” this shows that even though support is needed, but they were able to receive complete handling assistance.



Source: Online Survey (2020)

VII. Participation in Events and Expectations and Preferences

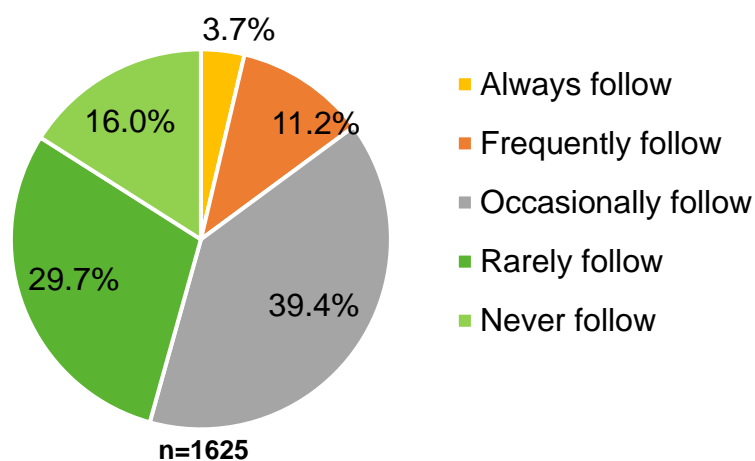
For future expectations of events, “provide online video review” (61.8%) was the highest, and next was “allow downloading of forum or course content briefings” (54.1%); both had more than 50% expectations. Compared to providing more functions, such as real-time translation and live streaming, or added-value, such as providing certificate of completion, expecting that contents can be saved is more important.



Source: Online Survey (2020)

VIII. Information Service

When it comes to how often Registrants pay attention to the network issues released by the Center, 39.4% indicated that they “follow occasionally” and 29.7% “rarely follow,” and the most common reasons why they followed was because they wanted to “keep up with internet news” (62.9%). When asked about issues that they expect in the future, 53.4% thought that there “more varied perspectives” and 47.8% thought that there should be “a wider range of topics.” This showed that Registrants indeed have higher expectations for information contents.



Reasons for attention n=1365

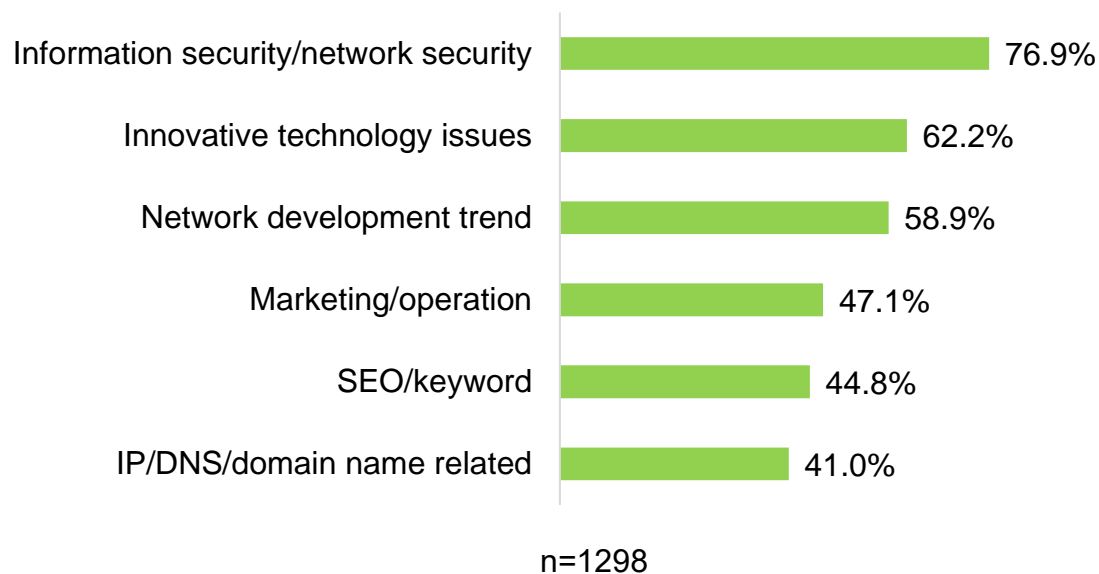
	n	%
To keep up with Internet news	858	62.9%
Work requirements	806	59.0%
Personal interest	422	30.9%

Issues expected n=1625

	n	%
More varied perspectives	868	53.4%
A wider range of topics	776	47.8%
More active publicity or advocacy	754	46.4%
More topics I want to learn about	528	32.5%

Source: Online Survey (2020)

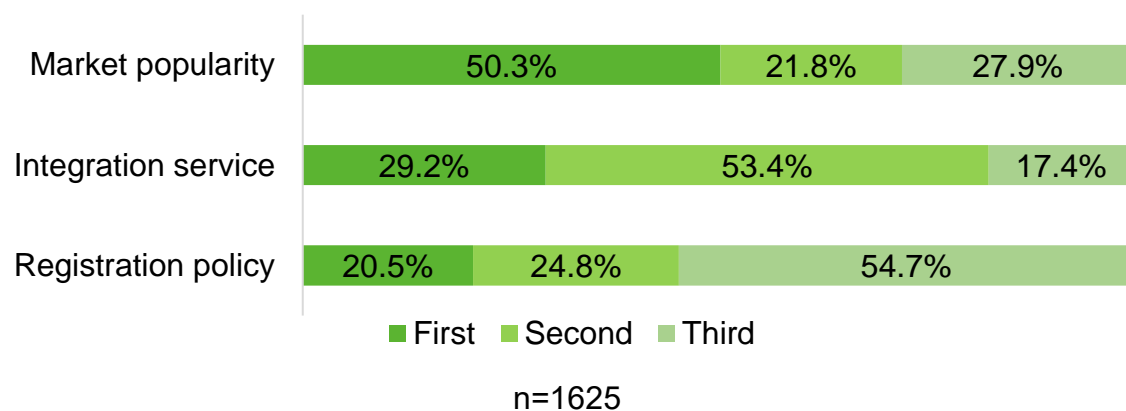
Topics that respondents wanted to know about the most was “network security/information security,” at 76.9%, and the next highest was “innovation and technology issues (such as 5G, IoT and AI)” at 62.2%. Topic such as “network development trend” was also close to 60%.



Source: Online Survey (2020)

IX. Expectations and Recommendations

Over half of the Registrants think that the first item that needs to be improved on for Taiwan’s .tw/.台灣 country code top-level domain name is “market awareness” (50.3%) and the next is “integration services” (29.2%).



Source: Online Survey (2020)

(I) Market Awareness

Among the respondents who chose to improve market awareness first, over 40% chose “increase exposure/not popular enough/marketing.” Currently, the .tw/.台灣 market is not popular enough and only some professionals know about it; they think that the popularity should first be increased in order for it to be possible to have more users. Therefore the focus should be on promoting the advantages of .tw/.台灣 whether it is marketing through commercials, educational training or seminars. In addition to marketing domain names, the unit should also perform brand marketing to establish popularity and accumulate trust for the brand.

(II) Integration Services

Among the respondents who chose that integration services need to be adjusted first, 40% thought that the most important thing is to have “more comprehensive services/integration services;” in addition to domain name registration needs, Registrants also wish there can be more services including various hosting services, domain name protection and website establishment related resources that should be integrated into the various services of the Center or have multiple supporting plans for stakeholders to choose from.

(III) Registration Policies

The most common reason why respondents chose that integration services need to be adjusted first was because of “registration process optimization;” they wish that registration processes can be faster and more convenient and that the registration procedures can be easier and smoother.

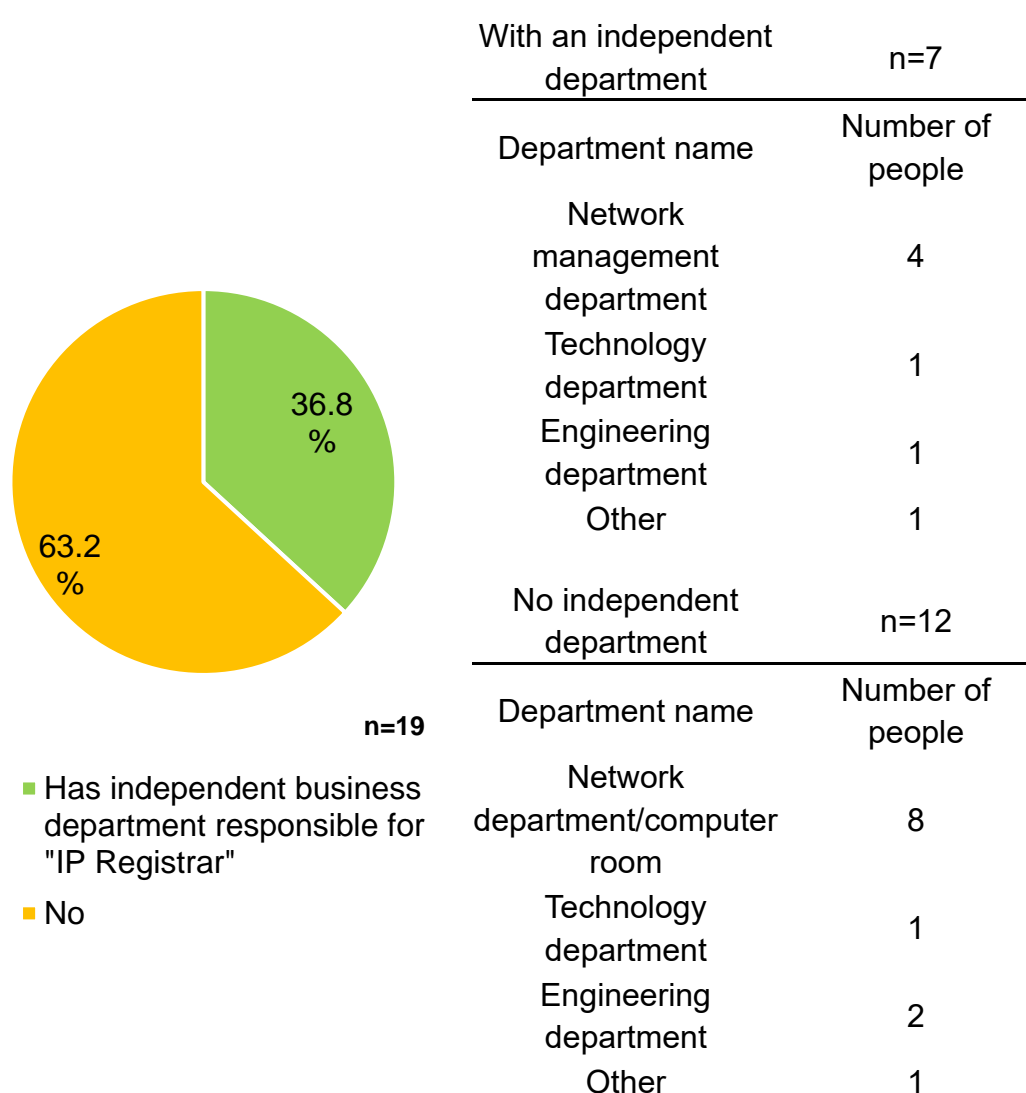
Chapter V. IP Members

Chapter V. IP members

I. Summary of Implementation

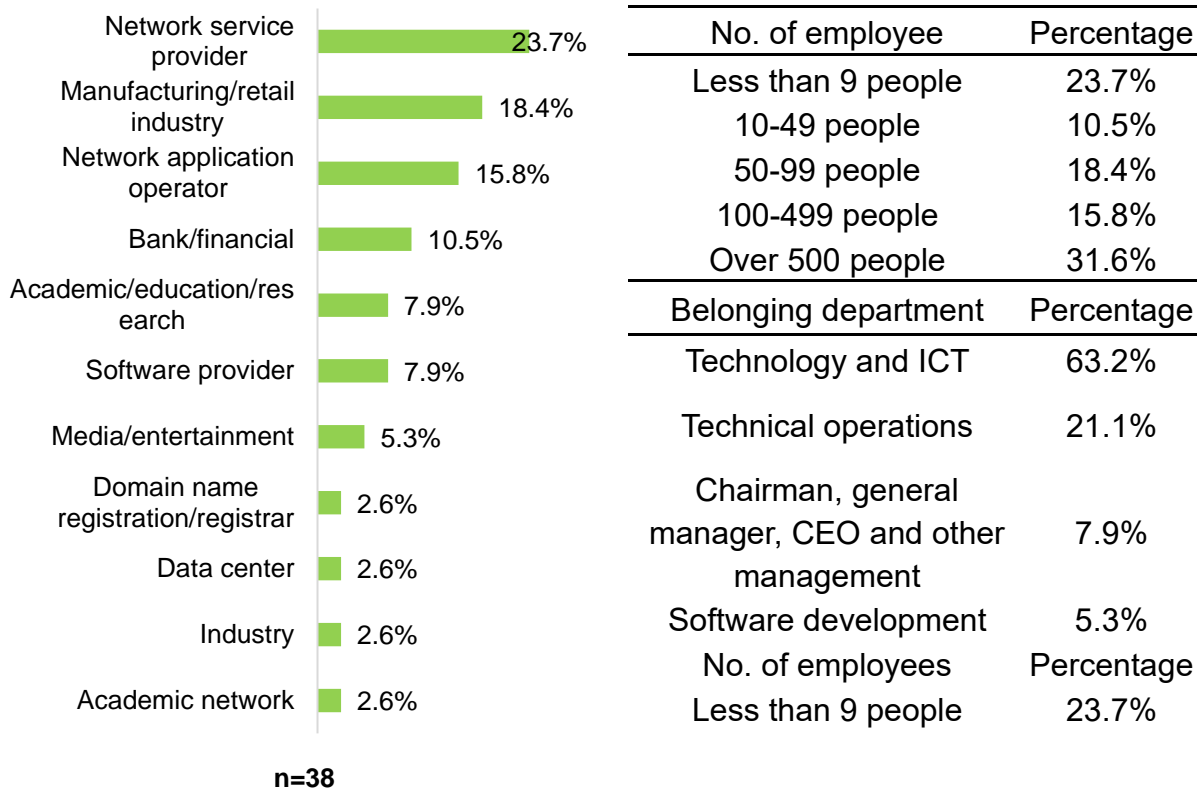
The first question of the survey asked members what they were going to use the applied IP for and categorized them into “IP Registrants” for “self-use after applying for IP” and “IP Registrars” for “distribute to other companies/units for use after applying for IP” and the ratio of the two was 7:3, where the majority was “IP Registrants” in this survey.

IP Registrars 33.3%



Source: Online Survey (2020)

IP Registrants 66.7%



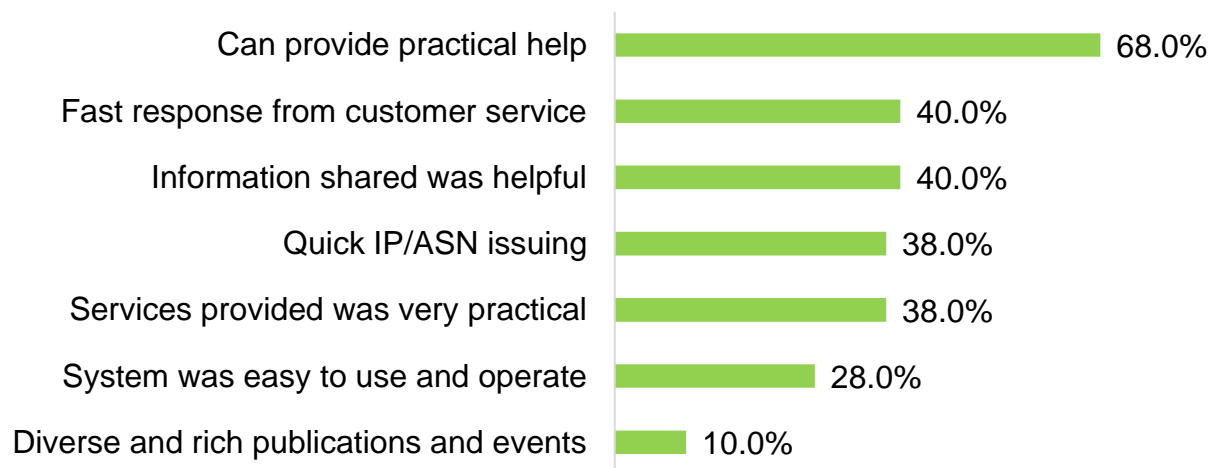
Source: Online Survey (2020)

In the further analysis of the satisfaction evaluation of using related services, the uses of the various services were mostly positive evaluations; among those who chose satisfied and very satisfied, the satisfaction levels for “IP address/ASN issuing and Second Opinion reviewing” were as high as 100%. The satisfaction level of “participate in TWNIC educational training,” “global IP address and AS number statistics” and “contact customer service through phone and email” were also all over 90%.

	Usage rate			Satisfaction level		
	IP member n=57	IP Registrants n=38	IP Registrars n=19	n=	Good	Great
Contact customer service through phone and email	43.9%	44.7%	42.1%	25	44.0%	48.0%
Use RPKI management system/RPKI Validator website	43.9%	39.5%	52.6%	25	56.0%	32.0%
Participate in TWNIC seminar	40.4%	34.2%	52.6%	23	52.2%	30.4%
IP member registration/IP member registration website	38.6%	50.0%	15.8%	22	45.5%	36.4%
Use RMS resource management system	38.6%	36.8%	42.1%	22	63.6%	18.2%
Participate in TWNIC educational training	33.3%	23.7%	52.6%	19	63.2%	31.6%
Browse website and blog of the Center	29.8%	26.3%	36.8%	17	41.2%	47.1%
Read annual reports and newsletters of the Center, ISP yearbook website and other contents	28.1%	26.3%	31.6%	16	43.8%	37.5%
Global IP address and AS number statistics	26.3%	26.3%	26.3%	15	53.3%	40.0%
IP address / ASN issuing and Second Opinion reviewing	21.1%	26.3%	10.5%	12	75.0%	25.0%
Taiwan IPv6 global ranking website	15.8%	15.8%	15.8%	9	44.4%	44.4%
Follow social networks of the Center	12.3%	10.5%	15.8%	7	28.6%	28.6%

Source: Online Survey (2020)

Among the reasons why the satisfaction level of services was good, “able to provide practical help” was as high as 70%; “fast response from customer service” and “information shared was helpful” were also both at 40%.



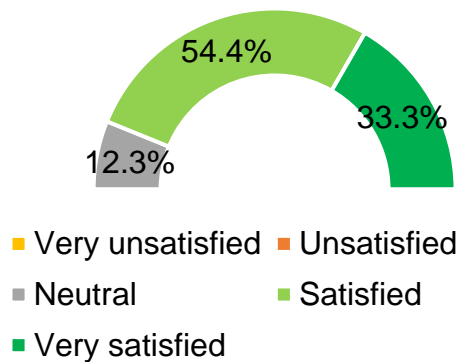
n=50

Source: Online Survey (2020)

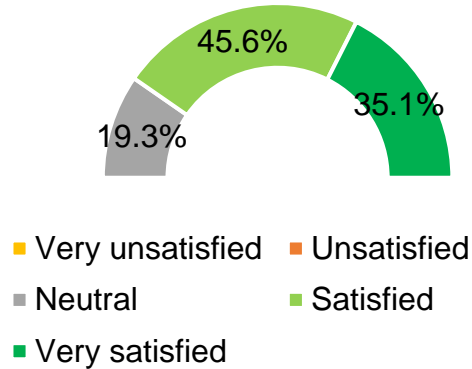
II. Evaluation of the Overall Satisfaction and Value Perceptions

Judging from the overall satisfaction evaluation of IP members for the Center, there was positive evaluation whether or not it was for “service quality” or “technical support” and they were all over 80%; the satisfaction level for the service quality was as high as 87.7% and the satisfaction level for “IP address allocation” was even as high as 91.2%. Further analysis of the overall satisfaction of “IP Registrants” and “IP Registrars” showed that “IP Registrars” gave higher satisfaction for the “service quality” index and “IP Registrants” gave higher satisfaction for “technical support” and “IP address allocation.”

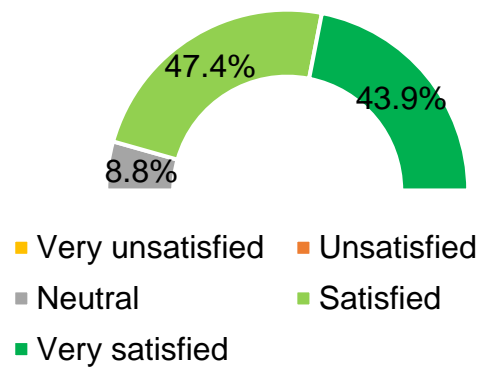
Service quality



Technical support



IP address allocation

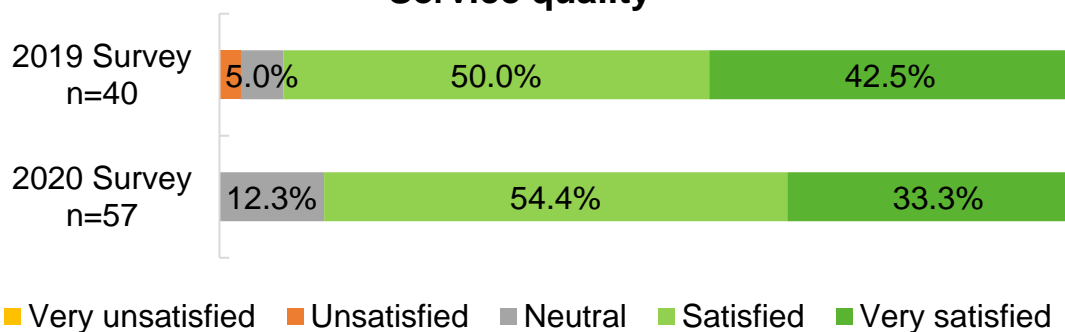


n=57

Source: Online Survey (2020)

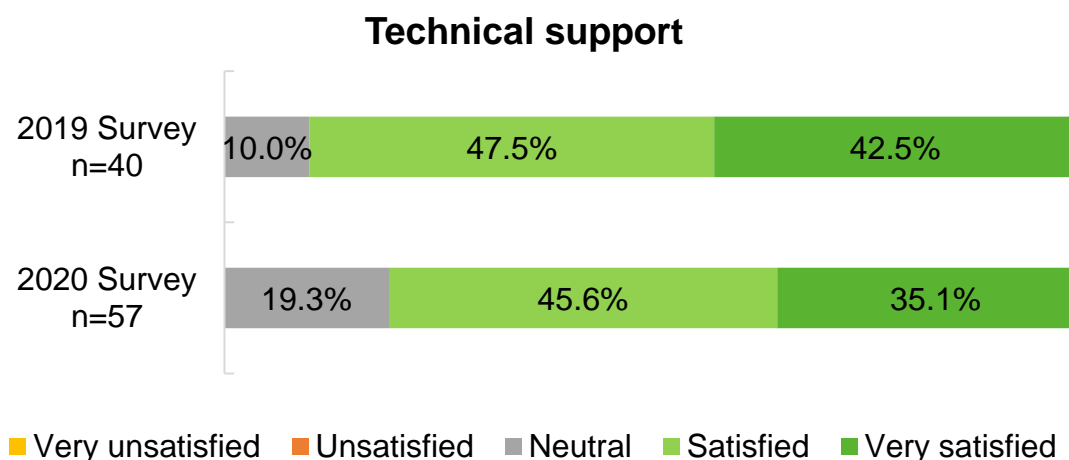
The satisfaction level for service quality this year is 87.7%, which dropped 4.8% compared to the 92.5% last year.

Service quality



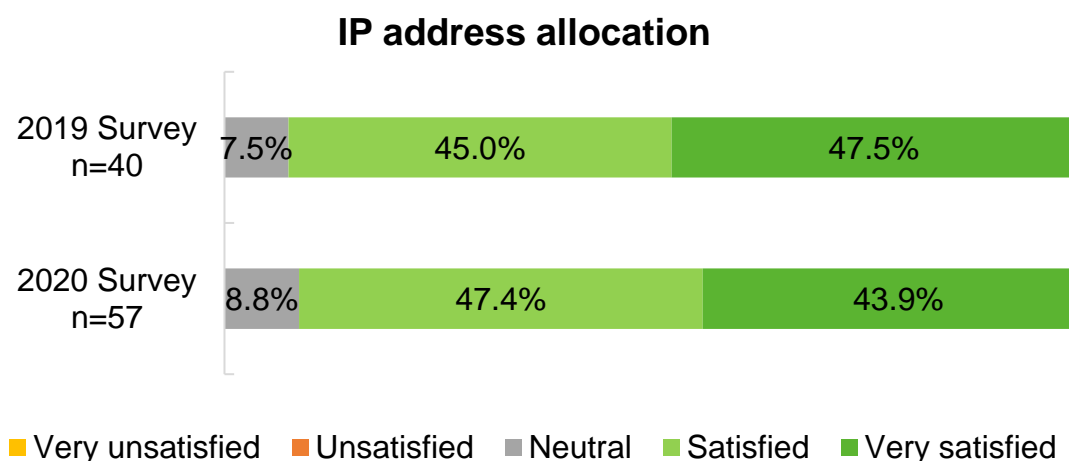
Source: Online Survey (2019/2020)

The satisfaction level for technical support last year was 90%; this year it dropped by 10% and the satisfaction level was only at 80.7%.



Source: Online Survey (2019/2020)

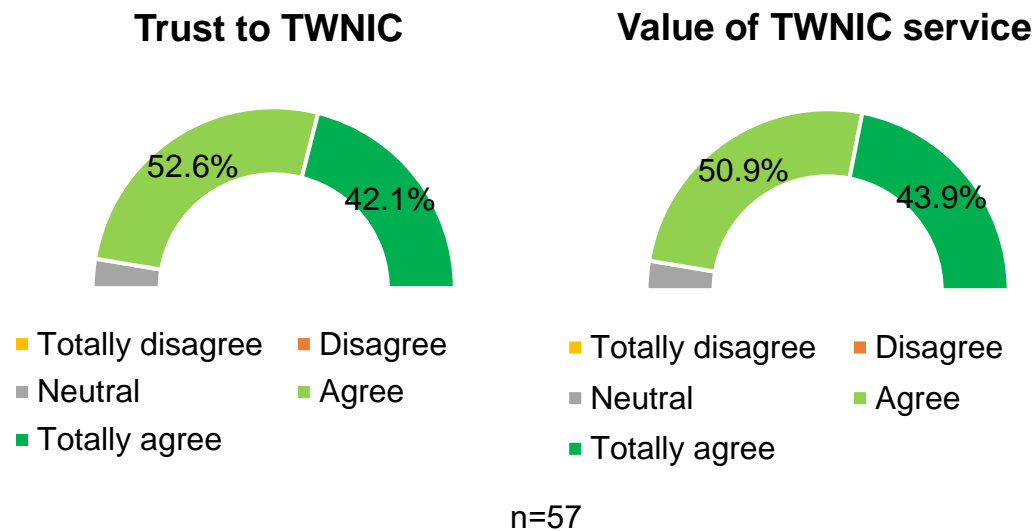
There were no significant differences for IP address allocation; it dropped by a small compared to last year.



Source: Online Survey (2019/2020)

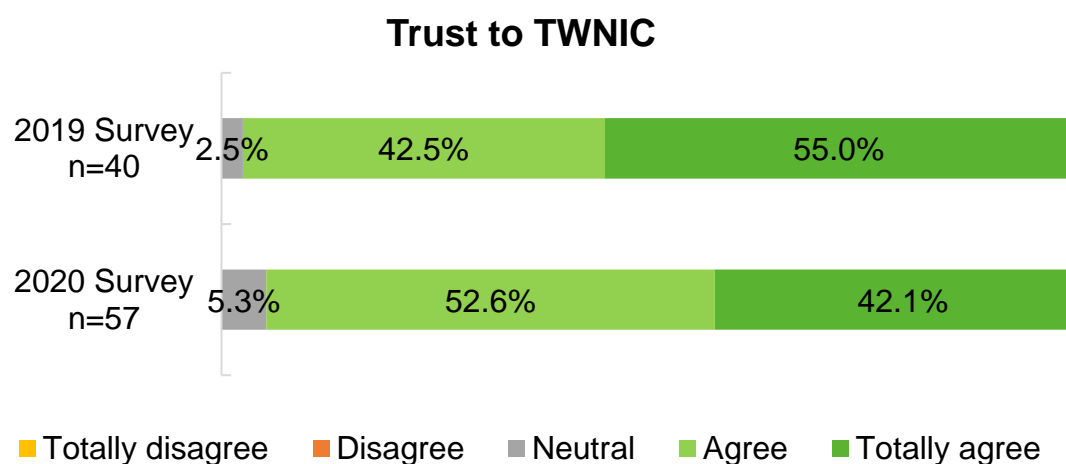
For the trust and value experience evaluation indices, the performances of both indexes were better than the overall satisfaction level. Respondents who chose “agree” were both over 50%, and both of their average scores were 4.4

points. There were no significant differences between the satisfaction levels of “IP Registrants” and “IP Registrars” and this shows that stakeholders highly approve of the Center’s service experience and trust.



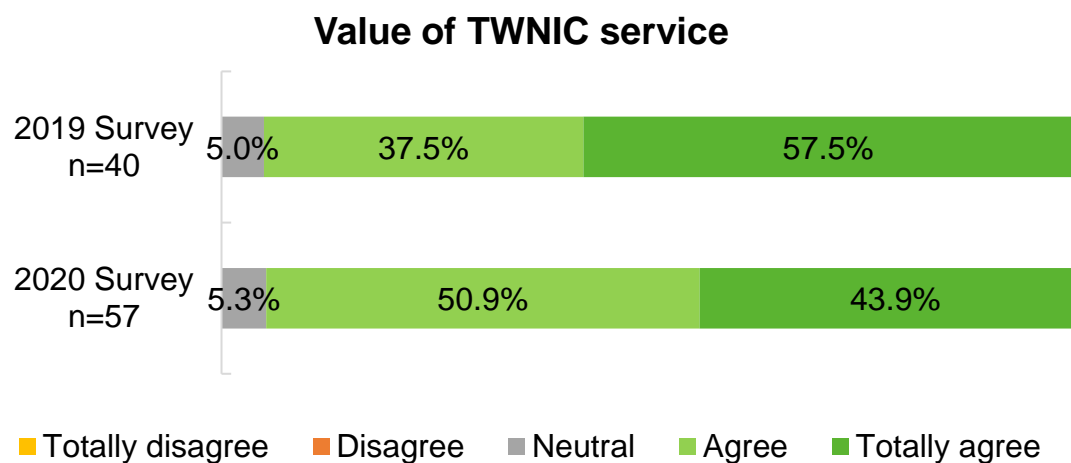
Source: Online Survey (2020)

Last year, there was 97.5% positive evaluation for trust; this year it dropped by 2.8% and the trust is at 94.7%.



Source: Online Survey (2019/2020)

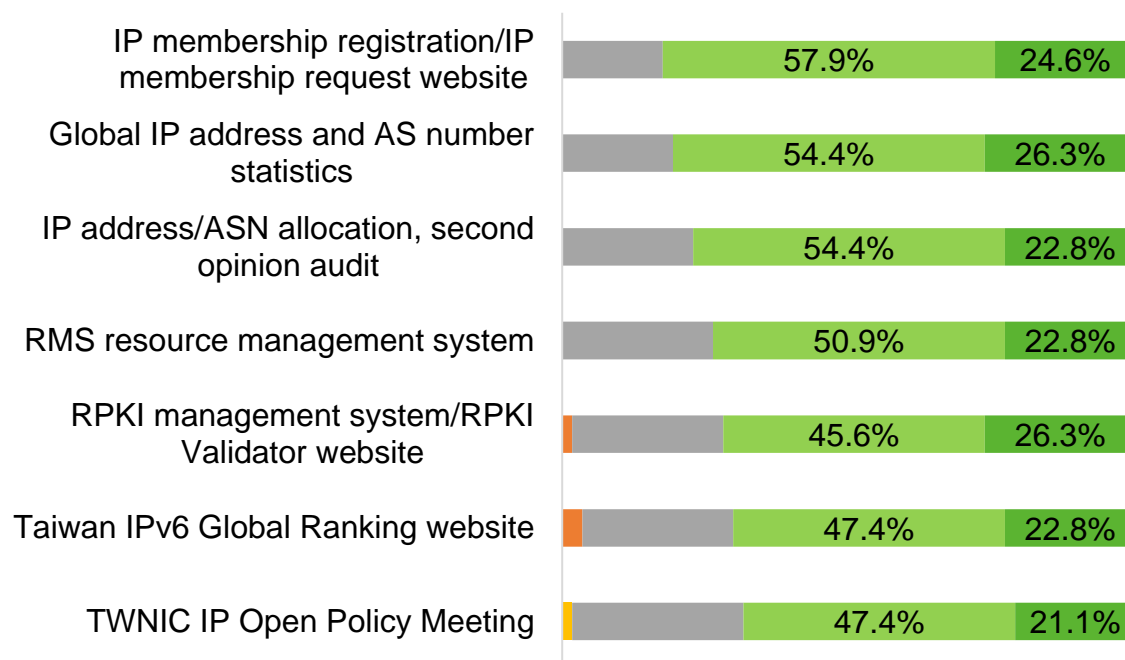
The value experience level was 95.0% last year and it hasn't changed much this year.



Source: Online Survey (2019/2020)

III. Evaluation of Service Value Perceptions

According to the value experience evaluation of IP members for the various registration businesses, their value experiences for the main service items “IP member registration / IP member registration website” were the highest at 82.5%. They also had 80% value experience for “global IP address and AS number statistics.” Their value experience for “IP address / ASN issuing and Second Opinion reviewing” was 77.2% and their value experience for the rest of the index items were all at around 70%.



■ Not valuable at all
 ■ Not valuable
 ■ Neutral
 ■ Valuable
 ■ Very valuable

n=57

Source: Online Survey (2020)

IV. Formulation of IP Allocation Policies and Satisfaction

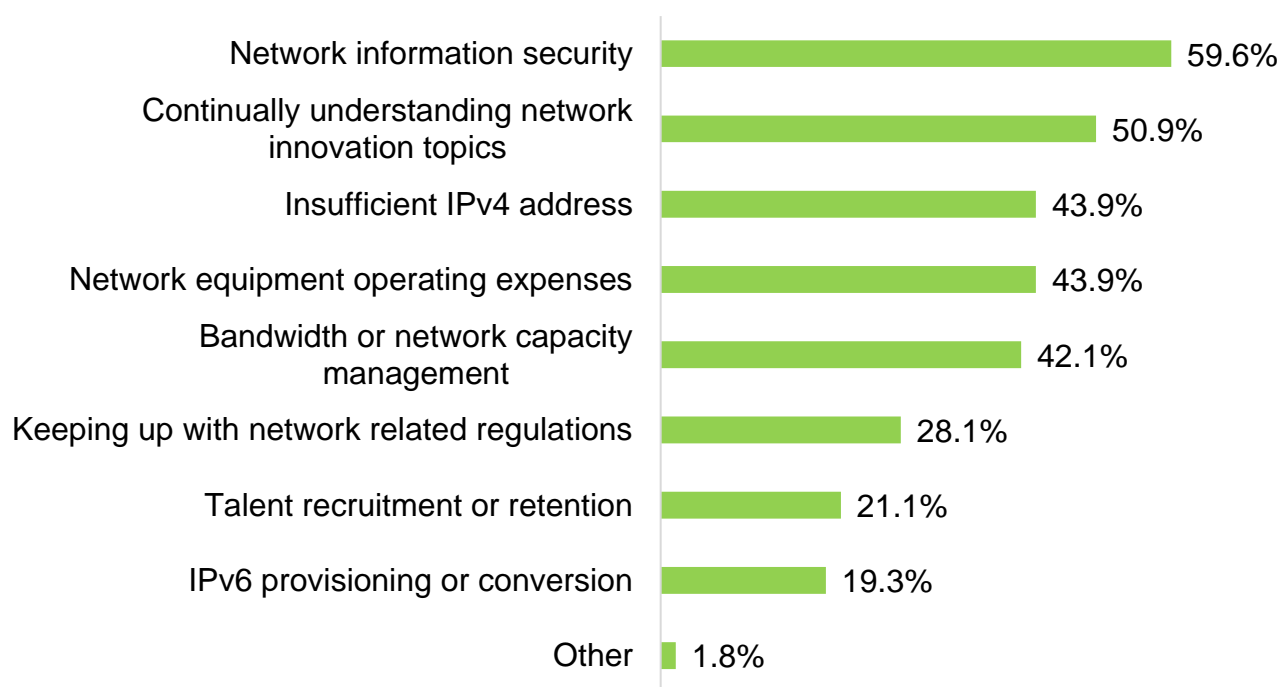
21.1% of the IP members have participated in the “formulation of IP issuing policies;” this means that there were 12 respondents, including 7 IP Registrants and 5 IP Registrars. The satisfaction level of “IP Registrants” for this formulation is 70%, which is higher than the 60% for “IP Registrars.”

Stakeholder	Participation rate	Satisfaction
IP registrants	18.4%	71.4% 28.6% Satisfied, 42.9% Very satisfied
IP Registrars	26.3%	60% 40% Satisfied, 20% Very satisfied

Source: Online Survey (2020)

V. Service Challenges and Difficulties in IPv4 Scarcity

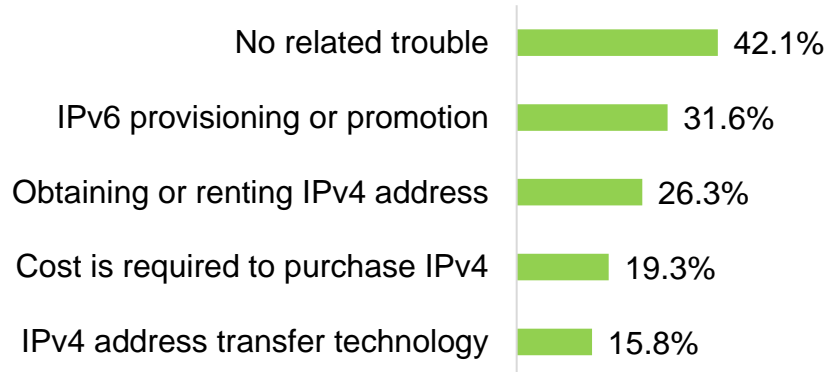
Most IP members think that challenges faced by current network businesses is “network information security” (59.6%), and the next highest is “continuously understanding network innovation topics” (50.9%) and the third is “insufficient IPv4 addresses” and “network equipment operating expenses,” both at 43.9%.



n=57

Source: Online Survey (2020)

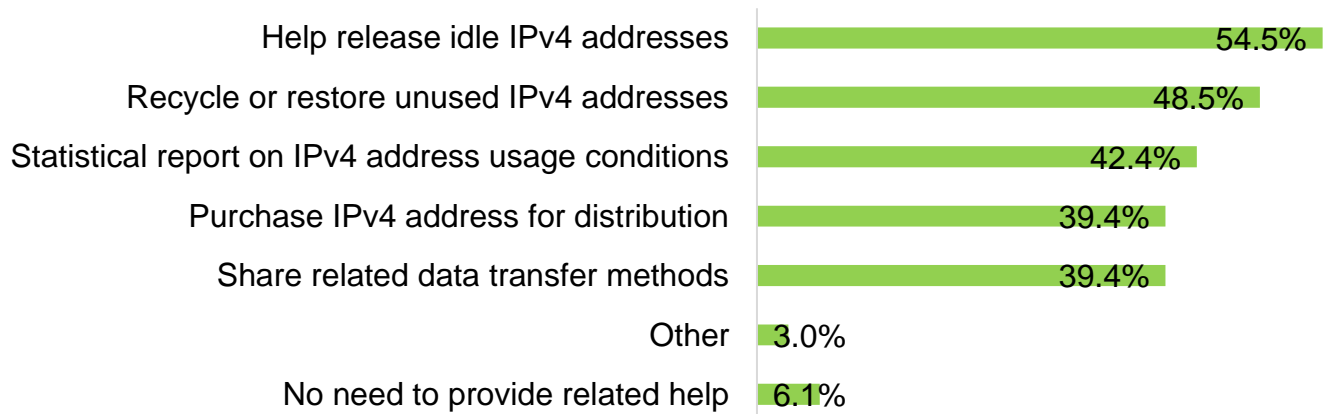
A total of 57.9% of IP members have IPv4 scarcity-related troubles; there were no differences in the proportion of the two stakeholders with different IP uses and roles in the scarcity of IPv4. The main trouble is “IPv6 provisioning or conversion” at 30% and the next is “obtaining or renting IPv4 addresses” at 26.3%.



n=57

Source: Online Survey (2020)

96.8% of the IP members think that the Center needs to provide related help for the scarcity of IPv4; the one with the highest percentage is “help release idle IPv4 addresses” (54.5%). “Recycle or restore unused IPv4 addresses” (48.5%) was also close to 50% and there was about 40% demand for “statistical report on IPv4 address usage conditions.”

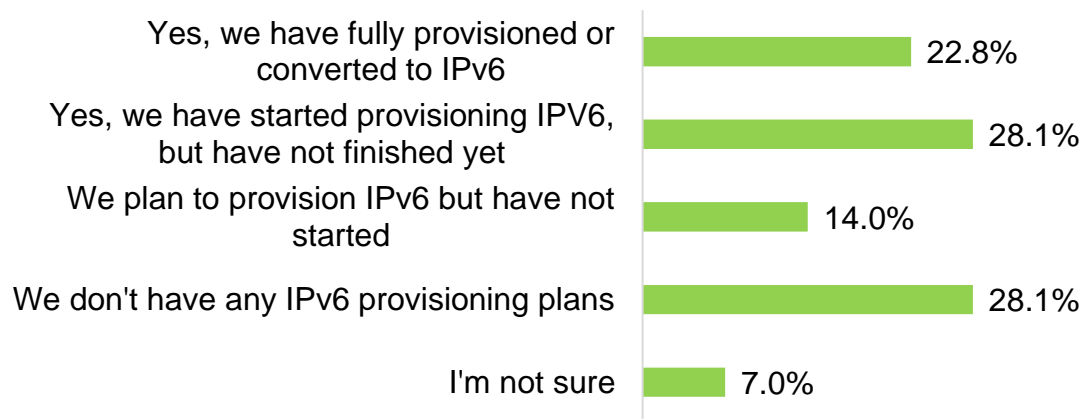


n=33

Source: Online Survey (2020)

VI. IPv6 Provisioning and Preparation

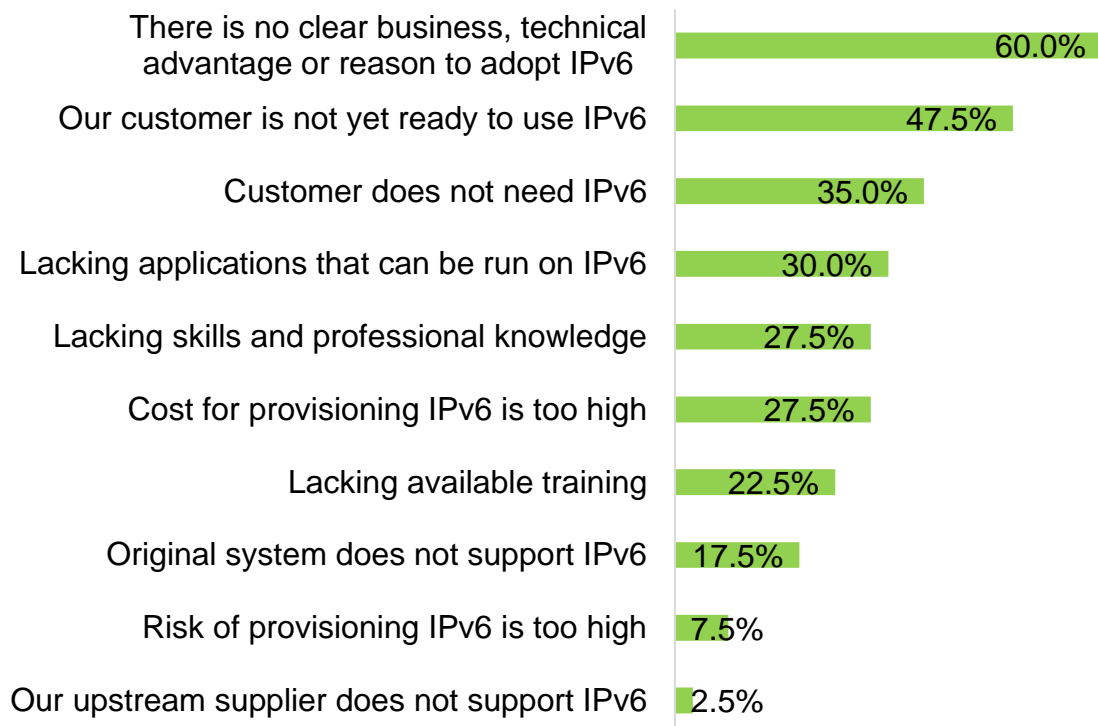
50% of the IP members indicated that they have already started plans to provide or convert to IPv6. Generally speaking, 22.8% have already completed provisioning and converting, 30% have not finished yet and 14.0% have plans to do so but have not started yet.



n=57

Source: Online Survey (2020)

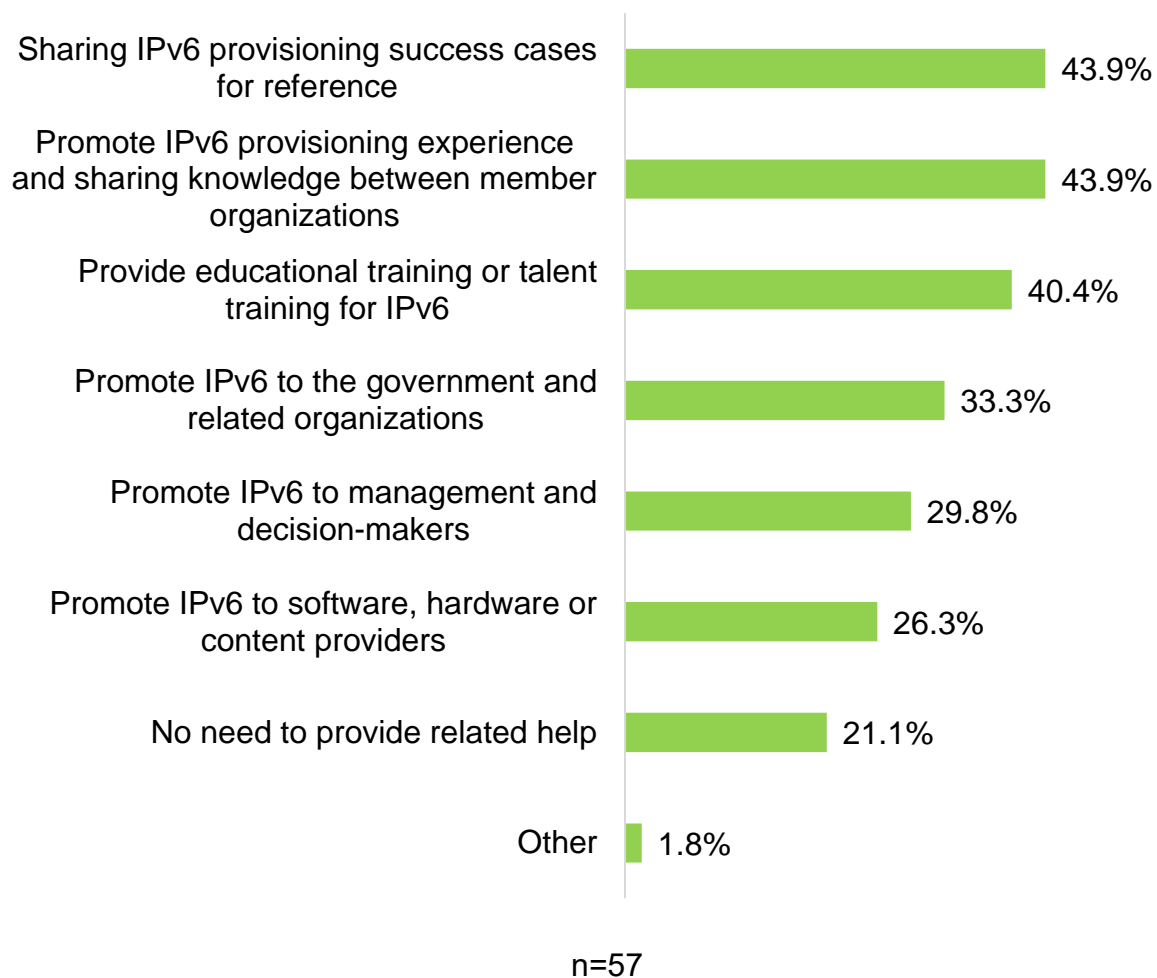
Among the difficulties provisioning IPv6, the difficulty that people faced the most is no motivation – “there is no clear business, technical advantage or reason to adopt IPv6” (60%). The second difficulty is on the client-end; for example, “our customer is not yet ready to use IPv6” (47.5%) and “customer does not need IPv6” (35%).



n=40

Source: Online Survey (2020)

Almost 80% of IP members think that IPv6 provisioning required related help from the Center. “Sharing IPv6 provisioning success cases for reference” and “promote IPv6 provisioning experience and sharing knowledge between member organizations” were each at 43.9%.



Source: Online Survey (2020)

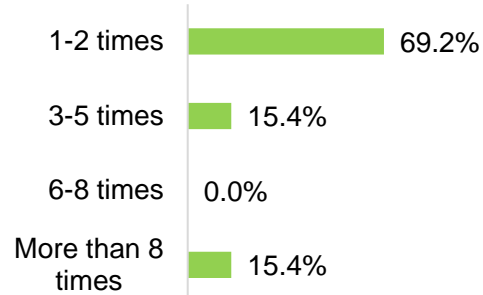
VII. Participation in Events

Participation of IP Registrars for educational training co-organized by APNIC was almost 70% and the number of participations were centered around 2 times. Their satisfaction level was 92.3% whereas the participation rate of IP Registrants was relatively lower and the satisfaction level was 88.2%.

IP Registrars

Participation rate
68.4%
(n=19)
Satisfaction level
92.3%
(n=13)

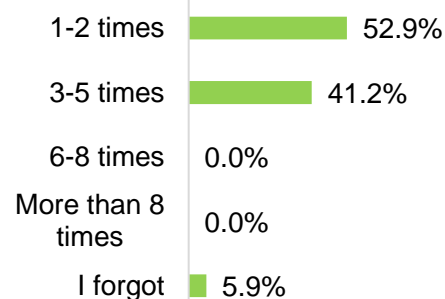
Participation count n=13



IP Registrants

Participation rate
44.7%
(n=38)
Satisfaction level
88.2%
(n=17)

Participation count n=17

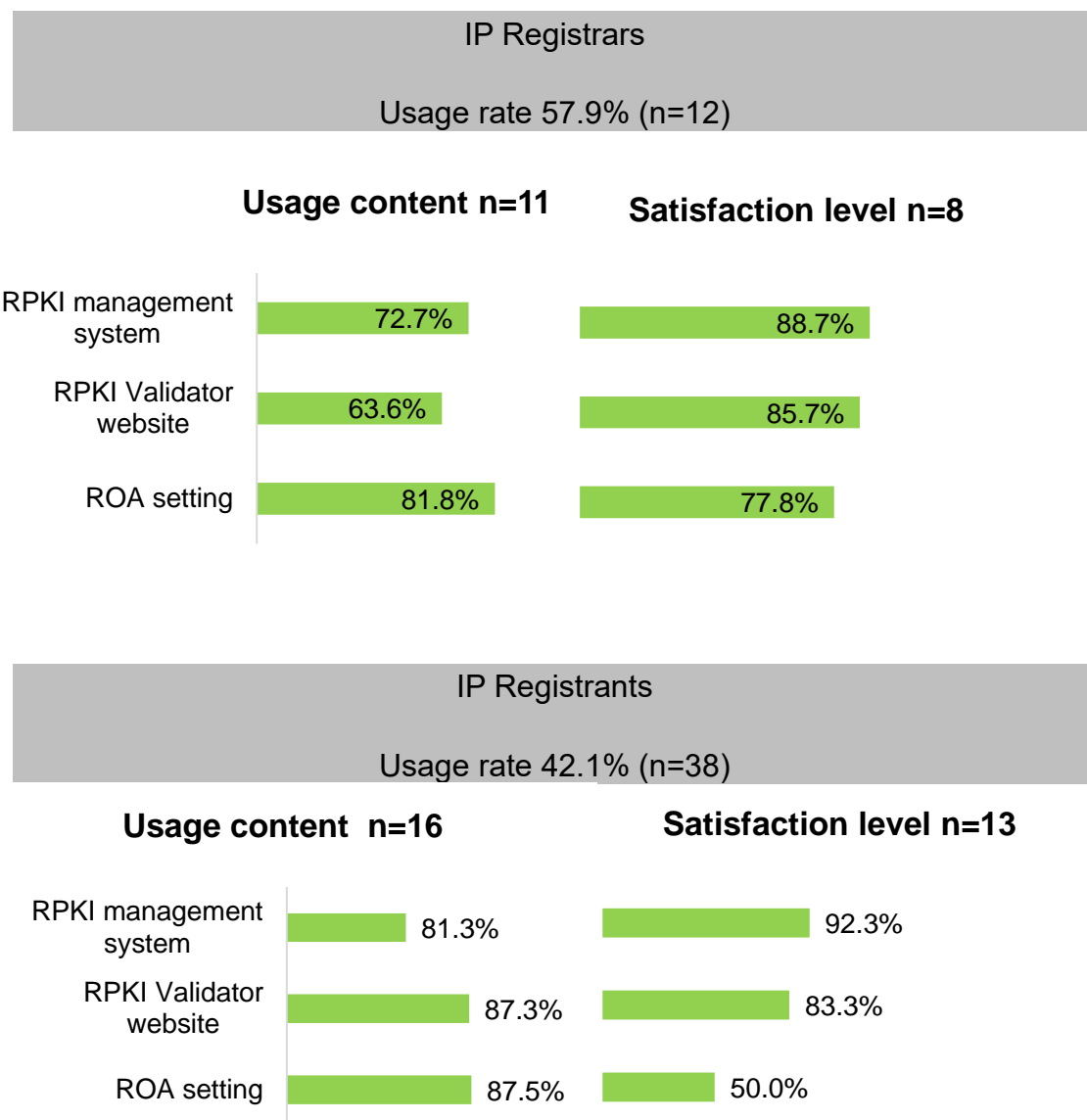


Source: Online Survey (2020)

VIII. RPKI Services

Among the usage of RPKI services provided by the Center, the usage rate of IP Registrars was almost 60% and the usage rate of “ROA setting” was over 80% with a satisfaction level of 77.8%. The one with the second highest usage rate is “RPKI management system,” but its satisfaction level was as high as 88.7%. The usage rate of RPKI services by IP Registrants was 42.1%

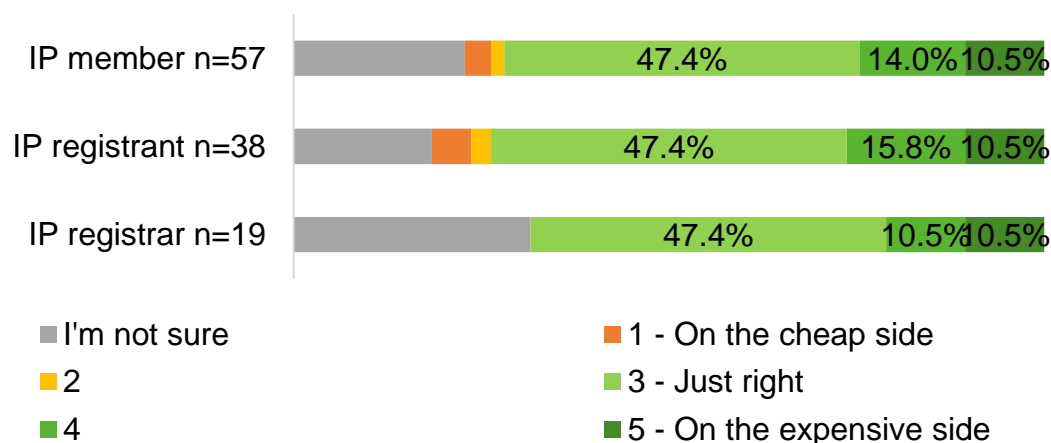
and the usage rate of the various services were all over 80%. The satisfaction level of “RPKI management system” was as high as 92.3%.



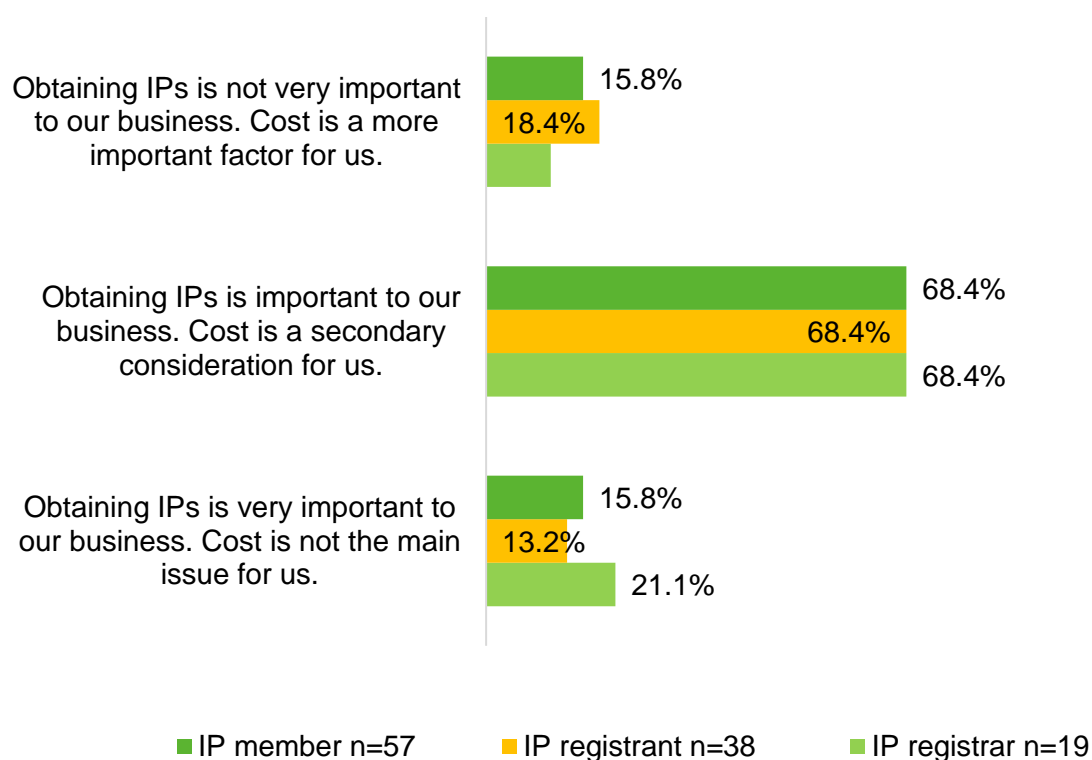
Source: Online Survey (2020)

IX. Strategy for Charges

Most IP members thought that the “IP issuing management fee” was “fees were reasonable and moderate”. Their values for the services and fees also appeared consistent; whether or not it was “IP Registrants” or “IP Registrars” approximately 70% of them thought that “obtaining IP is very important and how much it costs came after.”



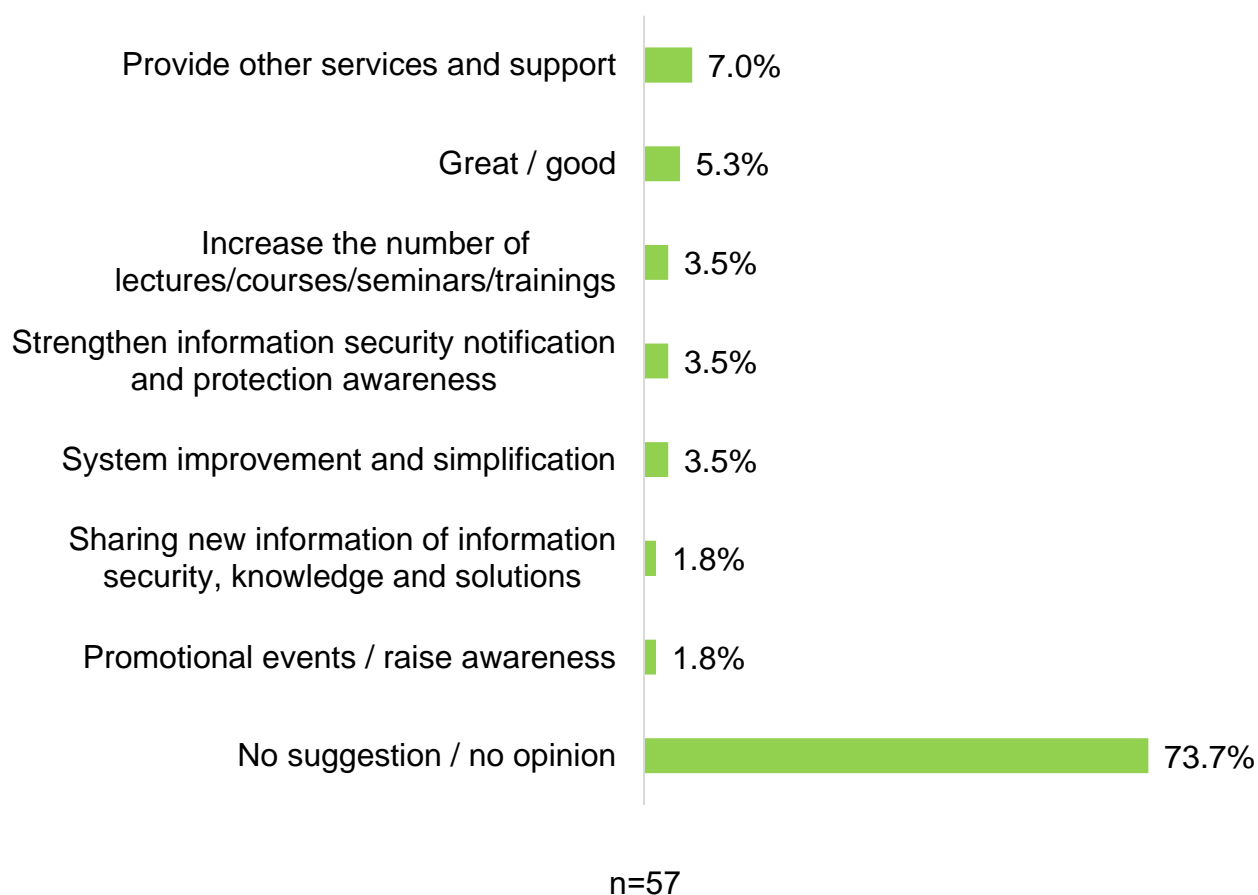
Source: Online Survey (2020)



Source: Online Survey (2020)

X. Expectations and Recommendations

Most respondents wish that TWNIC can “provide other services and support” in the future, such as: “provide more IPv4,” “encourage reducing bandwidth cost,” “provide more ISP commercial price standards and specifications” or “continue to play the role of network technical support”.



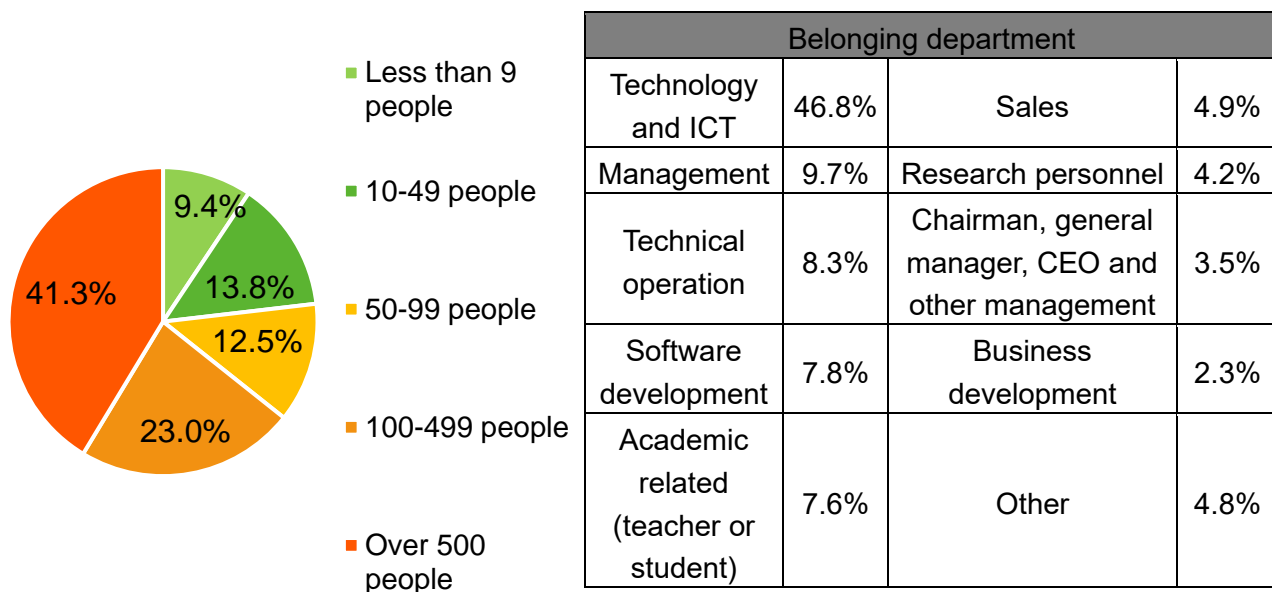
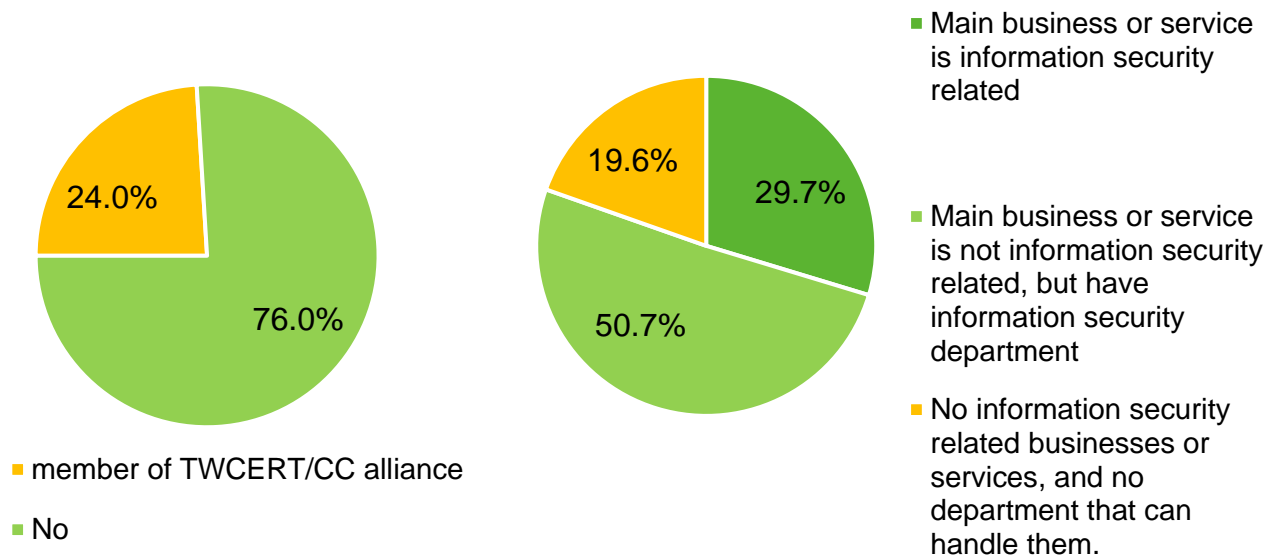
Source: Online Survey (2020)

Chapter VI. Subscribers of TWCERT/CC E-Newsletter



Chapter VI. Subscribers of TWCERT/CC E-Newsletter

I. Summary of Implementation



Source: Online Survey (2020)

II. Service Awareness and Usage Rate

Generally speaking, the ranking of service usage rate and service awareness are the same; “newsletter subscriber – TWCERT alliance member” had higher usage rate among the various services. Therefore, it can be discovered that alliance members are closer stakeholders who have frequent interactions with TWCERT/CC. The service with the highest satisfaction level was “product vulnerability notification” and the satisfaction level of “information security event notification” was also over 90%.

	Service awareness			Service usage rate			Service satisfaction		
	Newsletter subscriber – TWCERT alliance member	Newsletter subscriber with information security department	Newsletter subscriber without information security department	Newsletter subscriber – TWCERT alliance member	Newsletter subscriber with information security department	Newsletter subscriber without information security department			
n=	136	327	103	135	321	96	N	Satisfied	Very satisfied
Information security information sharing	95.6%	93.0%	87.4%	77.0%	55.1%	37.5%	317	50.5%	36.9%
Information security event notification	94.1%	88.1%	85.4%	57.8%	40.2%	31.3%	237	54.0%	36.3%
Information security awareness promotion	84.6%	80.4%	76.7%	48.1%	35.5%	29.2%	207	52.7%	37.2%
Product vulnerability notification	74.3%	67.3%	52.4%	32.6%	22.4%	19.8%	135	48.9%	43.7%
Malicious file detection service	53.7%	48.9%	46.6%	18.5%	15.0%	16.7%	89	38.2%	38.2%
Network phishing notification	51.5%	48.0%	41.7%	14.1%	10.0%	7.3%	58	32.8%	53.4%
Don't know/did not use	0.7%	1.8%	6.8%	7.4%	24.9%	41.7%			

Source: Online Survey (2020)

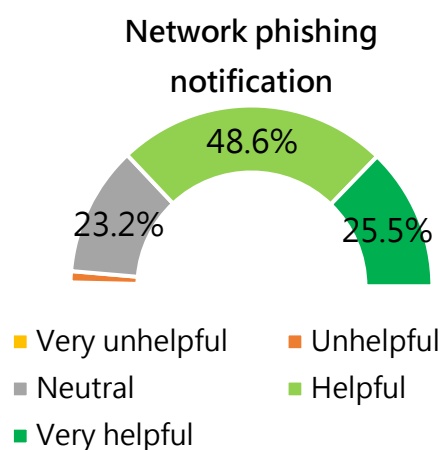
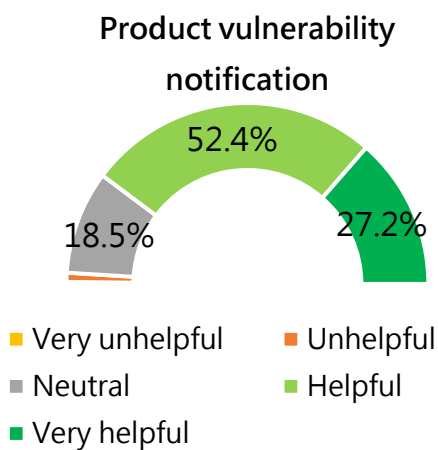
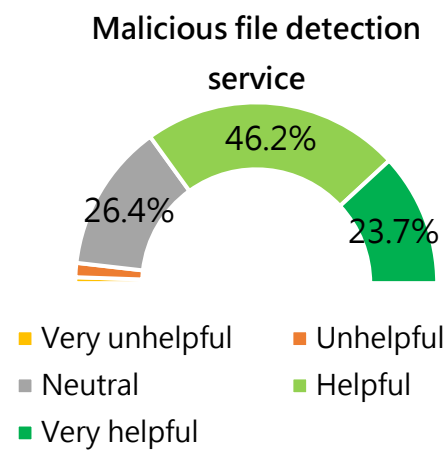
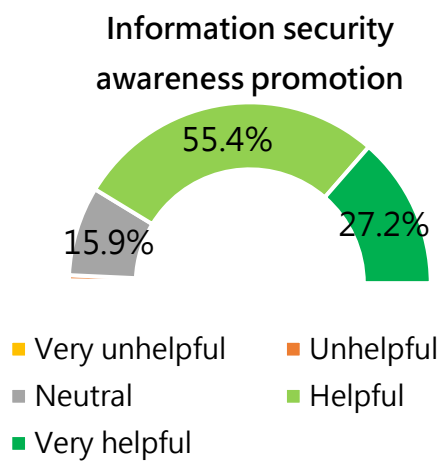
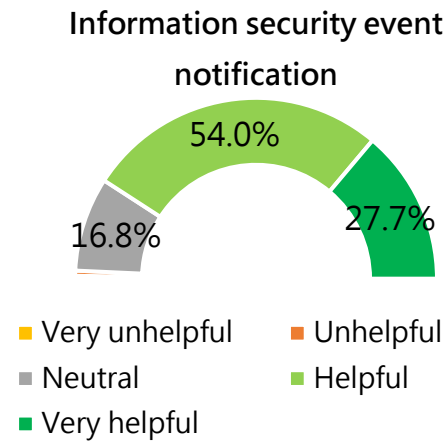
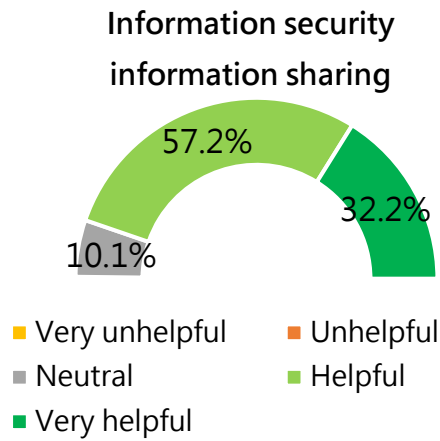
The reason with the highest proportion why respondents knew about TWCERT/CC services but did not use them was because they were “able to handle it on their own” which was about 30%. The second highest was because there was “no need for notification” at 22.4%; approximately 20% of them indicated that they “had no information security problems” at 19.1%.



Source: Online Survey (2020)

III. Service Helpfulness and Reasons

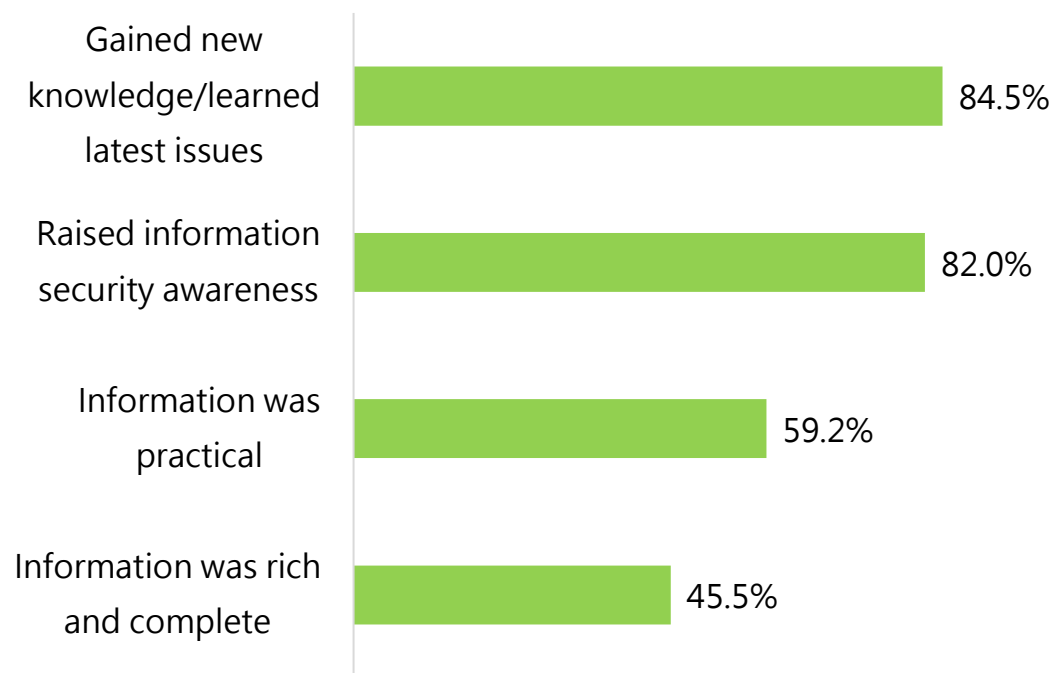
Among the service values, “information security information sharing” was evaluated at 32.2% as “very helpful;” “helpful” was 57.2%. Approximately 30% of “Information security event notification” and “information security awareness promotion” were “very helpful” and about 55% evaluated them as “helpful.” Over 25% evaluated “product vulnerability notification” and “network phishing notification” as “very helpful” and approximately 50% evaluated them as “helpful.” 23.7% evaluated “malicious file detection service” as “very helpful” and 46.2% evaluated it as “helpful.”



n=-566

Source: Online Survey (2020)

Among the respondents who thought that TWCERT/CC services were helpful, 80% was because they “gained new knowledge/learned latest issues” (84.5%) and “raised information security awareness” (82.0%); 59.2% thought that the “information was practical” and 45.5% thought that the “information was rich and complete.”

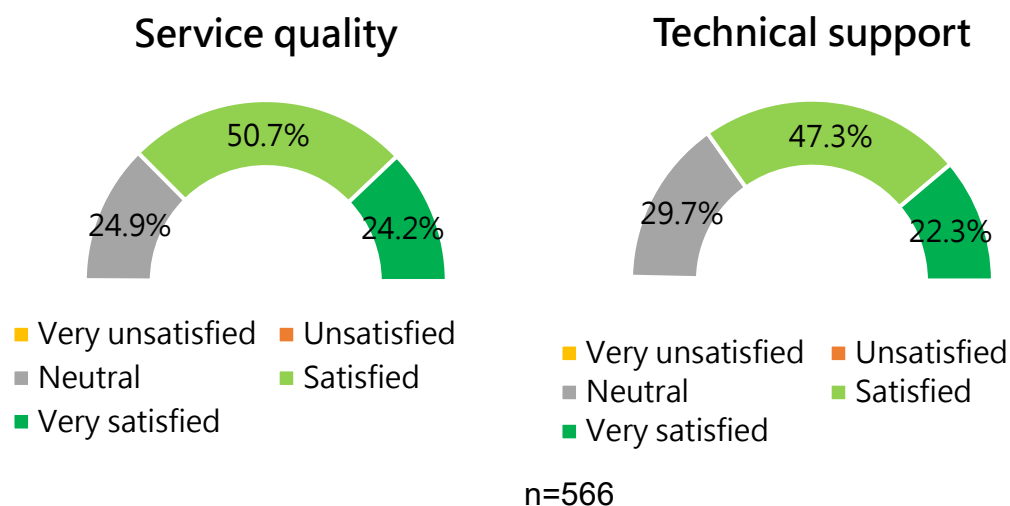


n=510

Source: Online Survey (2020)

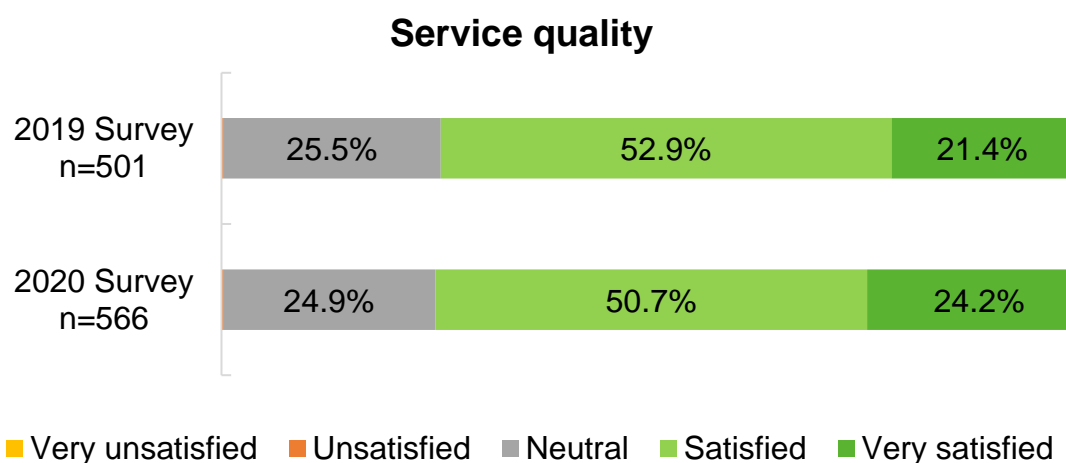
IV. Overall Satisfaction and Trust

20% of the respondents were satisfied with the overall service quality from TWCERT/CC; approximately 50% thought that the service quality from TWCERT/CC was good. 20% indicated that the technical support was very good and 47.3% gave a “good” evaluation.



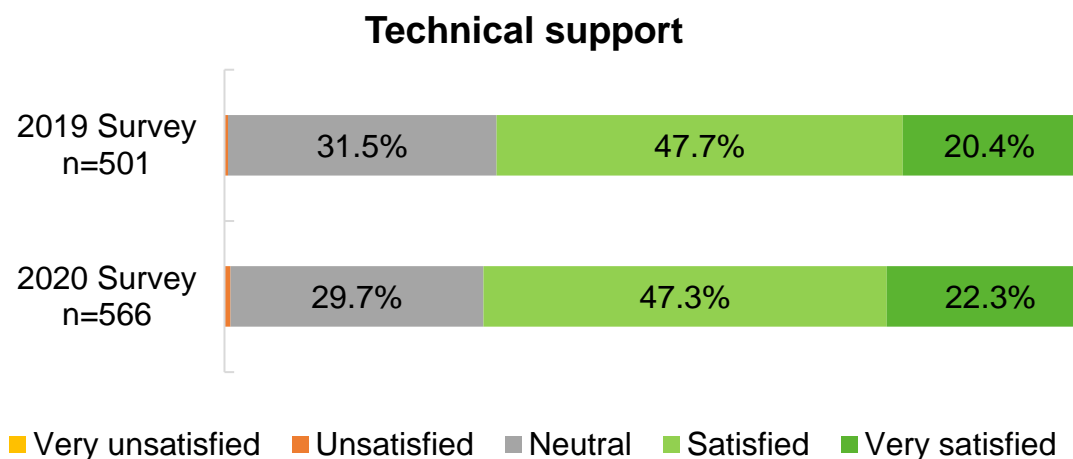
Source: Online Survey (2020)

The satisfaction level of the service quality last year was 74.3% and this year it slightly increased by 0.7% with a satisfaction level of 74.9%.



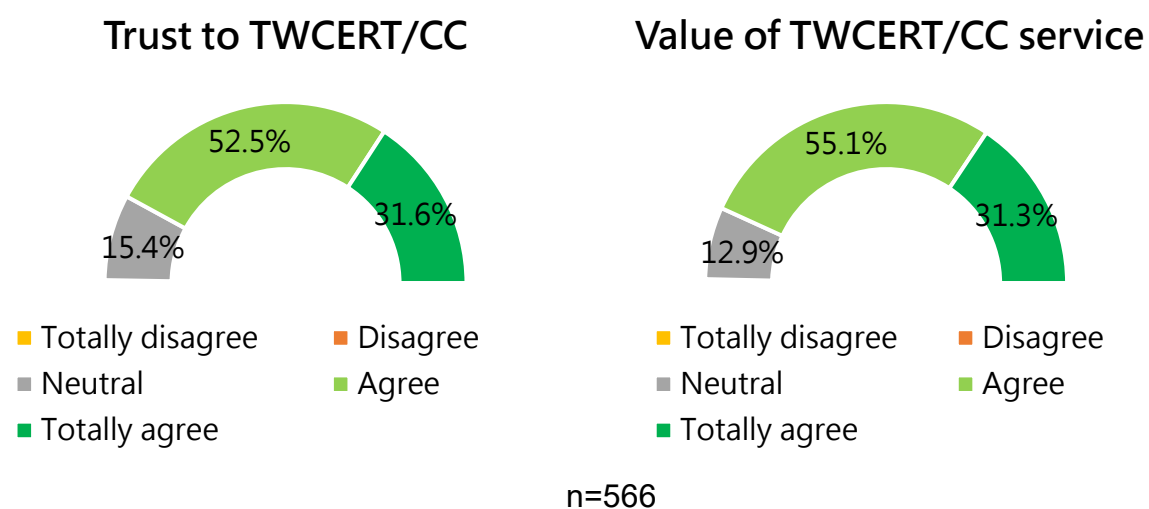
Source: Online Survey (2019/2020)

The satisfaction level for technical support this year was 69.6%, which increased by 1.5% compared to last year's 68.1%.



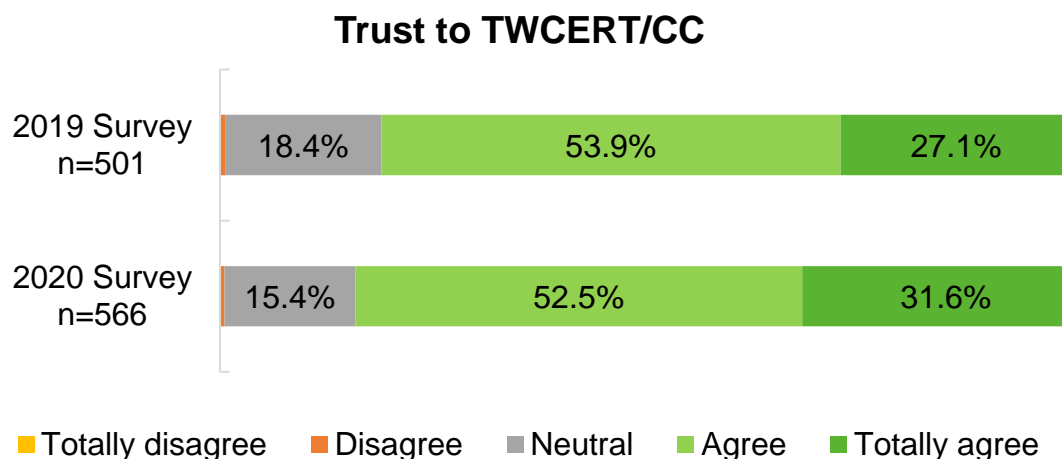
Source: Online Survey (2019/2020)

For the evaluation of the trust in TWCERT/CC, 31.6% of the respondents totally agree that they trusted TWCERT/CC and 52.5% “agree” that they trusted TWCERT/CC. As for the evaluation of service value, over 30% totally agree that the services provided by TWCERT/CC were valuable and 55.1% agree with the service value.



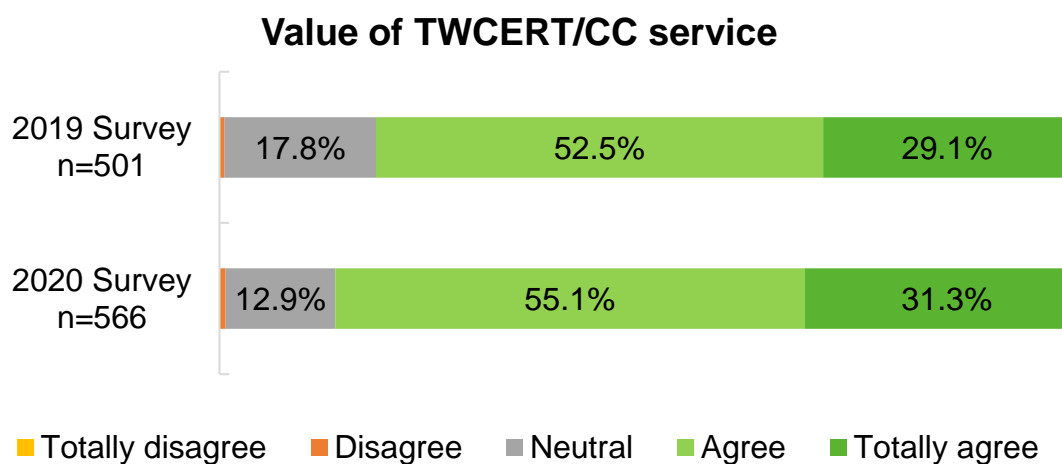
Source: Online Survey (2020)

The level of trust last year was 81.0%; this year it increased by 3.1% and reached 84.1% of positive trust.



Source: Online Survey (2019/2020)

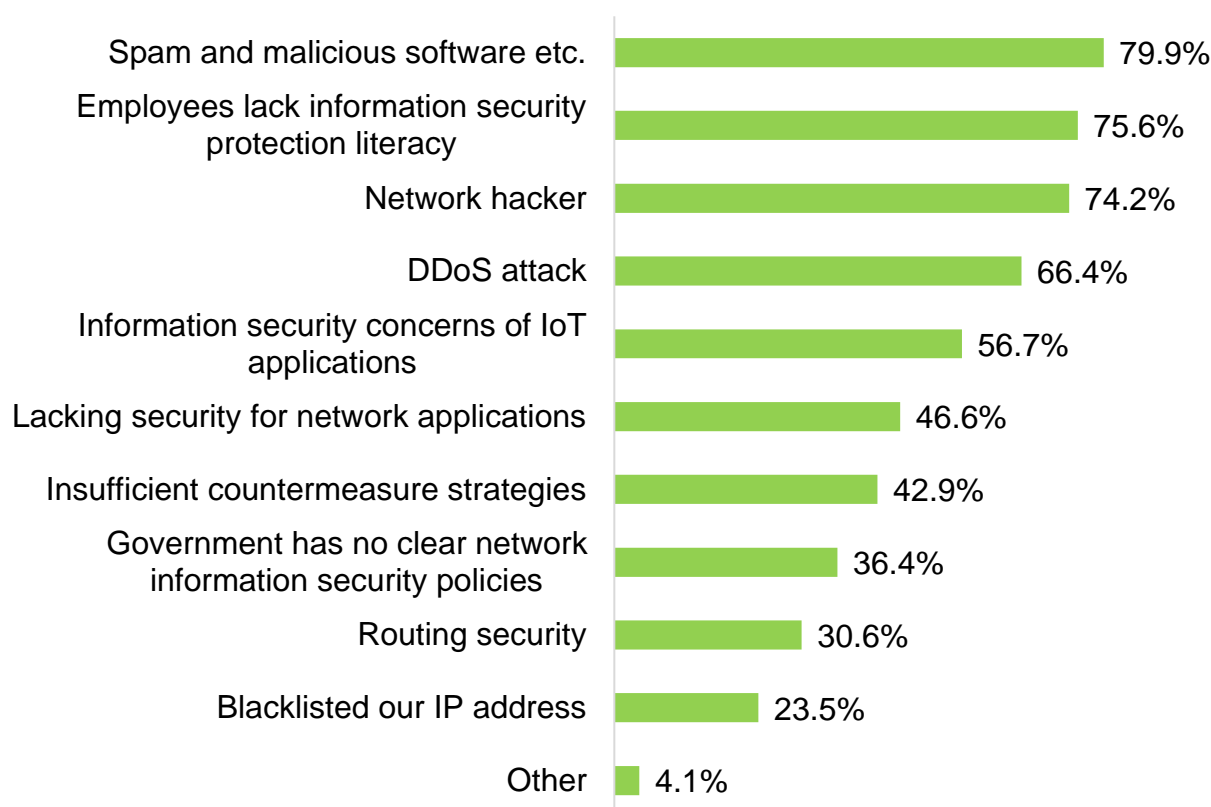
The service value experience increased by 4.8% from last year's 81.6%; the service value experience for this year was 86.4%.



Source: Online Survey (2019/2020)

V. Cybersecurity Threats and Problems in Taiwan

Among the information security threats in Taiwan, respondents had the highest awareness for “online survey, spam and malicious software” (79.9%); the second highest was around 70% where the respondents thought that “employees lacked information security protection literacy” (75.6%) and “network hacker” (74.2%). “DDoS attack” and “information security concerns for IoT applications” were at around 50%-60%.

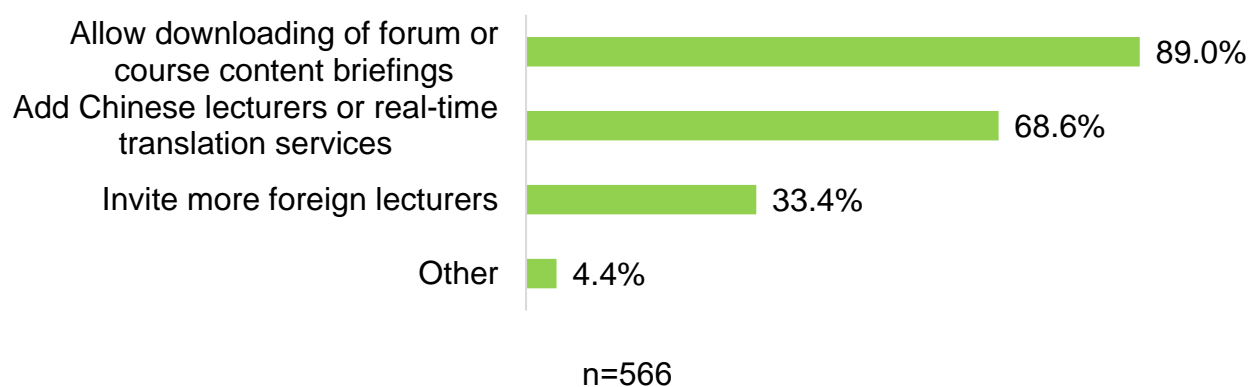


n=566

Source: Online Survey (2020)

VI. Expectations and Preferences for Training Courses

Almost 90% of respondents hope that they can “download forum or course content briefings” from TWCERT/CC forum conferences or educational training contents, 68.6% wish that they can “add Chinese lecturers or real-time translation services”, and 33% wish that they can “invite more foreign lecturers.”

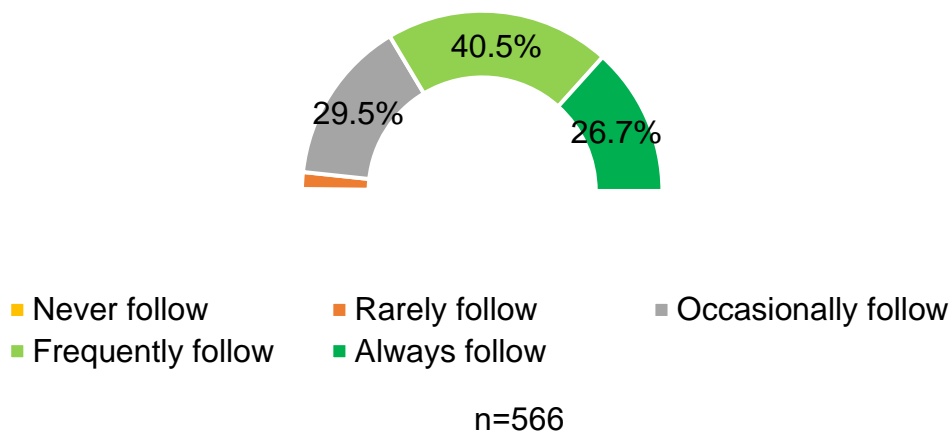


Source: Online Survey (2020)

VII. Information Service

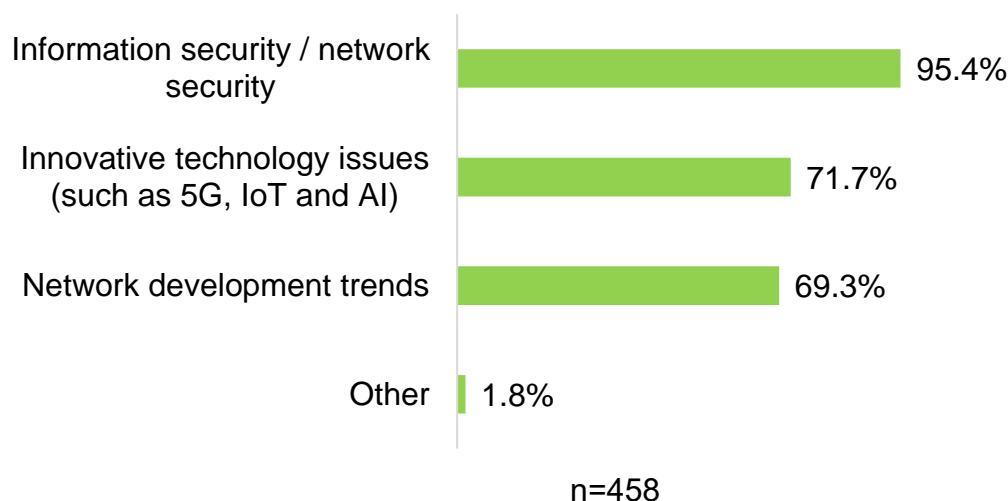
26.7% of the respondents always pay attention to information released by TWCERT/CC, 40% frequently pay attention and 29.5% only sometimes pay attention.

Attention situation of information released by TWCERT/CC



Source: Online Survey (2020)

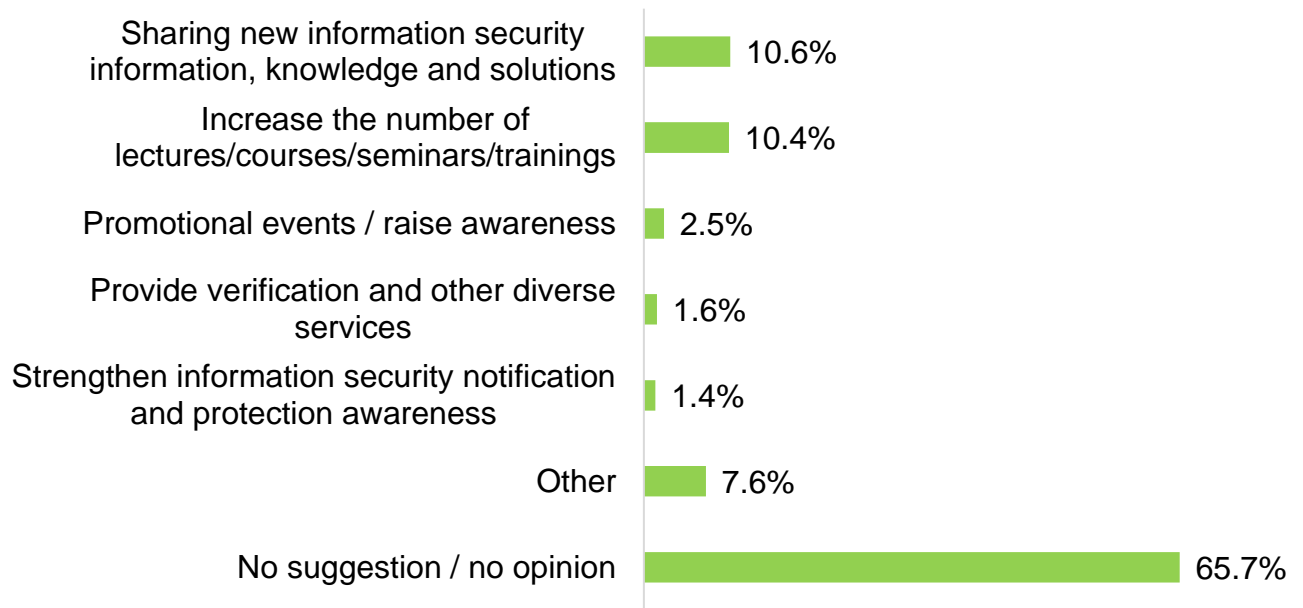
Among the network issues that respondents wish to further understand, “information security / network security” had the highest ratio at 95%. Others include “innovative technology issues (such as 5G, IoT and AI)” and “network development trends” where approximately 60%-70% of the respondents were interested in them.



Source: Online Survey (2020)

VIII. Expectations and Recommendations

To TWNIC or TWCERT/CC, respondents wish they can provide more “new information security information knowledge sharing and solutions” (10.6%), such as: “through the regional network center, we learned that your unit has many information on information security and blacklists; we wish that you can provide them and share them” and “we hope that you can bring everybody information security related issues and information intermittently” and 10.4% mentioned “increasing the number of lectures/courses/seminars/trainings”, such as “we hope that you can provide SMEs with more information security courses and information” and “provide online seminars, free lectures and training courses, and information security promotional videos for us to download.”



n=566

Source: Online Survey (2020)

Chapter VII. Taiwan CERT/CSIRT Alliance

Chapter VII. Taiwan CERT/CSIRT Alliance

A total of 4 Taiwan CERT/CSIRT alliance members were interviewed for this

stakeholder survey. The interviews were all performed through phone interviews and contents spoken were recorded using highlights, then displayed anonymous quotes.

- Do you know which services do TWNIC and TWCERT/CC provide?
How is the interaction between your organization unit and their business cooperation? Based on you or your unit's past business cooperation and interaction with TWCERT/CC, how do you feel about the level of help and how satisfied are you with the services provided by them?

I. Affirmed Information Sharing, Expecting Fast and In-depth Contents

As an alliance member, they think that information sharing was the most helpful service item; information on information security is diverse and updated rapidly. When it comes to private enterprises, they might not necessarily have dedicated information security teams that can help collect information; therefore, having regular sharing of information is very useful information.

- | *I think information sharing is most direct; we all work on information security here, and we usually only know about big events. But TWCERT/CC allows us to know what's going on, and this is quite useful to us; we can learn about different situations that different industries encountered.*
- | *I think they are doing a great job already; we've gained a lot of information from them.*

In addition to continuously providing information sharing, the alliance members also thought that TWCERT/CC provides a lot of information that covers sufficient range, and they pay attention to the technical aspects. But they also wish that in the future, TWCERT/CC could have better control of the timeliness and perform further analysis on the information so that not only can it achieve preventive effects, it can also be used as topics for educational trainings.

TWCERT/CC might be different; they can see things from wider aspects. They have a lot of information that they can share... when TWCERT/CC publish articles, they always check the technology; they most definitely have technical aspects in them. So it would be better if they extended on the information; for example, they can learn which domain was attacked more. They should perform some analyses on the information they accumulated and then hold educational training to share these vulnerabilities.

Stakeholders also mentioned that they wish that information related to domestic information security can be added because it would help meet actual market needs and raise the awareness of domestic information security dangers.

For example, we visit TWCERT/CC websites to read news on information security, but most of them seem to be foreign news and some people will feel that we are lucky because these foreign countries are far away from us. It would be better if there were more domestic news.

II. Simple and Convenient Introductions with Progress Report

Notification Added

Even though alliance members might not necessarily have all used notification services before, but those who have used it before think that the notification method was convenient and easy; however, they wish that the communication after notification can be improved. They wish that they can receive progress reports after notification instead of ending the service when notification was completed. For the informant, even if the processing of the reported incident has not been completed yet, they should at least let the informant know about the acceptance progress of this incident. It was suggested that interactive feedback methods should be added after notification in the future to actively notify the informant of the progress, or provide open searches. This way the information will have better understanding of the progress in the future and will be more willing to submit notifications.

My experience on the notification process was easy; you can just

fill in the form online, or I can just send them email to notify them of issues on their software. It was quite easy. However, sometimes I need to ask them to follow-up afterwards.

The first think I want to mention is on the communication; as I recall, sometimes there were time delays. So, if improvements are needed in the future, it might be for this. What can we do to increase the service speed if there was no response from them?

- Based on Taiwan's current network ecology, what do you think are the greatest difficulties and challenges faced for information security? Based on the aspect and observation of your unit, what do you think about the positioning development and services provided by TWCERT/CC? What other kinds of help do you wish TWCERT/CC can provide your unit / industries or other enterprises in Taiwan?

III. Cultivate Awareness for Active Notification and Provide Incentives to Collect Information

For the promotion of notification services, they mainly wish that the awareness for active notification can be cultivated. According to the experiences of alliance members, there are usually two situations when it comes to active notification in private enterprises. One is when an incident already happened and they are unable to handle it, then will the enterprise be willing to notify when they need help. The second is that they keep the notifications as records just like how police keep records of cases, and they don't really need help.

Therefore, when it comes to active notification in the future, not only do they need to continue to communicate the awareness of the notification service and the trust for the notification unit, when incidents happen in the future, they can help detect or provide consultation services to increase interactions with enterprises and also strengthen their trust for the notification process. They should make the notification process transparent and add the role of legal adviser and make notifications into legally effective reporting processes so

that notifications must be performed even if enterprises do not need help.

Sometimes business owners will make notifications just because they want you to perform free tests or services for them. They usually need this when something already happened, or when they received scam calls. The other type is like filing cases at police stations; they just want to keep the record for the case but they don't actually need help.

In addition to increasing the willingness for private enterprises to send notifications actively, calling for notification loopholes from third-parties is also a method. For example, alliance operations mentioned practices used in other countries; TWCERT/CC can provide resources for notification rewards to attract third-party units such as white-hat hackers to collect information security loopholes and share them with TWCERT/CC.

Currently, TWCERT/CC is a great medium; it can collect great information from other countries, or have domestic units collect information on loopholes that other people found. If you report it to other countries, you can receive money rewards, but not in Taiwan. There are no information security consulting or technical resources.

IV. Great Response from Events and Educational Training, Expecting More Events and Case-sharing

Alliance members gave positive evaluations for event hosting and educational training, reasons include useful contents, not about conducting businesses, great lecturer arrangement and free of charge etc. They all hope that this can continue in the future and increase the number of sessions.

I couldn't really give suggestions for the educational training because they've actually done great jobs; the lecturers they invited are also well-known in the industry. My initial response is that they've done very well and I hope that they can keep hosting these events.

When they host events, they don't favor specific companies and

that makes me more willing to participate. We participate because we want to learn from them; we want to take action but don't know where to start.

Suggestions they gave for the content was that they wish there could also be industries that can share actual cases because technical courses are more common, and there are many similar lectures everywhere. Also, because TWCERT/CC has a neutral role, when they invite enterprises to come share actual cases, they will be more willing to do so. However, they must beware and control the timeliness of the sharing to increase reference value; they can also set themes by paying attention to the targets of the educational training. Learn about their information security level or technical capability before the event to maximize the benefits of the educational training.

| *What seems to be appealing is the sharing of actual cases; but they usually do that once a year or once every six months, and the cases might be time-sensitive, so their reference values were no longer that great.*

| *I think the training should be divided into different levels; this will make it easier for lecturers to prepare and the audience would not have that much trouble listening. But since they don't have many courses right now, dividing them into different levels might be a bit strange too.*

V. Good Use of Third-party Roles to Increase Exchanges and Interactions in the Industry

For suggestions on future developments, alliance members think that private enterprises can develop in two directions, internally and externally. Externally, TWCERT/CC can make good use of its third-party neutral role and work as a bridge in the industry, allowing industries to have the opportunities to share their experiences and increase mutual cooperation or exchange information. As for internally, an information security guideline should be formulated for private enterprises to use as reference. Since enterprises might not necessarily know about the risks or demands for information security within the enterprise, they usually have internal support in order to implement information security protection. If TWCERT/CC can provide industrial specifications as a reference, not only will this help increase people's awareness of TWCERT/CC, it can also help industries improve information

security literacy.

- | *TWCERT/CC should host events and bring information security companies together to share experiences they encountered; they can achieve this with the third-party role that they play. Cooperation and exchanges will allow everybody to grow together.*
- | *Someone has to demand for it, otherwise everybody would think “why should I do this?”*

Chapter VIII. Government Agencies

Chapter VIII. Government Agencies

Among the stakeholders of business-related government units, a total of three business counterparts from the National Communications Commission, the

ICT Security of National Security Council (NSC) and the Department of Cyber Security were interviewed. Besides one of them who was also a stakeholder that was interviewed last year, the other two stakeholders came in contact with TWNIC and TWCERT/CC after their job transfers. Due to the nature of the unit and the content of the cooperative business, therefore this part of the interview will focus on the work content, organizational vision and expectations of TWCERT/CC. The interview content will also be displayed by quoting highlights, but keyword information was hidden appropriately to avoid referring to the interviewer.

- Based on the aspect and observation of your unit, what do you think about the positioning development and services provided by TWCERT/CC? What other kinds of help do you wish TWCERT/CC can provide to your unit?

I. Clear Organizational Positioning, Looking into Future Planning

The stakeholder first approved that the positioning of TWNIC is becoming clearer and the role and tasks of TWCERT/CC are also going in the correct directions. Compared to the survey last year, stakeholders from government units have higher expectations for the positioning of the organization and task inventory. The visions this year lean more towards raising awareness and the planning of follow-up development directions.

I think that the targets and tasks of CERT are well-written; they are in the right direction.

After TWCERT/CC moved to TWNIC, its positioning has become clearer; at least it's been a lot clearer in the past year, but they're still a bit slow on pushing it. Judging from a few indices, how many people know about the core services of TWCERT/CC and how they provide help? There is still a lot of room for improvement for these.

When looking at the next move, stakeholders from government units hope that TWNIC or TWCERT/CC can think over about the positioning of future developments. Whether or not it is operating by following the current plan and framework, or developing new business models and acting independently, the

most important thing is to set strategic goals for the future and proposing business plans, continuing providing services for private enterprises and improving the service quality.

| *Assume that TWNIC treats TWCERT/CC as a plan, then they should run it the way they are running now; but it is another problem if it is treated as a business or division because from the government's point of view, it is impossible for them to keep giving money.*

| *How to continue to expand SME service targets, improve the quality and quantity of information security services and think about highlight projects that can get more budget allocated by the Executive Yuan are major challenges currently faced.*

II. Continue to Increase Popularity at Home and Abroad

Stakeholders think that the raising of awareness includes multi-party integration domestically and internationally. Domestically, they should focus on raising enterprises and the public's awareness by performing promotional education. Internationally, they should become the bridge for Taiwan to connect to the rest of the world. The stakeholders mentioned that Taiwan has great technological capabilities and can use its technical strength to respond to international needs to achieve the goals of security or economic prosperity. Concrete practices include providing English information and update contents continuously, using the sharing of information to contact target countries for security cooperation and display Taiwan's valuable strategies and also establish smooth communication channels. Whether or not it is information on information security provided to us by international organizations or the other way around, we can grasp the progresses of the processing and development processes well.

| *First is concerning SMEs, they should let more SMEs know that they can ask the Center for help when events occur. We are also coordinating the cooperation of commercial departments on this area. The second part is they need to let the public know about them. Most of these require education and promotion.*

| *I think that we must connect with the rest of the world, so it needs English translations. Another thing is that there are many Chinese contents, but they may not have been updated continuously.*

I suggest that when TWCERT/CC is exchanging and processing international information, they can negotiate with international organizations that receive information about the report information that we should provide and establish feasible report principles and process report channels for international organizations so that we can make sure whether or not the information was processed properly and whether other countermeasures should be taken.

- Future outlook: This year, with the maturing of 5G developments and the implementation of more innovative applications, do you think that TWCERT/CC has the opportunity to provide relevant services for Taiwan's network ecology? Please suggest some services that can be developed. What issues and challenges should TWCERT/CC pay attention to for Taiwan's network development in the post-epidemic era?

III. Increase Corporate Visibility with Practical Needs

Since TWCERT/CC has the feature of bridging public and private fields, stakeholders continued to wish that more diversified promotional strategies can be developed between domestic enterprises to highlight its role as the notification center. They also pointed out that the Center can cooperate with the locals directly, and use practical development and the connection of enterprises to actively keep up with corporate trends or network issues to increase visibility. Take the digital transformation issue that enterprises pay much attention to recently for example, TWCERT/CC can have cross-industry cooperation and digital transformation research teams hold seminars, and use issues that appeal to enterprises to introduce the needs for information security, and further establish information security literacy for enterprises and achieve notification awareness. Or, use potential information security issues derived from the increased usage of video conferencing software brought by 5G applications, cloud printers or network printers which operate via wireless transmission and the impact of the epidemic, and propose corresponding solutions based on the usage requirements of enterprises.

TWCERT/CC should first have the ideas and tools, then people will go to them when there are contingency demand notifications afterwards. For example, they can have digital transformation research teams go share some information and everybody's awareness will be raised.

Due to the impact of the epidemic, many physical events have been switched to online or video events; this also drove the significant adoption of video conferencing software in different industries. I suggest that TWCERT/CC should continue to visit SMEs that they already provide information security services for and keep statistics on whether or not they have used video conferencing software with information security concerns and coach them actively; also strengthen the collection of related vulnerability information and share repair information with the SMEs.

- Do you have any suggestions for TWCERT/CC? Which directions do you think they can focus more on or what businesses could they develop?

IV. Develop Strategic Partners, Including Personal Promotion

Stakeholders also indicated possible methods to increase notification; besides continually thinking about incentives for how to attract active notifications, they can also specifically cooperate with related units and promote the prevention of information security events through local criminal police departments.

Another function of CERT is to connect with enterprises; since it is difficult for one unit to penetrate deep into every enterprise, they can cooperate with the criminal police departments and companies that provide government information services and individual protection cases up to certain extents. For example, what they should be careful of when shopping online and what they need to beware of when working remotely.

In addition to increasing enterprise promotions and cultivating information security literacy to bring about notification opportunities, things that can actually be done for the individual aspect can begin with the concept of protecting personal information. This will help raise the awareness of the notification service.

| *Information security is actually a concept for the promotion of information security and it includes the awareness to protect personal information. Currently, I haven't thought about how we should go about pushing it, but the protection of personal information should also be promoted in Taiwan. It would be great if CERT can also include the protection of personal information.*

Chapter IX. International Organization Stakeholders

Chapter IX. International Organization Stakeholders

Internet video and internet phone were used to conduct in-depth interviews with two managers of international organizations for this stakeholder survey. The interview results and content excerpt were done anonymously; and in order to prevent interview contents from referring to the interviewer, quoted

contents will be processed by not modifying the original meaning but modifying the keywords.

- Past & Current collaboration-Based on your experience or knowledge, how do you describe ICANN' s relationship with TWNIC? Thinking back, was it always like this?

I. Current Organization Status and Partnership

Stakeholders from the international organizations first praised TWNIC's cooperation overview; they think that TWNIC is a highly cooperative and service-oriented organization. Interactions between the two parties were great and they continuously provided help and contributions to the various events held by the stakeholders of international organizations and they expressed their thanks to the organizing team.

| *TWNIC culture is a very collaborative open minded sort of service and cooperative oriented organization....it's a really good indication that gives a sense of TWNIC, I'd call it sort of serious intent and commitment to what's important to us, which is collaborative community oriented service oriented pace.*

| *in terms of actively wanting to contribute to work, we are really grateful to thank for Kenny and his team that vision for wanting to contribute and give back to the community.*

In addition, due to the mutual influence background of the various network information security issues, they agreed when it was mentioned that TWNIC and TWCERT/CC were combined into international and national assistance roles under the same organization; they thought this was a very practical cooperation and will be able to effectively help with the healthy development of the network ecology.

But not only for the sake of the Pacific, or also for the sake of the internet much more broadly because lack of security in one place can and can immediately create security problems elsewhere. So I think TWNIC can with TWCERT as well for precisely that reason, can really argue for a national and international role in assisting internet development.

- Collaboration improvements-Are there priority areas where ICANN/APNIC feel TWNIC can invest or focus more to improve? Are there major priorities or future agendas that TWNIC can play a role or play a bigger role? Are there major events/projects/initiatives where TWNIC can contribute more?

II. Recommendation on Key Development Fields

For the expectations that the stakeholders from the international organization have on the cooperation progress, they continued on last year's suggestion and continued to mention technical field resources and educational training to support the two fields. This year, they were more specific and described opportunities for extensions of hot topics online, including the influence of 5G application and the popularizing of IoT. TWNIC plays the key role for the stakeholder's research on innovative technology, including opportunities for linking IP or domain names to develop innovative applications.

And we can only do that when we have partners like TWNIC, because it gives you a very clear sense as to how it gives people something to see and to touch and to feel to know that this is actually an organization that works on this. So again, it's like, you know, if there's some events or conferences related to topics like that, ...we can work together to just to make sure that we explain it to the wider stakeholder community.

They also mentioned the lack of educational training resources at this stage, including cross-language to improve the difficulty of teaching and the lack of technical resources. This also had an impact and caused reduced possibilities to communicate with the community. Therefore, they hope that TWNIC can help host educational training events and develop teaching materials to develop more interactions between international communities and cover wider language ranges.

We're always looking for people to help us scale up. Literally training activities, actual training delivery, but also training materials development training content development, educational materials more generally, the translation and interpretation of the, of the material as well.

- Future goals-Thinking about the bigger internet ecosystem in which ICANN/APNIC/TWNIC is in; what are there key trends, challenges that you foresee that may become important topics for us to watch out for?
- Do you have suggestions on how we can better position to address these challenges or stay ahead of these trends?

III. Future Positioning and Expectations of the Organization

For the organization positioning and future expectations of TWNIC, stakeholders encouraged Taiwan to continue to develop international relationships and they think that the pandemic is a thrust just like TWNIC's experience in helping international organizations organize various forum events in the past; there will be more opportunities in the future to continue organizing and hosting these events through online methods.

And I think Taiwan's foreign relationships have been important. I'm sure TWNIC is kind of is interested in. In, some international affairs part. And I'd encourage that... This opportunity for TWNIC for all of us to show the good work that we've done and, and to be involved, and to be activated in more of what's coming in future. In terms of the post COVID kind of world.

They also encouraged TWNIC that they should play two roles of active supervision and consultant in government relations. In the experience sharing of stakeholders from international organizations, taking positive attitudes towards government units can ensure that they move towards a healthy network society in network governance. As for the consultancy role, they can draw on the experience of international organizations to ensure that TWNIC can provide more international recommendations in the formulation of

government policies and have more opportunities to speak out.

| *Yeah, so there's a little bit of both. So the first is that we try to make sure we at least have an active relationship with the governments that deal with the internetThen the second area is some monitoring...So in this case this is where we a partnership works because TWNIC sees legislation. They can flag it to us and then we can provide some advice, which advice, mainly consists of education.*

Chapter X. Recommendations

Chapter X. Recommendations

Services Continuously Received Praises, Hoping for Diverse and Active Online Interactions

- In this year's survey, TWNIC and TWCERT/CC services still received great evaluations and maintained smooth communication channels with the stakeholders, as well as close interactions
- In the post-epidemic era, there are still opportunities to continue to maintain more online interactions in the future, it is necessary to further think about this during the larger network intermediary communications in the future, while providing diverse services, in addition to being able to maintain good interactions with multiple stakeholders, displaying active communication attitudes is also very important

Both Trust and Service Satisfaction Levels Were Great, Future Direction is to Improve Service Experience and Market Education

- TWNIC has provided outstanding domain name and IP registration and issuing services for a very long time; since TWCERT/CC joined, they also brought notification contingency and information security information sharing services. Stakeholders were all highly satisfied with the service value and trust of the various services. As the network era changes, users not only need to register and use domain and IP, the demand for related services have also increased. In addition to existing products and services, in order to provide outstanding services, recommend TWNIC and TWCERT/CC also add service experience and market education into their development direction in the future, continually and deepen service enhancement and interactions with stakeholders, positively influencing the construction of a healthy network society.

Deepen the Sharing of Information Internally, be Diplomatic in Using Technical Strength Externally

- Stakeholders unanimously agreed that TWNIC was highly practical in providing educational training or event lecturers for their original business; the information sharing of TWCERT/CC was even the one with the highest interactive usage rate. Their well-recognized information security technology capabilities can display the value of Taiwan's technologies and increase international visibility by being translated into English and updated continually.
- Increase visibility with practical needs, provide thoughts and suggestions for innovative network trends such as thoughts for IoT and 5G applications, or issue information security related reference data for issues that enterprises pay attention to, including digital transformation and the frequently used cloud printer or network printer, etc. Also point out potential information security problems with existing business cooperations, providing domestic industries and international communities with more references.