



# **Taiwan Network Information Center**

## **Stakeholder Survey 2021**

**Organizer : Taiwan Network Information Center**

**Implementer : InsightXplorer Ltd.**

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# **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 18, 2021 to September 21, 2021

Stakeholder	Sample Requirements	Email Sent	Email Opened	Email Open Rate	Email Replies	Valid Email Amount	Click-through Rate
Domain Name Registrant	Those who used TWNIC domain name services in the past year	74,578	25,118	33.7%	1,338	391	0.5%
IP Members	-	366	167	45.6%	34	21	5.7%
TWCERT/CC Newsletter Subscribers	Newsletter subscribers	5,856	2,550	43.5%	312	174	3.0%

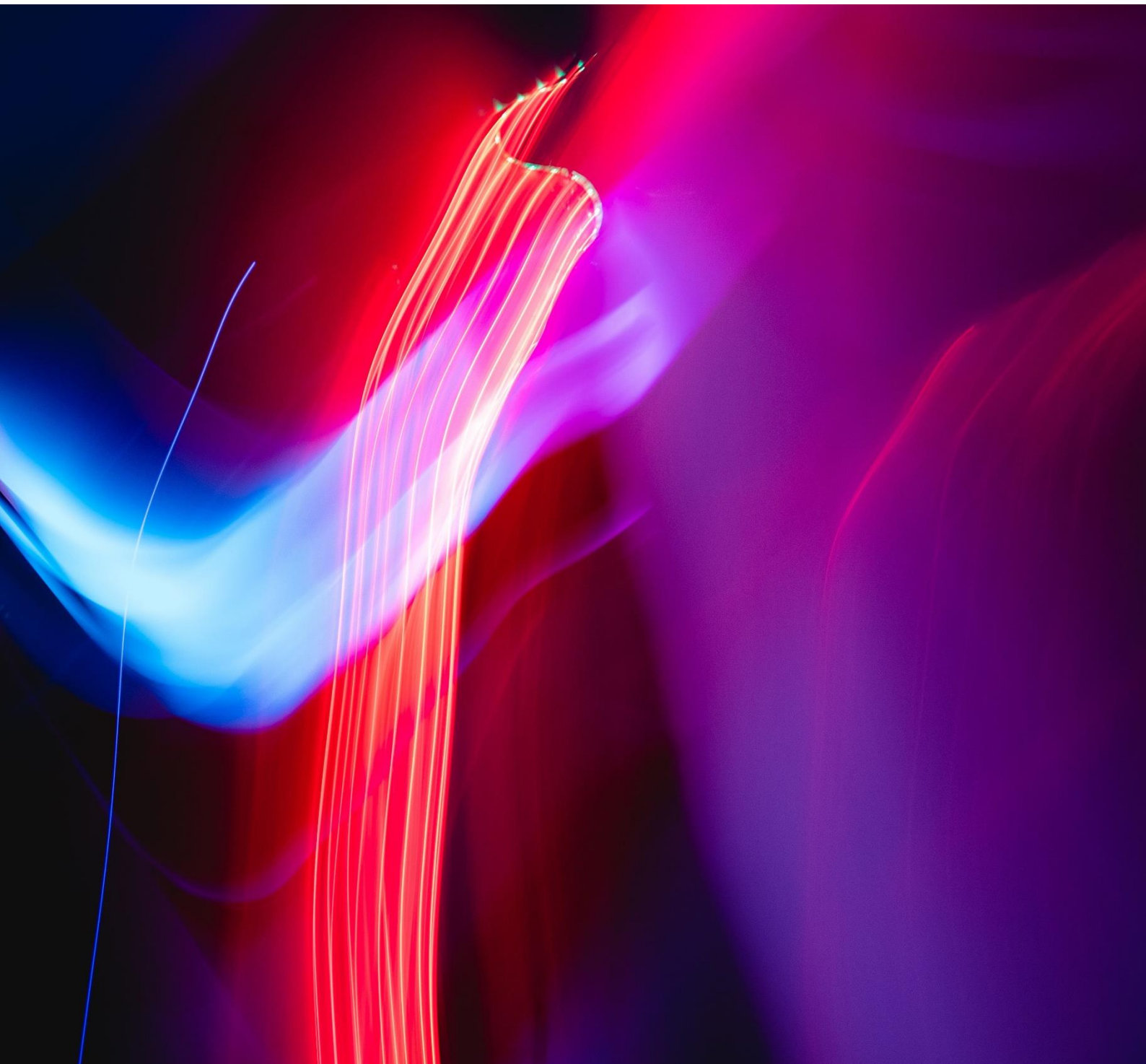
## II. In-depth Interviews

- The interview period: From September 15, 2021 to October 20, 2021

Stakeholder	Sample Requirements	Number of Interviewees	Methodology
Domain Name Registrar	-	3	Telephone call/Online telephone call
IP Registrar	-	2	Online telephone call
Taiwan CERT/CSIRT Alliance	-	2	Online telephone call
foreign CERT	-	1	Online telephone call
ICANN and APNIC	International organizations responsible for administering internet resources	3	Online telephone call
Relevant Government Agencies	Points of contact with frequent operational engagement	3	Telephone call/Online telephone call/Email



# Chapter II. Operational Overview



## Chapter II. Operational Overview

2021 marks the third year of TWNIC operation after it took over TWCERT/CC. The annual stakeholder survey has also been conducted for the third time. After performing a holistic check on the organization's skills and abilities in the first year, working on brand positioning and building the service framework in the second year, this year's goal is to proactively increase the brand value as well as scaling up the service capacities and communities.

The survey finds the stakeholders fairly satisfied with the performance of TWNIC and TWCERT/CC in the past year. As the services have been preemptively prepared, the regular service provision and business-related communications with stakeholders didn't suffer from any COVID-19 impact. There were no problems interacting with domestic or foreign stakeholders. With the active leadership style, TWNIC and TWCERT/CC are able to nurture their strength for technology interactions, improve the network stability and reinforce the security foundation. Moreover, the innovative way of holding hybrid events during COVID-19 has also impressed the international partners. Stakeholders from each category expect TWNIC and TWCERT/CC to proactively push forward each of their services in the next phase, increase their brand power and value, bring their influence to full play, expedite the digital transformation of network society and carry out the idea of whole-of-society readiness as a smart nation.

Strategies for TWNIC and TWCERT/CC suggested by the stakeholders two years ago were to undertake independent operations while complementing with each other for mutual benefits. However, the suggestions in this year's survey indicate that both organizations have complemented and supported each other well. For future business growth, the opportunities lie in the following aspects:

I. Optimizing services & interactions: The survey shows that both organizations haven't been affected by the COVID-19 outbreak. Stakeholders have rated the interactions/user experience/support as excellent. Both

organizations have also laid a solid foundation for online services and activities.

II. Proactively enhancing the brand image: The goal of the next phase is to continuously increase brand awareness, build brand value and create synergistic effect of both organizations. Specific goals to work on include increasing the visibility of ".tw/.台灣", promoting domain name awareness/education, advocating the necessity and increasing the incentive for industries to adopt IPv6, strengthening IP security of industries, making continuous efforts in security incident reporting/handling, info-sharing and security literacy education, persistently increasing brand awareness and actively pushing forward/promoting relevant services.

III. Scaling up connections/communities : The stakeholders encourage TWNIC and TWCERT/CC to foster active local communities and cultivate domestic/overseas community connections by reaching out to wider online communities in the core of industries or educational institutions, to initiate cross-field collaboration and establish ties among organizations of the same nature, to create brand synergy via new media forms, so that online communities from different industries can work together to strengthen Taiwan's cyber defense.

IV. Nurturing the strength of technical collaboration: Stakeholders from various fields have high expectations for TWNIC and TWCERT/CC to fulfill their requirement gaps with solid technical foundation and rich experiences in providing support. The expected achievements include assisting the industries in understanding the trends, domain/IP market training, domestic/overseas cyber defense know-how sharing etc. A certain international stakeholder also thinks TWNIC and TWCERT/CC can help other countries set up CERT and further expand the international communities by exporting the technologies, demonstrating the impact for opportunities to gain more discursive power.

# **Chapter III. Domain Name Registrar**





## Chapter III. Domain Name Registrar

This year the survey with domain name registrars were also conducted by having one on one in-depth interviews with 3 respondents.

- I. Close and streamlined online communications with minor COVID-19 impact

Even if the working model has changed during COVID-19, stakeholders have acknowledged TWNIC's excellent response and service deployment.

Communications and interactions are not affected by COVID-19 and the services are in operation as usual. Apart from that, stakeholders also wish to have more online events instead of physical ones.

- | *COVID-19 has no impact on how we work with TWNIC since everyone's working from home. We can say TWNIC has been well-prepared way ahead of time because they've long been accustomed to working from home and communicating remotely. Whenever an emergency came up, the handling process and speed of response were not affected.*
- | *I don't know what else I'd suggest for improvement because I have had not-so-well experience with other registries. So everything is really well done, with well-documented info and tech services. We also had no problems during COVID-19.*

- II. The system's operational process is to be optimized, and the status inquiry platform is to be built

There's not much of a problem with the basic features of system alignment, but I hope the operational process can be optimized, such as perfecting the current user interface. We are also concerned about the continuous impact of aging systems. Service efficiency and the status inquiry process can be enhanced, so we suggest building a status inquiry platform to reduce manual efforts. We also hope there's an official announcement specifying the number of working days of each process, so we can show our clients.

On the other hand, foreign stakeholders mentioned that system maintenance notice is usually sent via email, but it would be helpful to have it published on the website to indicate maintenance description and relevant information.

| *With respect to the operation, everyone's thinking about how to optimize the system/operational process. There's no problem with the alignment right now, but there might be more to work on and it would require more allocated resources.*

| *I think the issue lies in the registrar's user interface, which needs to be more comprehensive. Now the UI is made available for general users or guests. One cannot address the issue immediately if s/he is not a tech person.*

| *So I have not checked the website yet but as soon as I checked, I found there was no maintenance info on the website. I think it would be nice to have info on when the maintenance will take place when I visit the website.*

### III. Push forward domain name education with stronger marketing strategies and create brand value

Stakeholders wish TWNIC to continue the market education of domain names, so as to increase the importance and quality of ".tw/.台灣". Moreover, promotion and marketing should be done more effectively. Stakeholders mentioned that although the current image ad gives a comprehensive brand presentation, the click through rate is relatively low. Therefore, it's important to focus on marketing strategies on top of proactive training.

| *Domain names are the early-stage product, which is rather simple. In terms of its demand and supply, TWNIC should be able to play the role as a promoter and decide whether to expand its market or raise issues for discussion, and how it should reach potential clients.*

| *No matter how .tw is presented, it will be intuitively perceived as a regional domain name and therefore a lot of clients ask whether .tw is of effective use or not. That's why we suggest TWNIC to have a holistic description on .tw.*

### IV. Continue to hold events to maintain interactions among entities in the industry, and to improve the result of online tech training

Stakeholders have highly recognized the knowledge-sharing event/seminar series because they can learn about the latest news and exchange information with others in the industry. They also look forward to info-sharing events about international trends and experiences.

| *Actually, I made it to APNIC finally. I participate in APNIC events regularly. ICANN itself requires actual exchange of information like this. I think it is quite useful because it allows enterprises/industries to learn more about how domain name works.*

As to shifting from physical to virtual events during COVID-19, stakeholders believe the limitation of successful tech training results is to be overcome and it's necessary to rethink and design future tech training courses. Moreover, the nature of online events works well with making arrangements for fragmented time. With the event agenda/content split into a one-hour or two-hour session, participants are allowed to join freely as they wish. This model is also likely to attract more participants who are only interested in one single session or a particular topic.

- | *We need to think how to leverage tech and organize effective events. And the best solution is to use virtual conference room and have Q&A sessions online.*
- | *When we split the online meetings into 1 or 2 hours per day, clients are less stressed with shortened sessions. This is becoming the trend and we are organizing our future events as a series of short sessions.*

#### V. Review social media strategies, determine target audience and segmentation

Since TWNIC hasn't attracted enough attention on social media, domain name registrars suggest revisiting its social media strategies and determine the right target audience and segmentation, so that information can be presented and delivered in a proper and yet interesting way to increase exposure.

- | *Honestly I don't check their Facebook page. I am not that interested so I don't follow them closely. What you have said is about how the outside world look at them. Unless the comments are for registrars, which is me, then I will check them.*



VI. Have an adaptive business model and follow the trends, flexibly  
adjust the domain name policy

Additionally, one of the stakeholders expects flexibility in the policy for available domain names. For now, registrants are only allowed to pick either .com.tw or .tw. In case one's preferred wording has been chosen or in the event of cybersquatting, it would be useful to have more domain name options such as .net.tw and .org.tw

International stakeholders mentioned the best duration for a marketing promotion is 3 to 9 months. Considering the time the marketing team needs to invest in the campaign and material preparation, if the duration is too short, there won't be much time left for the actual campaign after the preparation is done.

| *TWNIC has set out rules for choosing .net.tw and .org.tw, but business owners wish such limitation can be removed because it's of little significance.*

| *If the registry comes to us and tells us that we are going to have a promotion for two weeks, it doesn't make much sense because I will need to go to our marketing team first. Next, they need to prepare for everything. And then we need to make an announcement. Until we are done, the promotion is gone. So, we are only interested in long-term promotion. So if we see that promotion is only a month long or something like that, in most of the cases, we will not take part in it because we also need time for preparation.*

# **Chapter IV. Domain Name Registrant**

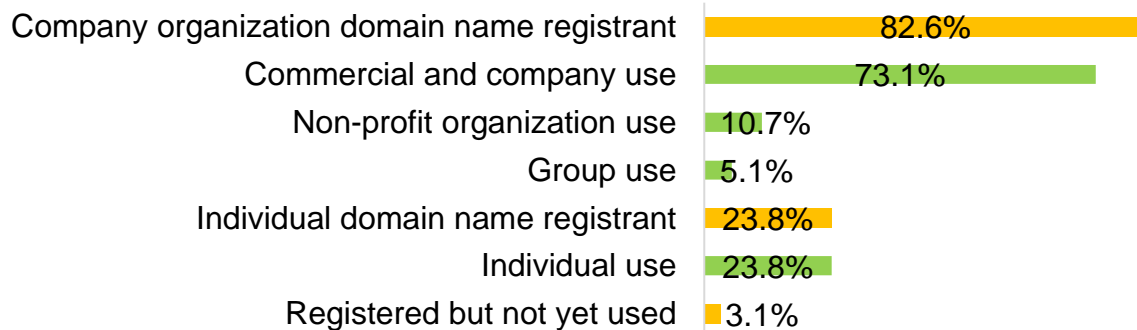


## Chapter IV. Domain Name Registrant

### I. Summary of Implementation

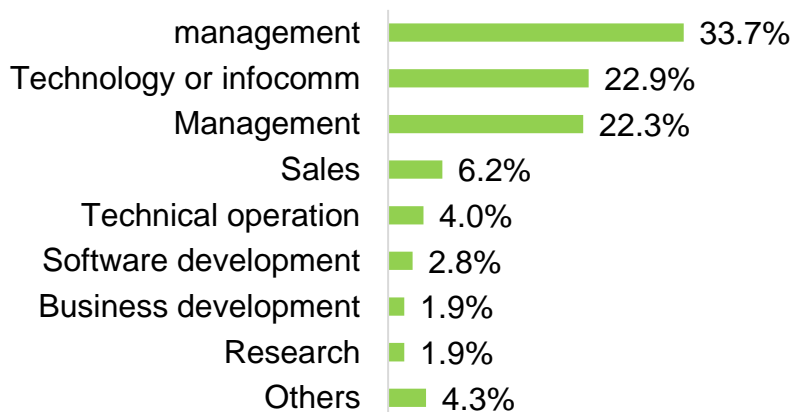
A total of 82.6% of registrants in this survey were "company and organization domain name registrants", 23.8% were "individual domain name registrants", and 3.1% were "registered but not used", indicating that the use by companies and organizations remain the majority. In addition, for respondents within the "company and organization domain name registrants" category, follow-up inquiries revealed that 33.7% of the respondents were "directors, general managers, CEOs and other management-level executives", while "technical, IT" and "general management" made up more than 20% each, indicating that the survey was completed by management or technical personnel, which can effectively reflect the opinions related to the use of the service.

### Uses of domain name registration n=391



Source: Online Survey (2021)

### Departments n=323



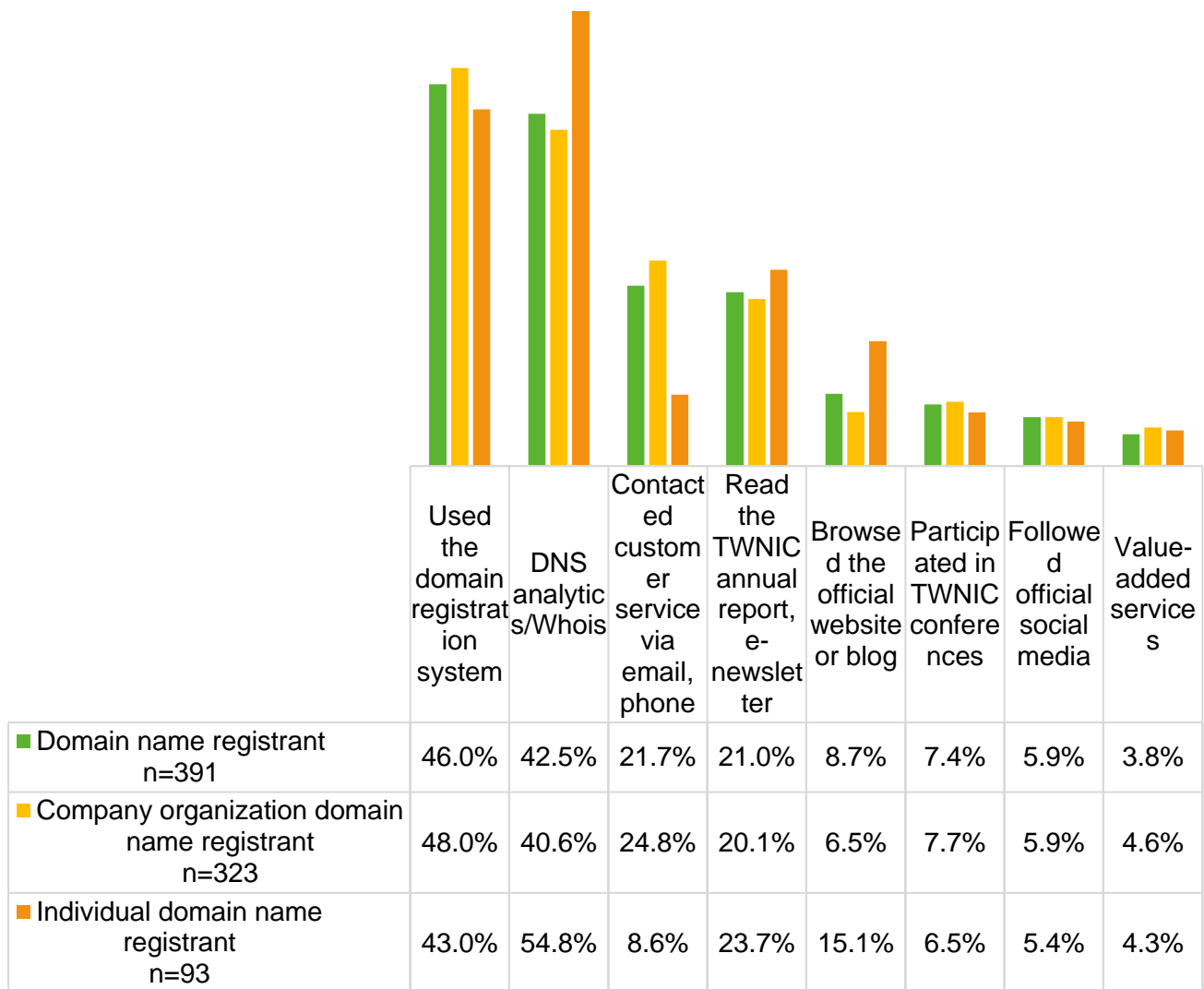
Source: Online Survey (2021)

A total of 64.5% of respondents were "primary applicants or decision-makers", 28.1% were "participants in applications or decisions", and 7.4% were neither, indicating that this survey can cover the interactive point of contacts that understand current service use and evaluation.

## II. Service Usage Rate

The survey asked domain name registrants about their usage based on various services provided by TWNIC. It analyzed the variances in usage between "company and organization domain name registrants" and "individual domain name registrants". Overall, the most frequently used service was the "Domain Name Registration System" (46.0%), with a slightly higher usage rate for company and organization domain name registrants. The next most frequently used service was the "DNS resolution service/Whois" (42.5%), which individual registrants more frequently used. The usage rate for "telephone, e-mail, and web-based customer service" was 21.7%. The usage rate among company and organization domain name registrants was significantly higher than that for individual domain name registrants. The

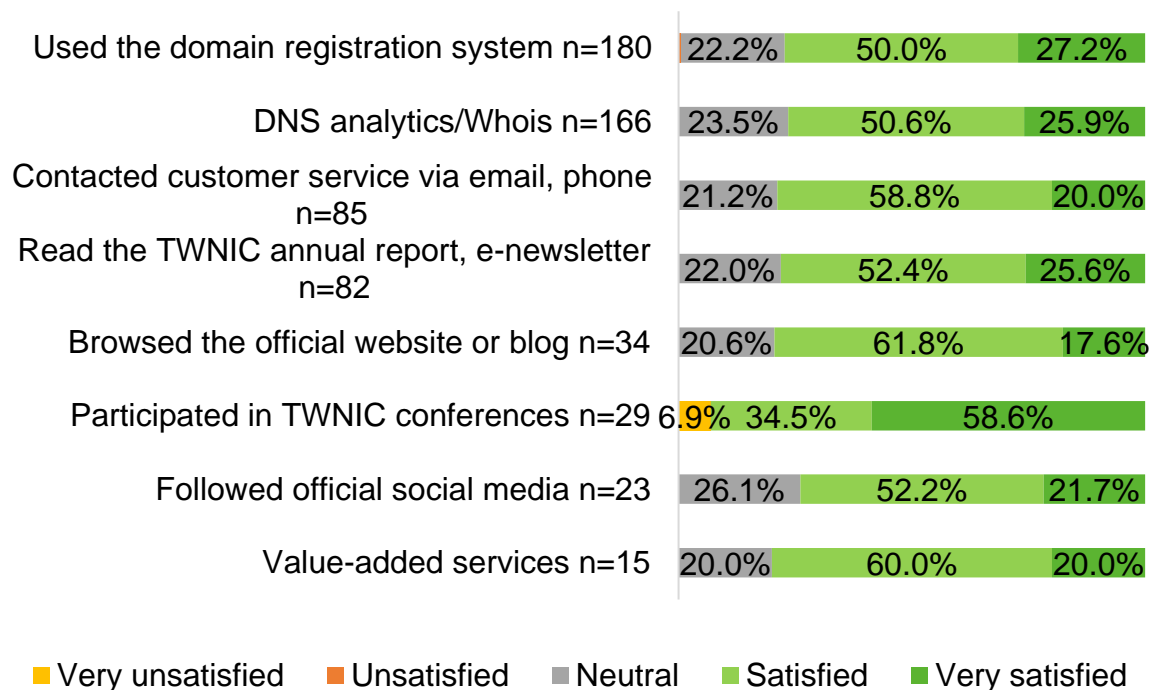
usage rate of "reading TWNIC's Annual Report, e-newsletter" was also 20%, with the usage rate among individual domain name registrants slightly higher.



Source: Online Survey (2021)

### III. Satisfaction of the Primary Services

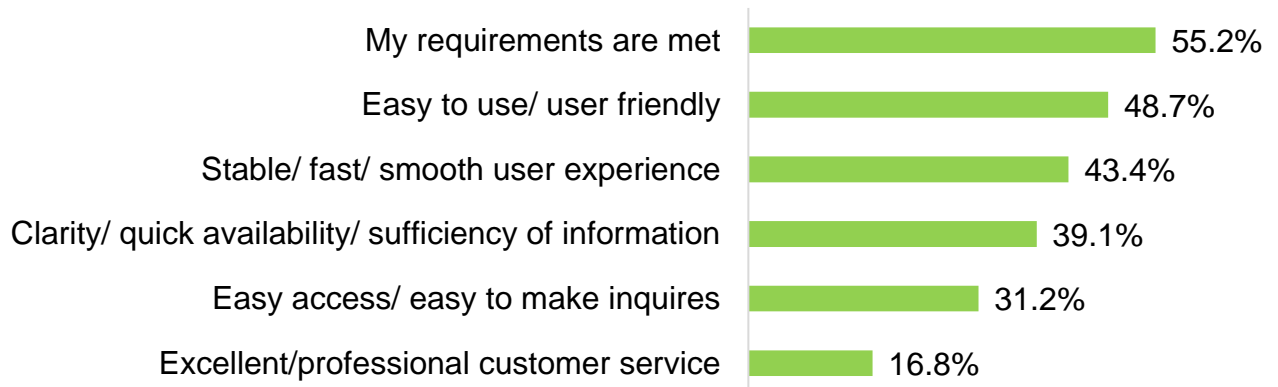
The highest satisfaction rate was "participation in TWNIC seminars" (93.1%). Although the usage rate was not high, most participants were satisfied with the seminars. This is followed by the satisfaction rate of "value-added services" at 80.0%, although the usage rate is not high as well. The satisfaction rate of "browsing the TWNIC's website and blog" was 79.4%, with the highest percentage of 60% saying they were satisfied with this service. The satisfaction rate for "telephone, e-mail, and online customer service" was 78.8%. The satisfaction rate of "reading TWNIC's Annual Report, e-newsletter" was 78.0%. The "Domain Name Registration System" was the most used service, with a satisfaction rate of 77.2%, with 50% of the respondents satisfied with the service. The second most used service, "DNS resolution service/Whois", received a satisfaction rate of 76.5%.



Source: Online Survey (2021)

The highest percentage of respondents were satisfied with the service for the reason of "meeting demand" with 55.2%, "easy/convenient operation" with nearly 50%, "stable/fast/smooth use" with 43.4%, and "clear/quick information/sufficient information" with 39.1%.

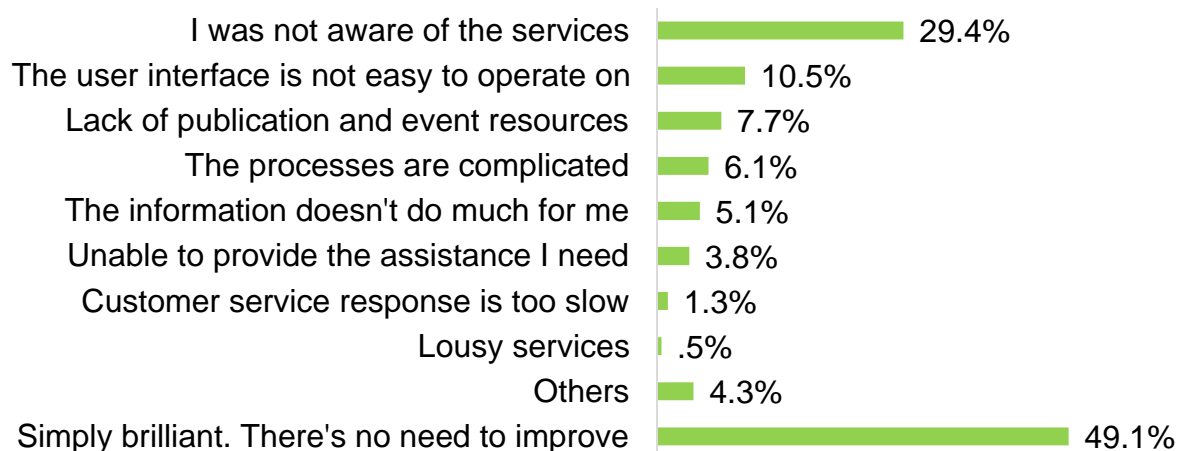
### Reasons why the service you used is [great] n=279



Source: Online Survey (2021)

All domain name registrants were asked what service experience could be improved. As many as 50% said the current level and scope of services is satisfactory. Another 30% said, "I didn't know services were available", suggesting that more promotion should be done to enhance the awareness of the services available. 10% responded that "the interface is not easy to operate", suggesting the user interface can be adjusted to make it more intuitive to operate and enhance user experience.

### Service improvement directions n=391



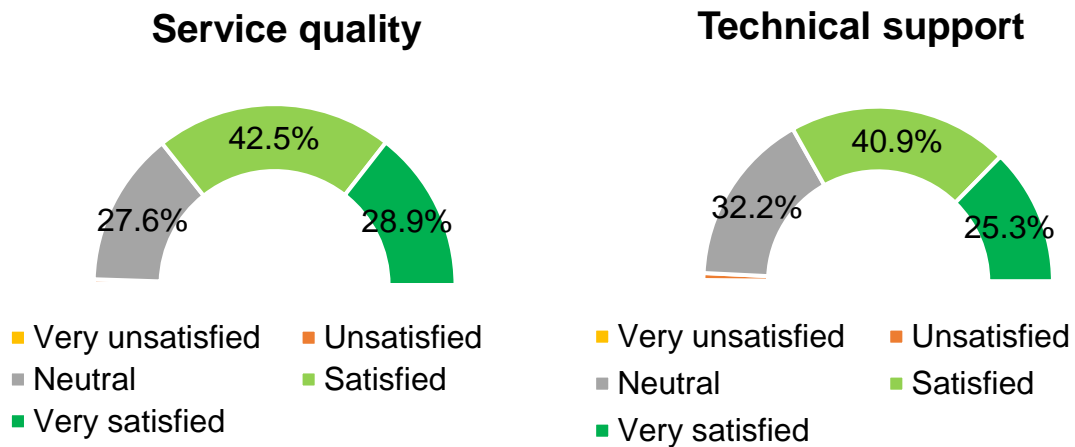
Source: Online Survey (2021)

#### IV. Evaluation of the Overall Satisfaction and Value Perceptions

In terms of domain name registrants' overall satisfaction with TWNIC, more than half of the registrants rated "quality of service" and "technical support" positively, including 71.4% who were satisfied with the "quality of services" provided by TWNIC and 66.2% who were satisfied with the "technical support" provided.

In terms of the satisfaction level of "company and organization domain name registrants" and "individual domain name registrants", "individual domain name registrants" consistently gave better satisfaction scores, with 76.3% overall positive rating among "individual domain name registrants" and 70.6% overall positive rating among "company and organization domain name registrants" for "quality of service" indicators. For the "technical support" indicators, 72.0% of "individual domain name registrants" gave a positive rating, while 65.3% of "company and organization domain name registrants" gave a positive rating.

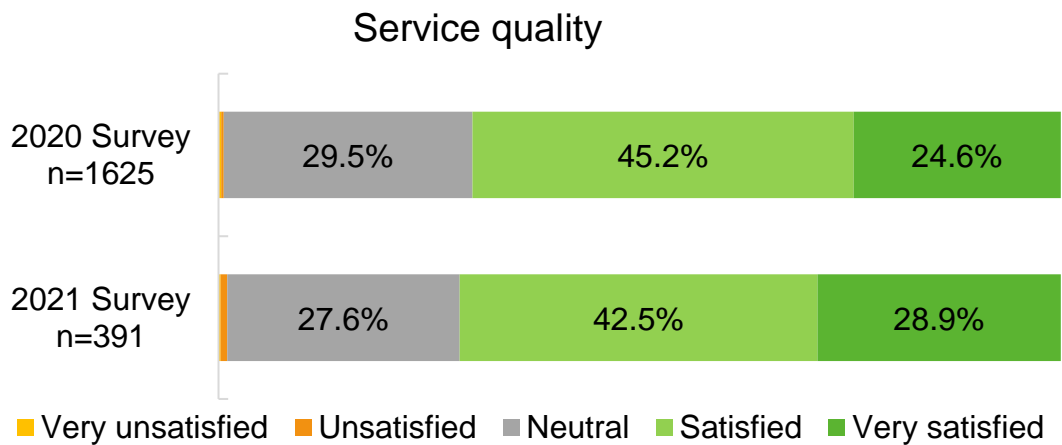




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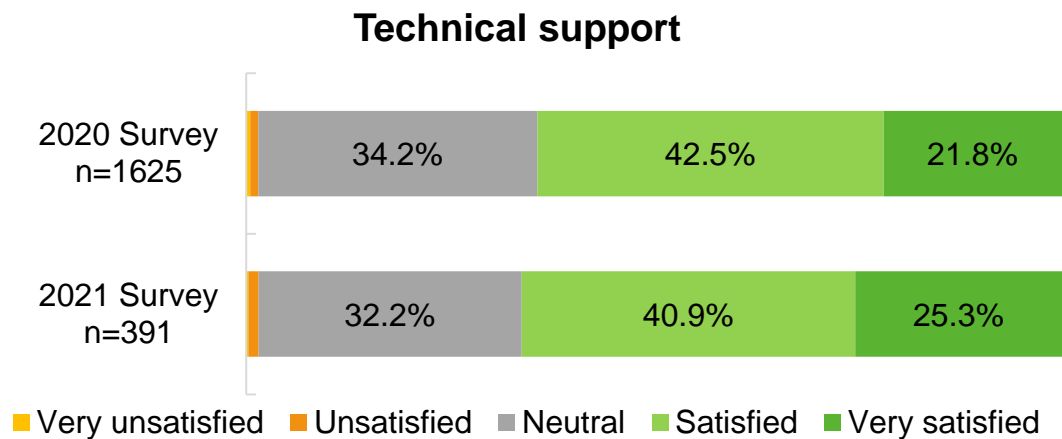
Source: Online Survey (2021)

Satisfaction with the quality of service this year was 71.4%, up 1.5% from 69.8% last year.



Source: Online Survey (2020/2021)

Satisfaction in technical support also increased by 1.9% from 64.3% last year to 66.2%.

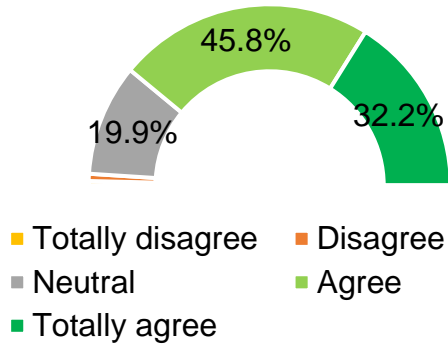


Source: Online Survey (2020/2021)

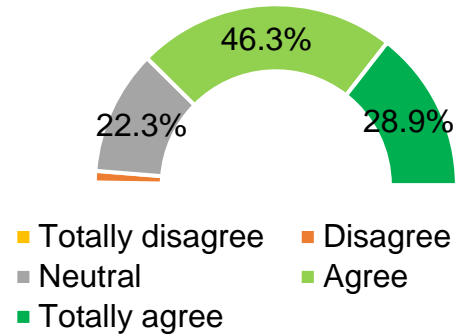
In addition to overall satisfaction, the evaluation indexes of trustworthiness and service value were also added. "I trust TWNIC" was confirmed by 78.0% of respondents, and 75.8% agreed that "the services provided by TWNIC are valuable to my business".

There is no significant difference in the level of trust between company and organization domain name registrants and individual domain name registrants, 78.0% of company and organization domain names were satisfied. In comparison, 77.4% of registrants of individual domain names were slightly less satisfied. There is no significant difference in the level of service value among different registrant categories, with a slightly higher percentage of individual domain name registrants indicating "I totally agree".

### Trust to TWNIC



### Value of TWNIC service

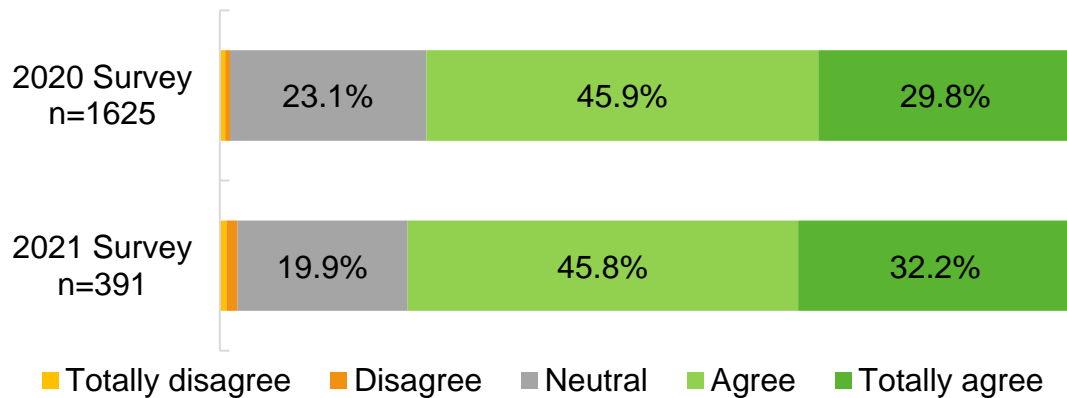


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Source: Online Survey (2021)

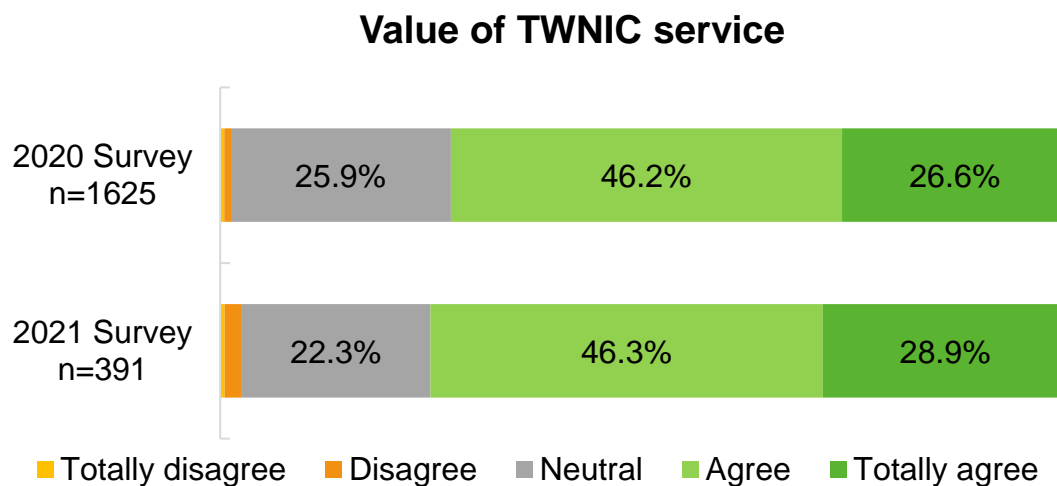
The trustworthiness increased by 2.3% compared to last year, from 75.8% last year to 78.0% this year.

### Trust to TWNIC



Source: Online Survey (2020/2021)

The value of services has increased the most compared to last year, with 75.2% this year, up 2.4% compared to last year.

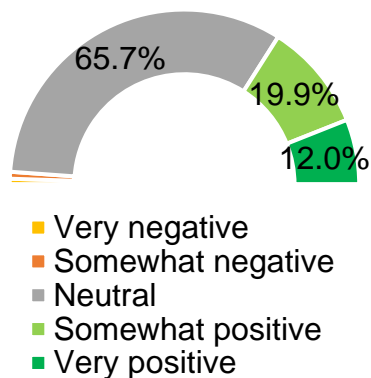


Source: Online Survey (2020/2021)

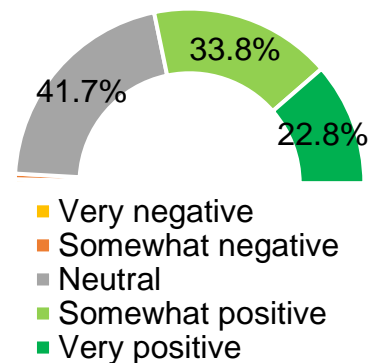
## V. Influence from Activities

Most of the respondents do not think that TWNIC's various domain name-related activities impact companies/organizations. The highest percentage of positive impact is "free registration of new company domain name" (61.1%), followed by "free registration of .tw/.台灣 domain name offers internationalized domain name IDN registration service" with 56.5% indicating a positive impact. Individual domain name registrants believed the activities had a higher positive impact, while "at.tw Domain Name Experimental Program Service" and "Domain Name Reserved Text Auction" had a positive impact of about 30%, respectively.

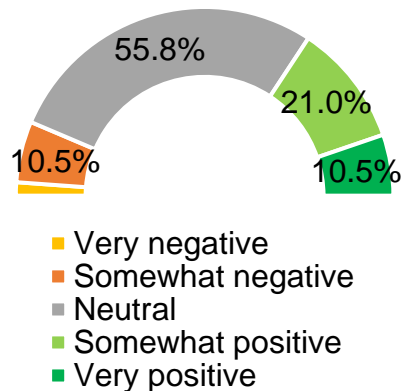
### Experimental service of at.tw: customized quick redirects



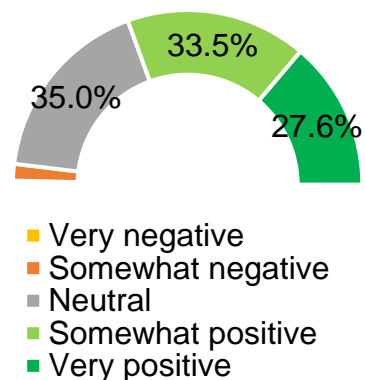
### IDN registration service for 「.tw/.台灣」



### Allowing reserved words of domain names for auction



### Free registration of new company domain names

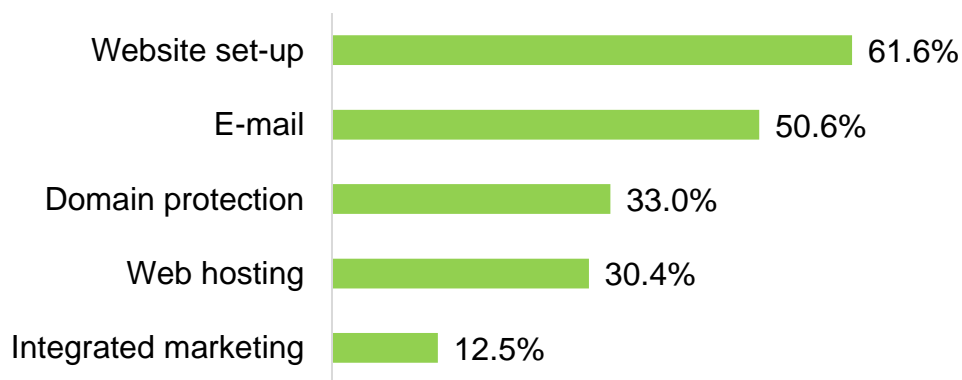


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Source: Online Survey (2021)

## VI. Business Development Needs and Supports

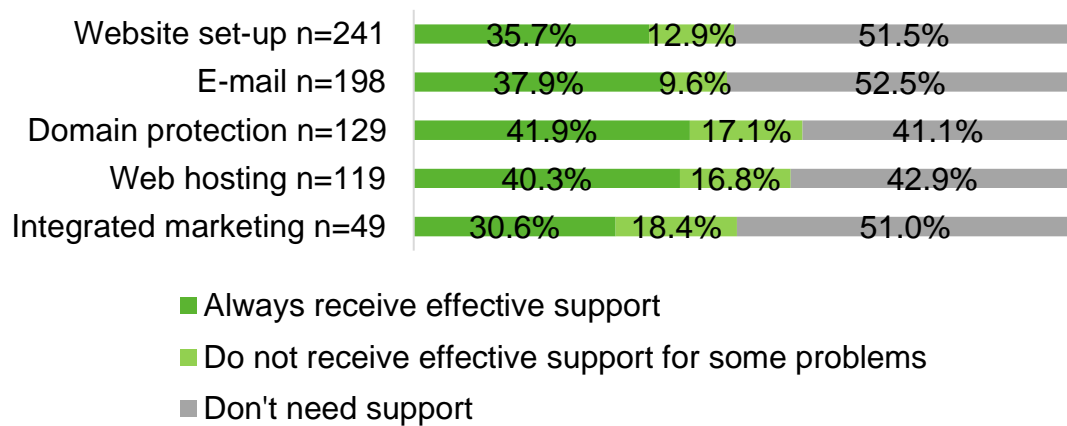
From the actual use of [.tw/.台灣 domain names], "website creation" is the service with the highest usage rate of 61.6%, followed by "e-mail" with 50% usage rate, "domain name protection" and "website hosting" with 30% usage rate respectively, and "integrated marketing" with less than 20%. In setting up websites, the usage rate by "individual domain name registrants" is higher than that of "company and organization domain name registrants". In comparison, the usage rate of all other services is higher for "company and organization domain name registrants".



n=391

Source: Online Survey (2021)

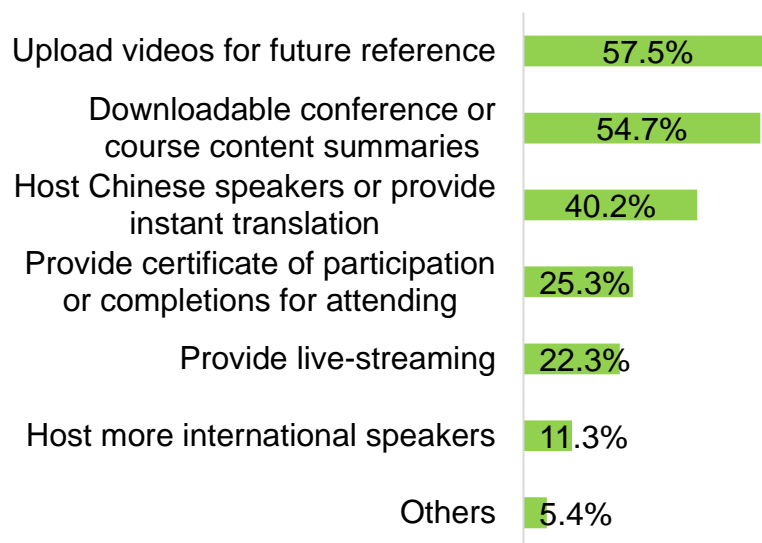
The next question was about the support services for those who have used [.tw/.台灣] domain name related services, the percentage of those who needed support for "website creation", "e-mail", and "integrated marketing" services was relatively low, with only about 50% of them needing support respectively. The percentage of respondents who received effective support for "e-mail" services is the highest among these three services at 37.9%. In addition, 60% needed support for either "domain name protection" or "web hosting" services, and 40% of respondents indicated they received effective support for both services.



Source: Online Survey (2021)

## VII. Participation in Events and Expectations and Preferences

In terms of future expectations for the event, "providing online video playback" (57.5%) topped the list, followed by "downloadable forum or course content presentations" (54.7%). 40% of registrants expect "more Chinese language lecturers or instant translation services", with a higher percentage of company and organization domain name registrants requesting the services than individual domain registrants.



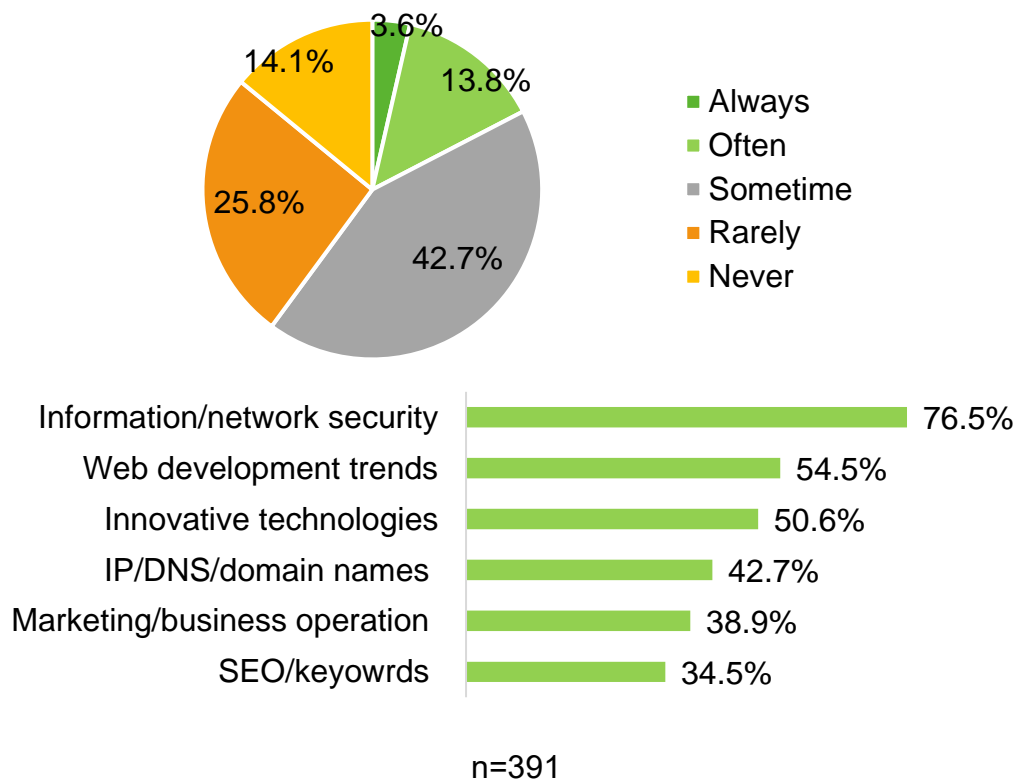
n=391

Source: Online Survey (2021)



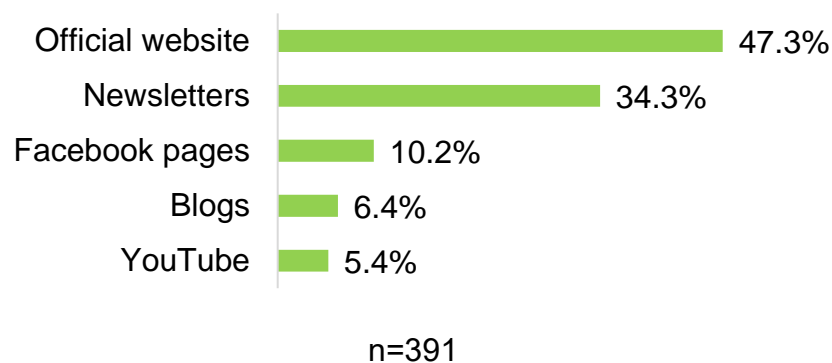
## VIII. Information Service

The level of registrants' attention to the Internet issues released by TWNIC was relatively low, with 47.2% responding they were "occasionally concerned" and 25.8% "rarely concerned". As for the issues they were looking forward to in the future, 76.5% want to know more about "information security/network security" related issues, and 50% want to know about "network development trends" and "innovative technology issues" (such as 5G, Internet of Things, AI, etc.). This indicates that domain name registrants are more interested in information and new trends in information security this year.



Source: Online Survey (2021)

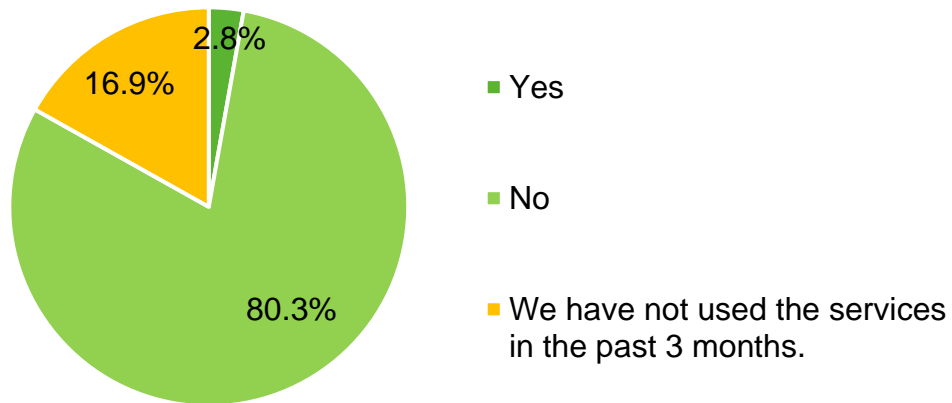
The highest percentage of respondents obtained domain name related information through "search engines" with 57.8%. The next highest percentage was "official website" with 40%. "News websites", "social networking sites", "e-newspapers" and "forums" have 20% each. The respondents were asked about the preferred source of information of TWNIC: "official website" with nearly 50%, "e-newsletter" with 34.3%, and "Facebook fan group" with 10%.



Source: Online Survey (2021)

## IX. Impact of COVID-19

In the past three months, only 2.8% of respondents' companies/organizations have been affected in their use of domain name related services. The impacts mostly involve network issues resulting from DDoS, URL transfer, and DNS hosting. Some respondents also reported a decrease in traffic and customer demand.

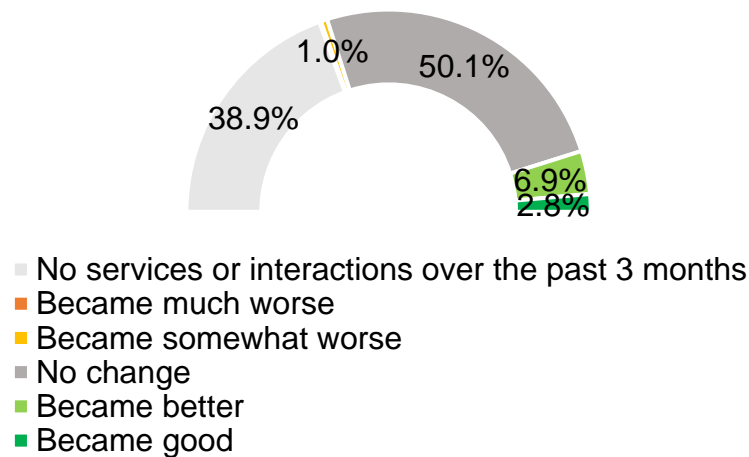


n=391

Source: Online Survey (2021)

About 40% of domain name registrants indicated that they had not used the service or interacted with TWNIC in the past three months, and 50% of them thought that the service provided by TWNIC had not changed in the past three months, indicating that TWNIC services were in place during the Epidemic Alert Level 3.

### Service experience over the past 3 months

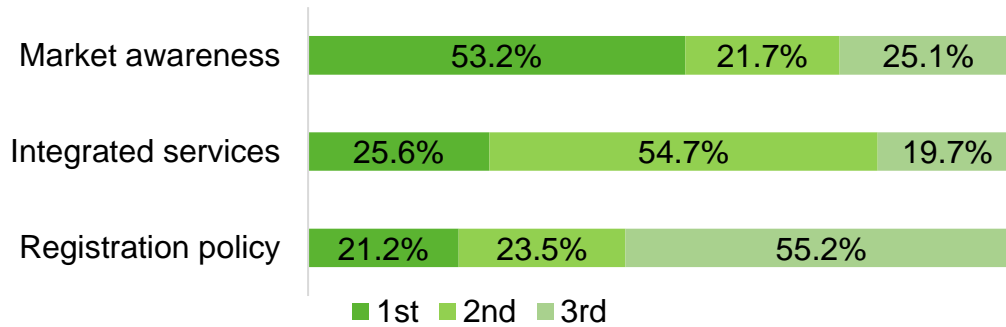


n=391

Source: Online Survey (2021)

## X. Expectations and Recommendations

More than half of the registrants believe that the priority of improvements for .tw/.台灣 ccTLD is "market awareness" (53.2%), followed by "integration services" (25.6%).



n=391

Source: Online Survey (2021)

### (I) Market Awareness

More than 40% of respondents who chose to prioritize improving market awareness indicated "increase exposure/not enough awareness/marketing", and .tw/.台灣 ccTLD is less well known and needs more exposure, marketing, and advertising to make more people aware of the advantages of .tw/.台灣. In addition, 16.3% of the respondents believed that the .tw top-level domain name should be "internationally recognized", and that .tw is not well-known enough on the international stage, and that the international community should know that .tw represents Taiwan, with many recommending that it should be open for application by foreign companies.

## (II) Integration Services

For respondents who indicated “integration services” were a priority for adjustment, 20% of them said that "more comprehensive service/integration services" is the first priority. They responded that the domain name related data and information are fragmented. They hoped TWNIC could help integrate the related data or provide the service together with the relevant partners to provide more comprehensive support. As for respondents who chose "one-stop website/easy interface/more intuitive operation", 13.0% of the respondents suggested that it can be completed in one-stop so that more time can be saved for setting without looking for other resources.

## (III) Registration Policies

The highest percentage of respondents who chose “domain name registration policy needs to be adjusted” hoped for "registration process optimization". They indicated that the convenience and transparency of registration are very important. The process should be more convenient and clear for the service to be more efficient. Next, 13.3% of the respondents who chose "domain name squatting/domain name dispute" indicated that to avoid the appearance of similar domain names and confuse the general consumer's awareness, they hoped for more protective measures for fair use. There is also mention of the controversy of whether nationals or companies can only apply for .tw to avoid illegal use; and that companies should be given priority in registering domain names so that others do not rush to register first, resulting in the need to acquire the domain name at a high price.

# Chapter V. IP Members

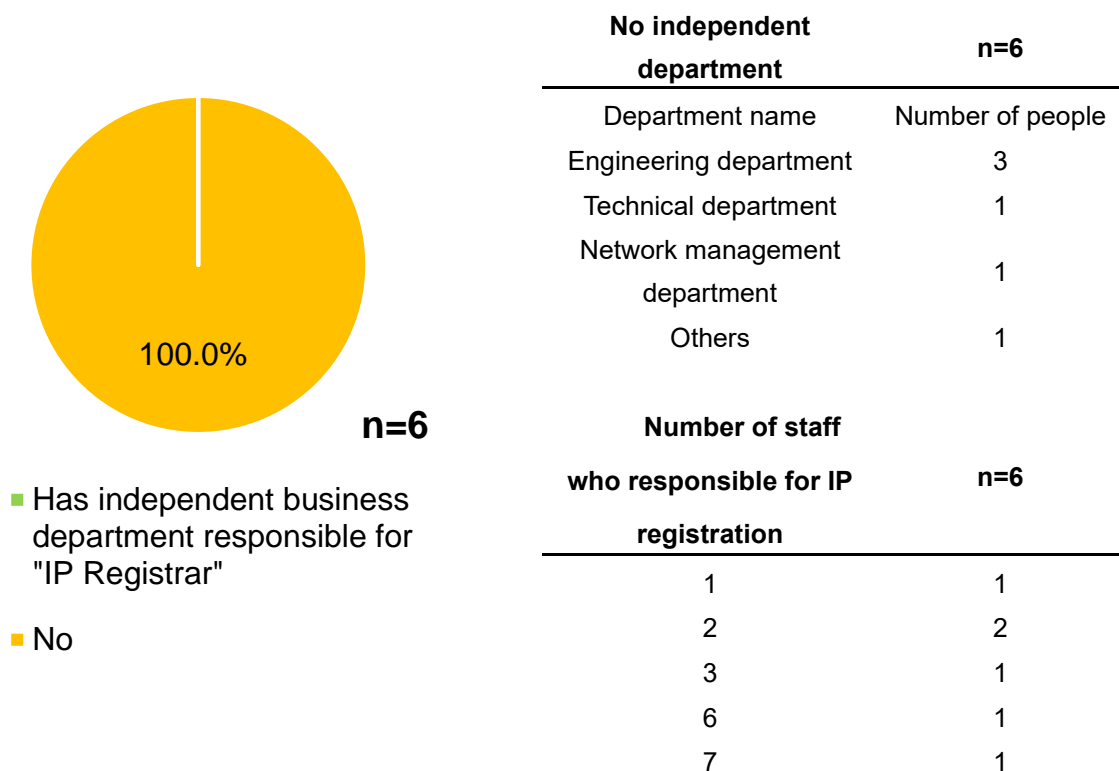


## Chapter V. IP members

### I. Summary of Implementation

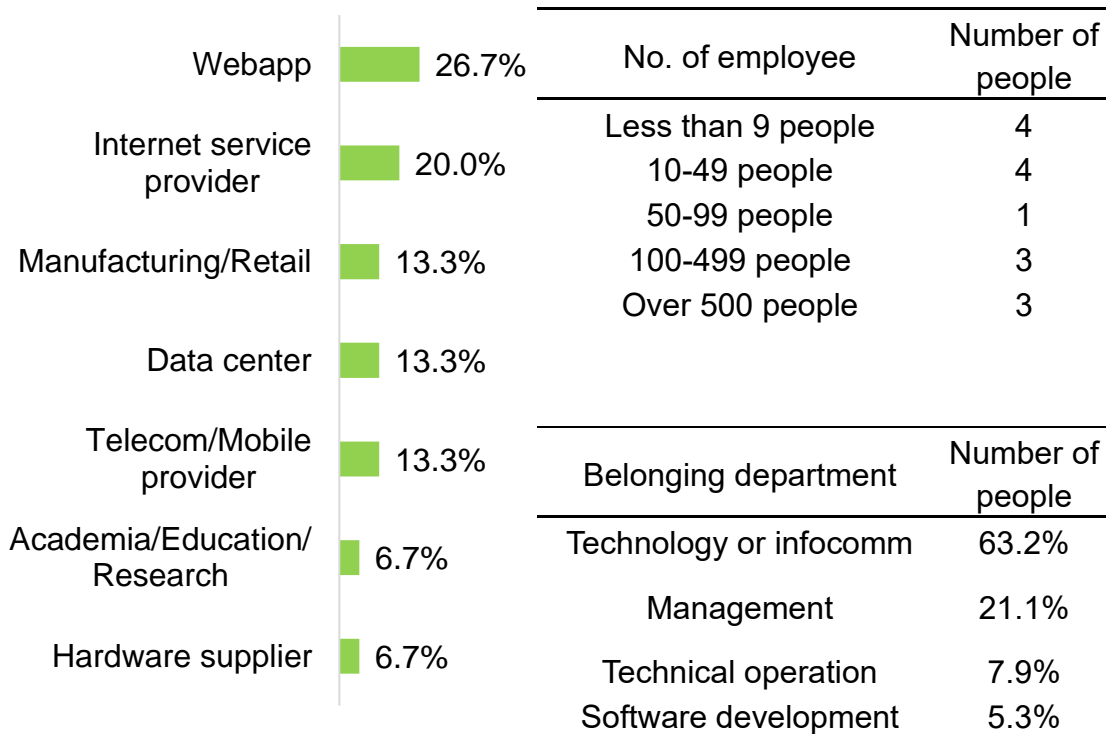
For IP member questionnaires, IP registrars and Non-IP registrars users were invited to fill in the questionnaires by e-mail invitation only, with 21 valid questionnaires collected. The first question asked members on their intended use for IP applications. It was divided into "Non-IP registrar" who "apply for their own use" and "IP registrar" who "apply for IP and distribute it to other companies/units for use", and the ratio of the two was 7 to 3. The majority of the respondents in this survey were "Non-IP registrars".

IP Registrars 28.6%



Source: Online Survey (2021)

## IP Registrants 71.4%



n=15

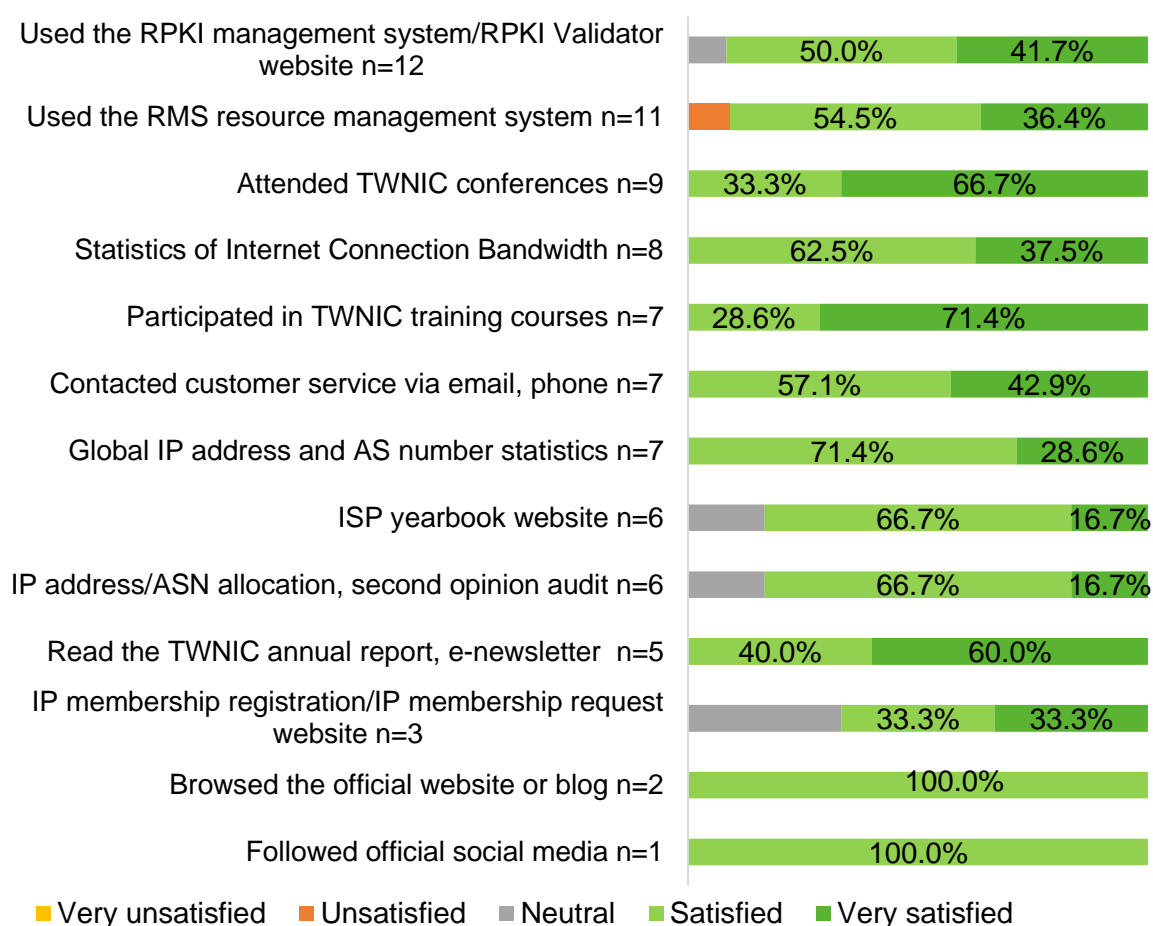
Source: Online Survey (2021)

Most of the services of TWNIC were positively evaluated, respondents who chose "satisfied" or "very satisfied" indicated 100% satisfaction with "participation in TWNIC seminars", "connection bandwidth survey", "participation in TWNIC education and training", "contacting customer service by phone or e-mail", "global IP address and AS number statistics", "reading TWNIC's Annual Report and e-newsletter", "browsing TWNIC's website and blog", and "following TWNIC's social media posts". The "RPKI Management

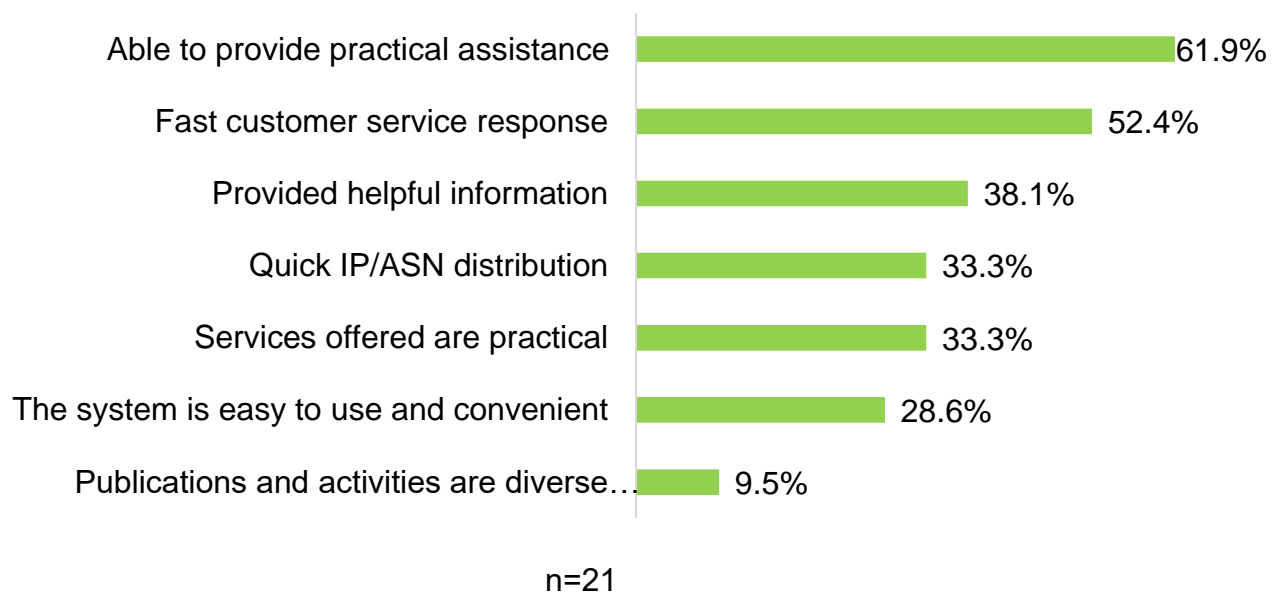


System/RPKI Validator Website" and "RMS Resource Management System" had the highest usage rates, and each had a 90% satisfaction rate. The satisfaction rate of "ISP annual authentication website" and "IP address/ASN issuance and Second Opinion audit" were both above 80%. The satisfaction rate of "IP member registration/IP membership application website" was only 66.7%, while the remaining 33.3% of respondents all indicated "average" satisfaction.

Source: Online Survey (2021)



Among the reasons for positive satisfaction with the service, 61.9% of the respondents indicated TWNIC was "able to provide practical assistance", more than 50% indicated TWNIC had "fast customer service response", and about 40% indicated TWNIC was "helpful in providing the information shared". The percentages of "fast IP/ASN distribution " and "useful services provided" were 33.3% each.

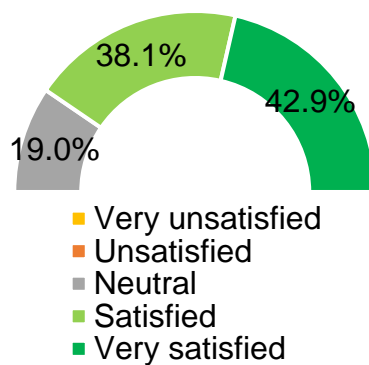


Source: Online Survey (2021)

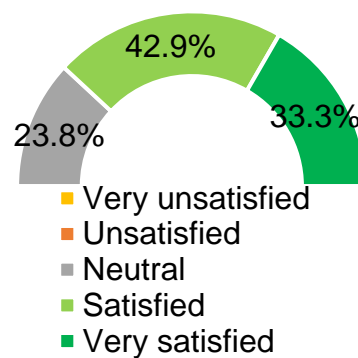
## II. Evaluation of the Overall Satisfaction and Value Perceptions

The overall satisfaction rate of IP members on TWNIC falls into the average and positive categories. The satisfaction rate for "IP Distribution Service" was 81.0%. The satisfaction rate of "service quality" was also 81.0%. The satisfaction rate of "technical support" was 76.2%, more than the other two indicators.

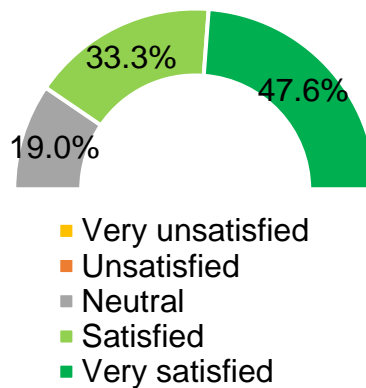
### Service quality



### Technical support



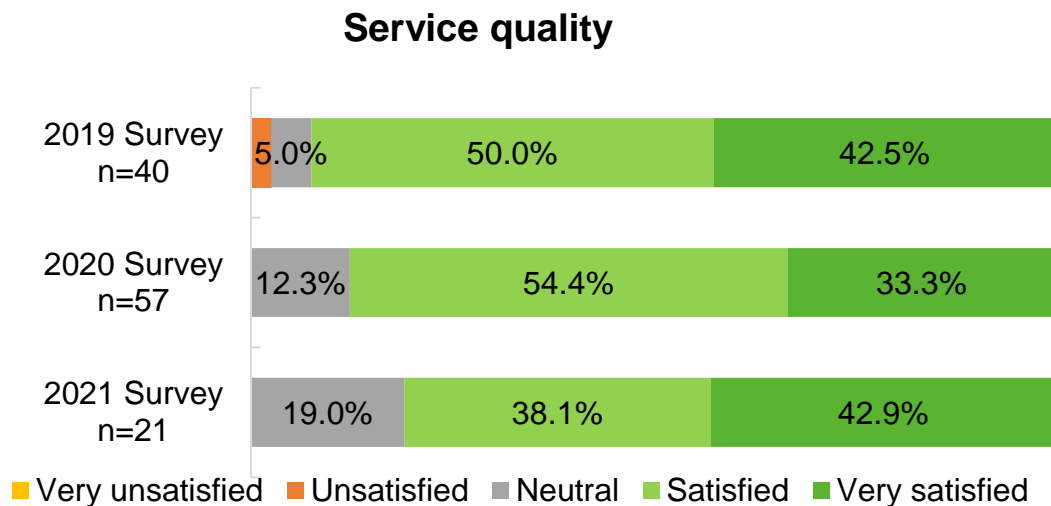
### IP address allocation



n=21

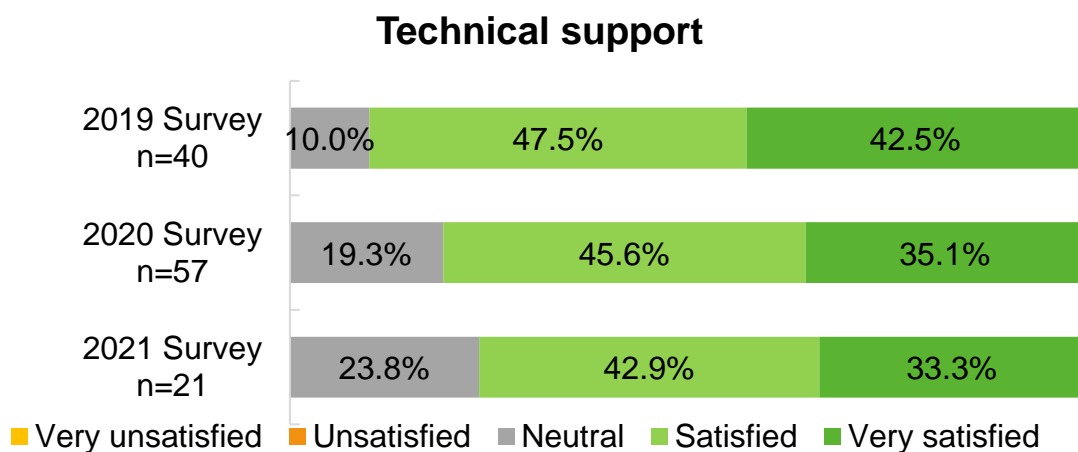
Source: Online Survey (2021)

The satisfaction rate of service quality stood at 81.0%, down 6.8% from 87.7% last year, and the percentage of "very good" rating this year was the highest ever.



Source: Online Survey (2019/2020/2021)

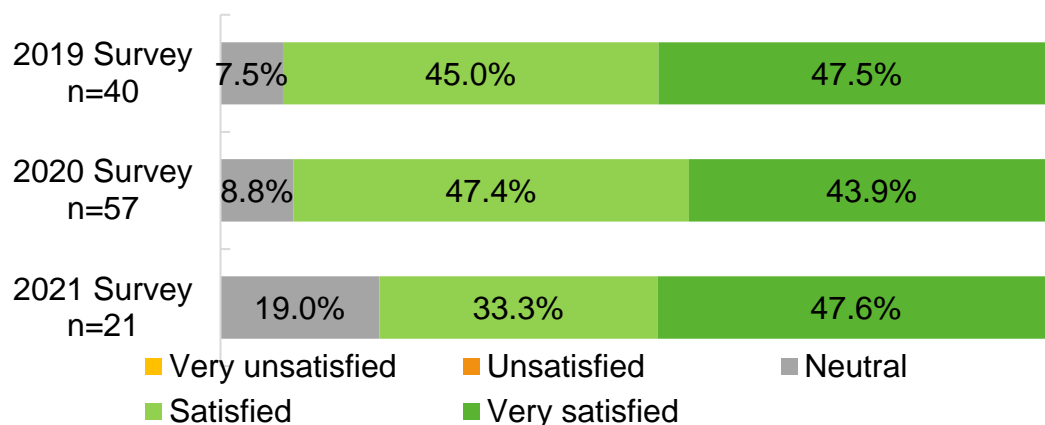
Last year, the satisfaction rate of technical support was 80.7%, but this year, it dropped by 4.5%, with a satisfaction rate of only 76.2%. The satisfaction rate of technical support has been decreasing over the years, and the percentage of those who chose "average" has been increasing every year.



Source: Online Survey (2019/2020/2021)

The satisfaction rate of IP distribution service this year is 81.0%, down 10% from the previous year. The percentage of those who chose "average" this year also grew most significantly, while the percentage of those who chose "very good" this year was the highest.

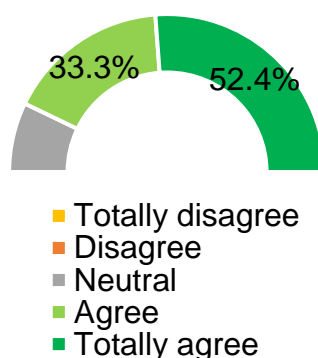
### IP address allocation



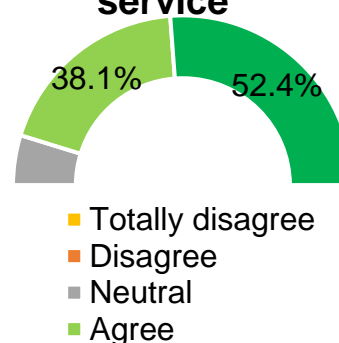
Source: Online Survey (2019/2020/2021)

Both trust and value perception indicators performed better than overall satisfaction. More than half of the respondents chose "very good", with a trustworthiness level of 85.7%, and the value of the service was even as high as 90%.

### Trust to TWNIC



### Value of TWNIC service

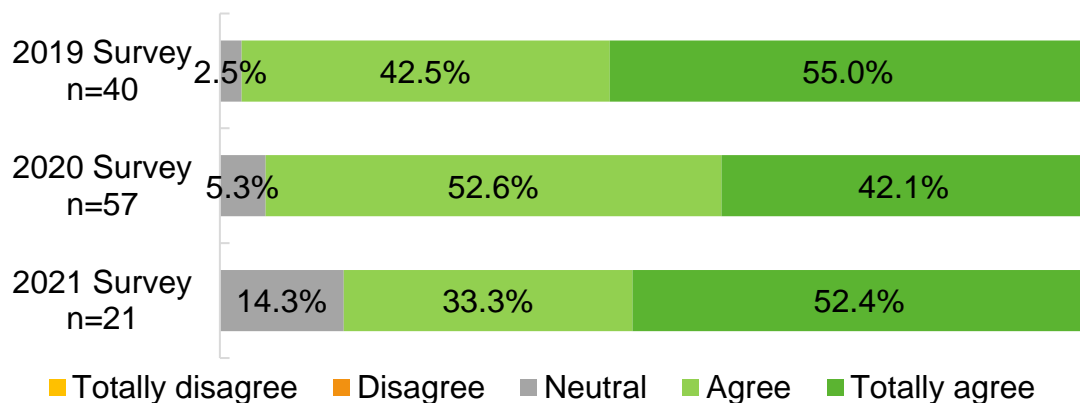


n=21

Source: Online Survey (2021)

The trustworthiness level has dropped by 9.0% this year, with 85.7% compared to previous years. The trustworthiness level has gradually declined, and the proportion of those who chose "average" this year was significantly higher than previous years' surveys.

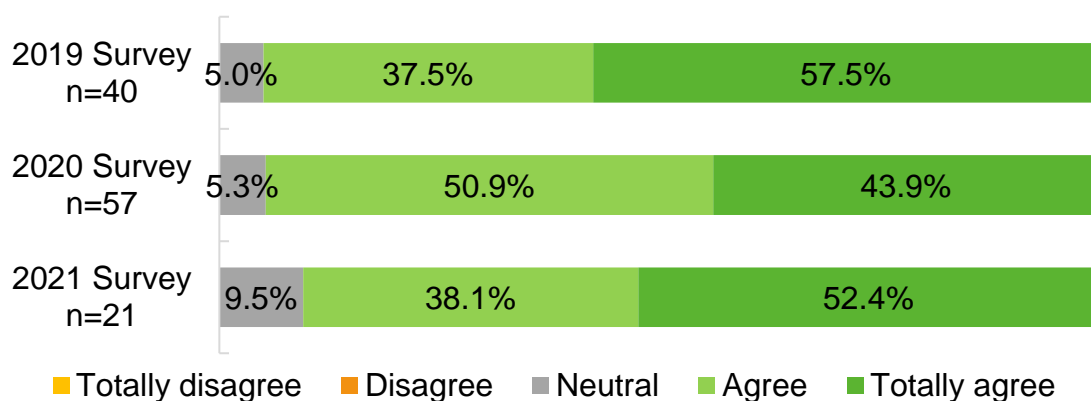
### Trust to TWNIC



Source: Online Survey (2019/2020/2021)

The value perception level is 90.5%, down 4.3% compared to last year, and the percentage of people choosing "average" this year was also slightly higher than last year.

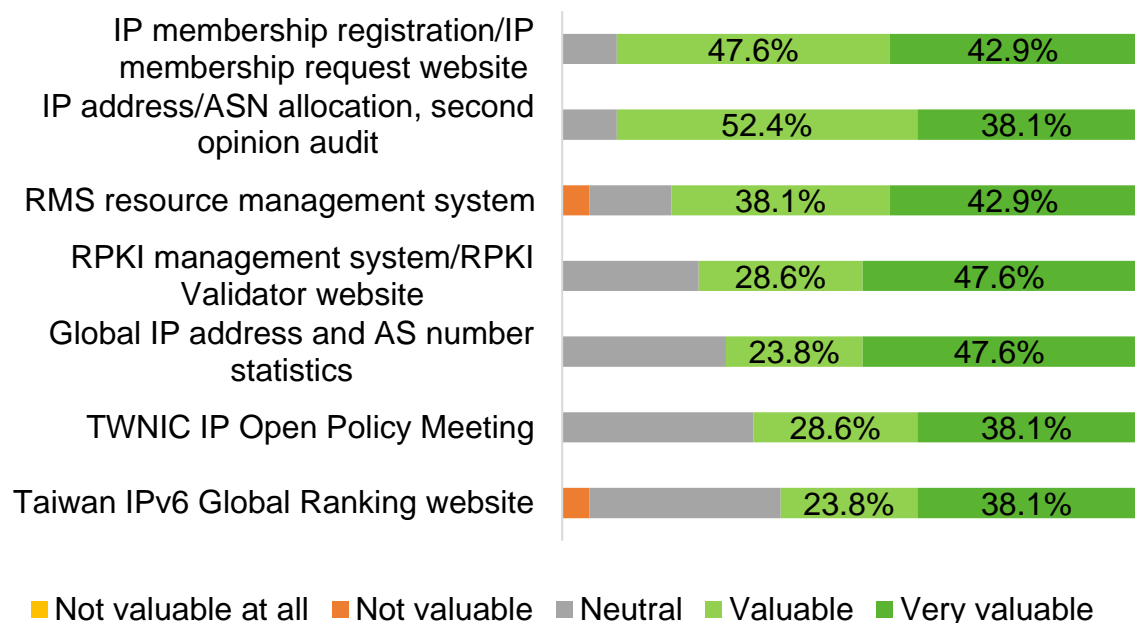
### Value of TWNIC service



Source: Online Survey (2019/2020/2021)

### III. Evaluation of Service Value Perceptions

According to the evaluation of IP members' perception of the value of each registrar service, "IP member registration/IP member application website" and "IP address/ASN issuance, Second Opinion audit" had the highest perception of service value, with 90% for both indicators. The value of the "RMS" service was 80%. The value of "RPKI Management System/RPKI Validator Website" was 76.2%, and the value of "Global IP Address and ASN Statistics" was 71.4%, with the highest percentage of "very valuable" among all indicators.

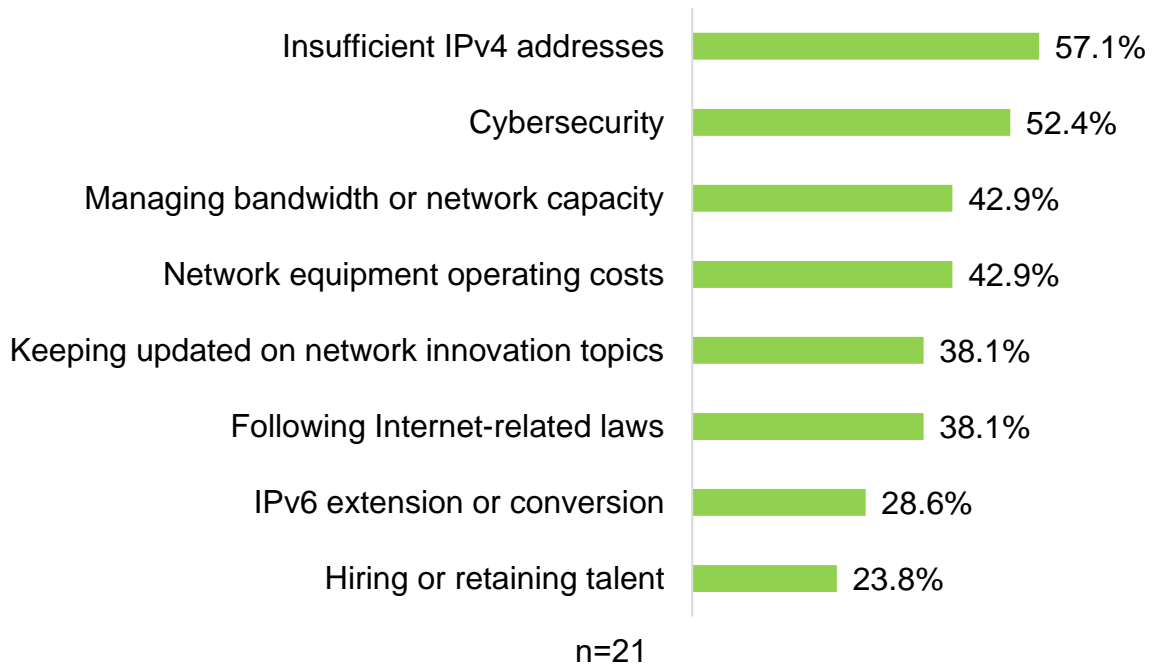


n=21

Source: Online Survey (2021)

#### IV. Service Challenges and Difficulties in IPv4 Scarcity

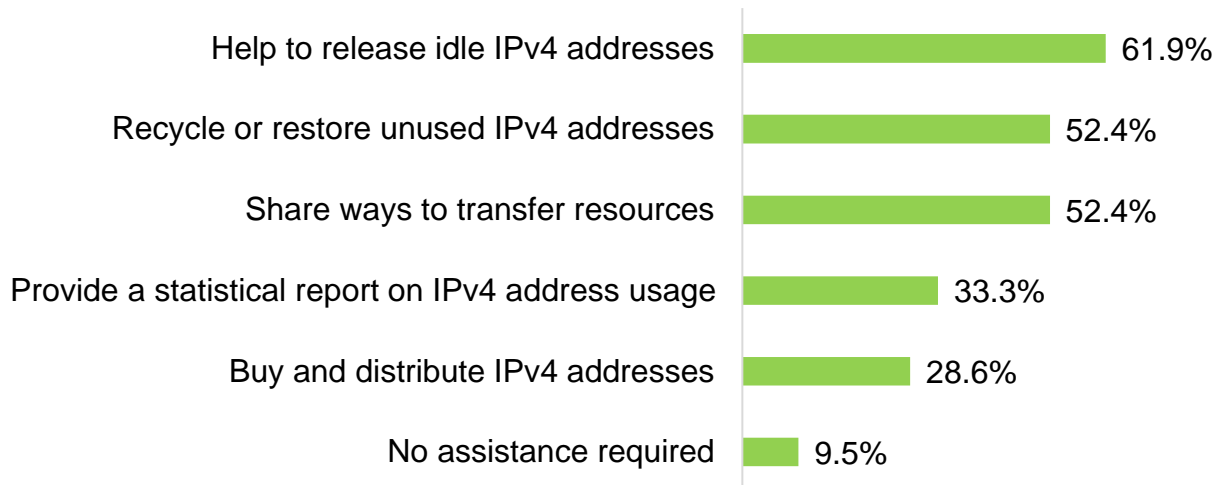
IP members believe that the challenge facing the current network business is "insufficient IPv4 addresses" (57.1%), with a higher percentage of IP registrars facing this problem, while "network information security" (52.4%) has a higher percentage of IP address-using units, and "managing bandwidth or network capacity" and "network equipment operating costs" have more than 40% each. In both cases, the proportion of IP address usage units was higher.



Source: Online Survey (2021)

In the face of IPv4 scarcity, the highest percentage of IP members want the center to "help release unused IPv4 addresses" (61.9%). The percentages of "recovering or restoring unused IPv4 addresses" and "sharing ways to transfer related resources" were both over 50%, respectively.



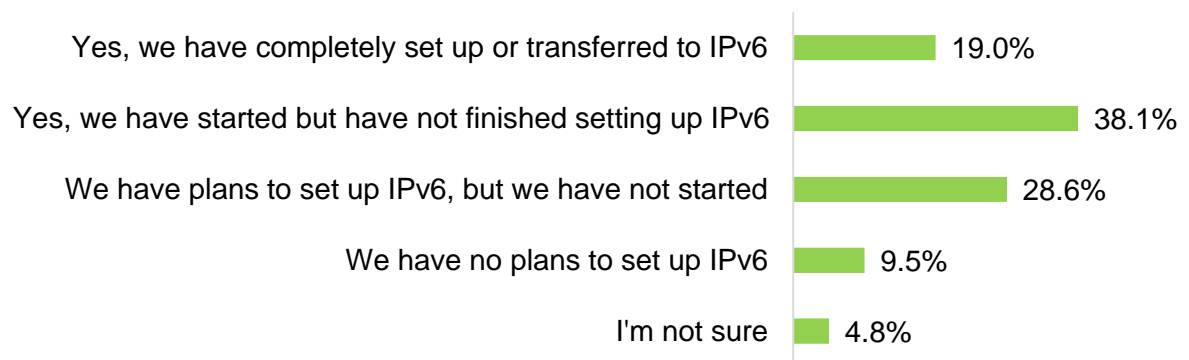


n=33

Source: Online Survey (2021)

#### V. IPv6 Provisioning and Preparation

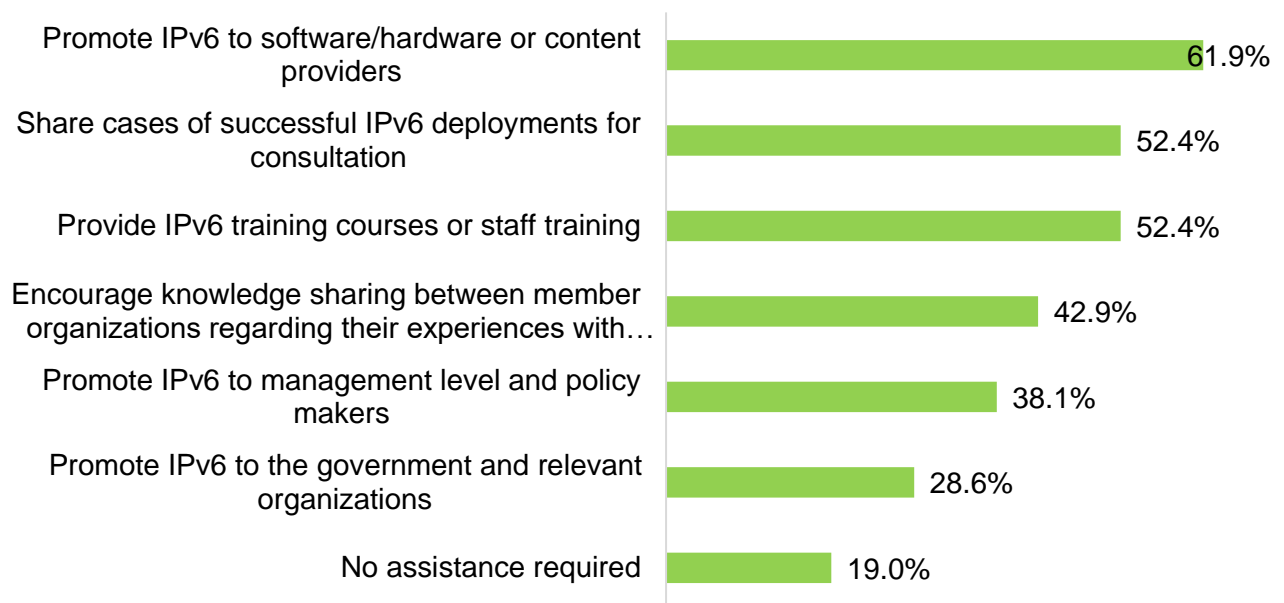
57.1% of IP members said they have already started to deploy or convert to IPv6, with 19% overall having completed deployment and conversion, 38.1% are in the process of deploying but not yet completed, and 28.6% have plans but have not commenced the work.



n=21

Source: Online Survey (2021)

80% of IP members believe that IPv6 deployment requires assistance from TWNIC. The highest percentage was "promoting IPv6 to hardware, software and content providers" at 61.9%, while the percentage of "sharing successful IPv6 deployment cases for reference" and "providing IPv6 education and training" were both 52.4%. "Knowledge sharing among member organizations on IPv6 deployment experience" accounted for over 40%.



n=21

Source: Online Survey (2021)

## VI. RPKI Services

Among the RPKI services provided by TWNIC, the utilization rate of Non-IP Registrars was 73.3%, the utilization rate of "ROA setting" was 100%, with the satisfaction rate highest at 81.8%, followed by the utilization rate of the RPKI management system at 70% and satisfaction rate at 75%. The utilization rate of RPKI Validator website stood lower at 36.4%, but the satisfaction rate was only 75%. The usage rate of RPKI service for IP registrars was 83.3%, the usage rate of the RPKI management system was 100%, and the usage rate of ROA setting and RPKI Validator website was more than 40%. The satisfaction rate of all three services was 100%.

### IP Registrars

Usage rate 83.3% (n=6)

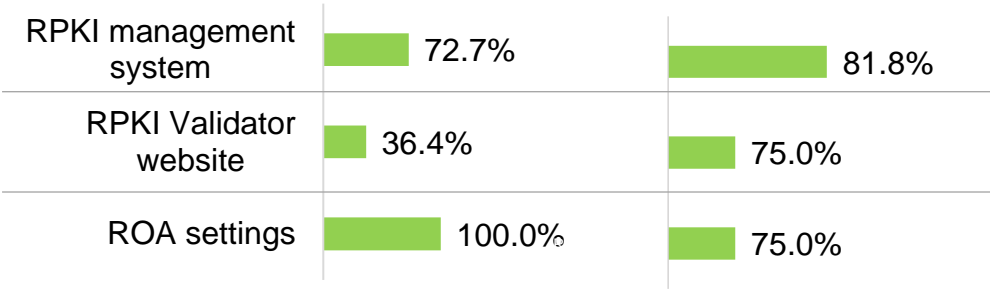
#### Usage content n=5    Satisfaction level n=5

RPKI management system	100.0%	100.0%
RPKI Validator website	40.0%	100.0%
ROA setting	40.0%	100.0%

IP Registrants

Usage rate 73.3% (n=15)

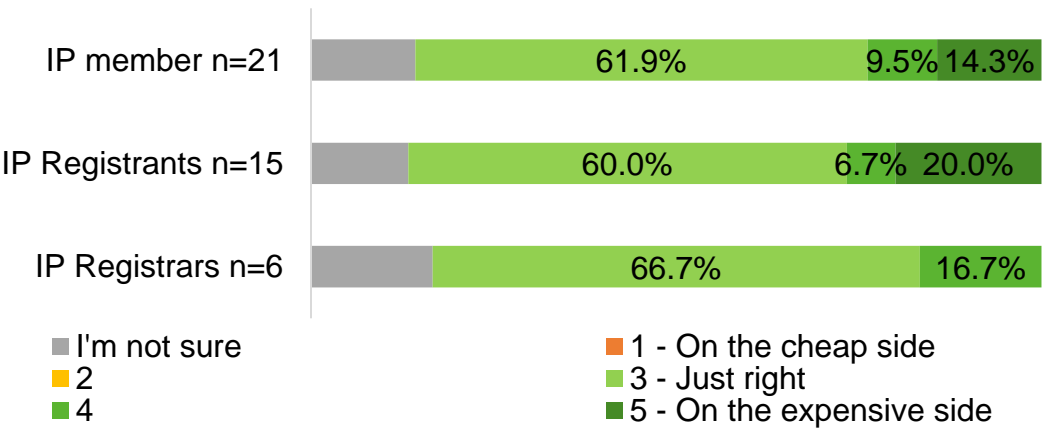
**Usage content n=11    Satisfaction level n=11**



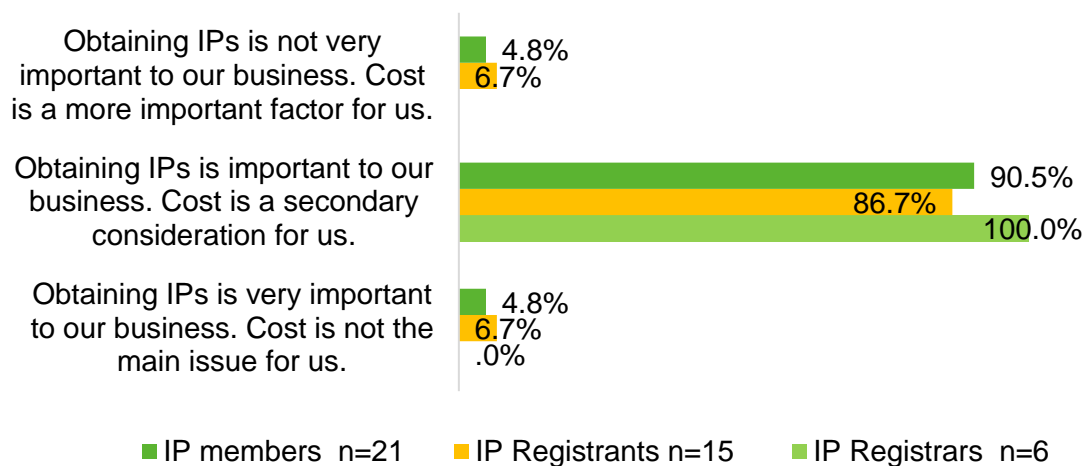
Source: Online Survey (2021)

VII. Strategy for Charges

60% of IP members thought that "the fee is reasonable" for "IP distribution management fees". 20% of Non-IP Registrar members thought that the fee was slightly expensive. IP members had the same view on TWNIC's IP services and charges, and most of them thought that "obtaining IP is important, and the amount of charges is secondary".



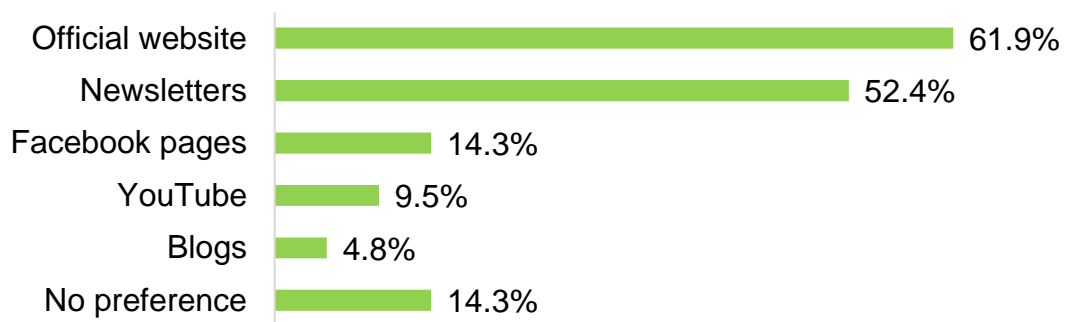
Source: Online Survey (2021)



Source: Online Survey (2021)

## VIII. Information Services

More than 60% of IP members usually received information on IP topics through "official websites", more than 40% through "search engines" and "e-newspapers", and 30% through "news websites". Twenty percent of the IP members usually get information through "friends, family and colleagues" and "blogs". Sixty percent of the IP members preferred to get information related to the center through "official websites", 50% preferred to get it through "e-newsletters", about 15% preferred to get it through "Facebook fan groups", and 10% preferred to get it through "YouTube".

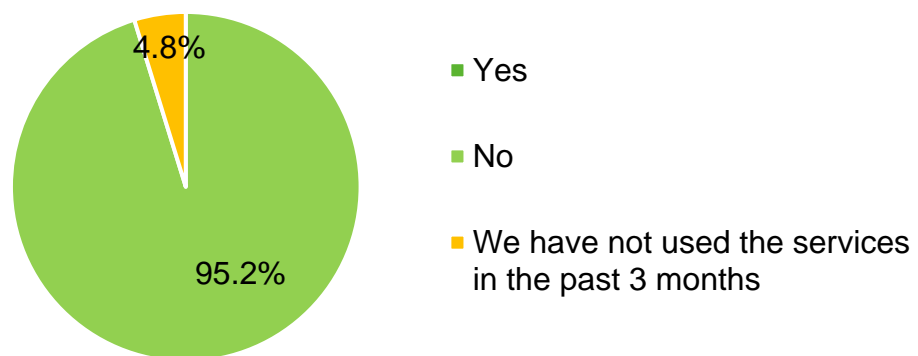


n=21

Source: Online Survey (2021)

#### IX. Impact of COVID-19

95.2% of IP members using the service in the past three months were not affected.

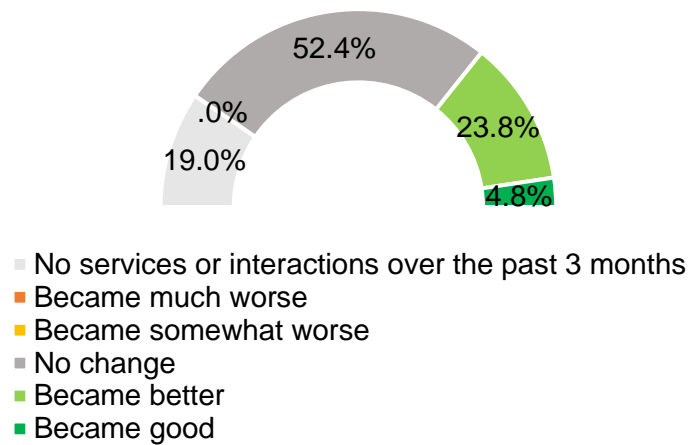


n=21

Source: Online Survey (2021)

During the epidemic period in the past three months, 50% of IP members said that the service condition had not changed and 30% thought that the service had improved.

### Service experience over the past 3 months



n=21

Source: Online Survey (2021)

## X. Expectations and Recommendations

IP members indicated that they hope TWNIC can organize more activities in the future, such as education training and seminars. They also hoped that the service could be digitized and operated online, and that more assistance can be provided to deal with the IPv4 scarcity problem.

Anticipated content	Responses
RMS can do better	1
More education training can be provided based on actual needs	1
More seminars and conferences can be held	1
It is recommended to create an online system to change the route object and other related information directly without manual processing via e-mail. The questionnaire can be filled in by adding the options that were changed before the previous page.	1
Development and cultivation (of clients)	1
Release more IPv4	1
None	15

n=21

Source: Online Survey (2021)



## **Chapter VI.**

## **IP Registrar**



## Chapter VI. IP Registrar

In this year's survey for IP members, in addition to the existing online quantitative survey, we added one on one in-depth interviews with IP address allocation agencies and interviewed two respondents.

- I. Services have been fully digitized, and thus business interactions are safe from COVID-19 impact

As TWNIC's online services and interaction mechanism are in full operation, business interactions and communications between the two parties went smoothly and suffered no impact from COVID-19 even if both sides started working remotely. In addition, stakeholders also think the online events/training sessions went very well. They are quite satisfied with their interactions with TWNIC in general.

- | *We interact with TWNIC mainly on the phone and via email, so there was no problem with communications. Most of the seminars and conferences have gone online, so there wasn't much effect. So far it looks like COVID-19 has no impact on our interactions with TWNIC.*
- | *A lot of services have been digitized before the COVID-19 outbreak, so we can handle the majority of issues with what's available on the TWNIC website. We rarely met each other in person these two years because of COVID-19. Now that the training sessions have gone online, I think everything is fine.*

- II. Enhance system stability and user friendliness, assist in troubleshooting and follow-ups

Based on their user experience, stakeholders remind TWNIC to watch out for data/system maintenance and stability and wish to have a friendlier UI. They also mentioned their current IP interface system is maintained by an outsourced service provider, so they are not able to reach the tech person

immediately whenever there's a problem. Therefore, they hope TWNIC can help them with troubleshooting and issue tracking.

- | *So far everything's ok, but we should pay more attention to maintenance and update. System stability is still our main concern because we want to avoid data inconsistency. As to minor issues, we wonder if an inquiry screen can be made available or if the UI can be more user-friendly.*
- | *We hope TWNIC to set up a specific point of contact to help us track issues with the outsourced service provider. Since this interface was built by TWNIC's outsourced partner, we hope TWNIC can help us do the follow-ups when we raise issues.*

### III. The necessity and incentive to expedite IPv6 adoption in Internet industry

Stakeholders have mentioned that TWNIC needs to promote IPv6 adoption more actively to increase its necessity; for example, urging content businesses to switch their websites to IPv6 and setting IPv6 as default on equipment related to IoT application. They also expect TWNIC to assist in the widespread IPv6 adoption by providing the industries with incentives such as rent/tax deduction to expedite the implementation.

- | *For potential adopters in IoT businesses, it would be helpful if TWNIC initiates the communication by suggesting prioritizing v6 over v4 to accelerate the widespread adoption of v6.*
- | *As to IPv6 compatible devices, it would be great to take into account the government's special subsidies so that rent/tax reduction can serve as an incentive for device vendors and users to speed up their v6 adoption.*

### IV. Promote awareness on security issues derived from the services, assist the industry in strengthening their cyber defense

When asked about suggestions to the services, stakeholders said TWNIC can incorporate TWCERT/CC services in theirs and focus more on providing

security training on issues associated with IP. As to the current security requirements of IP address allocation agencies, they hope the planned pace can be adjusted and allow businesses to achieve the recommended requirements in their own pace.

| *For now, it appears a lot of issues occur on users' side. For example, a regular user might be used as a springboard because s/he uses an IP camera or has virus on the computer. I believe the security problem can be addressed more efficiently if TWNIC can promote the security awareness or provide a certain solutions.*

- V. Insightful and helpful event topics/content, looking forward to timely updates and explaining complicated subject matters in simple terms

In terms of information provision, stakeholders have approved what's been delivered in training courses, activities and publications. They also look forward to insight sharing about network trends and technologies as well as timely-updated website with the latest topics, tech info made simple with easy-to-understand explanation to reach a larger audience.

| *I like the topics and discussion in training courses and seminars and maybe there can be more info on latest issues, new technologies and how RPKI evolves.*

| *They have a lot of materials which tech people can easily understand, but for the general public, it would be better to translate down the subject matters with easy-to-understand description.*

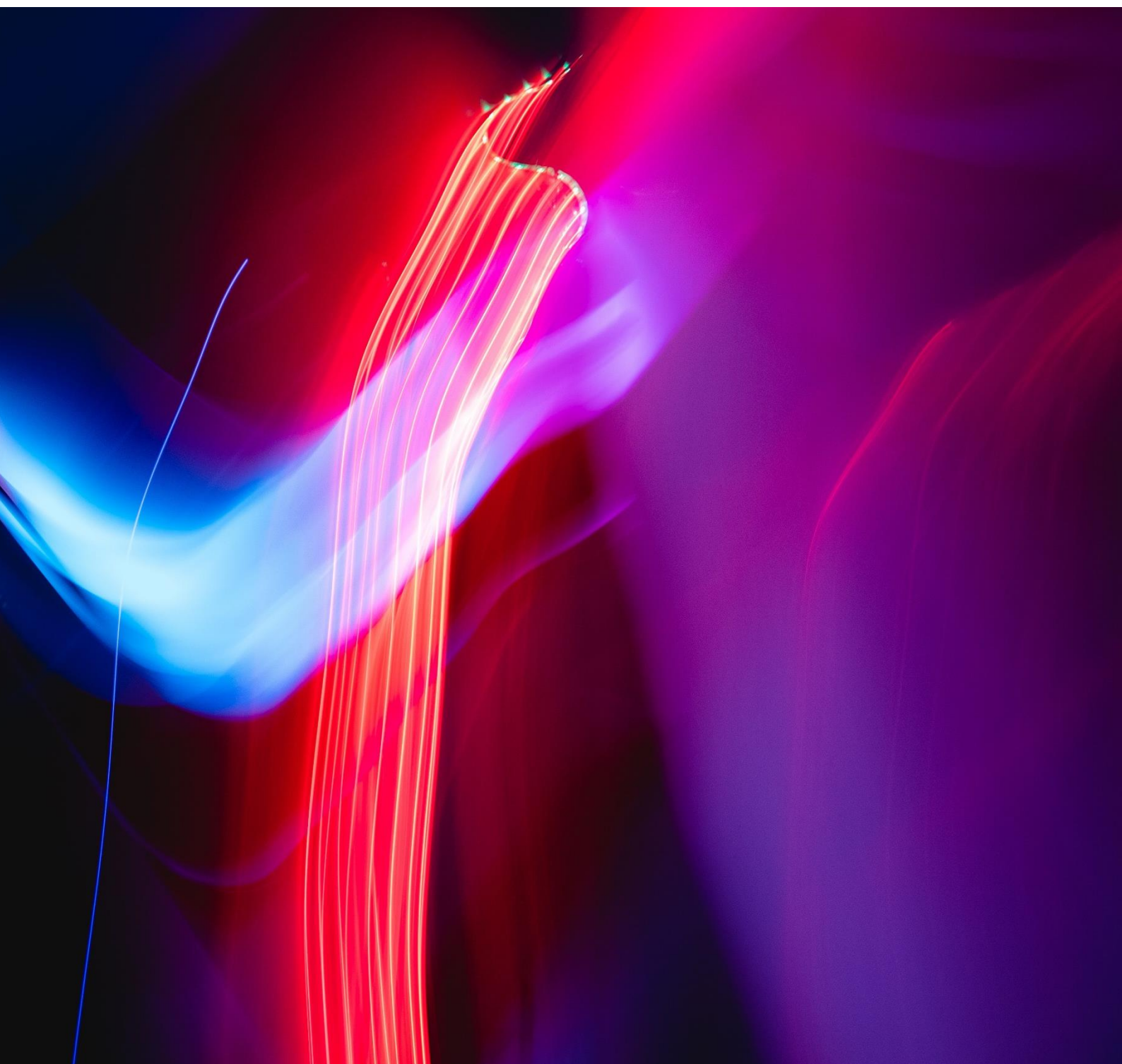
- VI. Bring the cross-field synergy of social media into play

TWNIC and TWCERT/CC are running their social media accounts separately, but they should put emphasis on the relevance of their services and create synergistic effect strategically. Through different content/service users, they can expand their influence to other social media and bring the collaborative benefits into play.

| *The content is information-rich, which is good. However, it looks like there are many websites and Facebook pages related to TWNIC, such as "domain name friends" and TWCERT/CC. I suggest making use of the relevance despite the differences... Whenever TWNIC publishes a post about cyber-security, they should make sure users can be directed to TWCERT/CC even if it's a shared/forwarded post. It is also important to share each other's post.*

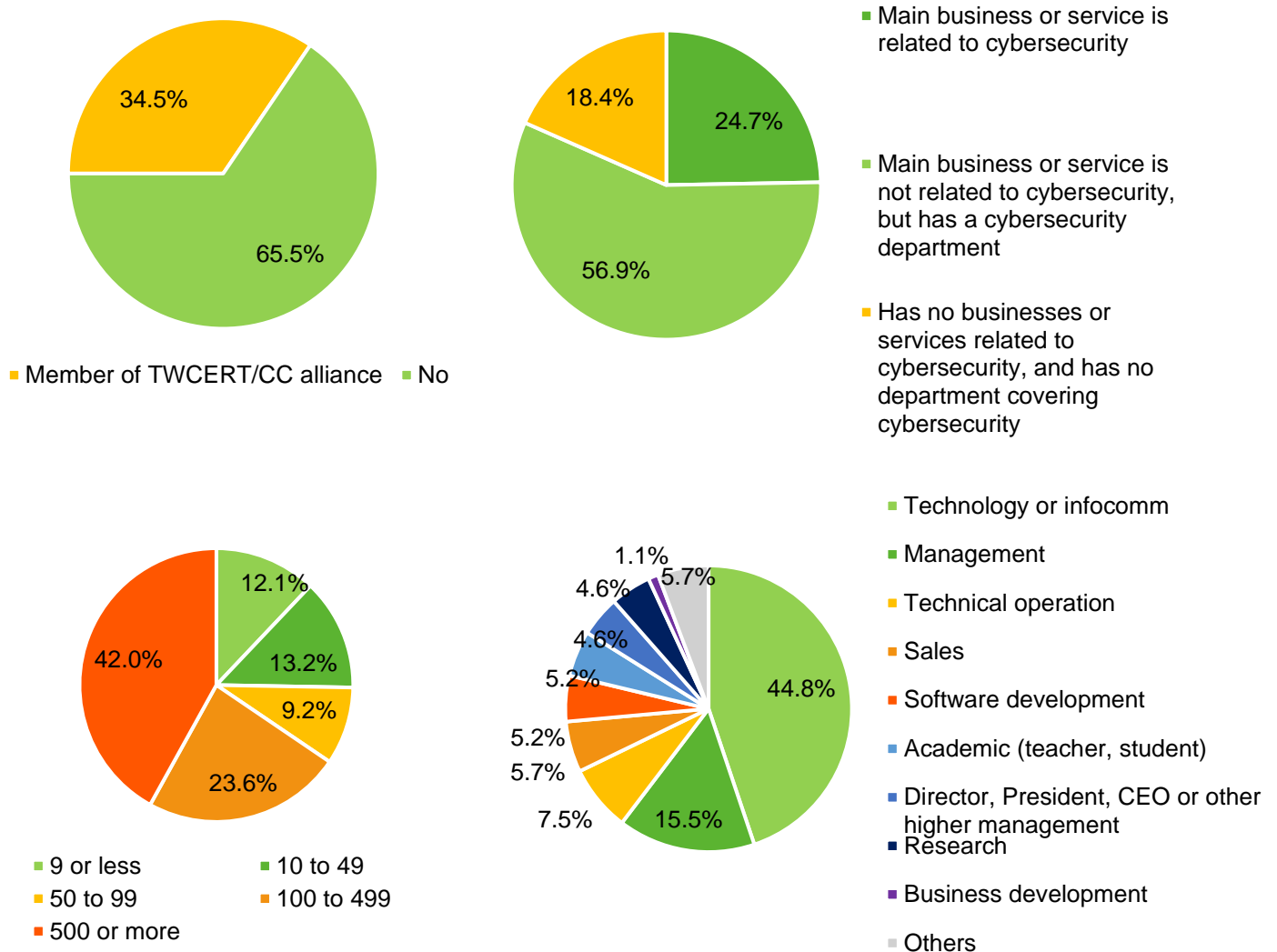


# **Chapter VII.      Subscribers of TWCERT/CC Newsletter**



## Chapter VII. Subscribers of TWCERT/CC Newsletter

### I. Summary of Implementation



n=174

Source: Online Survey (2021)

## II. Service Awareness and Usage Rate

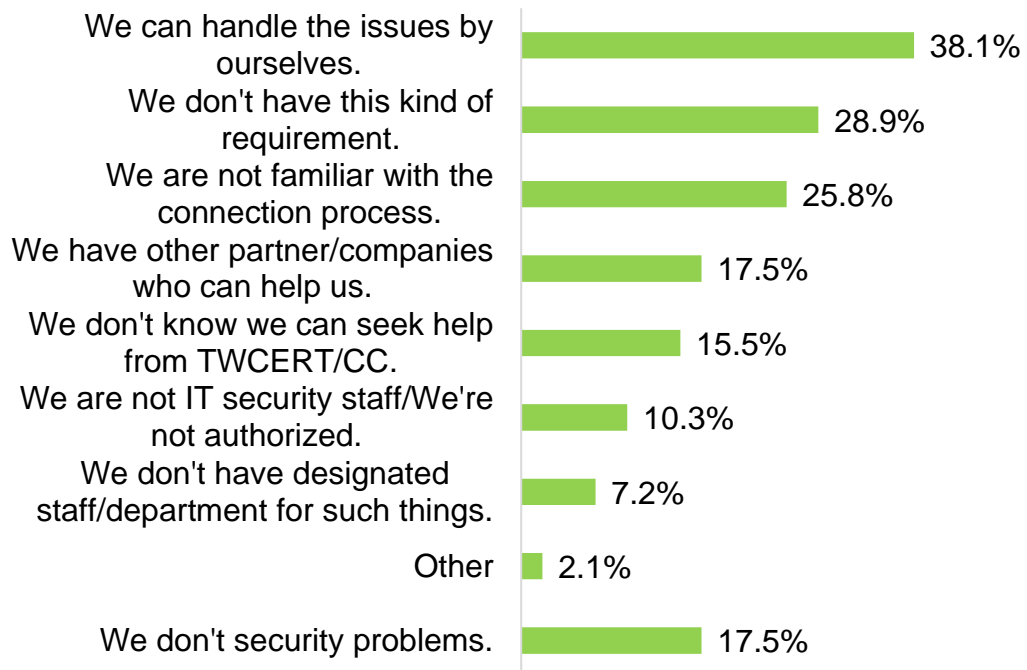
The "e-Newsletter Subscriber -TWCERT Alliance Members" have a higher awareness of various services, especially in "information security information sharing", "information security awareness promotion," and "information security incident notification and assistance", which have over 90% awareness. The " e-Newsletter Subscriber -TWCERT Alliance Members " also have a higher usage rate of all services. It can be observed that the consortium members are the stakeholders who have more frequent interaction with TWCERT/CC. For the respondents' satisfaction level of each service, "malicious file detection service", was rated as very good or good, with more than 50% of users indicating the service was very good. For "phishing notification", all users were satisfied. Nearly 50% of the users of "information security incident notification and assistance" indicated the service was very good. The highest "product vulnerability notification" percentage was 53.3%, and the service was considered good. "Information security awareness promotion" was rated as good by 50%. The percentage of users who said the "information security information sharing" service was good was 44.6%.



	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=	174	60	87	27	60	83	23	N	好
Cyber security information sharing	89.7%	96.7%	87.4%	81.5%	80.0%	50.6%	47.8%	101	43.6%
Promoting cyber security awareness	86.2%	93.3%	83.9%	77.8%	56.7%	39.8%	60.9%	81	50.6%
Report and respond cyber security incidents	77.6%	91.7%	70.1%	70.4%	35.0%	19.3%	4.3%	38	44.7%
Product vulnerability reporting	67.8%	78.3%	62.1%	63.0%	41.7%	14.5%	34.8%	45	53.3%
Malicious file detection service	56.3%	66.7%	52.9%	44.4%	28.3%	16.9%	4.3%	32	46.9%
Network phishing reporting	54.0%	61.7%	50.6%	48.1%	23.3%	12.0%	.0%	24	58.3%
None of the above	4.6%	.0%	4.6%	14.8%	6.7%	30.1%	26.1%		

Source: Online Survey (2021)

The highest percentage of respondents who knew about TWCERT/CC information security notification service but did not use it was because they could "handle it by themselves", with nearly 40%. The next highest percentage was "no need" with nearly 30%, and 25% said they were "not familiar with the related process". The percentages of "have other vendors" and "no information security problems" were 17.5%, respectively.



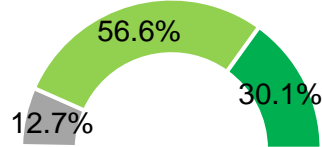
n=152

Source: Online Survey (2021)

### III. Service Helpfulness and Reasons

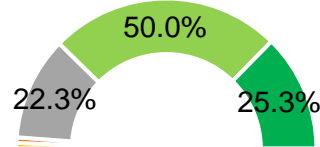
For the service value, 86.7% of the respondents rated "information sharing" as helpful. A total of 83.1% of respondents rated the service as helpful for "information security awareness promotion". Among the "product vulnerability reports", 50% of the respondents thought the service was helpful. 50% of respondents thought "information security incident notification" was helpful. For "phishing notification", 45.8% said the service was helpful. The overall level of helpfulness of the "malicious file detection service" was nearly 70%.

### Information security information sharing



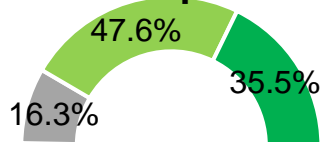
■ Very unhelpful    ■ Unhelpful  
■ Neutral    ■ Helpful  
■ Very helpful

### Information security event notification



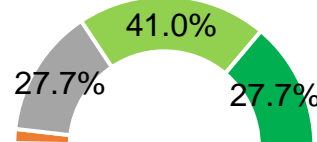
■ Very unhelpful    ■ Unhelpful  
■ Neutral    ■ Helpful  
■ Very helpful

### Information security awareness promotion



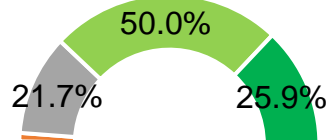
■ Very unhelpful    ■ Unhelpful  
■ Neutral    ■ Helpful  
■ Very helpful

### Malicious file detection service



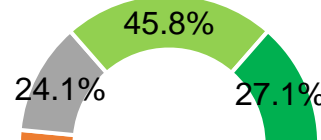
■ Very unhelpful    ■ Unhelpful  
■ Neutral    ■ Helpful  
■ Very helpful

### Product vulnerability notification



■ Very unhelpful    ■ Unhelpful  
■ Neutral    ■ Helpful  
■ Very helpful

### Network phishing notification

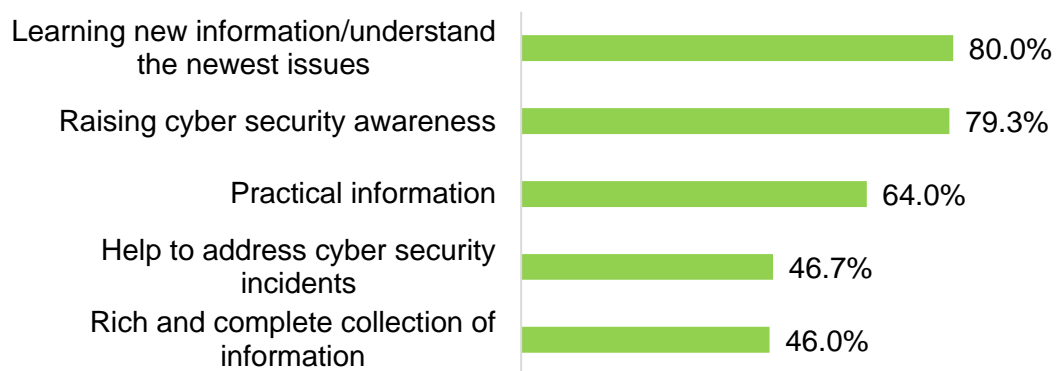


■ Very unhelpful    ■ Unhelpful  
■ Neutral    ■ Helpful  
■ Very helpful

n=166

Source: Online Survey (2021)

The percentage of respondents who found the TWCERT/CC service helpful was 80% for "acquiring new knowledge/understanding the latest issues" and "enhancing information security awareness" (79.3%), 64.0% for "useful information", and about 46% for "helping to solve information security problems" and "abundant and complete information" respectively.

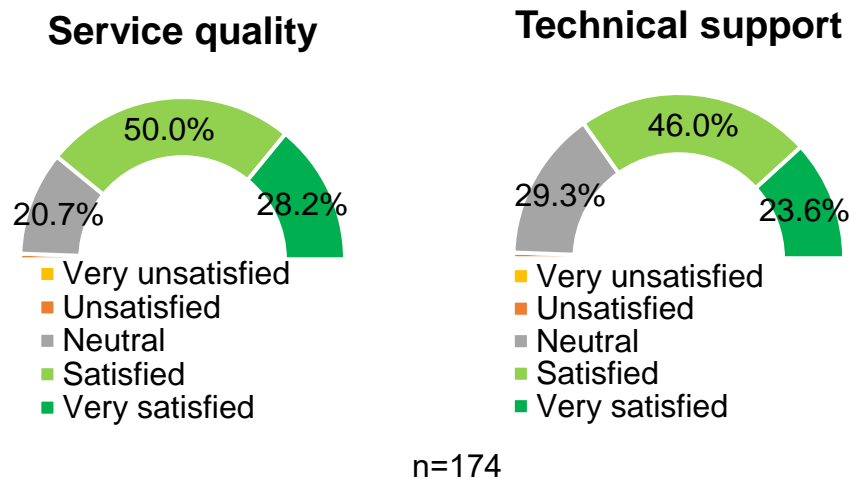


n=150

Source: Online Survey (2021)

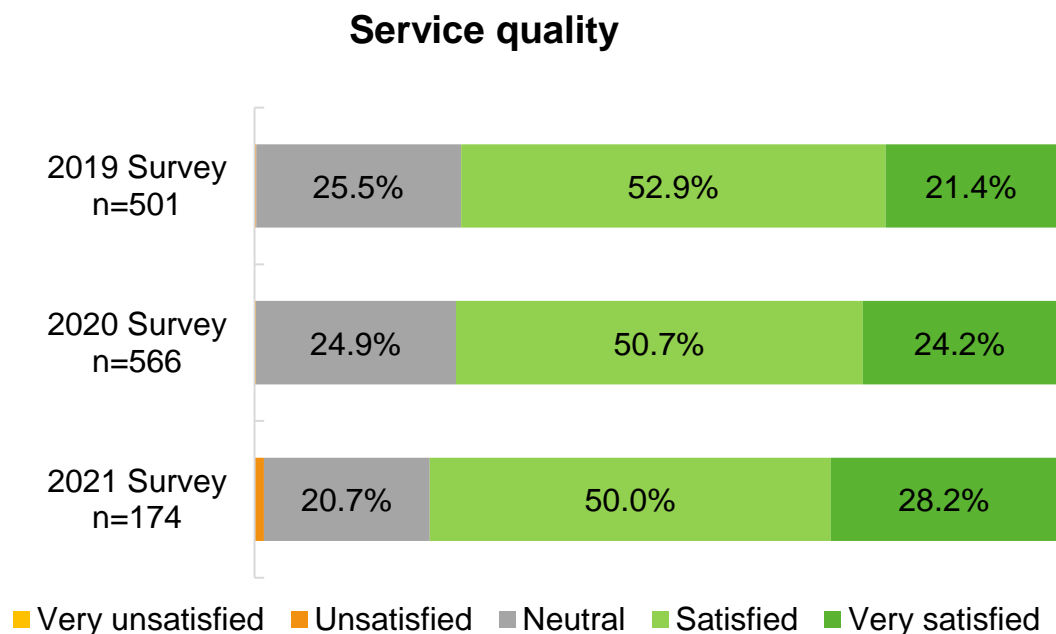
#### IV. Overall Satisfaction and Trust

78.2% of respondents thought the quality of TWCERT/CC service was good or very good. About 70% preferred the technical support.



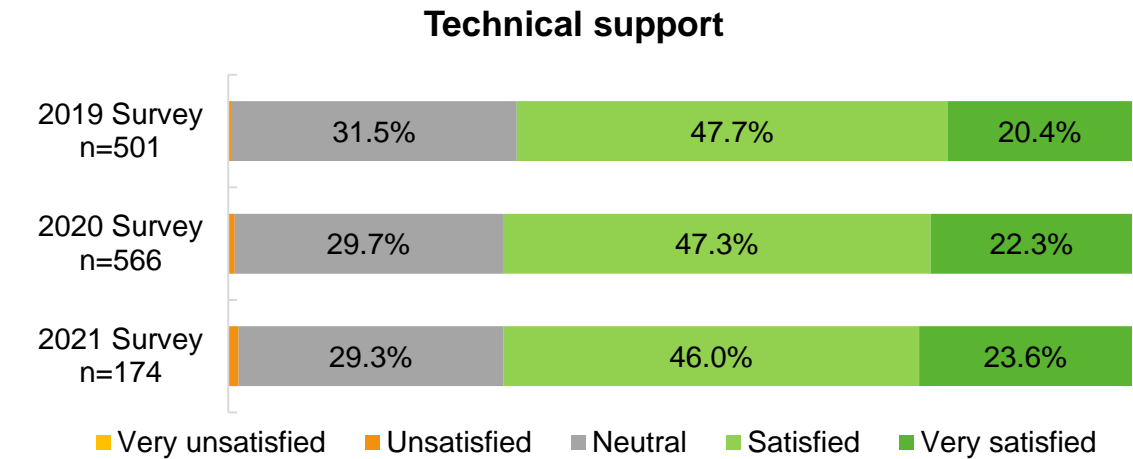
Source: Online Survey (2021)

Last year, the satisfaction rate of service quality was 74.3%, but this year, the satisfaction rate increased by 3.2% and 78.2%.



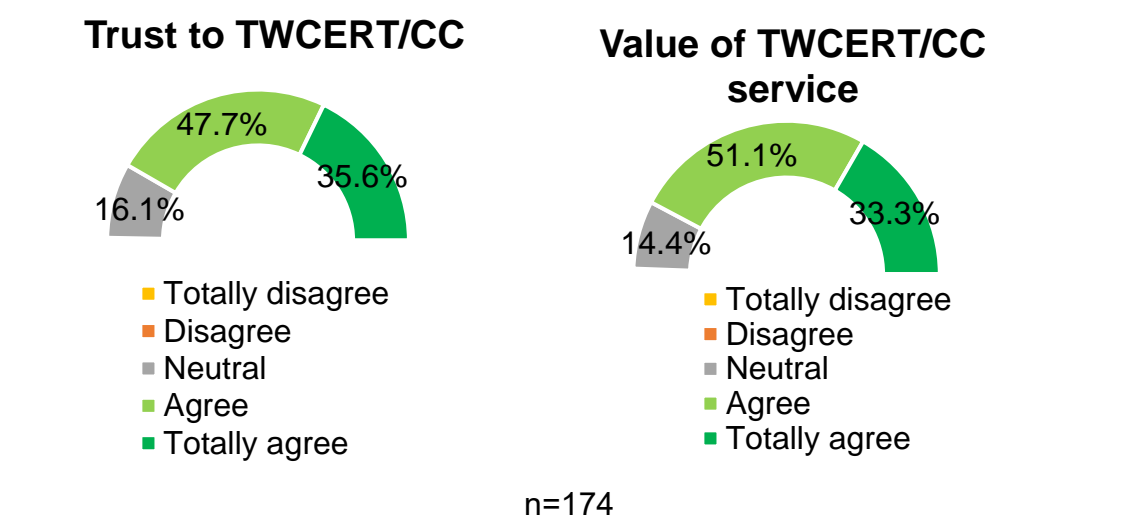
Source: Online Survey (2019/2020/2021)

This year's technical support satisfaction rate was 69.5%, which is only 0.1% less than last year, and the satisfaction rate of technical support has remained more or less the same over the years.



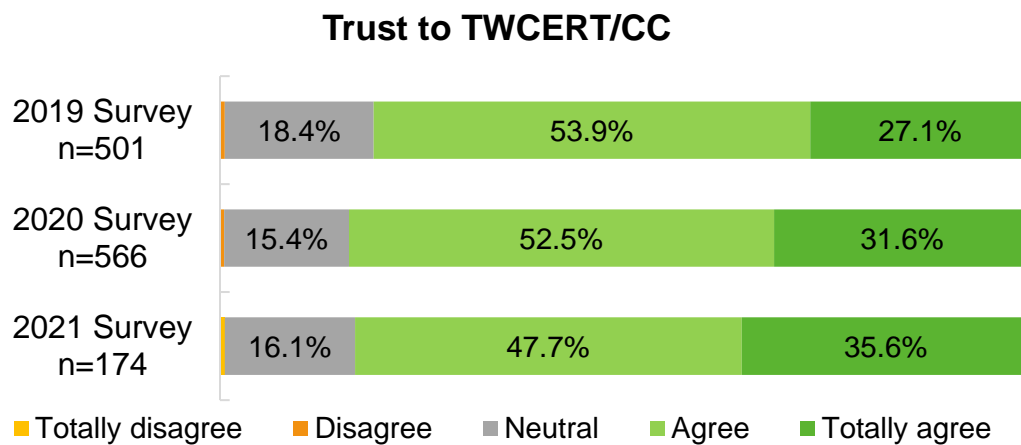
Source: Online Survey (2019/2020/2021)

35.6% of respondents fully agreed that they trust TWCERT/CC, and 47.7% "agreed" that they trust it. More than 30% of the respondents agreed that the services provided by TWCERT/CC are valuable, 51.1% agreed with the value of the services provided.



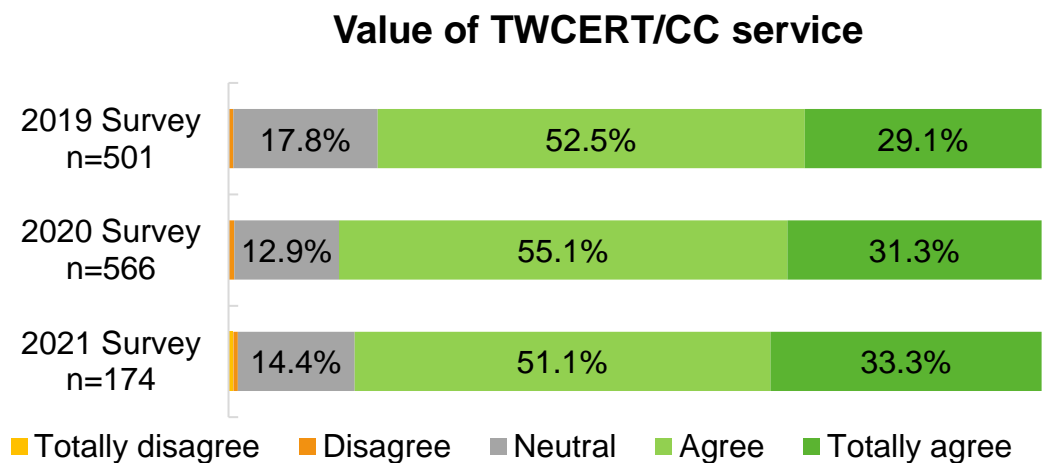
Source: Online Survey (2021)

This year, the trustworthiness was 83.3%, down 0.8% from last year, but still higher than the 81.0% in the 2019 survey.



Source: Online Survey (2019/2020/2021)

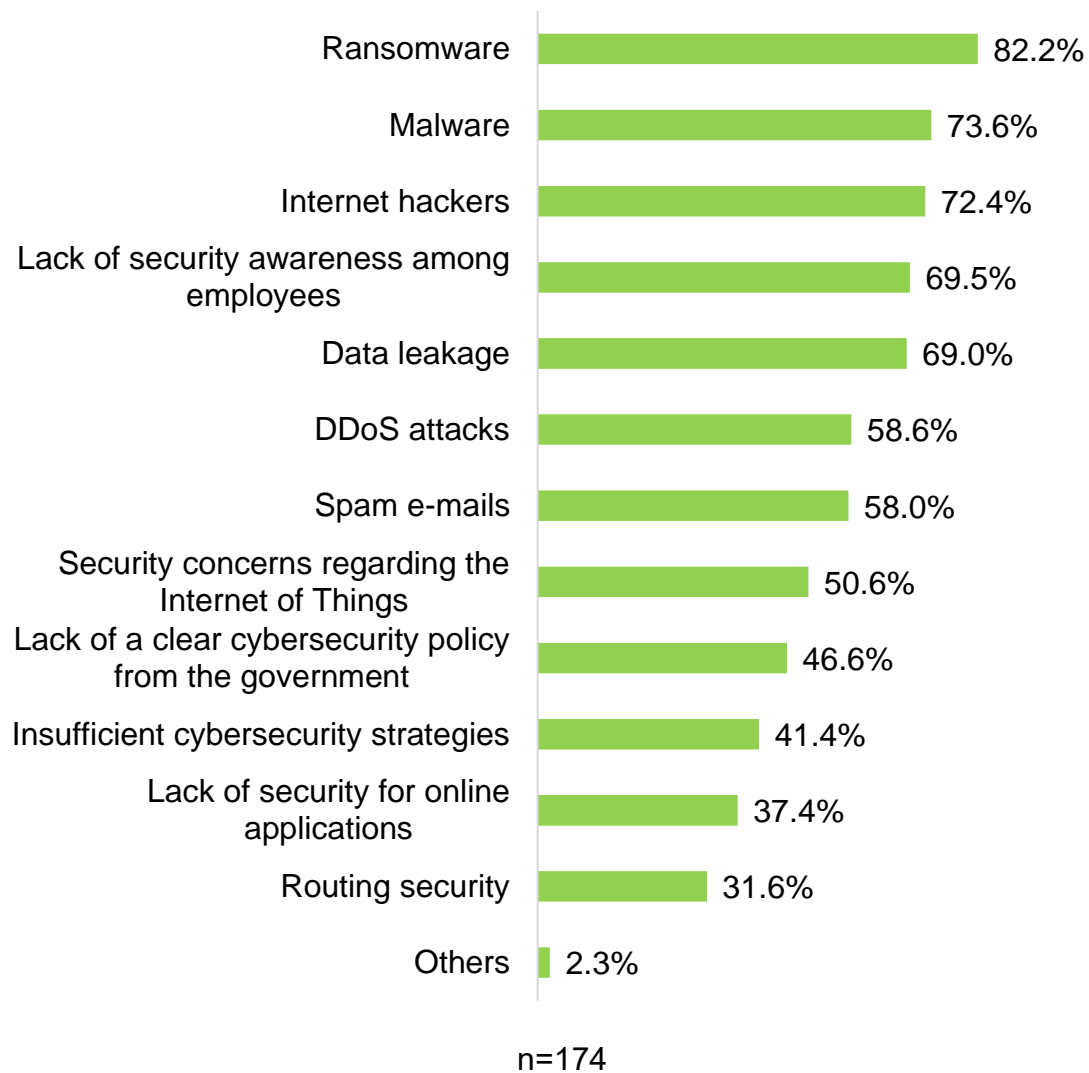
Service value perception was 84.5% this year, down 1.9% from last year.



Source: Online Survey (2019/2020/2021)

## V. Cybersecurity Threats and Problems in Taiwan

Among the information security threats in Taiwan, "ransomware incident" had the highest awareness level (82.2%), followed by about 70% for "malware attacks" (73.6%), "internet hacks" (72.4%), "lack of information security awareness among employees" (69.5%) and "DDoS attacks" (69.0%) respectively.

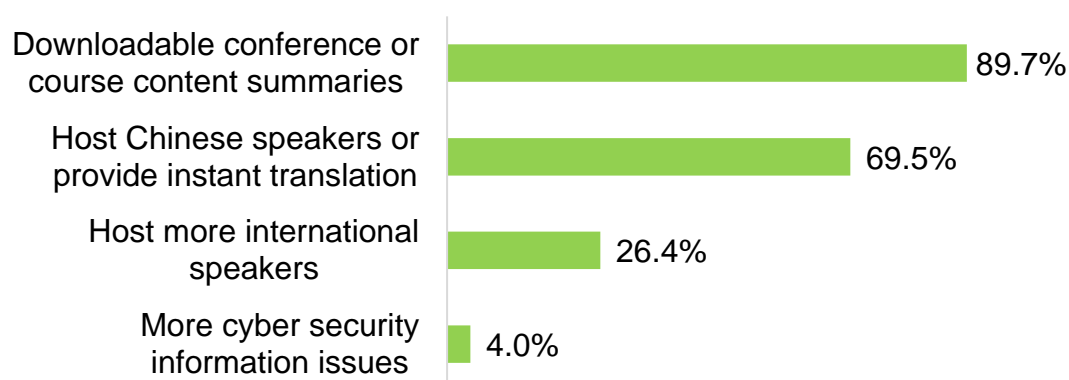


Source: Online Survey (2021)



## VI. Expectations and Preferences for Training Courses

Nearly 90% of the respondents expected "downloadable presentations of forum or course contents", 70% expected "more Chinese speaking lecturers or real-time translation services", and 26.4% expected "more foreign speakers to be invited" for TWCERT/CC forum meetings or educational training contents.



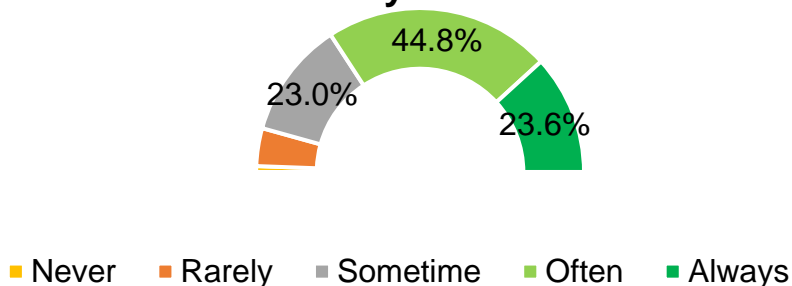
n=174

Source: Online Survey (2021)

## VII. Information Service

The overall attention score for the messages posted by TWCERT/CC was 3.8, with 23.6% always concerned, 40% often concerned, and 44.8% occasionally concerned.

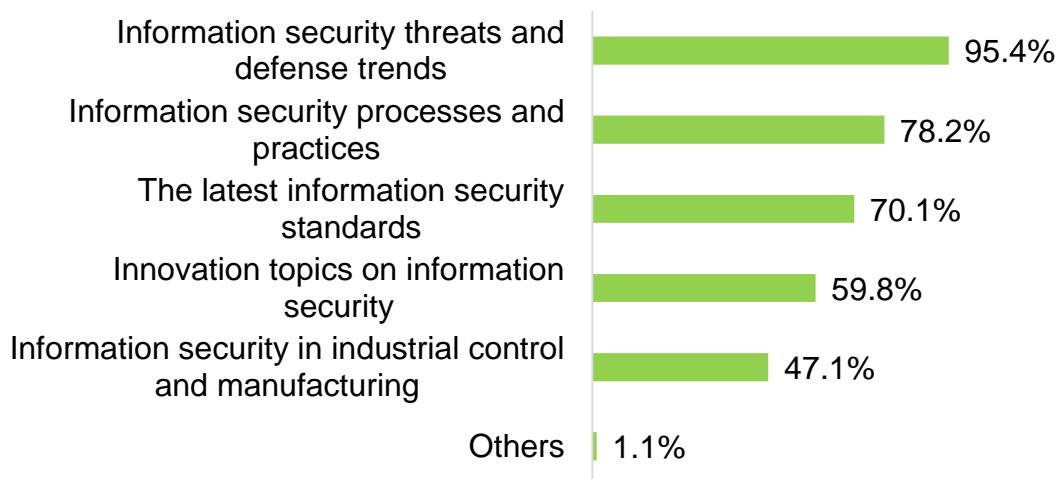
### Attention situation of information released by TWCERT/CC



n=174

Source: Online Survey (2021)

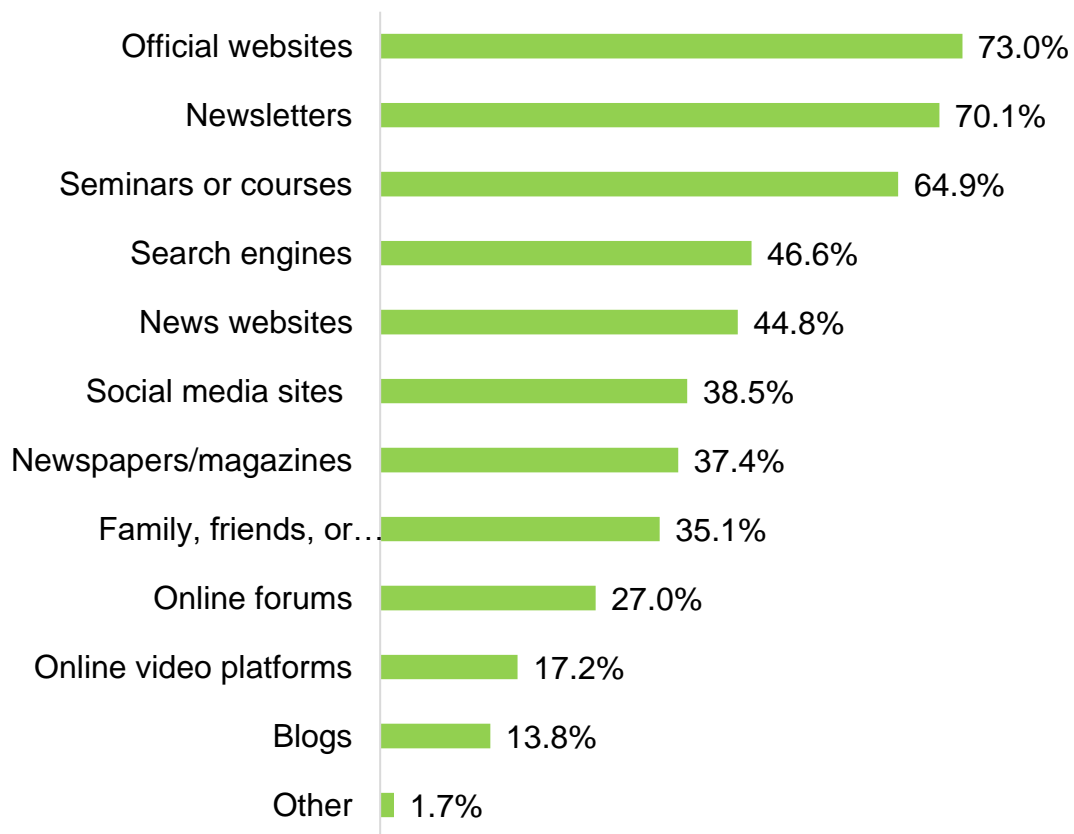
The highest percentage of Internet issues respondents were interested in was "information security threats and defense trends" (95.4%). Nearly 80% of the respondents wanted to know more about "information security processes and practices", and 70% wanted to know more about "the latest information security standards".



n=174

Source: Online Survey (2021)

Respondents usually obtained information and new knowledge related to information security mainly through "official websites" (73.0%) and "e-newsletters" (70.1%). 64.9% obtain information through "seminars or courses". The main preferred form of information security-related content was "articles and discussions" (web pages and documents with text-based content, supplemented by pictures), with 92.5% of the respondents. The next 50% preferred "videos" (YouTube, Vimeo), and 44.8% wanted "photos, photo albums" (content with pictures as the main content, supplemented by text).

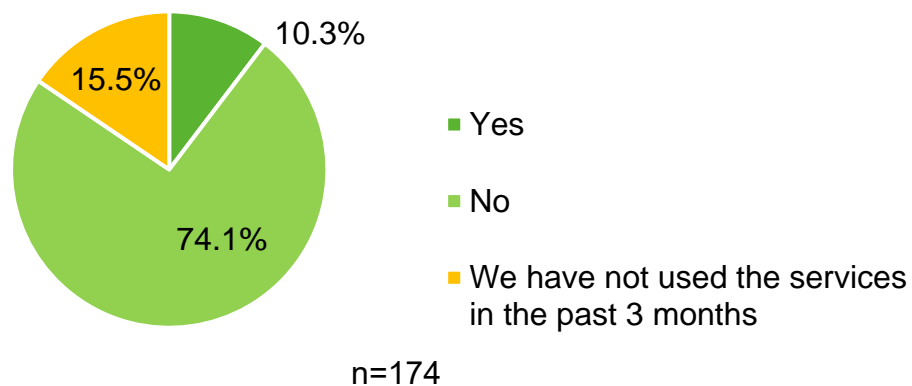


n=174

Source: Online Survey (2021)

## VIII. Impact of COVID-19

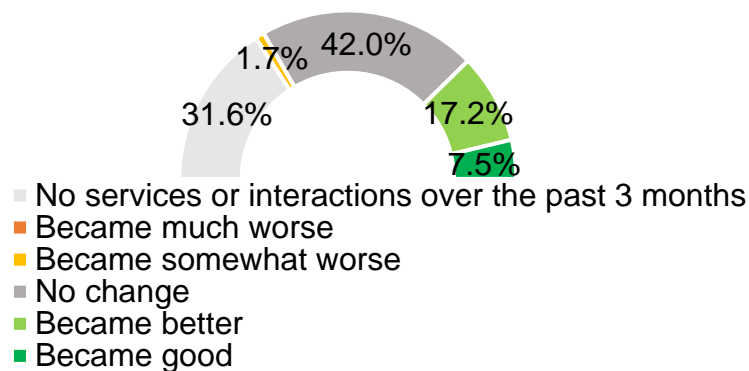
In the past three months, 10% of the respondents' companies/organizations were affected in terms of information security needs or protection methods. Most of the respondents mentioned that they have immediate needs for information asset protection in their home or remote offices, and that remote (non-company) office environments may become information security vulnerabilities during the epidemic due to the derivation of information security issues and the lack of awareness of information security among employees. In addition to education and training for personnel to enhance their knowledge, practical protection such as employee identity authentication, anti-virus software application and protection means are also important during the epidemic.



Source: Online Survey (2021)

In the past three months, 24.7% of respondents thought the services provided by TWCERT/CC have become better, 40% thought they are largely the same, and 30% of respondents did not use services nor interact with each TWNIC.

### Service experience over the past 3 months

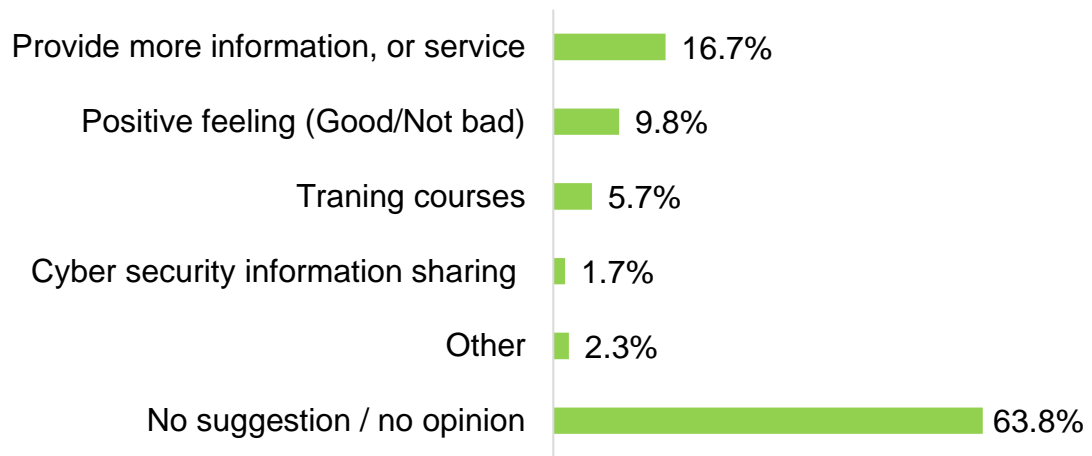


n=174

Source: Online Survey (2021)

### IX. Expectations and Recommendations

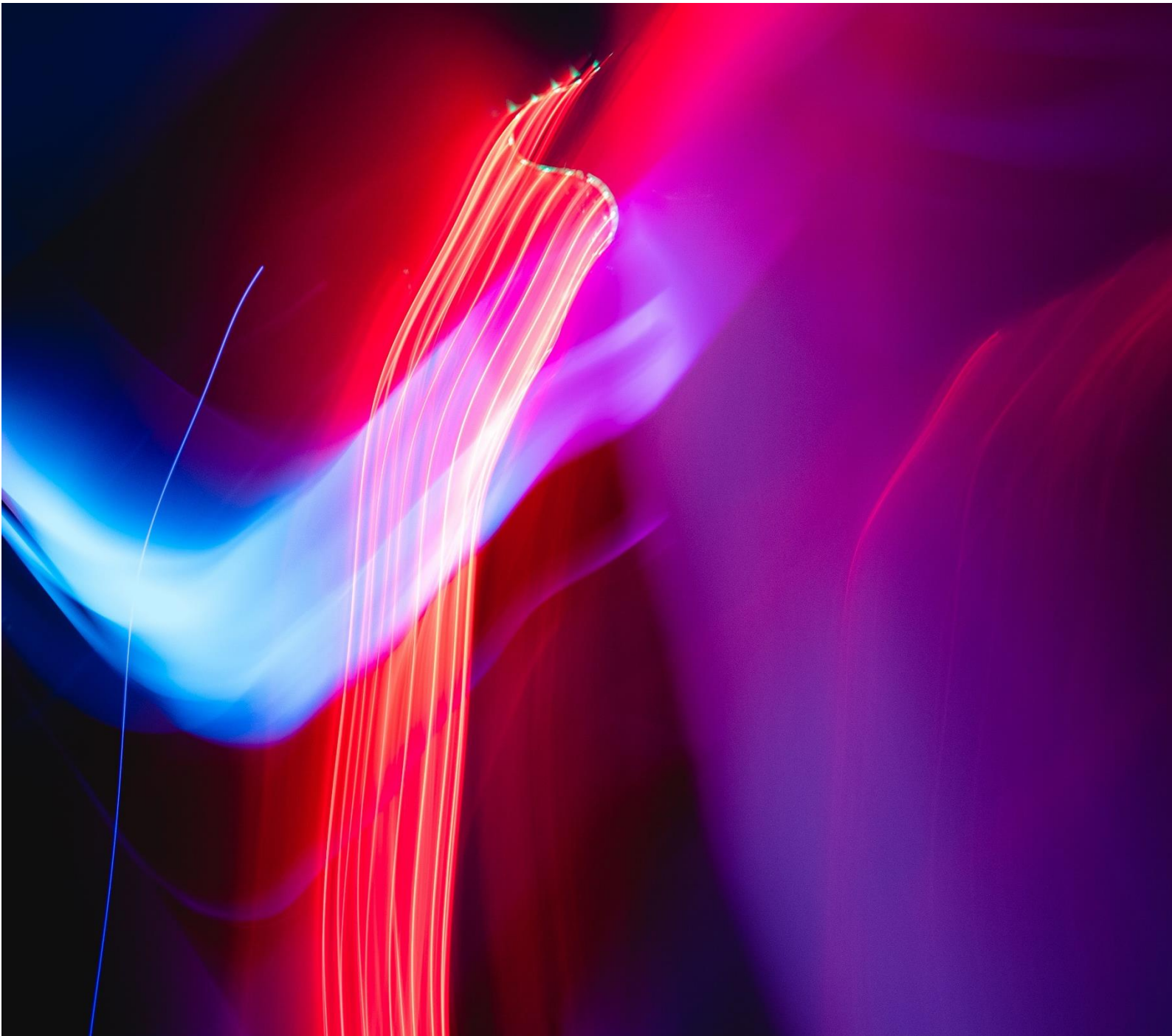
The respondents hoped TWNIC or TWCERT/CC could "provide more services/information" (16.7%). In terms of information provision, some respondents mentioned that they hope TWNIC or TWCERT/CC can continue to provide information related to information security, restore the previous full content PDF file of the e-newsletter, expect the information to be transparent and open, enhance usability, and improve the efficiency of intelligence disclosure. After the notification, we hope to provide quicker and more accurate assistance to deal with the information security crisis as soon as possible. For services, respondents hoped TWNIC or TWCERT/CC could provide more Internet defense technology or provide more guidance and advice on network protection. After notification, they hoped that case follow-ups could be faster and more precise to help deal with the information security crisis as soon as possible.



n=174

Source: Online Survey (2021)

# **Chapter VIII. Taiwan CERT/CSIRT Alliance**



## Chapter VIII. Taiwan CERT/CSIRT Alliance

The 2021 stakeholder survey has interviewed 2 members from Taiwan CERT/CSIRT alliance. Both surveys were conducted online.

- I. The interviewees have acknowledged the events and the info-sharing activities. They expect more efficient notification by making good use of a variety of platforms.

TWNIC has received good reviews from alliance members three years in a row. The events and info-sharing activities are fairly helpful. The events were organized with meticulous efforts and a rich variety of topics. The information is clear and timely updated with diverse methods. In addition to notification, newsletter and website announcement, stakeholders would also like to be notified by using API directly. This shows even if the notification has the same information, the platform it's delivered and the level of disclosure mean differently for stakeholders. Therefore, if TWNIC can share information based on different platform's features, it will be more efficient for users to learn, handle and make use of it.

*The information they offered is pretty good because it's either the end of 2020 or the beginning of 2021, they started to use the MITRE ATT&CK framework to describe the entire process of cyber kill chain. With this description technique used worldwide, it gives fairly clear information on how specific ransom cyber-attacks have worked.*

*I am in their LINE group which offers information mostly about cyber security. Of course the LINE messages can be read timely, but the newsletter has pretty much the same content. So when I read the newsletter, I don't read LINE messages.*



The alliance members also think TWCERT/CC provides a lot of information covering a wide range of topics, but it needs to be more careful about the accuracy and timeliness.

- | *It's a pity that TWCERT/CC sometimes sends out time-sensitive information late... it's impossible for us to wait another one or two weeks to get the full picture of it.*
- | *It also happens that my coworker didn't read through TWCERT/CC's message and blocked the one s/he thinks is important. Later when we wondered why something had been blocked, we checked and realized the scenario is very common. That's why we hope them to offer more precise information.*

## II. Add incident status inquiry or notification, increase effectiveness of cross-country incident reporting

Stakeholders think the domestic incident reporting and subsequent handling process is fairly smooth but cross-country reporting/handling is not as satisfactory. Based on their experience, since the incident was labelled as other countries, it took a very long time for inappropriate content to be removed and there was no way for them to know how the incident was handled afterwards. Besides, they'd also like to have an incident status inquiry function and to be notified timely, so that the reporter can learn about the incident status and become more willing to report incidents.

- | *TWCERT/CC helps us with this. When CERT has security incidents, we also contact other CERTs through TWCERT/CC. This also works when educational institutions in Taiwan encounter security incidents. Personally I think they did a good job on the communication process.*
- | *On the same occasion we also realized it was difficult to track malicious phishing sites from a nation's perspective. After we finished reporting on TWCERT/CC website, there's no access for us to inquire the incident's status.*

### III. Take industry requirements/gaps into consideration and deploy services to assist

Stakeholders think TWCERT/CC serves as the bridge of communication between the government and the private sector; therefore, they project their industry requirements onto expectations for TWCERT/CC, wishing TWCERT/CC to help them understand industry trends and formulate specifications/standards. Besides giving an evaluation on how to assist the industries with their requirement gaps, it's more important for TWCERT/CC to make sure these industries understand their role/position/missions.

Stakeholders also suggested that TWCERT/CC should take advantage of Taiwan's flourishing high-tech industry and build up the industry's vulnerability database. TWCERT/CC should leverage its neutral role and collect industry-specific/product-specific security experiences, so as to enhance Taiwan's security protection capacities and create its own cyber defense features.

- | *There are a lot of high-tech manufacturing businesses in Taiwan. If everyone is willing to provide TWCERT/CC with relevant information, maybe it can be the organization that owns Taiwanese manufacturers' first-hand cyber security experiences. This might help TWCERT/CC stand out and play a more distinctive role in global cyber defense.*
- | *TWCERT/CC also has this kind of training. By bringing together the power of PSIRT in Taiwan, Taiwan's software security protection capacities can be enhanced.*

#### IV. Improve online tech training results and continue to put efforts in segmented security education

Even though stakeholders said they don't think COVID-19 has affected how they interact with TWNIC, we cannot neglect that they pointed out online tech training results should be improved. As hands-on training classes produce more fruitful learning results, shifting to online classes certainly has impact on the learning model. Therefore, they look forward to a better way for training classes to proceed.

| *In the past, the TWCERT/CC conferences we joined usually took the entire afternoon or half day. I think being there in-person has the best learning outcomes. I can ask a questions anytime. However during COVID-19, there are fewer sessions, so I hope there's a better way to deliver the info in hands-on courses.*

Stakeholders also have given positive recognition to the information section on the official website. Although alliance members aren't likely to use it often, they must have used it to inform the general public whether in the form of security education or raising security awareness. In addition to continuously providing security information, making persistent efforts in providing security education to the general public also helps the society well-prepared for security incidents.

| *As to the official website, I think it's better to have information suitable for the general public/non-IT employees. The content can be combined with latest news/topics. They have made short videos before. When we think the content is informative, we will forward the messages to our coworkers.*

| *The information available on the official website promotes people's security awareness and shows how to safeguard one's own assets or devices. I think the information is also useful to our coworkers and other corporate users.*

# **Chapter IX.      Government Agencies**



## Chapter IX. Government Agencies

For stakeholders in government agencies with frequent operational engagement, we have interviewed three points of contact from Communications and Cyber Security Center, the Information and Communication Security Office of National Security Council and Department of Cyber Security, Executive Yuan. Due to the nature of the agencies and the operations between them and TWNIC, the interview in this part only focused on TWCERT/CC's tasks/operations, organizational vision and their expectations.

- I. With solid and complete foundation, the expectation is to proactively increase brand awareness and value

Stakeholders think TWNIC and TWCERT/CC have a solid foundation in brand positioning and serve as an important role to assist the government with excellent performance. This year stakeholders look forward to more extraordinary and flourishing progress on top of TWCERT/CC's existing services.

*Let me begin by praising TWNIC for its performance in the last year. They gave specific suggestions on how to respond to gambling websites. The RPZ (Response Policy Zone) they are working on is also a solution to be presented to the government, which helps with illegal websites or gray-ware. From this perspective, it saves people from fraudulent acts and I think it's excellent.*

*TWCERT/CC's achievements have met the government's expectation for them. We also look forward to more proactive and productive results and the government will do its best in facilitating their achievement. Once the overall framework is in place, the key is to work on the depth and the width.*

Stakeholders also gave positive recognition to TWCERT/CC's efforts in coordination/handling incident reporting, info sharing and security literacy education while looking forward to increasing brand awareness, reaching out to more people/companies/industries, promoting relevant services and campaigns and thus bringing its influences to full play.

Specific courses of action include transforming the negative COVID-19 impact into fuels boosting marketing effects such as the remote working security section made available on the official website that consolidates handy information for users. It's also advantageous to leverage the popularity of social media to reach a larger audience, scale up marketing campaigns to attract more attention, build brand awareness as well as establishing the brand value.

- | *COVID-19 appears to be an excellent opportunity for TWCERT/CC to gradually impress everyone by sharing tips about working from home and video conferencing.*
- | *The established security information section and created content are positive efforts made to nurture the security awareness of enterprises and their capacities to handle security incidents. This kind of know-hows and insights need more promotion and publicity. It's necessary to collaborate with more organizations to exert greater influence.*

## II. Follow closely on international security and network development trends, deploy security standards/specifications

Stakeholders suggest TWCERT/CC to follow international security trends and the latest development of internet applications so that they can identify opportunities to provide services and discover new requirements and clients. As TWCERT/CC is well equipped with solid tech strength and interacts closely with industries and government agencies, it can play a significant role in coordinating the development of each new technology associated with cyber-security.

- | *If we pay close attention to international security trends, we can learn about the development of these new emerging applications/services. Besides, the majority of these new applications/services are not the government agencies specified in Cyber Security Management Act. Therefore they are all clients of TWCERT/CC.*
- | *As technologies advance, such as 5G, AIoT, online platforms being used as an extension of intellectual property, all kinds of innovative applications/services are derived thereof. No matter how new and creative the applications are, they will certainly need security protection for continuous development. And this is what TWCERT/CC excels at.*

## III. Continue to review work results, integrate horizontally, build a solid foundation, and initiate cross-field collaboration

Stakeholders view TWCERT/CC as a bridge connecting the public and private sectors and thus expect it to create closer and more diverse interactions among the industry, government and academia. By visiting all the services currently in operation, TWCERT/CC should be able to understand its clientele and expand the value of services. Through different cross-field collaboration models, TWCERT/CC can consolidate security agencies/companies of the



same nature horizontally, build a solid foundation by promoting people's security literacy, incorporate enterprise security requirements, academic research results and survey information shared by government agencies. By leveraging the strength of different parties, the vision is to build a thorough security protection network as formidable as a fortress.

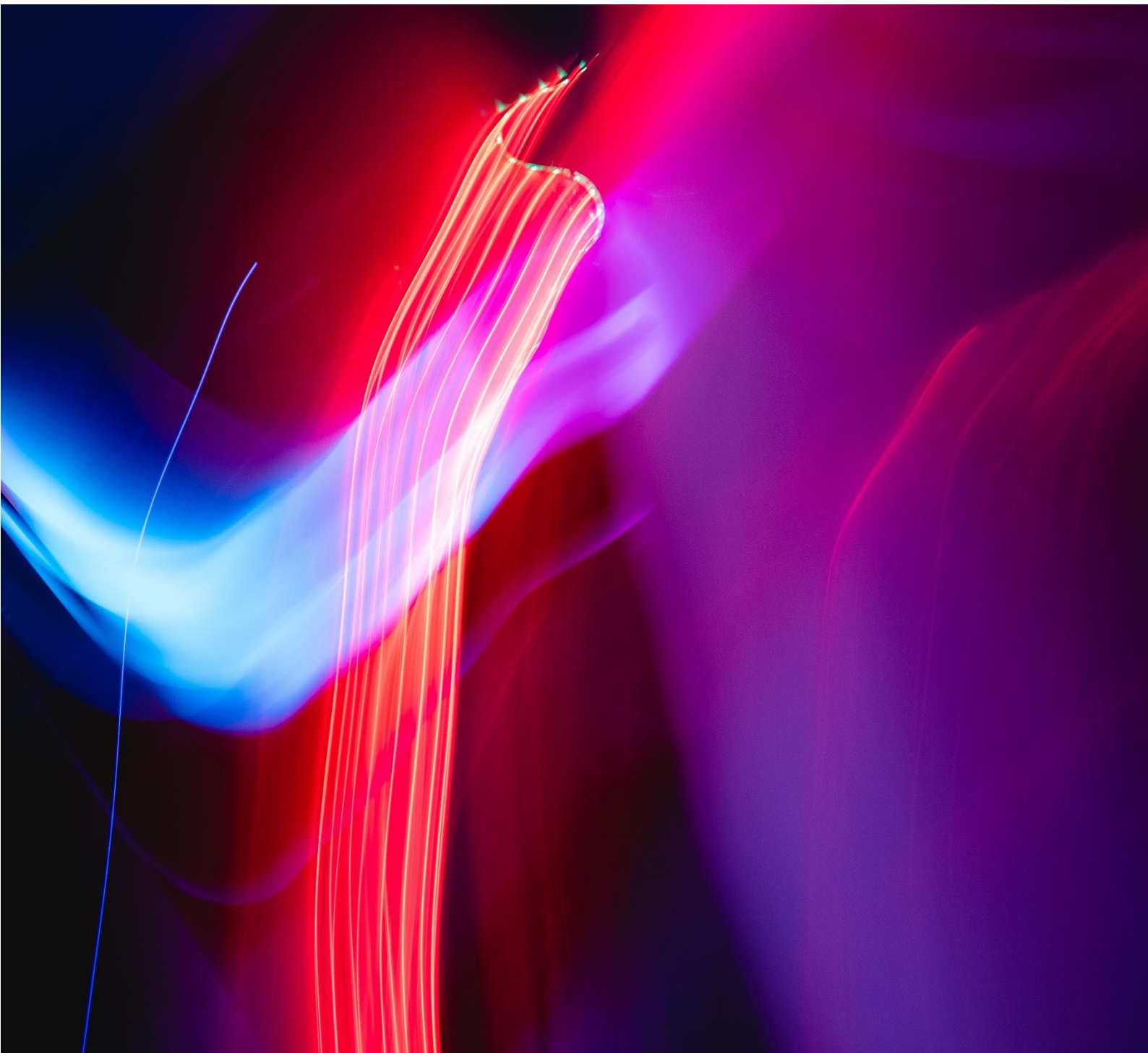
| *TWCERT/CC can work internally in the enterprises and offer their help in coordinating/handling incidents. This is my idea that TWCERT/CC can play different roles from info sharing, info provision to acting as a consultant. It requires thorough consideration to decide whether to work with security businesses, to let security businesses work on their own or to seek help from TWCERT/CC.*

| *After all, TWCERT/CC has limited resources and manpower. Therefore it's important to put emphasis on cross-field collaboration and leverage the strength of the industry, government, academia and research groups. In the future, TWCERT/CC can work with ICT associations on organizing incident reporting and response seminars, security info sharing conferences and run TWCERT/CC social media sites for promotion and publicity so as to build reciprocal trust.*



## **Chapter IX.**

# **International Organization Stakeholders**



## Chapter X. International Organization Stakeholders

The stakeholder survey has involved 4 respondents from international organizations -- one from ICANN, one from APNIC, and two from a foreign CERT agency, one from the management level and one point of contact. Although the tasks and operations of these 3 organizations differ from those of TWCERT/CC, considering they have offered their suggestions from the same angle as an international organization and shared how their practices can be applied in Taiwan, the 4 interviews are put in the same stakeholder category as international organizations.

### I. Current Organization Status and Partnership

Stakeholders from international organizations have shown their satisfaction with the excellent interactions and partnership with TWNIC and TWCERT/CC. They also appreciate the efforts TWNIC and TWCERT/CC made and contributed to the international communities. They view TWNIC as a strong partner in promoting security policies and technologies. Under the CEO's proactive leadership, TWNIC is able to build a solid foundation for technologies and interactions, to successfully improve network stability and cyber safety.

- | *The thing that they're part of those are working group activities and we really appreciate those contribution from TWCERT in terms of those working group activities and things like that so I would expect there I look forward to their continuous contribution to those working groups and APCERT activities.*
- | *I think TWNIC has always been one of the leaders in helping to establish better practices, new services and technologies and so forth so this despite a little bit quite a lot of technical development going on at the moment.*

Stakeholders also highly recognized how the events were held without being hindered by COVID-19. TWNIC has proactively encouraged collaboration and participation as well as maintaining communications with home and overseas partners. The event communication went very well. Holding hybrid events during COVID-19 has also greatly impressed the international partners.

*That event was actually the first sort of a hybrid event that we actually manage to have with fellow collaborators, so it was kind of like a bit of a milestone for us because I think before that all the other events, we were able to do that they were either smaller scale or they would just be online. So that forum actually in April was the first one that we actually really did something that's like a full on like forum and it's in a hybrid mode.*

## II. Recommendation on Key Development Fields

As to collaboration progress, stakeholders from international organizations suggest to continue put in more efforts and share resources/experiences from Taiwan with the international communities in addition to intensifying collaboration by maintaining current efforts in technologies and providing training support/registration operation. In fact, it is wise to increase exposure by making good use of the mass media and reach a larger audience with content in different forms. For example, it is nice to create a video summary after the event so that people who don't have time to participate can also learn about the key takeaways.

*So that sort of like, exposure to the community, not only to the technical community but also to the wider general users... exposure is one of the approaches to, but there is no quick solution to this question. So you have to work on it for a long time, I think it takes a while for people to actually get an understanding of organization and like getting trust so it's not an easy solution.*

| *So we had to do the events, but if you want to engage your wider audience, then we have to work in building in content that is in bite sizes through today's audience's attention span, because people would follow you for one hour they will just do it for like maybe 10 minutes they will jump on, but only the things that are relevant for them.*

Using different languages for cross-country communication is the bridge and foundation for creating more interaction opportunities with the international communities.

| *I didn't recall many publications are made in English so I think in terms of reaching out to more wider audience or partners, I guess, pumping up more about English publication of forms or like advisories. I think they're doing quite good technical capability as well so I guess that's that part might be one of the, you know, One of the ways to actually increase their engagement, more audience.*

### III. Future Positioning and Expectations of the Organization

While being highly recognized for pushing forward the connections with organizations home and abroad as well as nurturing local communities, stakeholders encourage and expect TWNIC to make progress on international relations, facilitate active local communities and promote the connections between online communities from Taiwan and abroad.

| *I think we're also like quite grateful that TWNIC that they have a lot of good ideas to try and facilitate that sort of the interaction with the people who are in Taiwan.*

| *They can encourage industries in Taiwan or younger generation in school to involve in internet governance and management. After all, they have closer connections with local communities. I think it's a better direction to work on by building further ties with local communities and bringing the experience to APNIC.*

Stakeholders also pointed out TWNIC's unique and favorable role as the bridge between the public and private sectors. With the advantage of operating TWCERT/CC, the suggestion is to assist/give advice to other countries in setting up CERT so as to scale up the international community by exporting the tech know-hows, demonstrate Taiwan's tech capacities to impress and build trust with international partners, and enhance its influence on the international stage for opportunities to gain more discursive power.

*CERTs come in a lot of different flavors and knowing, and from the excessively governmental and bureaucratic national security oriented to something much more practical and hands on. My understanding of TWCERT that had some gifts in the middle but towards the practical end, I think the way of TWNIC has always been a very pragmatic and practical hands on sort of approach and that also that also potentially gives a role in providing services elsewhere and we has been helping with the establishment of certs in small Pacific Island places where a CERT is literally a couple of people employed to do that and they've got a huge job because they are looking after relations with government, police and NGOs, sort of non government sector in business and everything. So, that possibly that potentially is a role for TWNIC and one where we could certainly have a collaboration so that that the ability to create the necessary human relationships and to extend the circles of trust, which are really important in the surf community through that and build it on a technology transfer sort of relationship is quite huge.*



# Chapter XI. Recommendations



## Chapter XI. Recommendations

The services have been preemptively prepared to avoid COVID impact and the optimized system has served as a channel for smooth service provision and interactions.

- Interactions with stakeholders are safe from COVID impact. This can be attributed to the preemptively-prepared and well-structured online services so business interactions/communications went smoothly. Going forward, it's necessary to consider how shifting physical events to online ones can be designed and how to achieve the expected result. Besides, it's also important to strive for constant improvement for maintaining different online channels for interaction and present more diverse topics in multiple forms.
- We suggest upgrading/optimizing the operation system and paying attention to system stability/maintenance. In addition, it's necessary to build a process status inquiry platform to enhance the efficiency. It's also necessary to add incident status inquiry function or notifications, so that the incident reporter can learn about the incident status and become more willing to report incidents.

Proactively increase brand awareness and value, make effective use of the new media to scale up online community.

- The goal of the next phase is to have more excellent/vibrant advancement on top of existing services - specifically towards increasing the visibility of ".tw/.台灣", promoting domain name awareness education, invigorating the industries, driving IPv6 implementation, strengthening IP security, making continuous efforts in security incident reporting/handling, info-sharing and security literacy education, persistently increasing brand awareness and actively pushing forward/promoting relevant services.
- Make good use of new media forms to interact with the public, such as using the booming social media to identify proper audience for advocacy and creating connections with more audience with more diverse media forms and multiple channels.

**Nurture local communities and connect with international organizations, encourage and establish the foundation of multi-party internet governance.**

- Continue to foster active local communities and domestic/overseas community connections, assist in resource coordination in Taiwan, reach out to new online communities in the core of industries or schools, enhance people's security literacy and digital skills, initiate cross-field collaboration for synergistic effects, establish ties with organizations of the same nature, initiate industry interactions, set up new security tech standards, and strengthen Taiwan's cyber defense.
- By leveraging TWNIC's semi-official role and its advantage of operating TWCERT/CC, the suggestion is to assist/give advice to other countries in setting up CERT so as to scale up the international community by exporting the technologies, demonstrate Taiwan's tech capacities to impress and build trust with international partners.