



# Taiwan Network Information Center Stakeholder Survey 2022

Organizer : Taiwan Network Information Center  
Implementer : Pearson Data Ltd.

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# Chapter I. Study Overview

## I. Online Survey

Stakeholders	Sample Requirements	Email Sent	Email Opened	Email Open Rate	Email Replies	Valid Email Amount	Click-through Rate
Domain name registrant	Those who used the domain name services in the past year	23,286	5,830	25.0%	824	330	1.4%
IP Member	-	288	173	60.1%	46	29	10.1%
TWCERT/CC Newsletter Subscribers	Newsletter Subscribers	6,850	3,439	50.2%	789	538	7.9%
Taiwan CERT/CSIRT Alliance	-	712	398	55.9%	202	166	23.3%

## II. In-depth Interviews

Stakeholders	Sample Requirements	Number of Interviewees	Interviews
Domain name registrars	-	2	Online interview
IP Registrar	-	3	Online interview
Relevant Government Agencies	Points of contact with frequent operational engagement	3	Online interview
Taiwan CERT/CSIRT Alliance Member	-	2	Online interview
ICANN, APNIC, JPCERT	International organizations responsible for administering internet resources or cyber security	4	Online interview

## CHAPTER II. Operational Overview

As Taiwan enters the postpandemic era in 2022, the Taiwan Network Information Center (hereinafter referred to as TWNIC) has adjusted and improved its services to meet its annual core objectives, namely to provide access to registration information, databases, promotion initiatives, and education training while remaining neutral and championing the spirit of mutual assistance and network resource sharing. The TWNIC has also enhanced the cyber security, response, and recovery capability of Taiwan, provided high-quality network technology services, and trained numerous domestic cyber security personnel. This report used the satisfaction of stakeholders to analyze the annual performance of the TWNIC, and utilized the opinions of stakeholders as a reference for future development and projects.

The results of the adjustments demonstrated that the domain name registrars, internet protocol agents, and governmental institutions were all satisfied with the services provided by the TWNIC and the Taiwan Computer Emergency Response Team and Coordination Center (TWCERT/CC). The stakeholders had a high level of trust in and highly approval of the service value, and their satisfaction with the service quality and technical support provided to them remained high and stable. The reason is because the TWNIC has always actively responded to their demands and maintained close cooperation with society, the government, and international network communities. The stakeholders were particularly satisfied with the TWNIC's interaction, solutions, and feedback on problems. The TWNIC remains a nonprofit organization amid the uncertainties of the postpandemic era and responsibly and successfully fulfills its role to meet the expectations of the institutions that it services.

During the interview, the topic of cyber security was often mentioned, including references to the data security of personal mobile phones, computers, and internet banking, and network links between self-driving cars, smart home appliances, and online or offline transaction devices. Cyber security requires a more robust protection system. Domestic and international industries have been engaging in digital transformation since 5G, AI, and AIoT have begun to be extensively applied in different sectors. In general, the interviewees approved of the work of the TWNIC and TWCERT/CC, because they protect the cyber security of people using the internet in their everyday lives. The TWCERT/CC has continued to monitor the latest cyber threats and attacks, update cyber security reports and coordination services, enhance their international cyber security and intelligence report system, and compile and analyze intelligence from domestic and international cyber security organizations. These efforts have substantially improved the cyber security defense capability of Taiwan.

The TWNIC and TWCERT/CC further extend their efforts in the following four service orientations:

1. Actively connecting Taiwan to the rest of the world



The role of the TWNIC in maintaining technical connections with international online groups is evident, but with the rapid development of information and communication technology, businesses can still expect the TWNIC to host more international seminars, offer opportunities for training and recruiting talent in Taiwan, provide Taiwanese pedagogues and industries with information on the developmental status of international Internet-related topics, and invite an increasing number of leading Internet experts from all over the world to Taiwan to engage with local online communities. Especially with the international situation currently unresolved, the role of the TWNIC as a bridge between online businesses in Taiwan and network information from overseas is paramount. Whether relating to an overseas case study or an international trend, overseas information is a valuable index for Taiwanese users, serving as a reference for comparison with other countries and regions, particularly the European Union and the United States, and stimulating businesses to develop new ideas and perspectives.

## 2. Guiding businesses to develop service chains

This year, agencies that handle domain name registration continue to overcome the negative effects of the pandemic on market demands; this challenge is compounded by latecomer social media platforms. As such, these agencies have fervently expressed a desire for the TWNIC to lead them in discovering new frontiers. Whether assisting with vertical integration along the service chain or horizontal alliances across industries, the TWNIC's obligations are not restricted to its original founding goals, which were to promote the popularization of international applications in every industry in Taiwan, to coordinate the integration and exchange of information services, to assist and support governments in their affairs, and to promote matters of public interest concerning online information. Industries and businesses look forward to more active demonstrations of support from the TWNIC, such as assistance in deriving more services with information value that meets market demands. The TWNIC has international visibility and many resources within Taiwan, which it can leverage to influence technical life cycles, competition, and future developmental trends.

## 3. Establishing new models of cooperation with the private sector

Cyber security is a growing concern, and the overall operational environments of businesses have shifted as a result of international war and the global pandemic. The constant transformation of industry chains has become routine. Because operations have shifted from being customer-oriented to being community-oriented, insights into technological trends and predictions of industry developments have become fundamental to businesses' survival in the market. The special neutral status of the TWCERT/CC enables it to act as a liaison between the government and the private sector and to incorporate appropriate policies to improve its resource utilization and promote favorable public interest services.

## 4. Integrating resources to provide services in response to challenges



Over the past few years, both the TWNIC and TWCERT/CC have actively faced challenges created by the pandemic and have successfully held hybrid online and offline events using video conferencing technology, inviting attendees from all over the world to broaden the agenda. Responding to trends, remote offices were established to collect relevant knowledge, to reduce the threat of cyber security breaches to the public, and to coordinate cyber security in the gathering and integration of information when forging cyber security alliances. Through these actions, both the TWNIC and TWCERT/CC have demonstrated the positioning of their organizational roles and have offered steady support for Taiwan’s continued promotion of digital development.

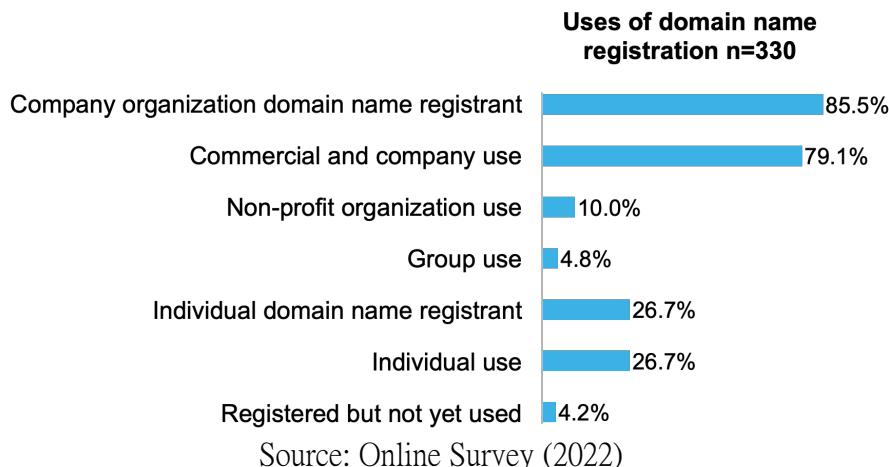
# CHAPTER IV. Domain Name Registrant

## I. Summary of Implementation

The first question of the questionnaire will ask the registrant the purpose of registering the domain name. If the registrant cannot answer the purpose of registrar, the questionnaire will be closed after this question, and considering that domain registration is not limited to a single time or a single domain name, the purpose of domain name is a multiple choice.

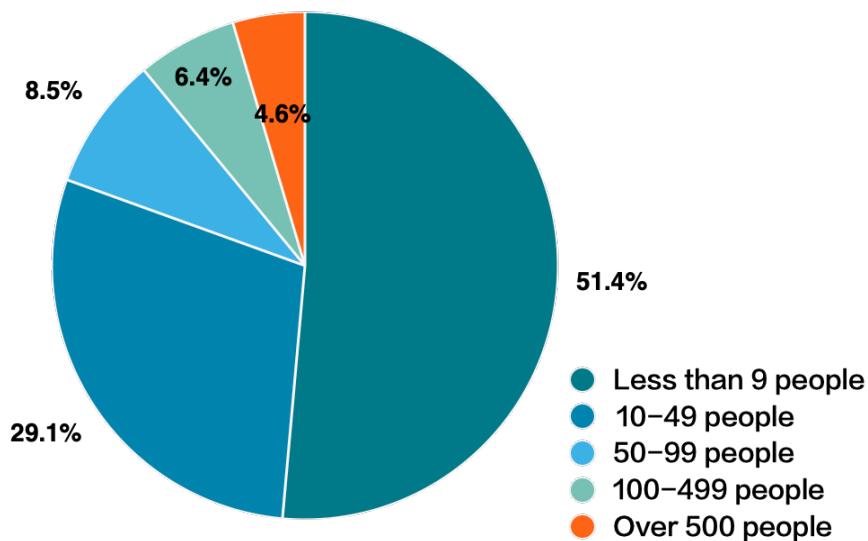
The use of registered domain names 85.5% are "company organization domain name registrant" , 79.1% for "commercial and company use", followed by "personal use" (26.7%); 26.7% are "Individual use". And 4.2% are "registered but not used", indicating that the use of companies and organizations is still the majority.

In addition, 34.8% of the respondents were "directors, general managers, CEOs and other management", while "technology, infocomm" accounted for about 20% of the respondents." This survey was completed by the management or technical staff, so it can effectively reflect the opinions related to the use of the service.



Regarding the number of company/organization registrants, about 50% of them are less than 9 persons, followed by 29.1% with 10-49 persons, which shows that there are more registrants working for small and medium enterprises.

11. How many employees does your company/organization have?  
n=282



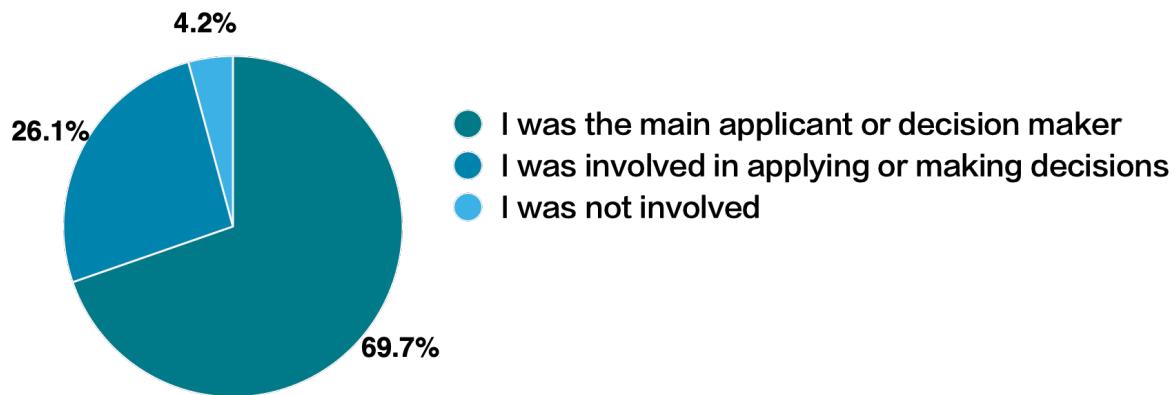
Source: Online Survey (2022)

In this survey, 70.2% of the respondents were "main users or decision makers", 24.7% were "involved in registrations or decisions", and 5.2% were neither of them, indicating that this survey covers the interactive window to understand the usage and evaluation of services.



Source: Online Survey (2022)

A total of 69.7% of "primary applicants or decision makers", 26.1% of "participants in applications or decisions", and 4.2% of neither, indicate that this survey can cover the interactive window for understanding service usage and evaluation.

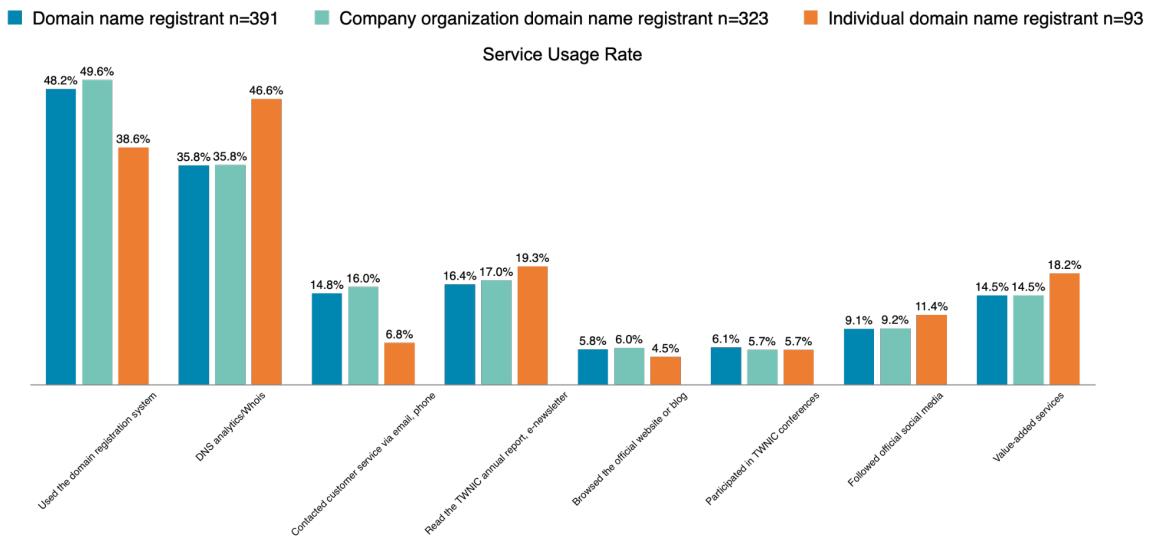


Source: Online Survey (2022)

## II. Service Usage Rate

Overall, the most frequently used service was the "Domain Name Registration System" (48.2%), 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" (46.6%), which individual registrants more frequently used.

The usage rate for "phone, e-mail, and web-based customer service" was 14.8%. 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 19.3%, with the usage rate among individual domain name registrants slightly higher.

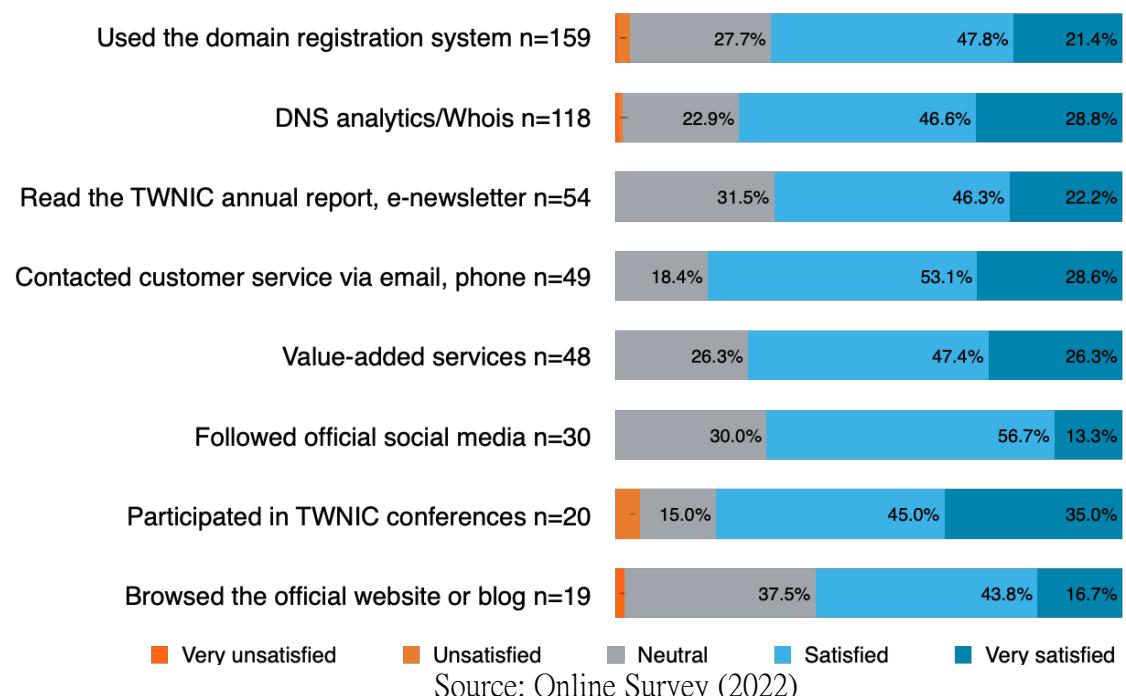


Source: Online Survey (2022)

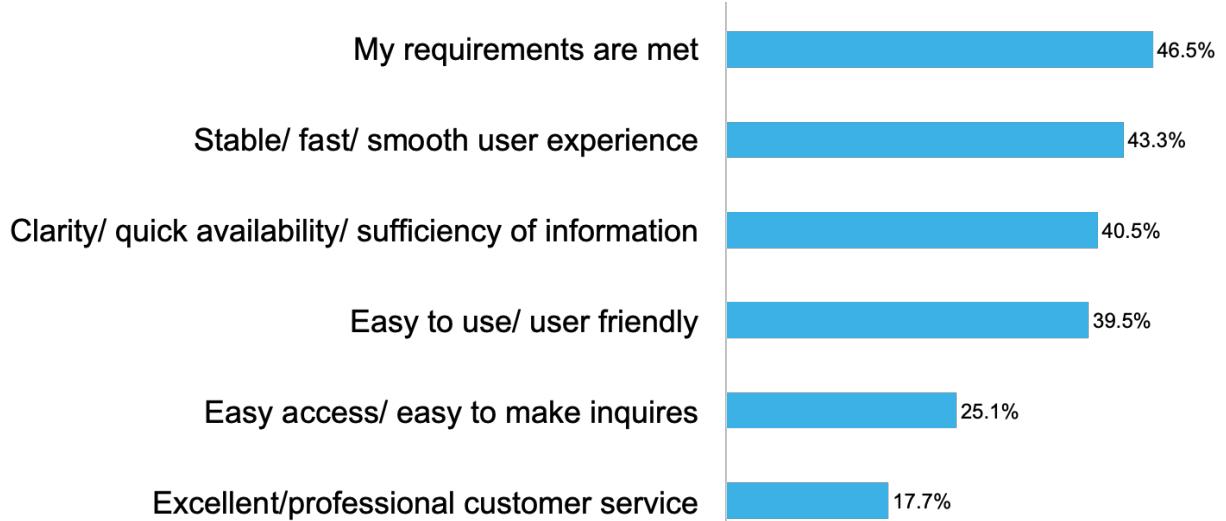
### III. Satisfaction of the Primary Services

The highest satisfaction rate was "Contacted customer service via email, phone" (81.7%). This is followed by satisfaction of "participation in TWNIC seminars" at 80.0%, although the usage rate was not high, most participants were satisfied with the seminars.

The "Domain Name Registration System" was the most used service, with a satisfaction rate of 69.2%. The second most used service, "DNS resolution service/Whois", received a satisfaction rate of 75.4%.

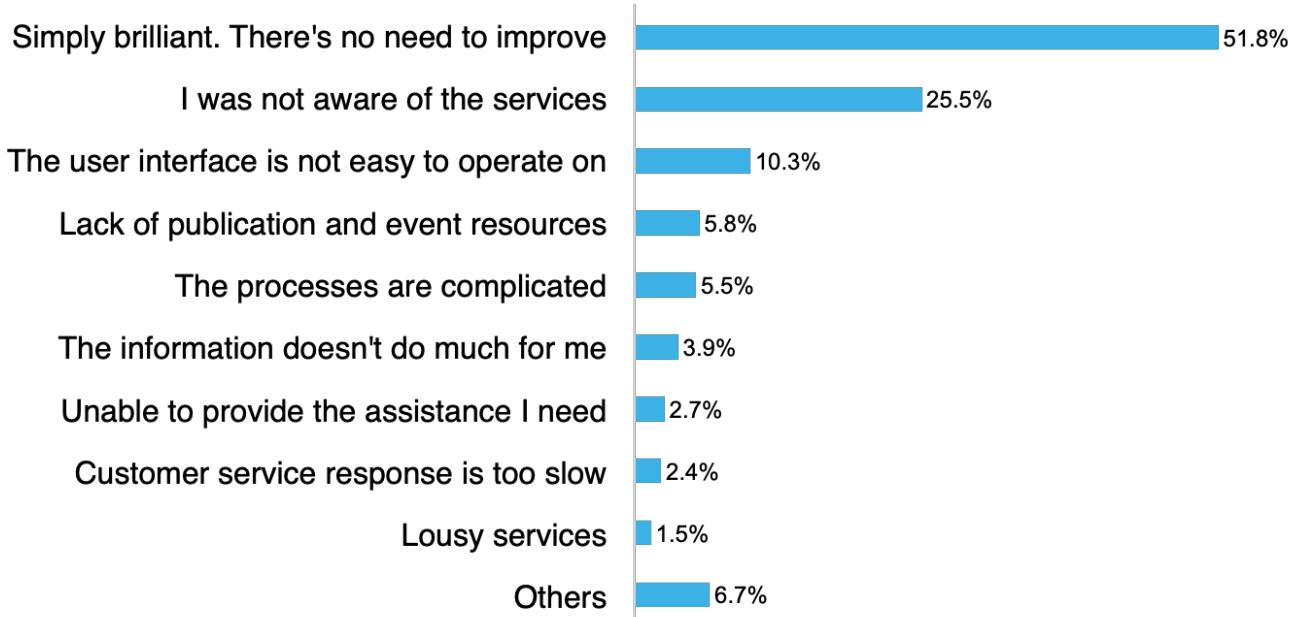


Among those who were very satisfied or satisfied with any of the service satisfaction indicators, the highest percentage of those who were satisfied with the service was 46.5%, followed by 43.3% for "stable/fast/smooth", 40.5% for "clear/quick/sufficient information", and more than 20% (39.5%) for "easy to use/user friendly".



Source: Online Survey (2022)

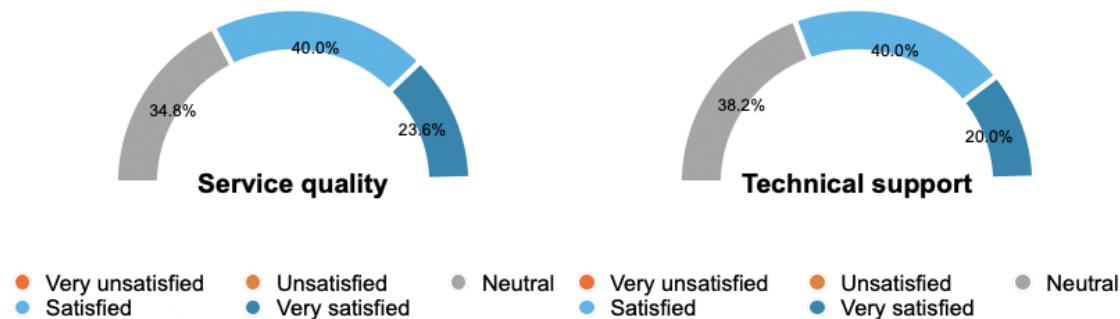
Next, all domain name registrants were asked what service experience could be improved, and over 50% of them thought the current service was very good. Another 25.5% said "I was not aware of the service", suggesting that more promotion should be done to enhance the awareness of the service content. 10.3% said "the user interface is not easy to operate", and that the user interface could be adjusted to make it much easy to use.



Source: Online Survey (2022)

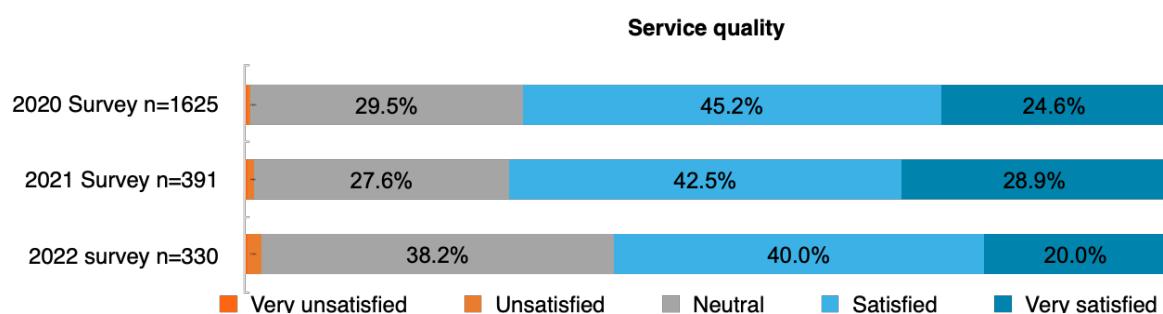
## IV. Evaluation of the Overall Satisfaction and Value Perceptions

In terms of registrants' overall satisfaction with TWNIC, more than half of the registrants rated TWNIC positively on both "service quality" and "technical support", including 63.6% who were satisfied with the "quality of services" provided by TWNIC and 60% who were satisfied with the "technical support" provided. Satisfaction of service quality this year is 63.6%, down 1.6% from 65.2% last year. Technical support decreased by 6.2% from last year's 66.2% to 60.0% satisfaction.



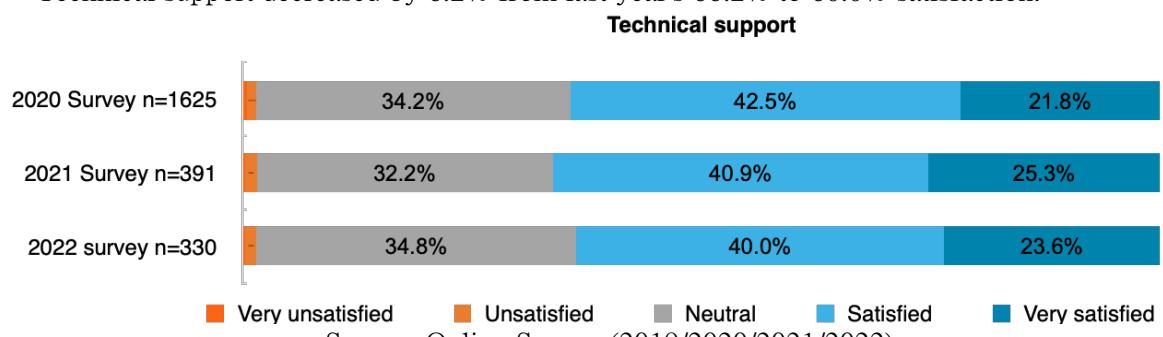
Source: Online Survey (2022)

Satisfaction of service quality this year is 63.6%, down 1.6% from 65.2% last year.



Source: Online Survey (2019/2020/2021/2022)

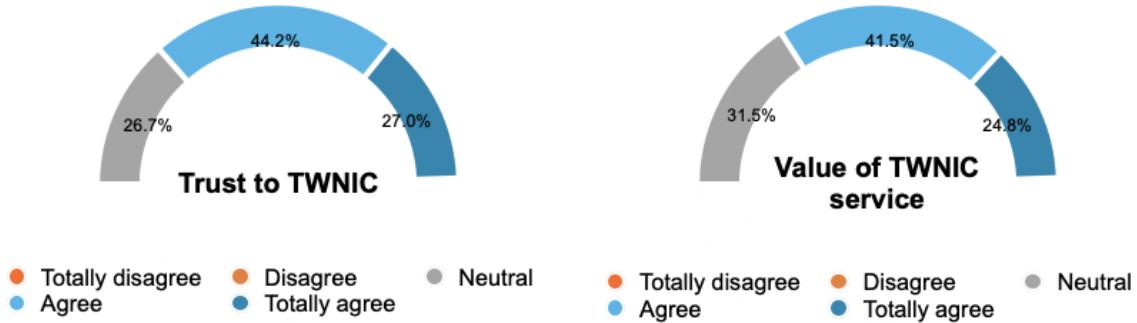
Technical support decreased by 6.2% from last year's 66.2% to 60.0% satisfaction.



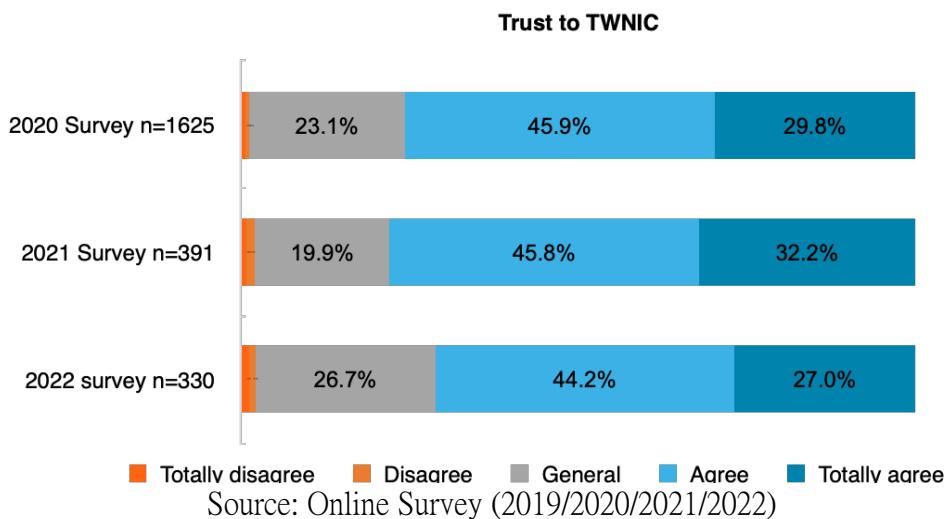
Source: Online Survey (2019/2020/2021/2022)

## V. Trust and Value Experience Evaluation

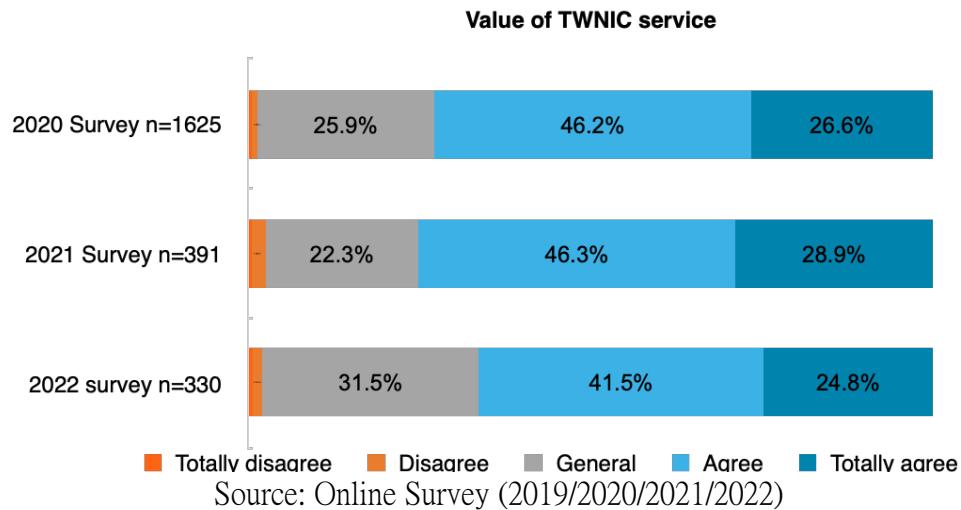
In addition to overall satisfaction, the evaluation indexes of trustworthiness and service value were also added. "I trust TWNIC" was confirmed by 71.2% of respondents, and 66.3% agreed that "the services provided by TWNIC are valuable to my business".



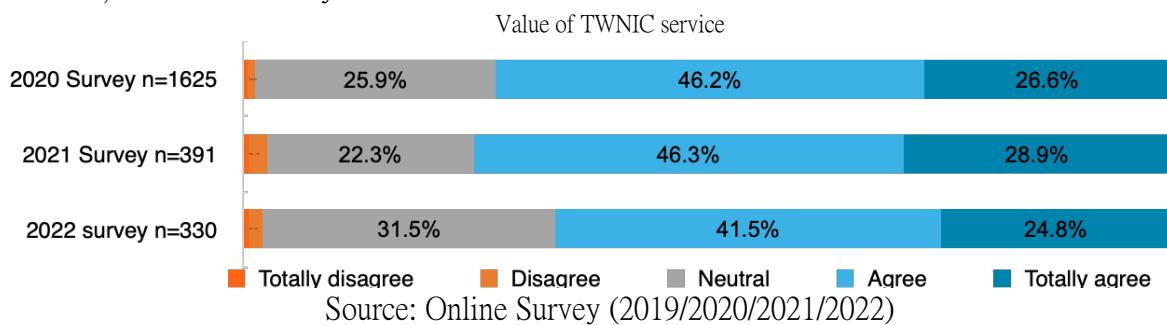
Source: Online Survey (2022)



The value of services has decreased the most compared to last year, with 66.3% this year.

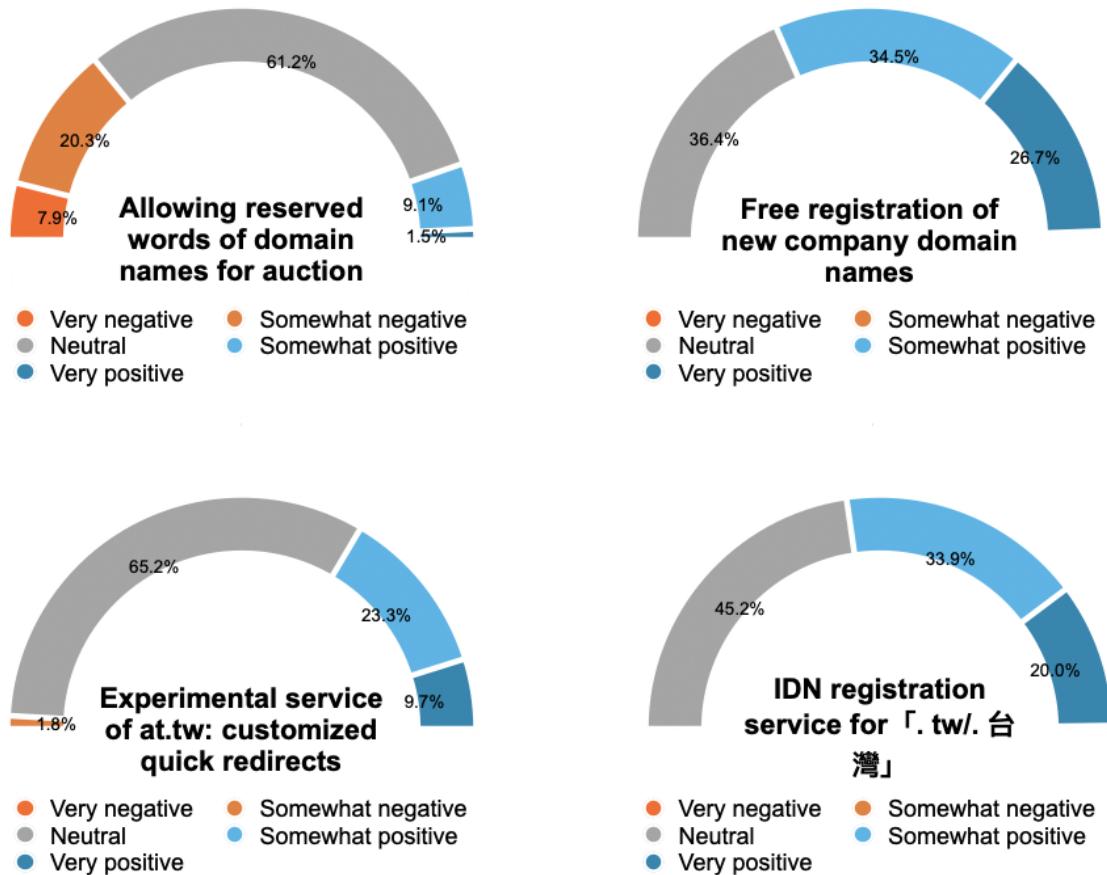


The value of services has decreased the most compared to last year, with 70.0% this year, down 3.7% compared to last year. Compared to last year, a higher percentage of services decreased in value, from 75.2% last year to 66.3%.



## VI. 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" (61.2%), followed by "free registration of .tw/.台灣 domain name offers internationalized domain name IDN registration service" with 53.9% 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 33% 、10.6%, respectively.



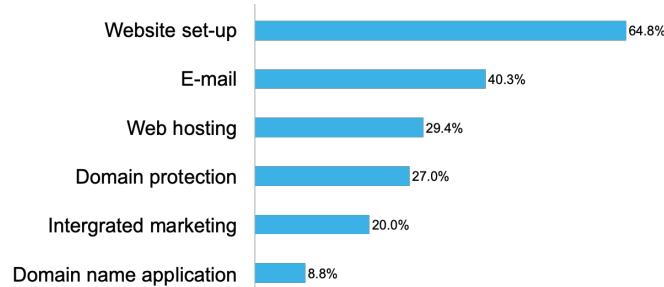
Source: Online Survey (2022)

## VII. Business Development Needs and Supports

- From the actual use of domain names .tw/.台灣, "website set-up" is the service with the highest usage rate of 66.9%, followed by "e-mail" with 40% usage rate, "domain name protection" and "website hosting" with 30% usage rate respectively, and "integrated marketing" with 20% usage rate.

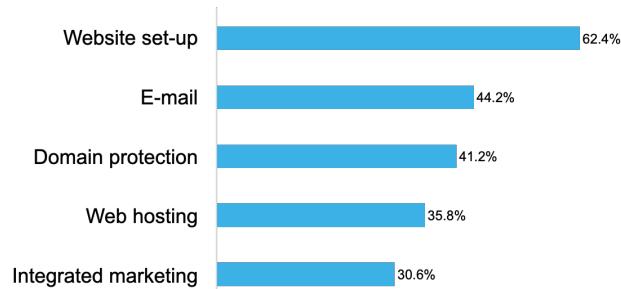
In setting up websites, the usage rate by "individual domain name registrants" is higher than that of "company and organization domain name registrants". In comparison, the usage rate of all other services is higher for "company and organization domain name registrants".

**B1. Which .tw/.台灣 domain name services does your company/organization use?**  
(Multiple choice) n= 330



Source: Online Survey (2022)

**C1. Which kinds of services does your company/organization need when using .tw/.台灣 domain services? (Multiple choice) n= 330**

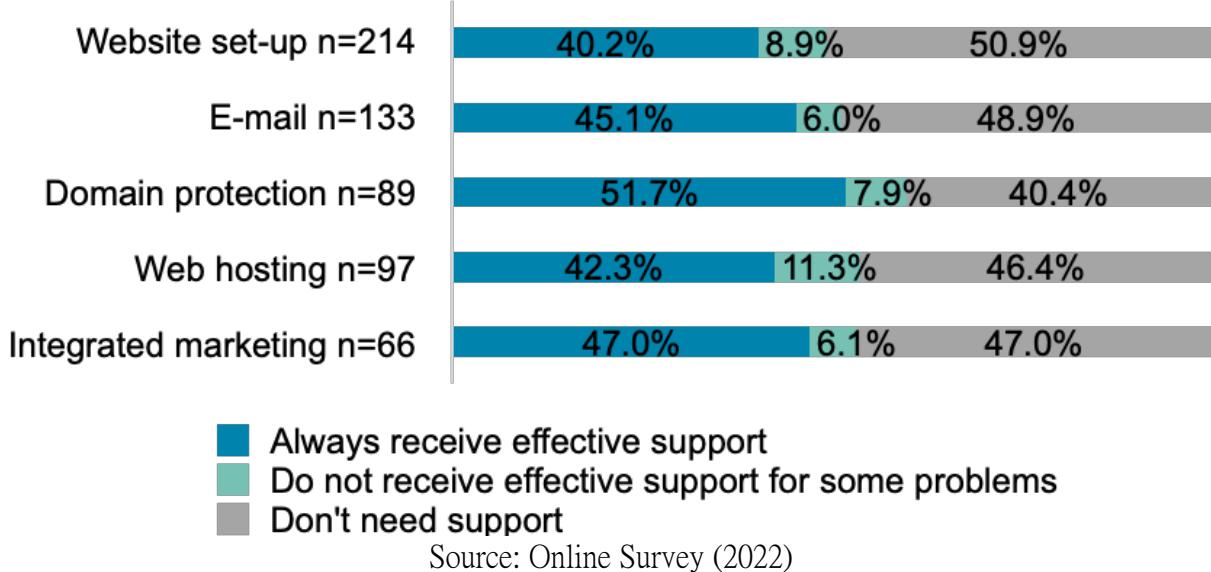


Source: Online Survey (2022)

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 set-up" and "e-mail" services was relatively low, with only about 50% of them needing support respectively.

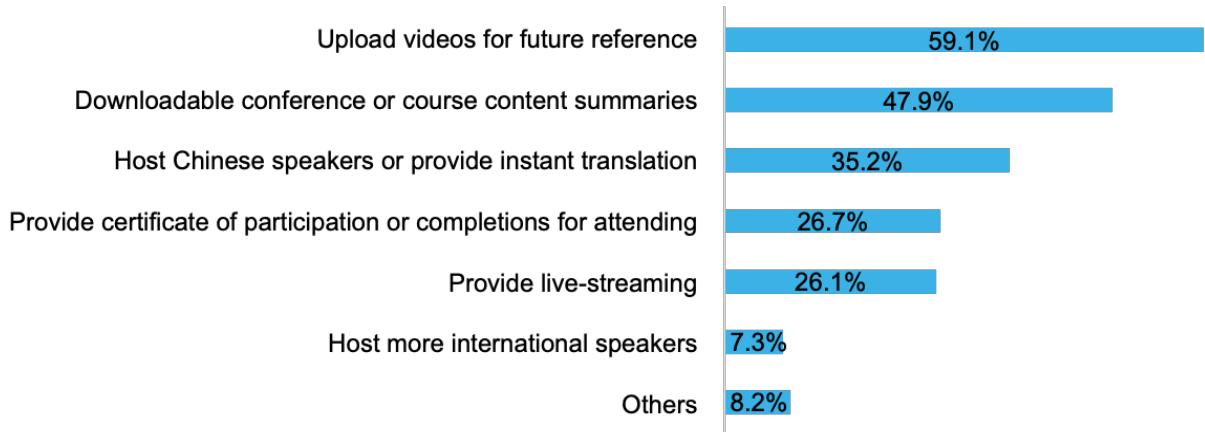
The percentage of respondents who received effective support for "domain protection" services is the highest among these three services at 51.7%.

In addition, 60% needed support for either "Integrated marketing" or "e-mail" services, and 45% of respondents indicated they received effective support for both services.



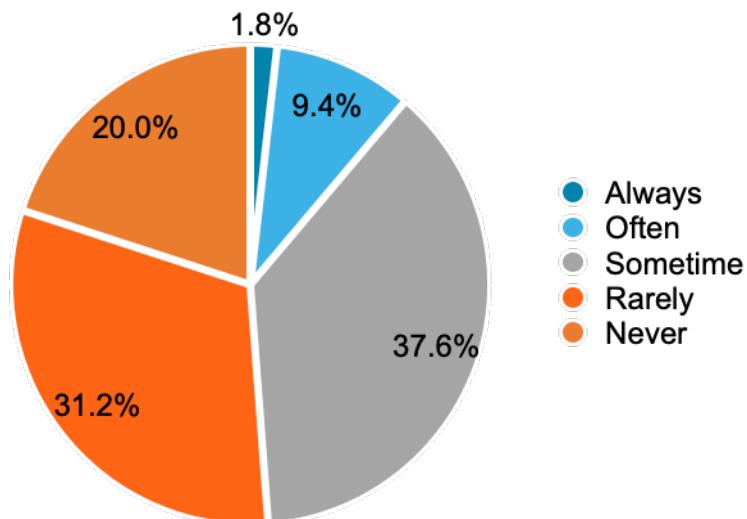
## VIII. Participation in Events and Expectations and Preferences

In terms of future expectations for the event, "upload videos for future reference" (59.1%) topped the list, followed by "downloadable forum or course content presentations" (47.9%). 35.2% of registrants expect "host Chinese speakers or provide instant translation", with a higher percentage of company and organization domain name registrants requesting the services than individual domain registrants.



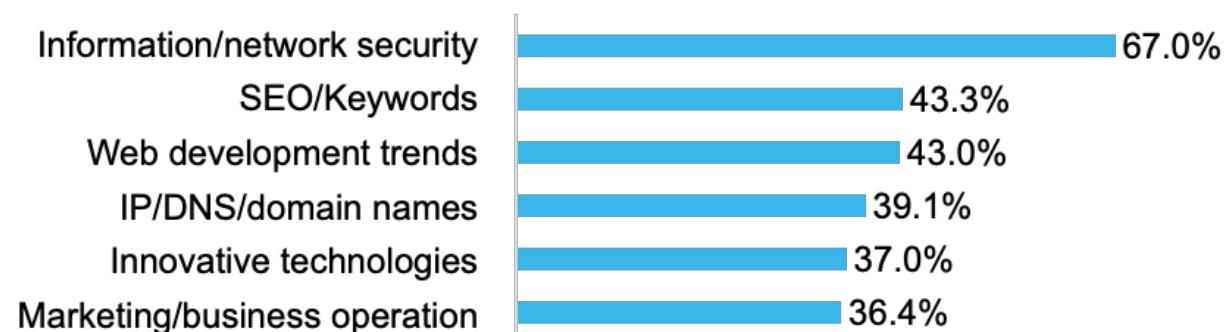
## IX. Information Services

The overall attention score of registrants is 37.6% 'occasionally concerned"(sometimes) and 31.2% "rarely concerned".



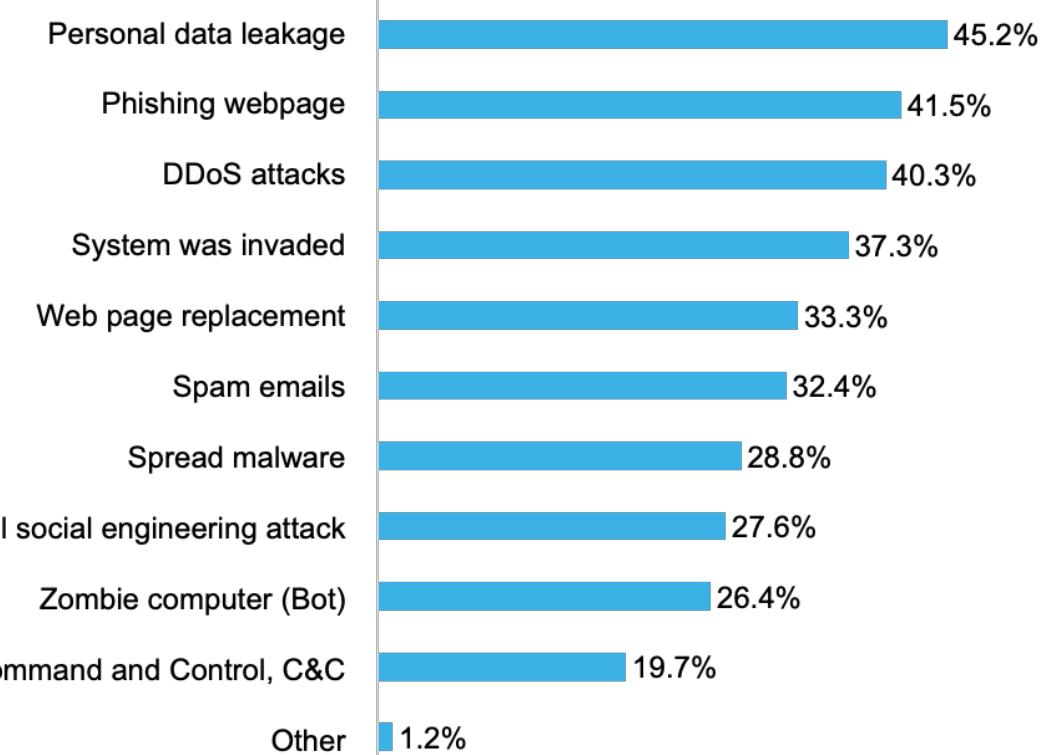
Source: Online Survey (2022)

As for the issues they were looking forward, 67% want to know more about "cyber security/network security" related issues, and 43% want to know about "Web development trends" and "SEO/Keywords".



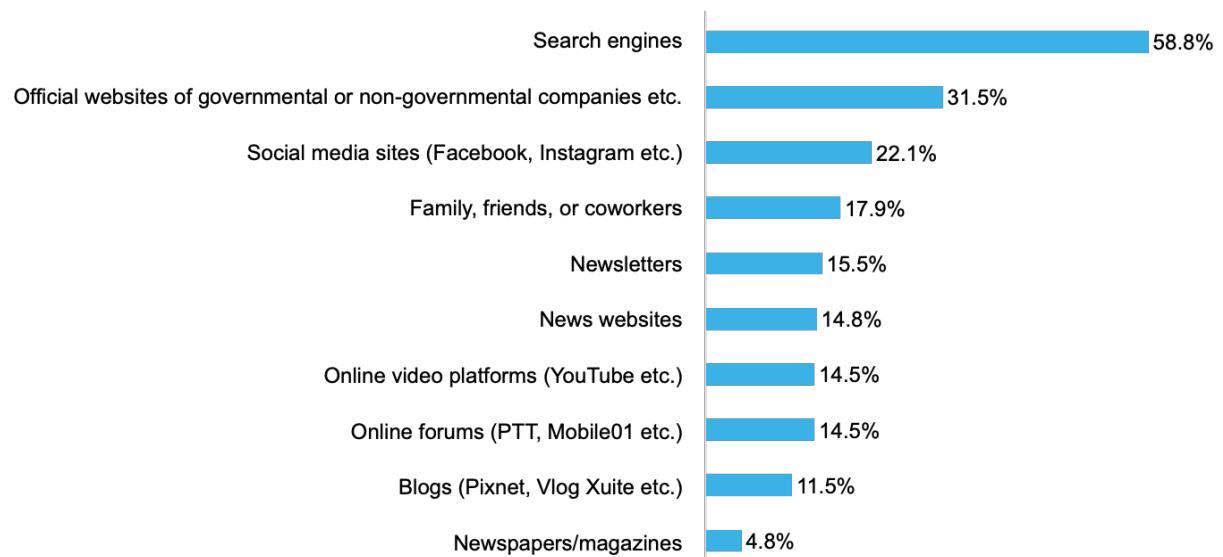
Source: Online Survey (2022)

In addition, this year, we also conducted a survey on the content of information and network security-related information, and most people thought the topic of "personal data leakage" was the most helpful, followed by the topics related to "phishing webpage" and "DDoS attacks".



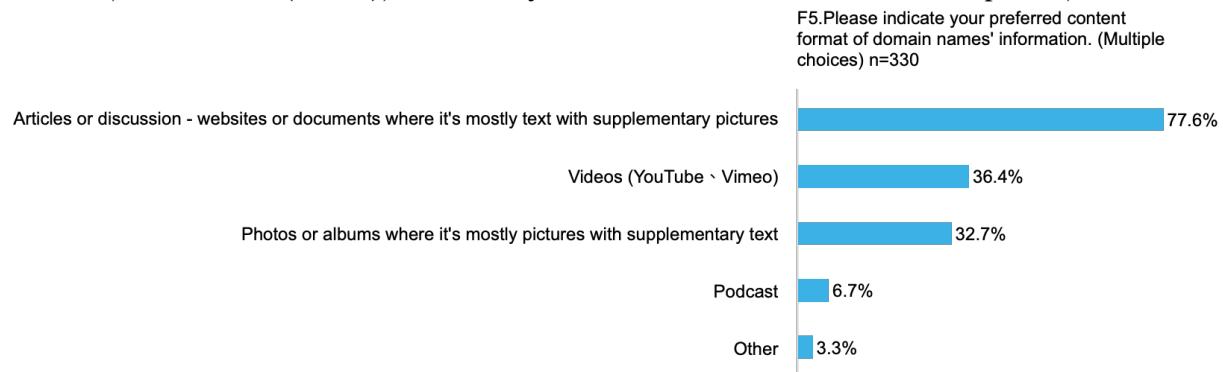
Source: Online Survey (2022)

The highest percentage of respondents obtained domain name related information through "search engines" with 58.8%. The next highest percentage was 31.5% for "official websites". The percentage of "social networking sites" was 20%.



Source: Online Survey (2022)

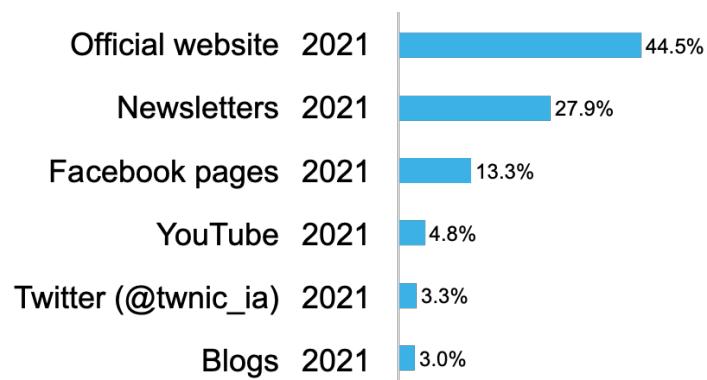
Domain registrants' preference for domain name related information and new knowledge was "articles, discussions" (77.6%), followed by 36.4% for "videos" and 32.7% for "photos, albums".



Source: Online Survey (2022)

The respondents were asked about the preferred source of information of TWNIC: "official website" with nearly 44.5%, "Newsletters" with 27.9%, and "Facebook pages" with 13.3%.

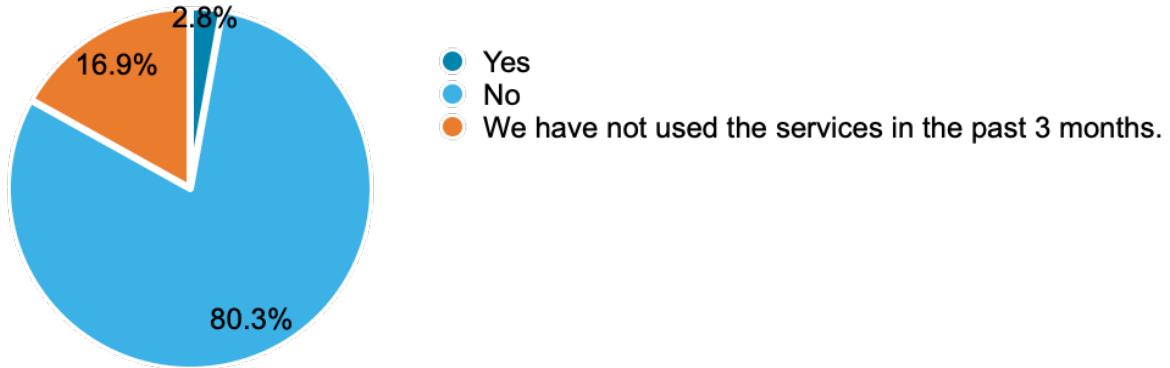
**B7. Through which channels do you prefer to get further information from TWNIC? (Multiple choice) n=330**



Source: Online Survey (2022)

## X. Impact of COVID-19

In the past three months, only 4.2% of respondents' companies/organizations have been affected in their use of domain name related services.



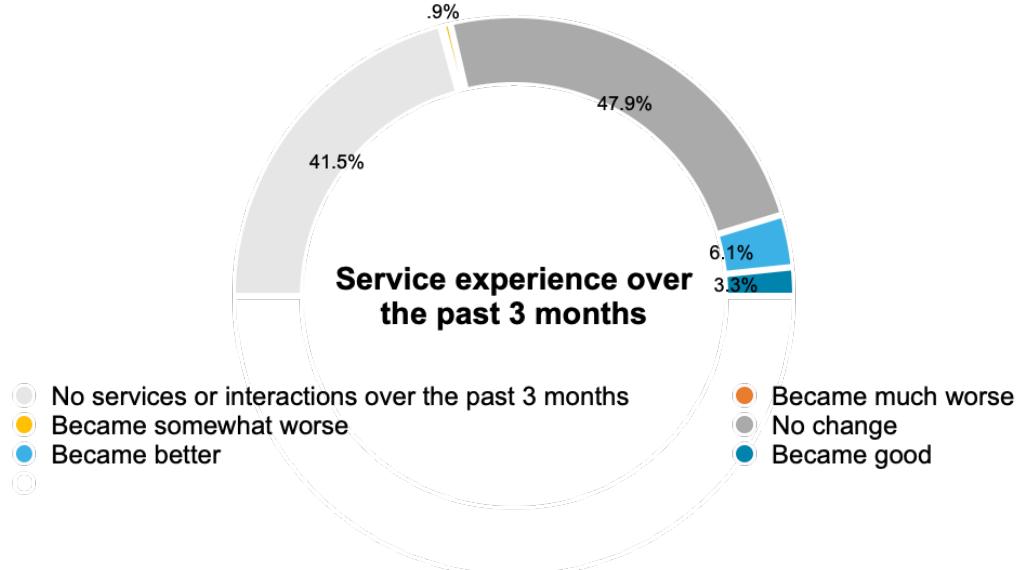
Source: Online Survey (2022)

Impacts such as the epidemic affected customer budgets, prices and fewer physical activities.

G2 domain name related impact content	Number of replies
Affects customer budgets due to the outbreak	1
No Business	1
Decrease in sales due to decrease in customer applications for domain names	1
Internationalization	1
Business Austerity	1
Fewer physical activities	1
Price	1
Decrease in revenue	2

Source: Online Survey (2022)

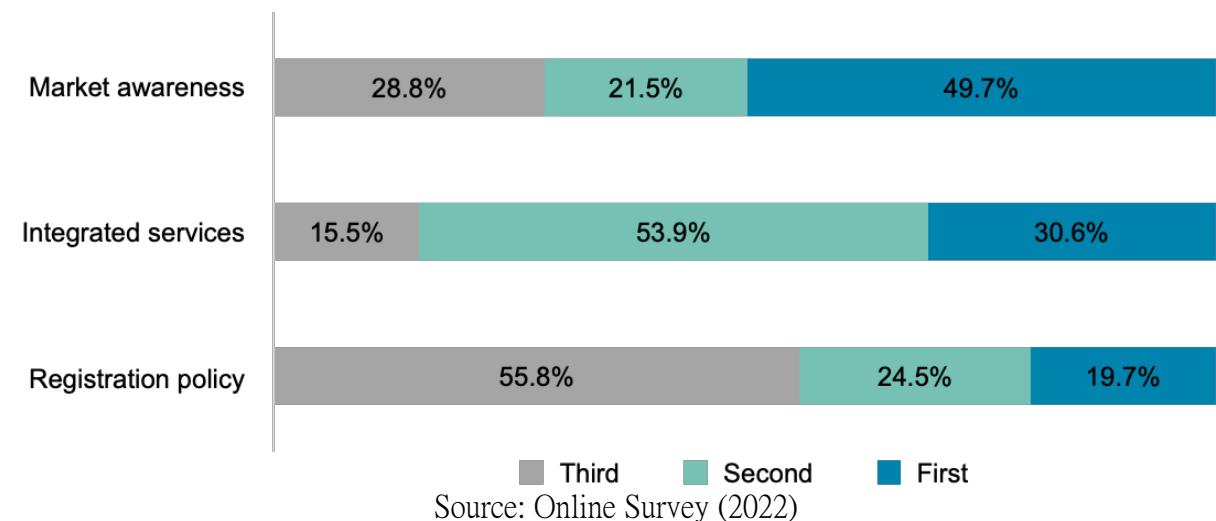
About 41.5% of domain name registrants indicated that they had not used the service or interacted with TWNIC in the past three months, and 47.9% of them thought that the service provided by TWNIC had not changed in the past three months.



Source: Online Survey (2022)

## XI. Expectations and Recommendations

Nearly 50% of registrants believe that the top-level domain name for .tw/. Taiwan's ccTLD priority is "market awareness" (49.7%), followed by "integration services" (30.6%).



Source: Online Survey (2022)

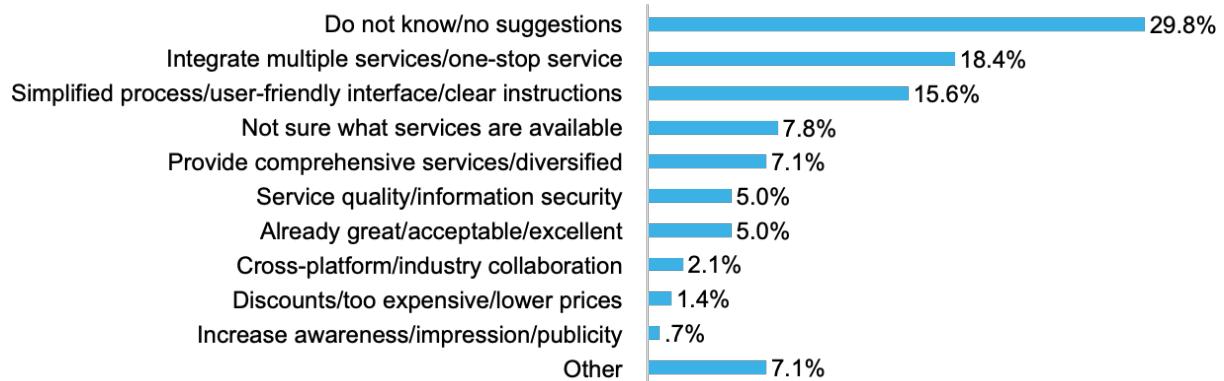
About 50% of the respondents who chose to prioritize improving market awareness said "increase impression/lack of publicity/marketing problems", and .tw/.台灣 ccTLD is less well known and needs more exposure, marketing, and advertising to make more people aware of the .tw/.台灣's advantages. 32.7% of the respondents believe that the trustworthiness of .tw should

be improved. In addition, 10.6% of the respondents thought that the .tw domain name should "Increase Taiwan's international publicity", and that .tw is not well known internationally.



Source: Online Survey (2022)

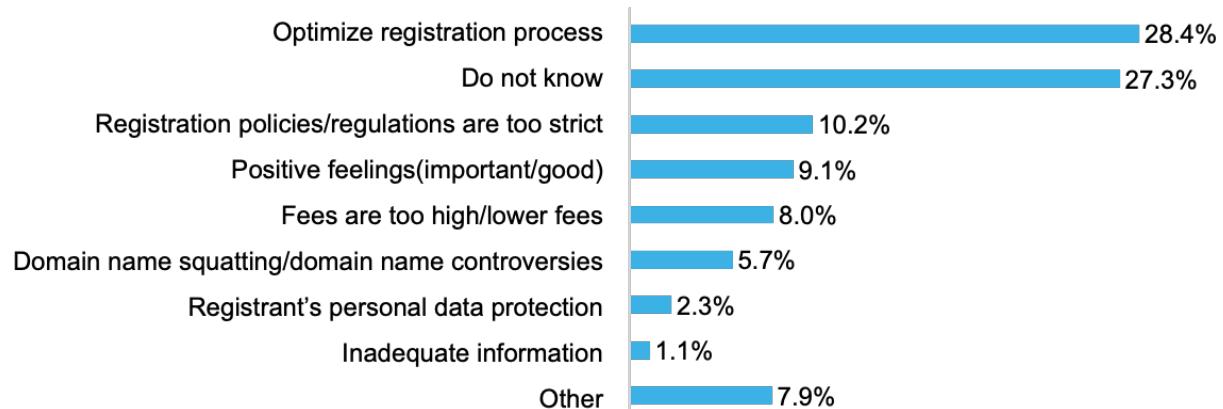
About 20% of the respondents who prefer to integrate services and need adjustments said that the priority is to "integrate multiple services/one-stop service", and domain name related data and information are fragmented. They hope that TWNIC can help integrate relevant data, or provide it to relevant cooperative manufacturers services to provide more comprehensive support. 15.6% of the respondents offered suggestions for "simplify the process/simple/simple interface/provide suggestions/clear instructions", which can simplify the process and improve the interface, and provide more detailed explanations on the information, saving users time.



Source: Online Survey (2022)

The highest proportion of respondents who preferred to adjust the registration policy wanted to "optimize the registration process". The convenience and transparency of registration are very important. If the process is more convenient and clear, the use of services will be more efficient. Secondly, "Registration regulations are too strict/registration policy" 10.2% of the respondents mentioned that the policy needs to be improved. The current policy is not only too strict, but also not simple and clear enough in terms of information provision. In addition, 8.0% of the

respondents said that the registration fee is too high, and they should follow the example of international price setting, so that more people can use the .tw domain name; 5.7% of the respondents said that "domain name squatting/domain name dispute" The author mentioned that .tw should only be applied by local people or enterprises to avoid the controversy of illegal use, and that companies should have the priority to register domain names, so as to prevent others from rushing to register first, resulting in the need to buy back the domain name at a high price.



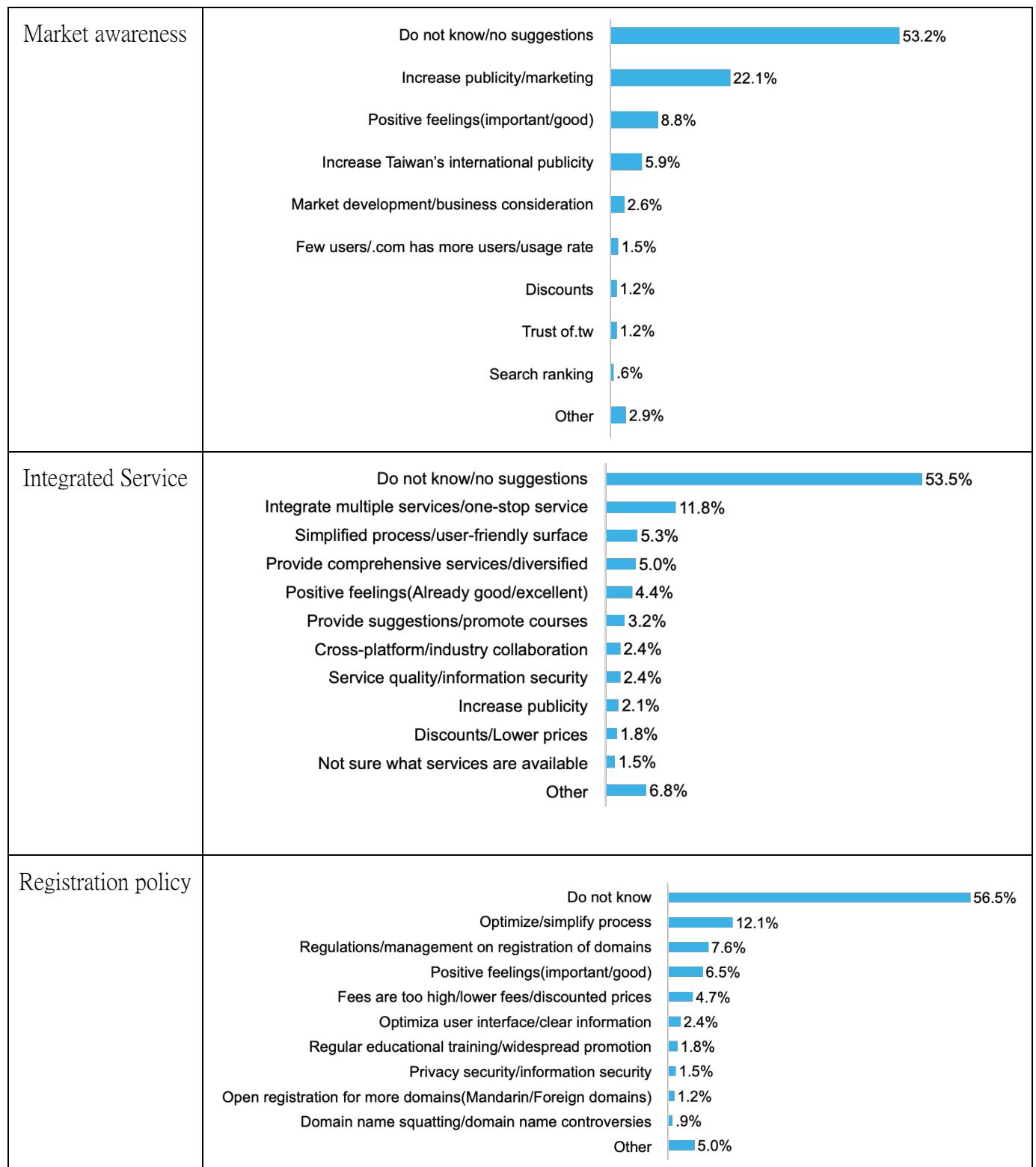
Source: Online Survey (2022)

The highest percentage of suggestions to improve market awareness falls on "increase publicity/marketing", more promotion and advertising should be done to increase market awareness, and TWNIC awareness should also be increased. By increasing exposure, the .tw domain name will become more widely known and trusted, and the number of uses will increase. In the international market, we can promote the application of .tw in multinational enterprise identification web pages, and increase the exposure of .tw in the international market can directly remind users of Taiwan, and enhance the recognition of Taiwan and Taiwan domain names in the international market.

The highest percentage of suggestions for service integration is "integration of multiple services/one-stop service". First, the services within the center can be integrated into a single portal for easier operation. Second, integration of upstream, midstream and downstream suppliers services is important. "More comprehensive services/diversification" was also expected, including the provision of domain name related extension services, such as SEO, redirecting, URL marketing, testing environment, etc.

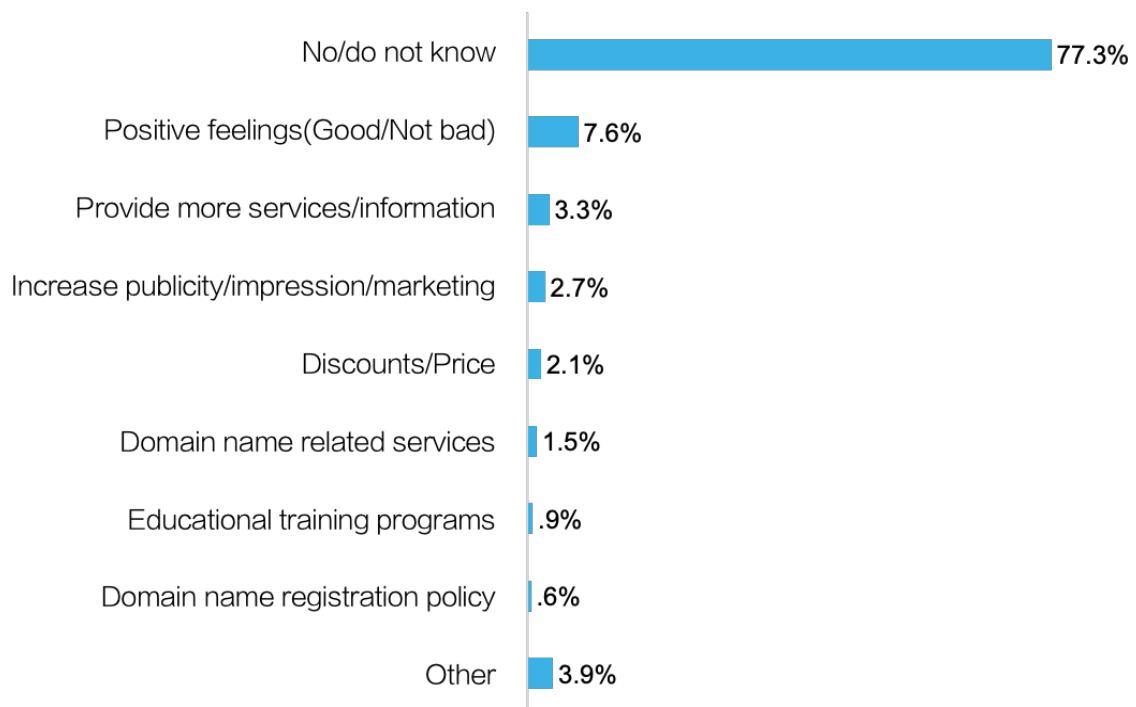
The highest percentage of suggestions of registration policy is "registration process optimization", hoping to simplify the registration process, so that users can have a more clear and easier process to register. "The current registration policy is too stringent, making it difficult to implement. In addition, many respondents also mentioned that under the premise of protecting domain names, it

is also important to avoid robbery and eligibility verification, and they hope that the verification system can be strengthened in domain name disputes and the domain names can be reserved for relevant government agencies.



Source: Online Survey (2022)

77% of the respondents had no suggestions about TWNIC, about 10% expressed positive feelings, and some of them hoped that more services/information could be provided, such as more information about the TWNIC's services, more technical support, more updates, trends in the development of the Internet industry and so on, to strengthen promotion and enhance customer service.



## CHAPTER III. Domain Name Registrar

This year, we conducted in-depth interviews with organizations that manage domain name registrations. In total, have two interviewees this year.

### I. Maintain Service Standards: Holding Exchange Meetings To Improve Industry Capacity

During the interviews, the interviewees (stakeholders) indicated that during the pandemic, the TWNIC maintained its service quality in troubleshooting or in providing assistance in hosting domain name-related activities. The stakeholders also affirmed the TWNIC's past efforts in regularly holding domain name exchanges and coordination meetings with registered organizations. Given that the pandemic restrictions are gradually being lifted, the interviewees hoped that the coordination meetings and exchanges can be organized once a month and twice a year, respectively, as was the norm prior to the pandemic. Through the regular activities and meetings hosted by the TWNIC, the participants learned about the latest trends in domain name management and registration. Furthermore, the meetings promoted exchanges among industry practitioners, thereby yielding the effect of industry advancement.

*/ To this date, the entire process has been quite smooth.*

*/ The TWNIC always responds quickly. In this regard, I think it is doing a good job.*

*/ They used to hold the meetings monthly, and in the middle and at the end of the year, they would have exchange meetings... During the pandemic, in-person meetings were suspended. By using [Microsoft] Teams, we could hold online discussions on the overall development trends of domain names and obtain insight on the latest activities in the industry, which is crucial.*

### II. System Interface Stability: Increasing The Elasticity Of The Feedback Procedure

The new interface was launched more than a year ago. The stakeholders' feedback regarding the interface was positive; they stated that the overall user experience was smooth and that their overall satisfaction increased compared with that in the previous year. However, they noted that in the new interface, consumers who wanted to cancel their trial services or existing services must write a mail to the registrar to seek assistance. They could not directly use the platform cancel the services and receive a refund. Thus, the stakeholders suggested that the system incorporate a "deactivate domain name" option to reduce the labor costs of both the TWNIC and the organization in handling registrations.

- 
- / The system interface stability is alright. There is nothing that specifically requires improvements. It operates smoothly when used, and I have yet to encounter any problems. I think TWNIC provides great service and responds timely to our problems.
  - / Their technical guidance allows us to quickly understand how to solve problems. I like that aspect.
  - / After the adjustments, the feedback procedure became slightly more inconvenient for us because many aspects became standardized. In other words, we have to follow the procedure of the epp. For example, if a client applies for a domain name and later wants to cancel it, in the past, we could directly cancel it and refund the client. But now, we cannot do so. Now, to cancel it... We must notify the TWNIC to inform them to treat this case as a special case. In other words, we have to request the manual intervention of the TWNIC each time. It has become less convenient.

### III. Continue to Cultivate ccTLDs

The stakeholders shared that, recently, fewer people have been registering “.tw/.台灣” domain names. They believed that domain names serve the function of reinforcing market positioning and brand identification for clients, and that they are key elements in brand management. Therefore, the stakeholders hoped that the TWNIC could increase their efforts to teach consumers the advantages of using ccTLD in Chinese and English. The registrars formed a consensus with the TWNIC regarding domain name policies, and it is willing to assist the TWNIC in providing promotional services.

- / My main concern is whether the center has the latest information, such as the latest policies or news regarding domain names. If the information is conducive to our clients, we can help to promote it.
- / Promotional videos and animations are more likely to interest people. If they are willing to produce and provide such content to us, then we can contribute to the promotional efforts. After all, the content is all about promoting the .tw domain name. Things like banners or other advertisements are helpful in a domain name. We are willing to cooperate in these promotional efforts.
- / Currently, the use of .tw is more common than .台灣 because Chinese domain names are less convenient to input and causes some problems, particularly in email addresses. Some companies applied for Chinese domain names, realized that they couldn't use them, and cancelled their domain. By contrast, the number of .com domain names is growing. We might need to think about why the use of .com is increasing and the use of .tw is decreasing... If a company wants to internationalize beyond Taiwan, it will want to buy



*a .com domain name. However, favorable .com domain names are relatively few [It's advantage for .tw. 台灣].*

*/ We hope that the NIC can provide more resources...For example, sharing information about domain names. The NIC can input more resources in this regard. I feel that in the last couple of years, their models have been largely the same. They have only been promoting pre-existing activities and projects. I hope that they can be more innovative and eye-catching in what they do so people realize that domain names are necessary and apply for them more.*

The stakeholders suggested that the TWNIC designate a section of the official website for announcing regulations that can easily cause consumer disputes during the process of selling and registering domain name; this measure ensures that the organizations providing registration services can clearly cite regulations when they are communicating with consumers. Moreover, when the TWNIC is about to terminate a service, it should notify the affected consumers to effectively address their doubts.

*/ At least the announcement on the official website, so that consumers can check, or he has what FAQ of the type of zone, so that is the consumer can go to do the question and answer will also be helpful.*

#### IV. Enhancing Cyber Security Measures With Existing Services At The Core

In addition to its main business of providing domain name services, the TWNIC is also proactive in assisting registrars to organize various seminars and activities, thereby reinforcing their connection with consumers. In addition to various marketing promotions, cyber security, which has been emphasized by global industries in recent years, was also highlighted in this interview. Cyber security comprises two levels, namely information exchange and technology protection. According to the stakeholders, in the past year, consumers (enterprises) had shown a strong willingness to cyber security experiences; this is a reflection of how cyber security has become a challenge for people and organizations across industries. For technology support, the stakeholders maintained that the process of registering domain names as an agency involves the use of sensitive consumer information; thus, they suggested the implementation of data masking or cryptographic technologies to increase the completeness of system cyber security. They also suggested the TWNIC emphasis on cyber security during the policies planning or setting of topics.

*/ I don't see a problem with that because the TWNIC has been quite supportive in these events. It also provides some assistance. As long as we play by its rules, we benefit in return. Additionally, it sends people over to assist us and hold talks on related topics. We have worked quite well with each other in that regard.*

*/ In terms of our client base, the domain name market is quite big. If we can attract some potential target customers, that'll also help a lot with our other products.*

- 
- / In many sectors, the transmitted data are confidential, so I hope they can work more on [cyber security].
  - / As for cyber security, I think TWNIC has done quite well in that regard. It has our trust. In terms of cyber security alone…we see no problem with that.
  - / Actually, I signed up to this conference because many of my clients send their staff, including information technology staff, to the event. We also hope that people can learn more about the latest trends, including those in cyber security, or whether there are any new viruses, for example, or anything that might affect our clients. They are quite interested in those topics and are willing to come see what we have to offer.

## V. Weathering Through The Pandemic, Bouncing Back, And Recruiting New Blood

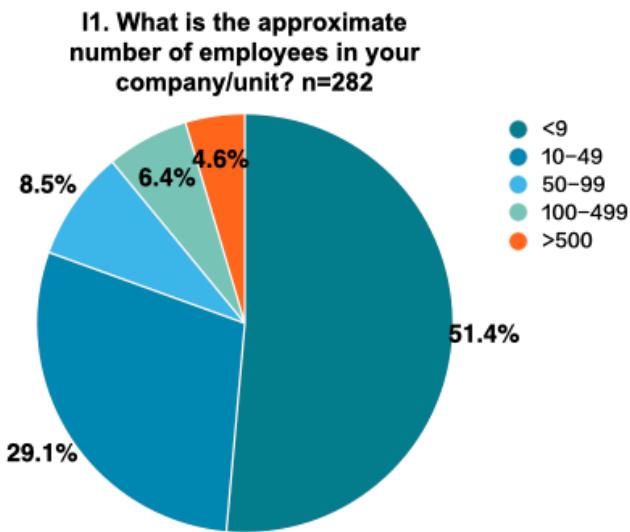
The stakeholders observed that the market demand for domain names has decreased. In the past year, this demand was affected by the pandemic. Furthermore, social media have been growing rapidly and gradually replaced the needs to establish websites. The most substantial changes pertained to the demand modes of newly founded companies, and these changes directly affected the core business of domain name registration. Nevertheless, the stakeholders hoped that the TWNIC can launch diverse marketing projects to expand business demand and lead efforts to innovate in Taiwan’s top-level domain name industry.

- / People have actually started to phase out websites and shift their focus to social media. An exclusive name wouldn’t be necessary to them if they can just do their business on Facebook or LINE, so we may have to think about how [websites and social media] can be tied together. They can still use social media, but [we need to make them understand that the] domain name is also important and that they shouldn’t just give up on using [websites].
- / Domain names are actually not that profitable. We just hope that they help us retain clients and make them consider our other products.
- / It’s probably due to Covid, or because many companies are actually trying to cut spending, so they don’t spend much on [domain names]. Overall, the number of registrations has been in decline for the past few years…We’re also wondering if TWNIC will continue to offer some promotions or deals, which they haven’t in the past 2 years. We’re thinking about starting new campaigns to attract clients and encourage them to register more domain names. We can make them realize that domain names are actually a way to protect their brands so they don’t just keep one domain name and scrap their other domain names to cut costs.

# Chapter V. IP Member

## I. Summary of Implementation

The first questionnaire asked members about the use of IP application, and the questionnaire was divided into "Non-IP Registrar" who "applied for IP and used it for their own use" and "IP Registrar" who "applied for IP and distributed it to other companies/units for use". The ratio of the two is 66% to 33%, and the majority of the survey is for "IP address users".



Source: Online Survey (2022)

The number of staff in charge of the relevant business is also low, except for one company which has exactly 10 staff members, the rest are all single digits, and the types of positions are There are more managerial and technical positions, while other positions are mostly held by the same person at the same time.

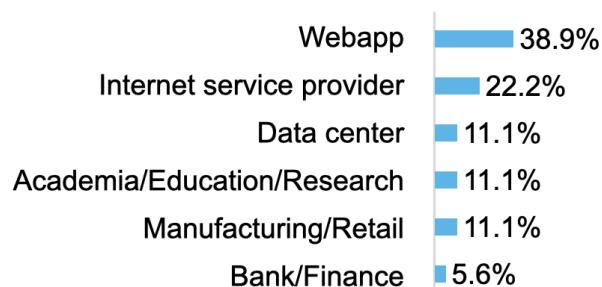
No separate department	n=8	Position Type	
Department Name	Number of people (person)	Number of positions	Fill in the number of respondents
Engineering Department	2		Management Jobs
Technical Department	2	1 position	6
Network Management Department	3		Policy
Other	1	1 position	4
			Operation
IP address allocate Number of staff in charge	n=9	1 position	3
1 position	6	3 positions	1
3 positions	1		Technology
5 positions	1	1 position	6
10 positions	1	2 positions 3 positions	1 1
			Customer Service
		1 position	4
			Billing
		1 position	3

Source: Online Survey (2022)

IP address users(Non-IP registrars) accounted for 38.89% of the total number of "Internet application providers," 22% of the total number of "Internet service providers (ISPs)," more than 10% each of "academic/education/research," "manufacturing/retail," and "data centers," and more than 49 and 500 employees, respectively, and the most common sector was "technology, information and communication.

Number of employees	Number of people
Within 9 people	3
10-49 people	6
50-99 people	1
100-499 people	2
More than 500 people	6
Alliance Member	Number of people
Technology, Information and Communication	13
Director, President, CEO, etc. Management	4
Technical operation	1

Source: Online Survey (2022)



Source: Online Survey (2022)

## II. Service Usage and Satisfaction

According to the services provided by TWNIC, the two services with the highest overall utilization rate were "used the RMS resource management system" and "contacted customer service via email, phone" (40.7%), followed by "statistics of internet connection bandwidth" with 37.0%. The usage rate of "global IP address and AS number statistics" is 33%, and the usage rate is the same for both IP registrars and Non-IP registrars users; the usage rate of "participating in TWNIC seminar", "read the TWNIC annual report, newsletter" and "IP member registration/IP members application website" is nearly 30% respectively; the usage rate of "used the RPKI management system/RPKI validator websites" and "IP address/ASN issuance and second opinion audit" accounted for 25.9%, while "participated in TWNIC training courses" and "ISP yearbook website" accounted for 22.2%.

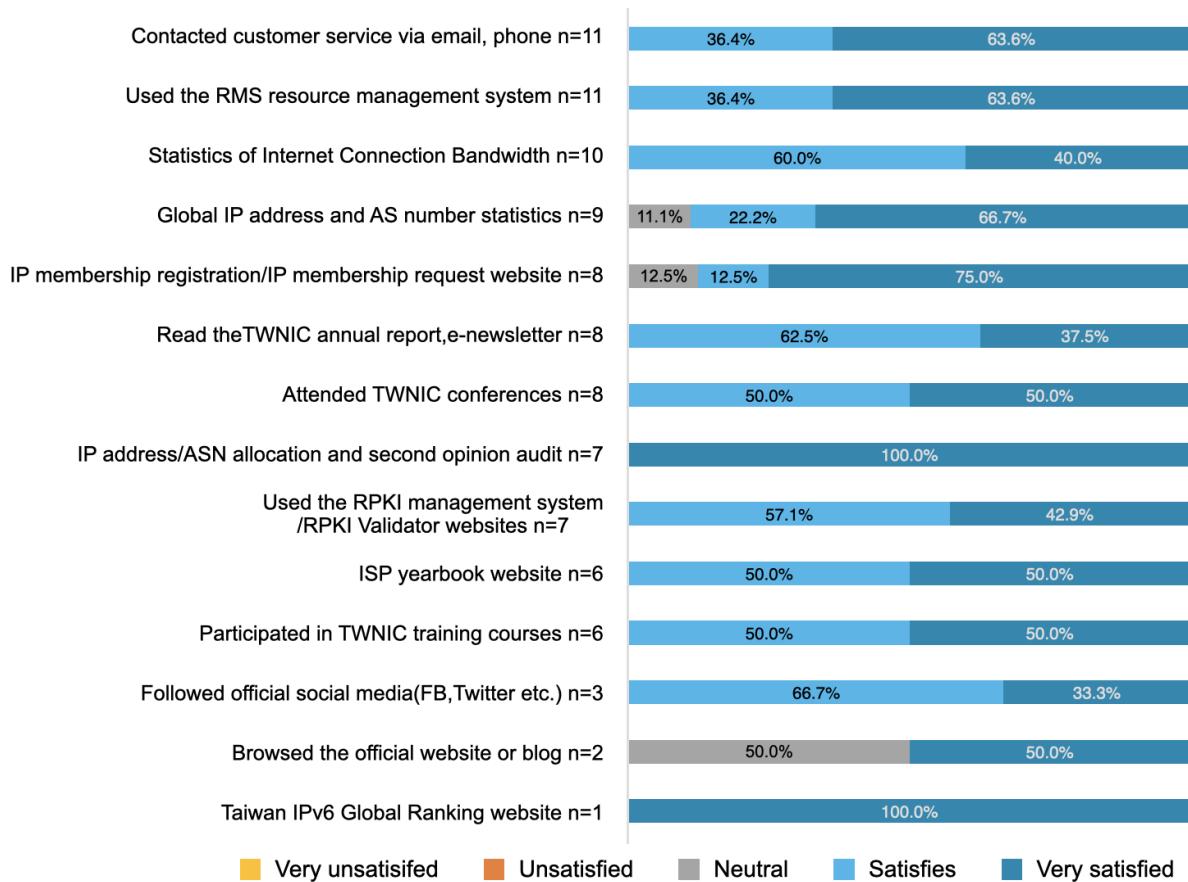
The usage rate of "browsed the official website or blog" and "Taiwan IPv6 global ranking websites" is less than 10%, and the service of "Taiwan IPv6 global ranking websites" has only been used by Non-IP registrars users.

	IP Member	Non-IP Registrars	IP Registrars
n=	27	18	9
Using the RPKI Management System / RPKI Validator Website	25.9%	27.8%	22.2%
Using the RMS Resource Management System	40.7%	38.9%	44.4%
Participate in TWNIC Seminar	29.6%	33.3%	22.2%
Connection Bandwidth Survey	37.0%	33.3%	44.4%
Participate in TWNIC Education Training	22.2%	22.2%	22.2%
Contact customer service by phone, email, etc.	40.7%	33.3%	55.6%
Global IP Address and AS Number Statistics	33.3%	33.3%	33.3%
ISP Yearbook Website	22.2%	22.2%	22.2%
IP address/ASN core issue, Second Opinion Audit	25.9%	27.8%	22.2%
Read the Center's annual report and e-newsletter	29.6%	33.3%	22.2%
IP Member Registration/IP Member Application Site	29.6%	22.2%	44.4%

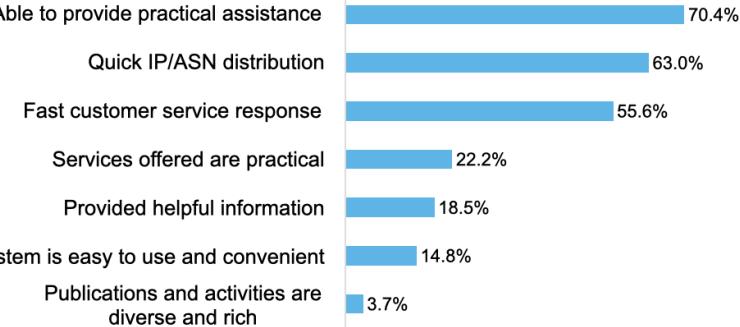
Browse the center website, blog	7.4%	5.6%	11.1%
Taiwan IPv6 Global Ranking Website	3.7%	5.6%	0.0%
Follow central social networking sites, such as Facebook fan groups, Twitter	11.1%	11.1%	11.1%

Source: Online Survey (2022)

Among the reasons for good service satisfaction, more than 70% said it was because "they able provide practical assistance", while the percentage of "quick IP/ASN distribution" was 63.0% and "fast customer service response" was 55.6%. As for "services offered are practical" (22.2%), "provided helpful information" (18.5%) and "the system is easy to use and convenient" (14.8%), the percentages ranged from 1 to 20% each.



Source: Online Survey (2022)



Source: Online Survey (2022)

IP members expressed less on the value of becoming an IP registrar and were willing to share different aspects, such as the ability to expand their services, add business items, or bring convenience to their business work, and for connection needs, etc., as listed below:

What to expect in the future	Number of replies
dnssec	1
IPv4 Add-On	1
Clearer Policy Promotion	1
Go for it!	1
1	1
no / NA	4
Not currently available / Not at the moment	5
None	13

Source: Online Survey (2022)

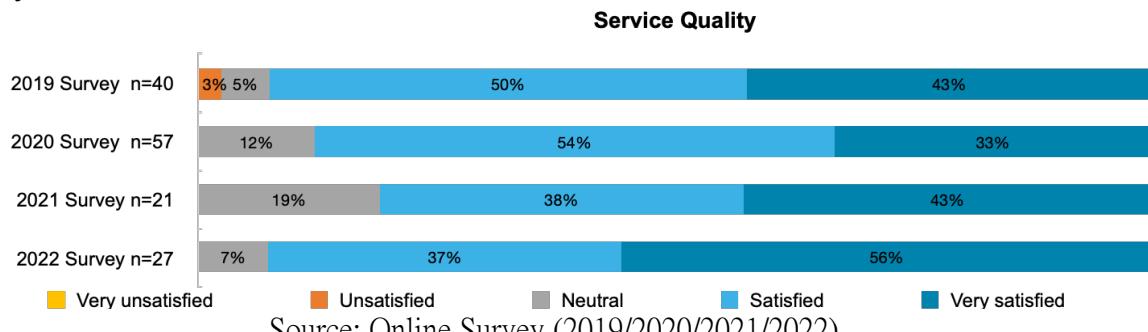
### III. Evaluation of the Overall Satisfaction and Value Perceptions

The overall satisfaction of IP members with TWNIC is almost always positive. The average score for "IP release service" was 4.5, with a satisfaction rate of 96.30%. When considering the responses of "satisfied" or "very satisfied", both "service quality" and "technical support" scored 92.6% with a high average score of 4.5.

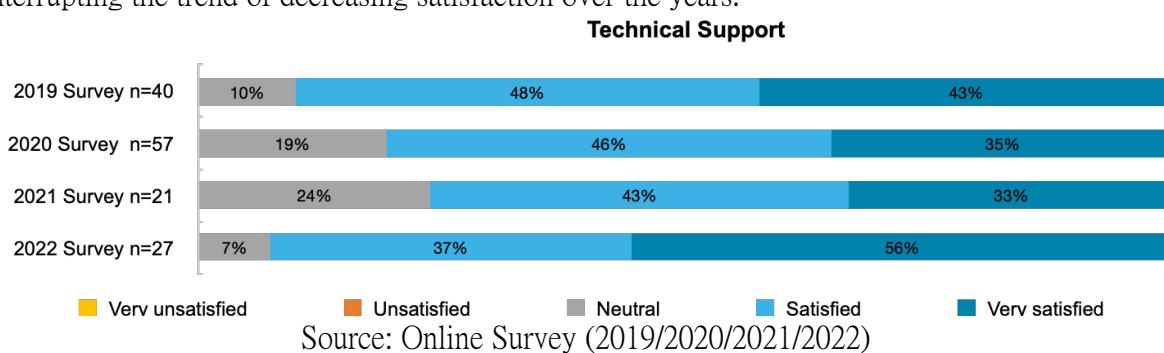


Source: Survey of this study (2022)

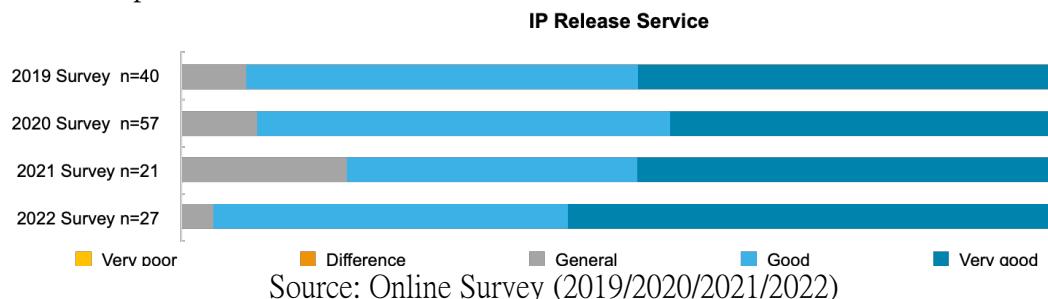
Satisfaction of service quality this year is 92.6%, up 11.6% from 81.0% last year, and the percentage of "very satisfied" ratings this year is the highest since the previous survey.



Satisfaction of technical support last year was 76.2%, the lowest ever, and satisfaction of technical support has been decreasing over the years, but this year's survey results rebounded to 92.6%, interrupting the trend of decreasing satisfaction over the years.

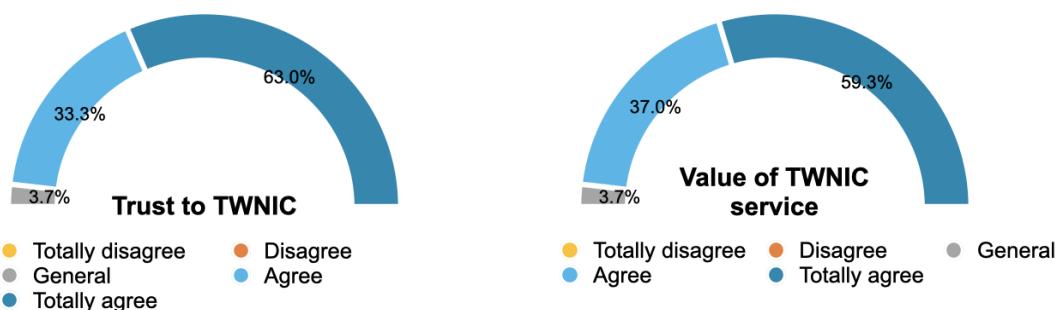


The percentage of those who chose "very satisfied" also grew most significantly this year, and only 3.7% of the respondents checked "neutral".



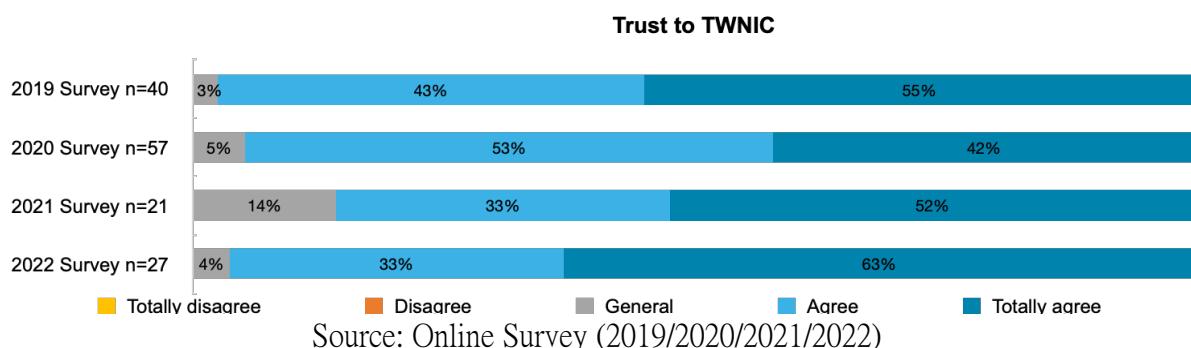
#### IV. Trust and Value Experience Evaluations

In addition to overall satisfaction, the indicators of trustworthiness and value perception were also added. Both indicators performed better than overall satisfaction, with respondents answering positive statements and scoring 4.6 on average.

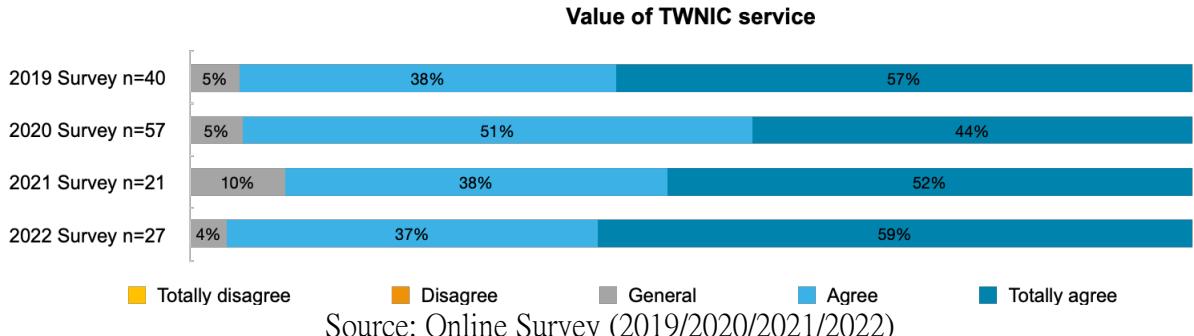


Source: Online Survey (/2022)

The trust level has increased by 10.6% this year, with a trust level of 96.3%. Compared to previous years, the trust level has rebounded significantly, and the proportion of those who chose "totally agree" this year is obviously higher than previous years' surveys.



The level of service value perception also reached the same level (96.3%), an increase of 5.8% compared to last year, and the percentage of those who chose "completely agree" this year is also significantly higher than last year.

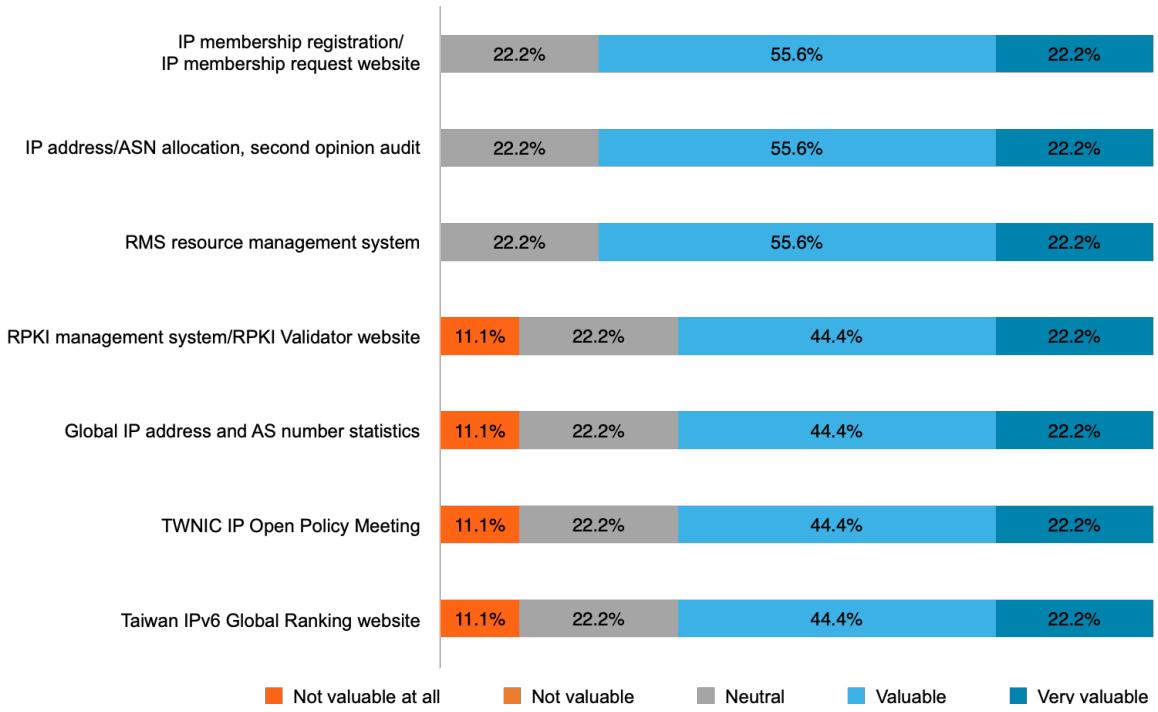


## V. Evaluation of Service Value Perceptions

According to the evaluation of IP members' perception of the value of each registrar service, "IP membership registration/IP membership request website", "IP address/ASN allocation, second opinion audit" and "RMS resource management system" have the same proportion of service value perception and The distribution is consistent at 77.8%.

And all those who answered this question are in "RPKI management system/RPKI Validator website", "Global IP address and AS number statistics", "TWNIC IP Open Policy Meeting", "Taiwan IPv6 global ranking website", are also very similar in service value. In these indicators, the proportion of "not valuable at all" is 11.1%, and the proportion of "neutral" It is 22.2%, the proportion of "valuable" is 44.4%, accounting for the most, and the proportion of "very valuable" is also 22.2%, which is the same as that of "normal".

As for the above four services, the same person answered "not valuable at all". It is speculated that the IP registrar may not use these four services, so this option is selected.

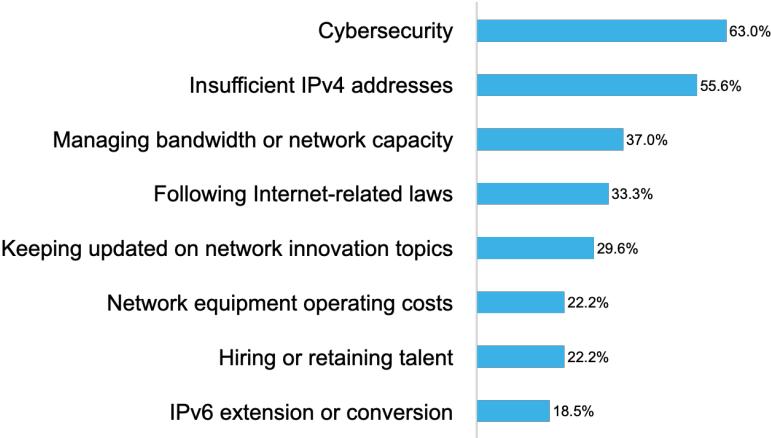


Source: Online Survey (2022)

## VI. Service Challenges and Difficulties in IPv4 Scarcity

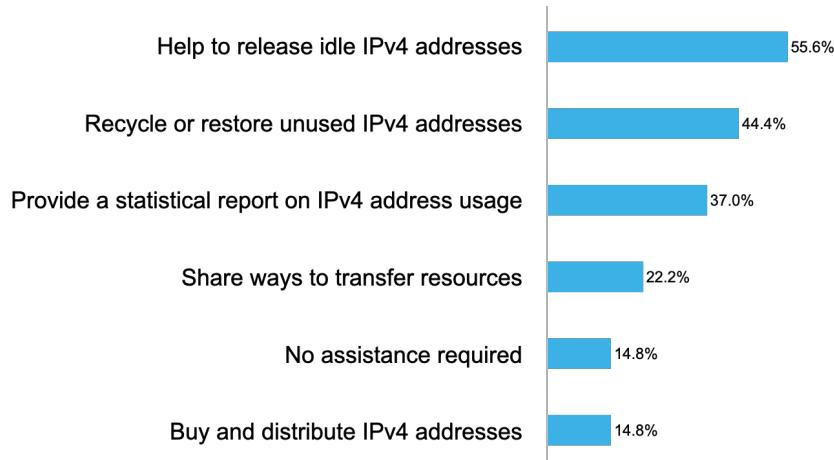
IP Member believe that the top two challenges facing the network business are "cybersecurity" (63.0%) and "insufficient IPv4 addresses" (55.6%), with a nearly percentage of Non-IP registrars users facing these two issues. In addition, the proportion of "managing bandwidth or network capacity" and "following Internet-related laws" are both more than 30%, among which the proportion of "managing bandwidth or network capacity" is higher for Non-IP registrars users and the proportion of "following Internet-related laws" is higher for IP registrars.

Finally, the percentages of "keeping updated on network innovation topics" (29.6%), "hiring or retaining talent" (22.2%) and "network equipment operation costs" (22.2%) are also more than 20%, with a higher percentage of " keeping updated on network innovation topics" for IP registrars, a higher percentage of "network equipment operation costs" for Non-IP registrars users, and the same percentage for "hiring or retaining talents".



Source: Online Survey (2022)

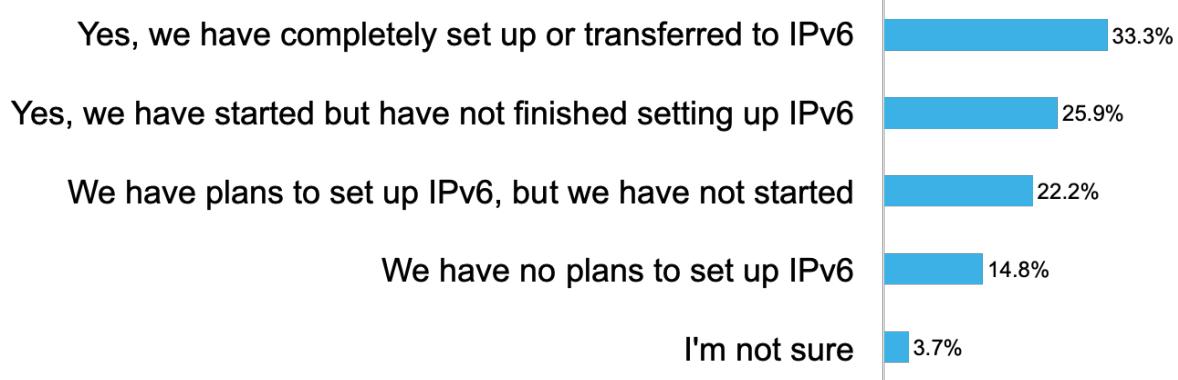
For IPv4 scarce issue, the highest percentage of IP members want TWNIC to "help release idle IPv4 addresses" (55.6%), while "recycle or restore unused IPv4 addresses" and "Provide a statistical report on IPv4 address usage" also account for about 44% and 37% respectively.



Source: Online Survey (2022)

## VII. IPv6 Provisioning and Preparation

48.1% of IP members said they have started to set up or transferred to IPv6. Overall, nearly half have completed the IPv6 setup, while the other half are in the process of transfer but not yet completed. 22.2% have plans but haven't started yet.



Source: Online Survey (2022)

The majority of IP members believe that IPv6 extension requires assistance from TWNIC. The highest percentage is "Share cases of successful IPv6 deployments for consultation" is over 51%, while "Encourage knowledge sharing between member organizations regarding their experiences with IPv6 deployment" accounts for 40.7%, "Provide IPv6 training courses or staff training" and "Promote IPv6 to software/hardware or content providers" also account for 37.0% and 33.3% respectively. The percentages of "Promote IPv6 to the government and relevant organizations", "promote IPv6 to management level and policy makers", "No assistance required" have the same proportion at 18.5%.



Source: Online Survey (2022)

## VIII. RPKI Services

In the usage of RPKI service provided by TWNIC, the utilization rate of Non-JP registrars users is 44.4%. RPKI Validator website had the highest utilization rate (75.0%) and the same satisfaction rate of 100% as the ROA setting, while the RPKI validator website had the same utilization rate and 80% satisfaction rate as the ROA settings.

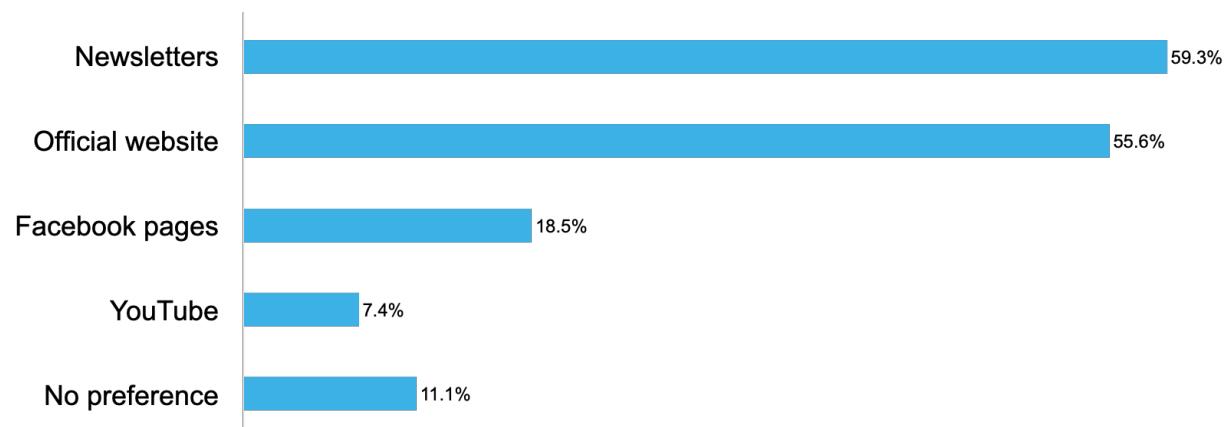
The usage rate of RPKI service for IP registrars was 66.7%, and the usage rate of "RPKI validator website" was the highest (83.3%), and satisfaction was 80%.

Stakeholders	Usage rate	Use of content		Satisfaction
	44.4%	RPKI Management System	75.0%	100.0%
Non-IP registrars		RPKI Validator Website	62.5%	80.0%
	(n=18)	ROA Settings	62.5%	100.0%
		(n=8)		(n=8)
	66.7%	RPKI Management System	66.7%	100%
IP registrars		RPKI Validator Website	83.3%	80%
	(n=9)	ROA Settings	66.7%	100%
		(n=6)		(n=6)

Source: Online Survey (2022)

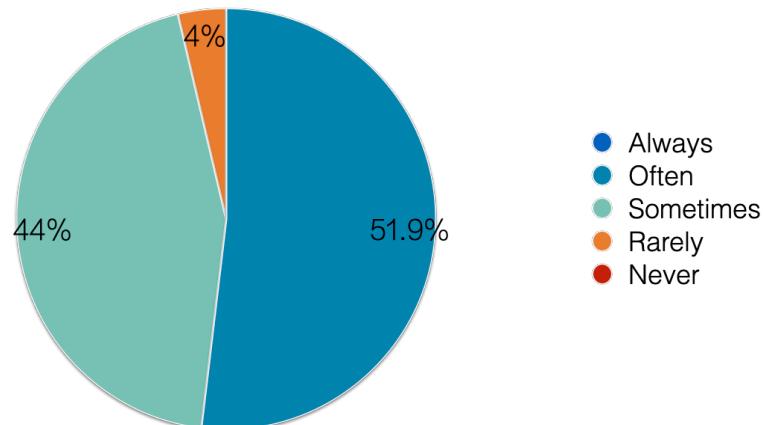
## IX. Information Service

In terms of getting information about TWNIC, 59.3% of IP members prefer to get it through "newsletters" and 55.6% prefer to get it through "official website", which is not a big difference. In addition, about 18.5% preferred to be informed by "Facebook pages", while only 7.4% preferred to be informed through "YouTube".



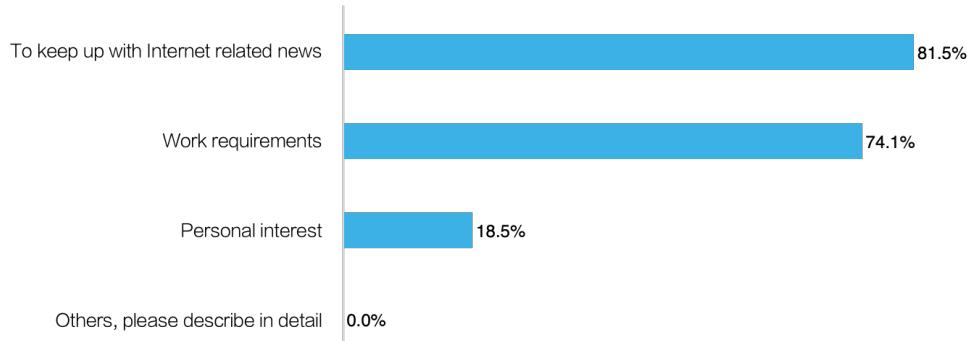
Source: Online Survey (2022)

Regarding the attention frequency of Internet issues released by the center, 51.9% of the highest proportion falls on "always attention", and 44.4% falls on "occasional attention".



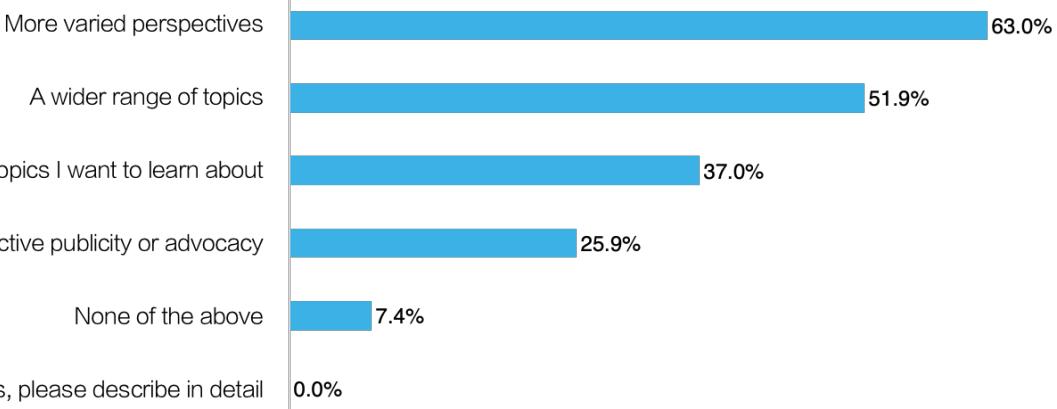
Source: Online Survey (2022)

In addition, the reasons for IP members to pay attention to the relevant Internet issues released by TWNIC are mainly for "understanding new Internet knowledge" and "work demand", which account for more than 70% and 80% respectively.



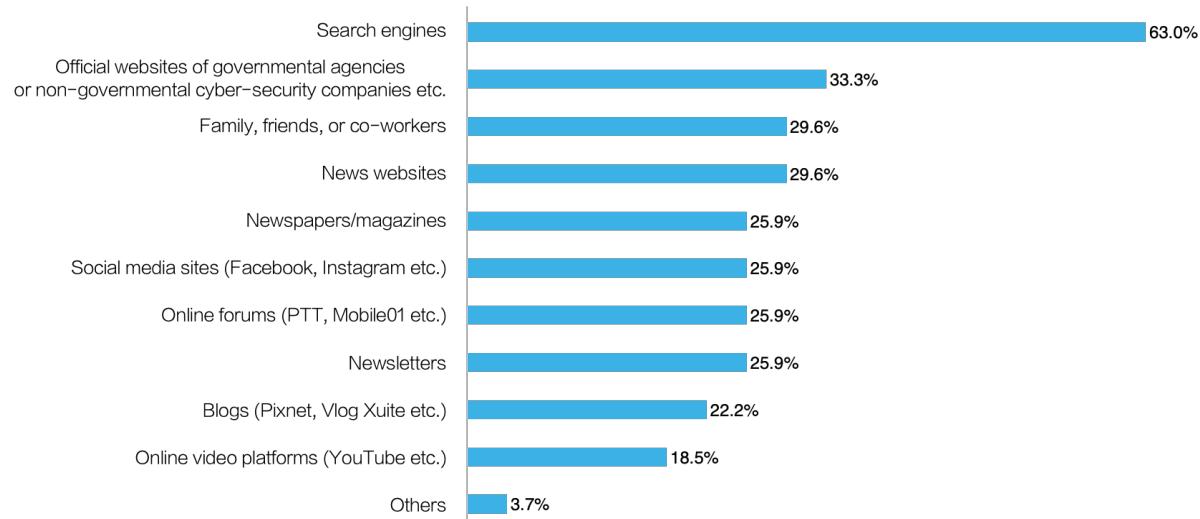
Source: Online Survey (2022)

Regarding the Internet-related topics that TWNIC will continue to provide in the future, more than 60% of the people expect to add more diverse viewpoints, and about 52% of the people hope to include a wider range of topics and increase what IP members want to know Topics (37.0%), and more active publicity or publicity accounted for about 20% (25.9%).

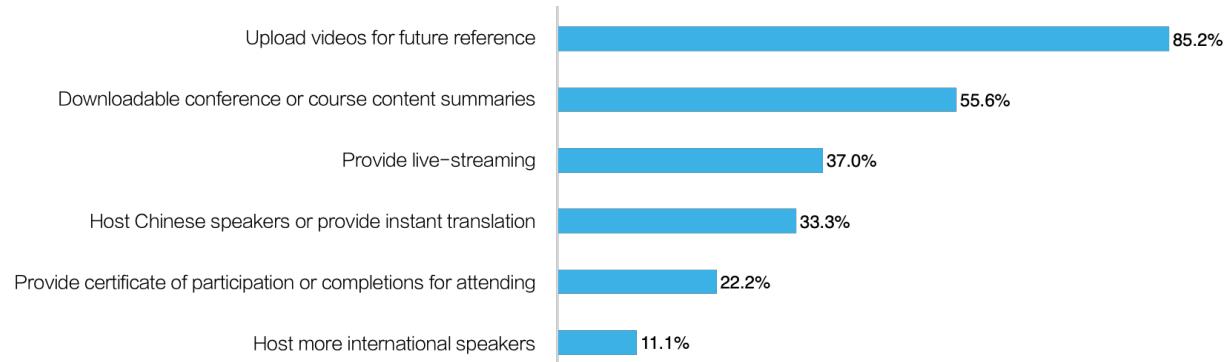


Source: Online Survey (2022)

63% of IP members usually obtained IP information from "search engines", and 33.3% through "official websites", while nearly 30% mainly through "friends, family and colleagues sharing" and "news websites", and the other 26% through "social networking sites", "e-newspapers", "forums" and "paper newspapers and magazines".

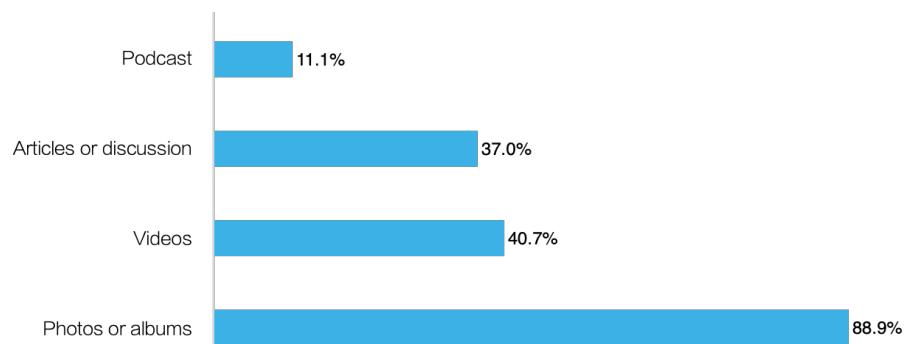


Source: Online Survey (2022)



Source: Online Survey (2022)

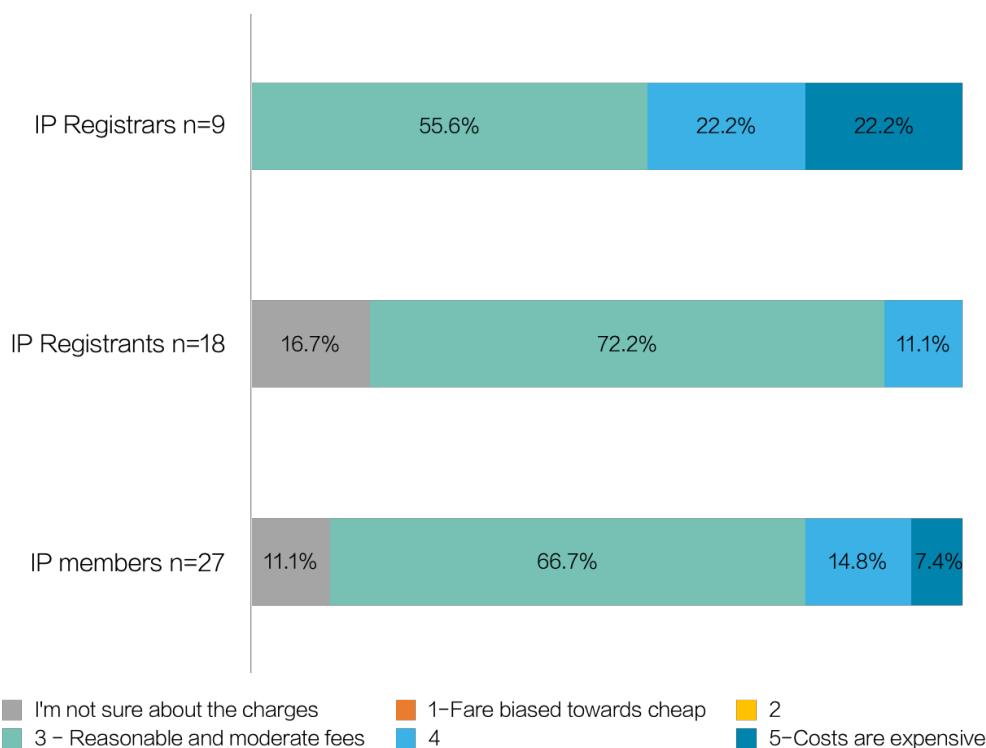
For IP-related information and new knowledge, as high as 88.9% preferred the content format of "articles and discussions", 40.7% preferred "videos", and 37.0% preferred "photos and photo albums".



Source: Online Survey (2022)

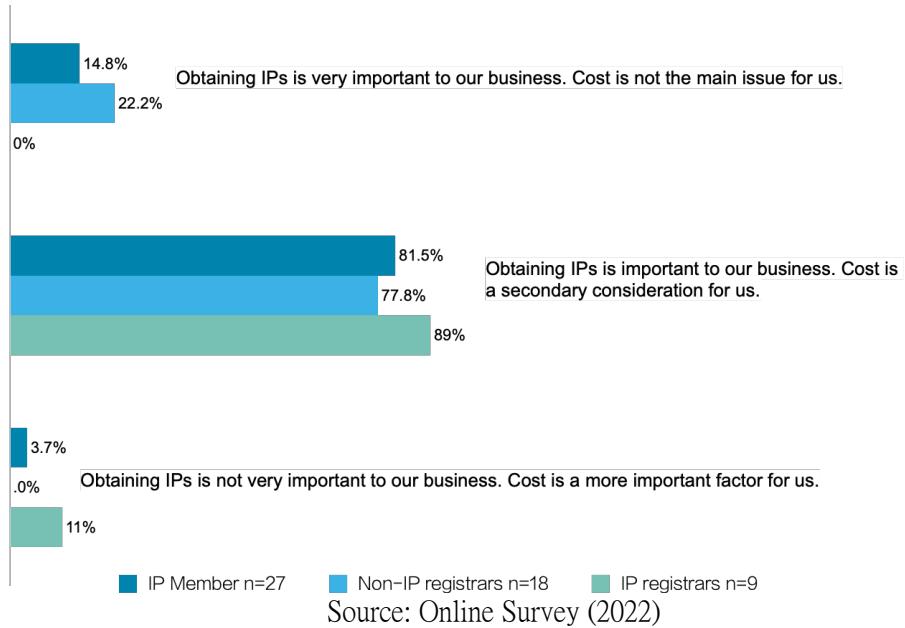
## X. Strategy for Charges

66.7% of IP members think that "reasonable and moderate fees", while 22.2% of IP registrars think that the current fees are expensive.



Source: Online Survey (2022)

IP members have quite the same view on TWNIC's IP service and charges, and most of them think that "obtaining IP is more important than the amount of charges is secondary".



## XI. Expectations and Recommendations

Most of them said they have no idea at present and have no special suggestions for the time being. However, some of them mentioned that they are looking forward to the information and sharing of domain name system security extensions (DNSSEC) in the future, more explicit policy promotion, and the IPv4 add-on issue that they hope to be handled with more assistance.

Table 16 Future Expectations

What to expect in the future	Number of replies
dnssec	1
IPv4 Add-On	1
Clearer Policy Promotion	1
Go for it!	1
1	1
NA	1

No	1
no	2
Not at the moment	2
Not currently available	3
None	13

Source: Online Survey (2022)

# Chapter VI. IP Registrar

This year, the number of interviewees of in-depth interviews held with IP registrars was increased to three.

## I. A Bridge Of Communication That Is Established To Achieve A Consensus

The interviewees (stakeholders) were satisfied with the service quality of the Taiwan Network Information Center (TWNIC), which played diverse roles including managing and maintaining the operation of Taiwan's Internet Carrier Routing System, actively participating in international technological communities, establishing an effective technology exchange network, and supporting the communication and coordination between industries and the government. In addition to providing positive reviews of TWNIC's service quality, the stakeholders expected the TWNIC to serve as bridge for communicating policies between the industry and government agencies. In the future, the TWNIC is expected to contribute to the attainment of a consensus between the public and private sectors.

*/ The TWNIC (Taiwan Network Information Center) serves as an interface between companies and the government, conveying the voices of enterprises and increasing their influence of the government. In this regard, the role of the NIC is vital.*

*/ We've been collaborating with the TWNIC for over two decades. I find that the TWNIC is well-intentioned and desires to assist industry practitioners with their core projects and is able to provide coaching and personnel training. These are all beneficial services.*

## II. Direct Rescue: Focus On Solution Projects

The stakeholders also highlighted that, notably, the TWNIC spared no effort in responding to the problems encountered by enterprises. Regardless of whether a problem was technical or related to policy communication, the TWNIC highly valued the opinions of the industry. Furthermore, they provided suggestions regarding the human – machine interface of the RPKI Management System/RPKI Validator Website. They wished that a search function be included and that the amount of data presented on a single webpage be increased. Currently, each web page can only present five repositories' worth of IP data, which are insufficient and inconvenient for navigation.

- 
- / Regarding its services, I find them satisfactory. When questions and concerns are raised in meetings or education trainings, they will provide us, either onsite or later, with timely and valuable responses or solutions.
  - / The TWNIC is promoting RPKI (Resource Public Key Infrastructure), which requires registering an ROA (route origin authorization) for a website. Registration is often performed by ISP device providers. I suggest that the TWNIC improves the user design of this website. My coworkers have reported that this website was difficult to operate. We manage numerous IP locations. However, the website can only present five items on at page at any given time. We often need to scroll down some 20 pages to find the relevant information. The website also lacks a search function, so we struggled to find relevant information.

### III. Satisfied With Collaboration: Introduce The Foreign Operator Experience Of IPv6 Deployment

The stakeholders were satisfied with the current cooperation and satisfied with the costs of IP allocation. For the future activities, the stakeholders suggested that the TWNIC could introduce more IPv6 transferred experiences from foreign Internet Service Providers (ISPs). And IP resource management policies, relative laws and regulations from other countries. Furthermore, the stakeholders express the willingness to cooperate with the TWNIC for the IPv6 deployment process in Taiwan.

- / So far, the charge seems reasonable and doesn't pose a burden, so I think the current state is OK.
- / Foreign countries or countries in Asia-Pacific may have IP resource management issues or technical problems. I think the overall environment, environments of individual countries, and information on regulations can be publicly released. Because these countries probably face similar problems, I think relevant information should be disclosed.....I think that our neighboring countries are probably facing similar problems. I think such information can be disclosed.
- / I hope that for the future activities and lectures, domestic and foreign cable modem operators can be invited to share their experiences in introducing IPv6.



## IV. Assist Enterprises Efficiently To Compliance The Cyber Security Regulations Upgraded By Government

The TWNIC serves as a key communication bridge between the industry and government agencies. As the facility of six key infrastructures, IP registrars are heavily influenced by changes in cyber security laws and regulations. The stakeholders stated that in the past, TWNIC allowed industry operators to express their opinions during the policy planning process. Communication between the TWNIC and industry operators at this stage was smooth. However, once the policies, laws, and regulations came into effect, the government seldom explained related supporting measures. Also, because of factors such as inadequate organizational adjustments and personnel training, immediate compliance was difficult. Stakeholders and IP registrars hoped that the TWNIC could provide them more help to decrease the time for enterprises to adapt.

- / *There are numerous legal requirements for cyber security, with specified penalties for noncompliance. So far, this aspect is challenging.*
- / *For this part, back then (when we had a meeting before the laws were established), we had maintained that cyber security-related professional skills and capabilities cannot be increased in 6 months or a year, as that would be unduly burdensome for us.*
- / *Cyber security-related explanations regarding policy or guidance must be expanded. The government should provide guidance or a direction to our industry practitioners. For IP registrar like us, we feel our business scope is clearer... When it is regulated by competent authorities or the government and when we are being protected by applicable cyber security. The TWNIC should address IP registrar, which have been elevated by the government to a subject of cyber security protection. The TWNIC should expand its explanations of or guidance on cyber security policy to provide guidance or directions for us industry practitioners.*

## V. Valuable Summaries Of Activities And Trends: Cultivate Cyber Security Talents

The stakeholders indicated that the articles detailing industrial training activities and overseas technology trends and development, which were compiled into abstracts and presented on the TWNIC website, are highly informative. Through these articles, those who missed TWNIC seminars could still access the latest updates. The stakeholders also mentioned that various external factors, including related laws and regulations as well as technology trends, have considerably increased the industry's demand for cyber security talents. Given that the TWNIC is an industry leader, the stakeholders recommended the TWNIC to cultivate cyber security talents and develop themes and content for education and training.

- 
- / In the early days, we had to look for reports about conferences. Now, the official website has them organized. Even if we don't have time to participate in a conference, we can still find relevant information. This is a favorable development, as sometimes our work does not allow us to participate in all conferences.
  - / When our technicians participate, they look for updated technology or special cases worldwide. They conduct exchanges with foreign cases using this exchange method. This is common in technical units. For the policy aspect, we would like to see more information about IP and DNS policies domestically and in foreign countries.
  - / The TWNIC holds some relevant meetings, and by attending them, we can learn about the latest domestic and foreign information.
  - / Regarding education training, cyber security-related courses can be increased. As I said, overall, the demand for cyber security talents in Taiwan is high. Therefore, education training can focus more on training such professionals.

## VI. Revitalize Industry Interaction And Assist Enterprise Upgrade

Finally, the stakeholders noted that despite the severity of the COVID-19 pandemic, the TWNIC had significantly and effectively converted its physical activities into online activities (e.g., online seminars and educational training). The TWNIC adapted to the new operating environment, made flexible adjustments, and provided updated information to IP registrars and stakeholders. In today's knowledge-based economy, improving employee (industry personnel) quality and promoting interactions and healthy competition between enterprises are essential to strengthening overall industry capacity and ensuring elevated industry competitiveness

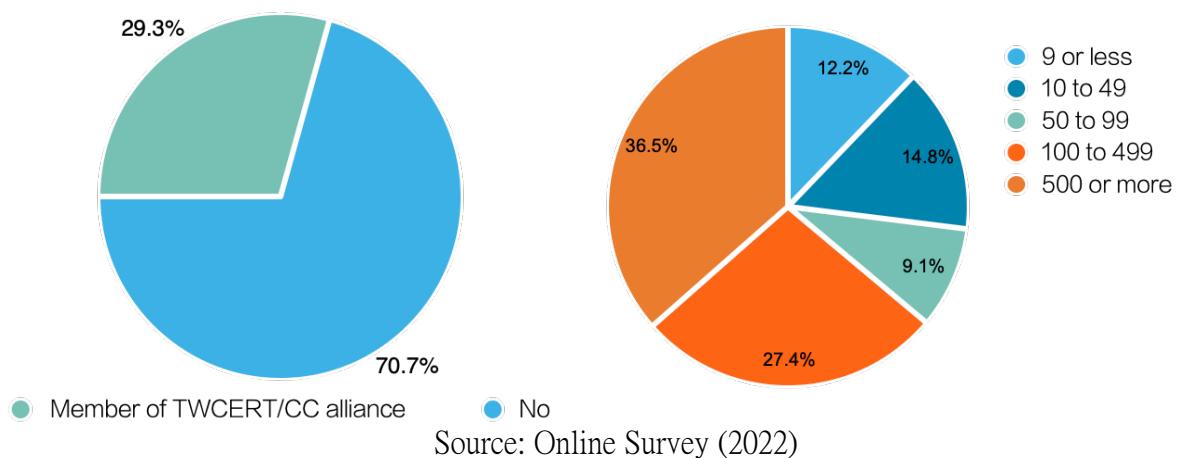
- / In the past, we would send coworkers to participate in meetings, such as DNS response policy zone discussion meetings, IP policy resource management meetings, and RPKI education trainings and registration services.
- / Nowadays, I think online meetings are a format we are more accustomed to. We don't need to leave the office. It is more favorable for us because we have a lot of work to do lately. To be frank, when listening to a speaker, listening to them online is as good as in person. Of course, there are some practical or onsite activities that cannot be replicated online, but this really depends on the topic of the activities.

# Chapter VII. Subscribers of TWCERT/CC Newsletter & Taiwan CERT/CSIRT Alliance

## I. Summary of Implementation

In this survey, 78.9% of the respondents of Taiwan CERT/CSIRT Alliance indicated that they have subscribed to the newsletter, while only 22.9% of the company's main business or service is related to cyber security. The most (62.6%), there is no business or service related to cyber security, and 14.5% of the departments can't deal with it.

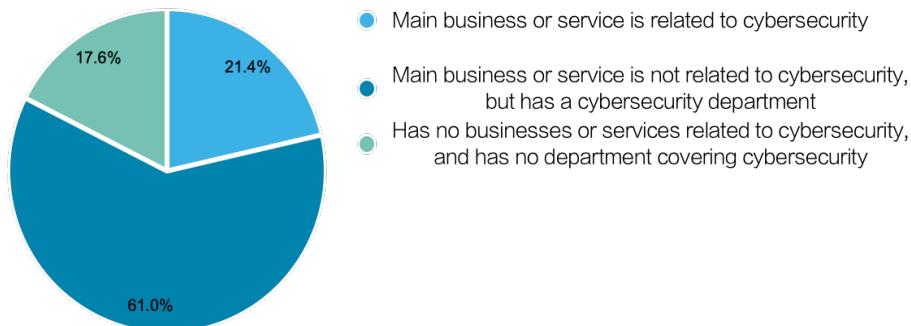
Most of the TWCERT/CC alliance members have companies with more than 500 employees, accounting for 39.2%, followed by 38.9% with 100-499 employees, and more than 20% with less than 100 employees.



Among the respondents whose main business or service is not related to cyber security, but have a cyber security department, the number of employees in their companies/organizations responsible for cyber security business is as high as 79.6%, with less than 5 employees, followed by 13.4% of employees dealing with cyber security business There are 6-10 people.

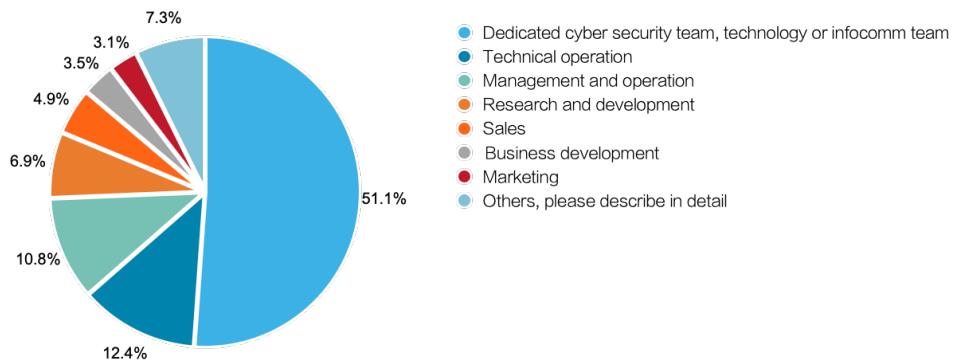
Number of security personnel:	
Less than 5 people (including 5 people)	68.1%
6-10 people	13.0%
11-19 people	3.2%
20-49 people	7.7%
More than 50 people	8.1%

Source: Online Survey (2022)



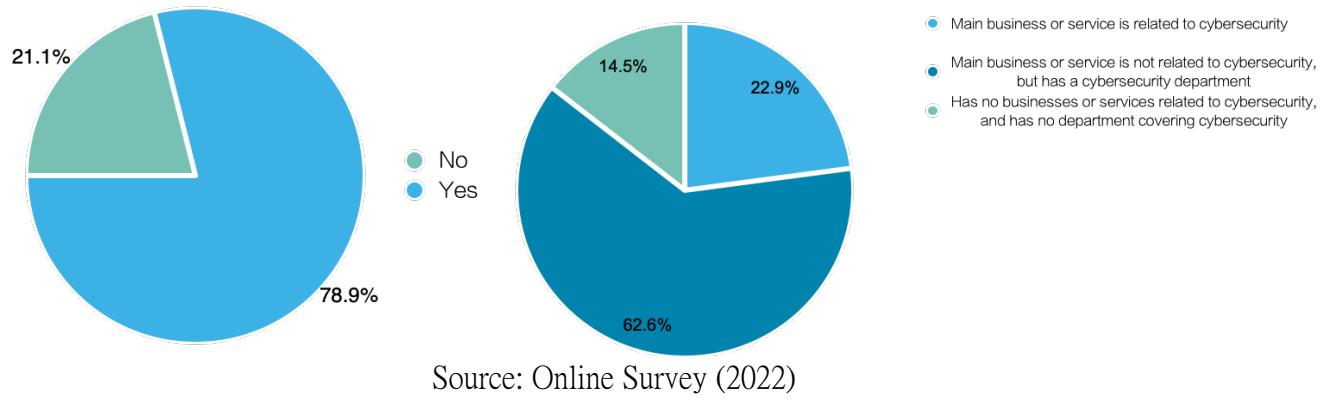
Source: Online Survey (2022)

Among TWCERT/CC newsletter subscribers, 51.1% belong to the "cyber security Specialized Department, Information Department" department, which is the largest department category, followed by "Technical Operation and Support" with 12.4%, and "Operation Management" with 10.8%.

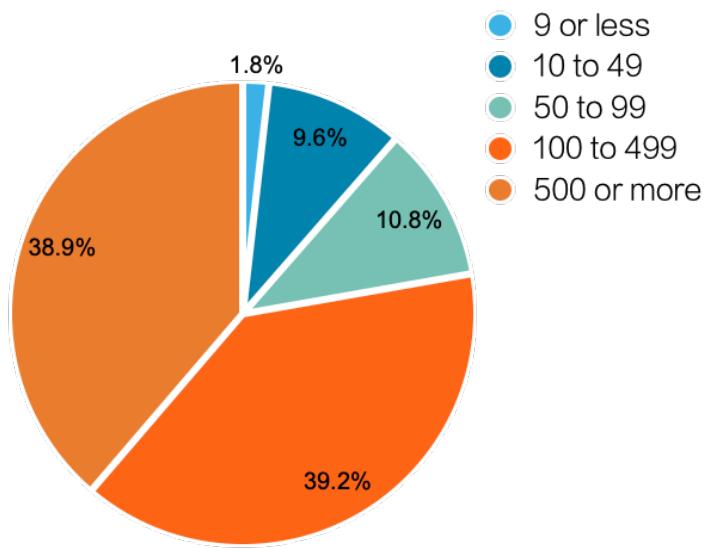


Source: Online Survey (2022)

TWCERT/CC consortium members in this survey 78.9% of respondents said they subscribe to e-newsletters, while only 22.9% of the company's organization's main business or service is cyber security-related, not cyber security-related but has the largest proportion of cyber security departments (62.6%), there is no cyber security-related business or service, and there is no department to deal with the proportion of 14.5%.



Most of the TWCERT/CC alliance members have companies with more than 500 employees, accounting for 39.2%, followed by 38.9% with 100-499 employees, and more than 20% with less than 100 employees.



Source: Online Survey (2022)

Among the respondents whose main business or service is not related to cyber security, but have a cyber security department, the number of employees in their companies/organizations responsible for cyber security business is as high as 79.6%, with less than 5 employees, followed by 13.4% of employees dealing with cyber security business. There are 6-10 people.

F3. How many employees are there in your company/unit who are responsible for [information security]?

Number of security personnel:	
Less than 5 people (including 5 people)	79.6%
6-10 people	13.4%
11-19 people	0%
20-49 people	4.9%
More than 50 people	2.1%

Source: Online Survey (2022)

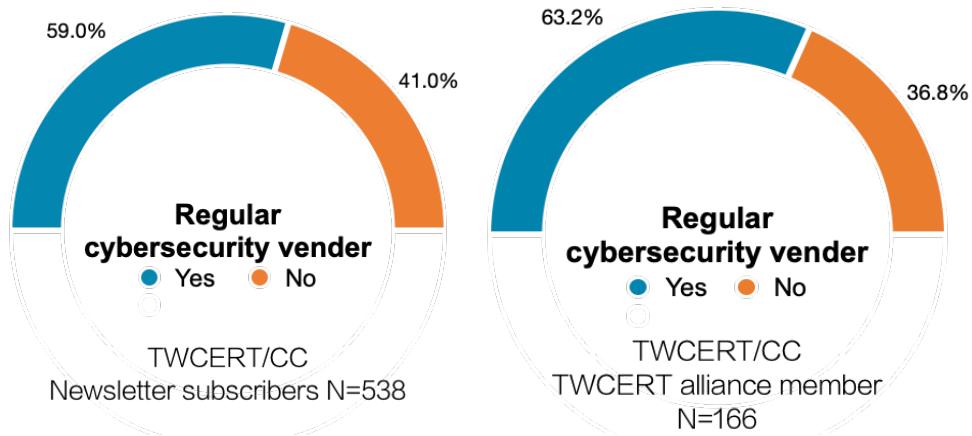
Among the TWCERT/CC alliance members, as many as 82.5% of the respondents belonged to the "cyber security, Information or technology or infocomm" department, which is the largest department category, followed by "management and operation" with 6.6%, which also shows that most of the alliance members main contacts are those with cyber security, information background or operational management capabilities.



Source: Online Survey (2022)

## II. Comparison and Cybersecurity Vender Cooperation

In this survey, we asked each company whether they have a regular cyber security vendor to cooperate with, and there is not much difference between newsletter subscribers and alliance members.

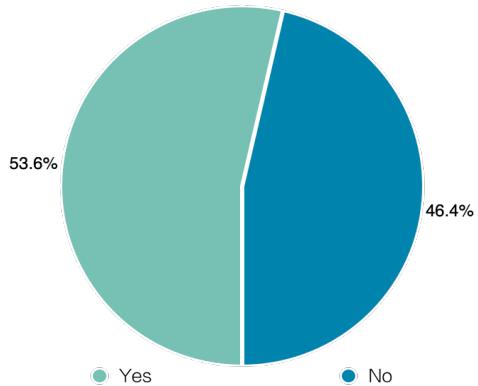


The current job position of the respondents can be seen slightly different, the highest percentage of newsletter subscribers is the general staff accounted for 54.8%, while the highest percentage of alliance members is the middle director 48.2%. In addition, newsletter subscribers also have 2.8% of the position of business owners / self-employed.

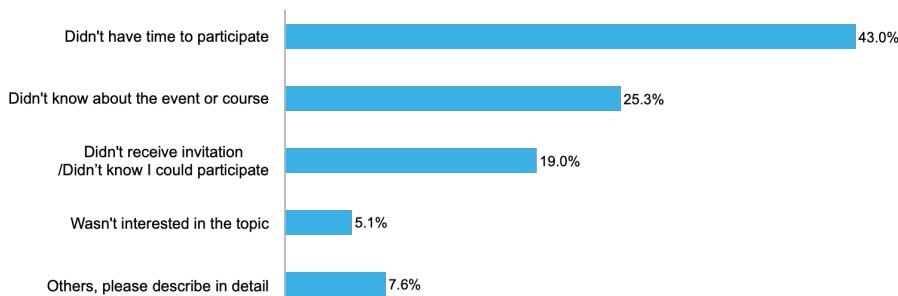
What is your current job title?	TWCERT/CC E-newsletter subscriber N=493	TWCERT/CC Affiliate N=166
General Staff	54.8%	39.2%
Basic Supervisor	30.8%	48.2%
Senior Executive	11.6%	12.7%
Business Ownership/Self-employment	2.8%	0.0%

Source: Online Survey (2022)

53.6% of the respondents who are members of the TWCERT/CC alliance said they had attended meetings or activities held by TWCERT/CC in the past year, while the remaining 46.4% of the respondents who did not participate in meetings or activities said that the main reason was "43% have no time to participate, followed by 25.3% who are "don't know about activities or course information" and 19.0% who are "haven't received an invitation/don't know that they can participate"



Source: Online Survey (2022)



Source: Online Survey (2022)

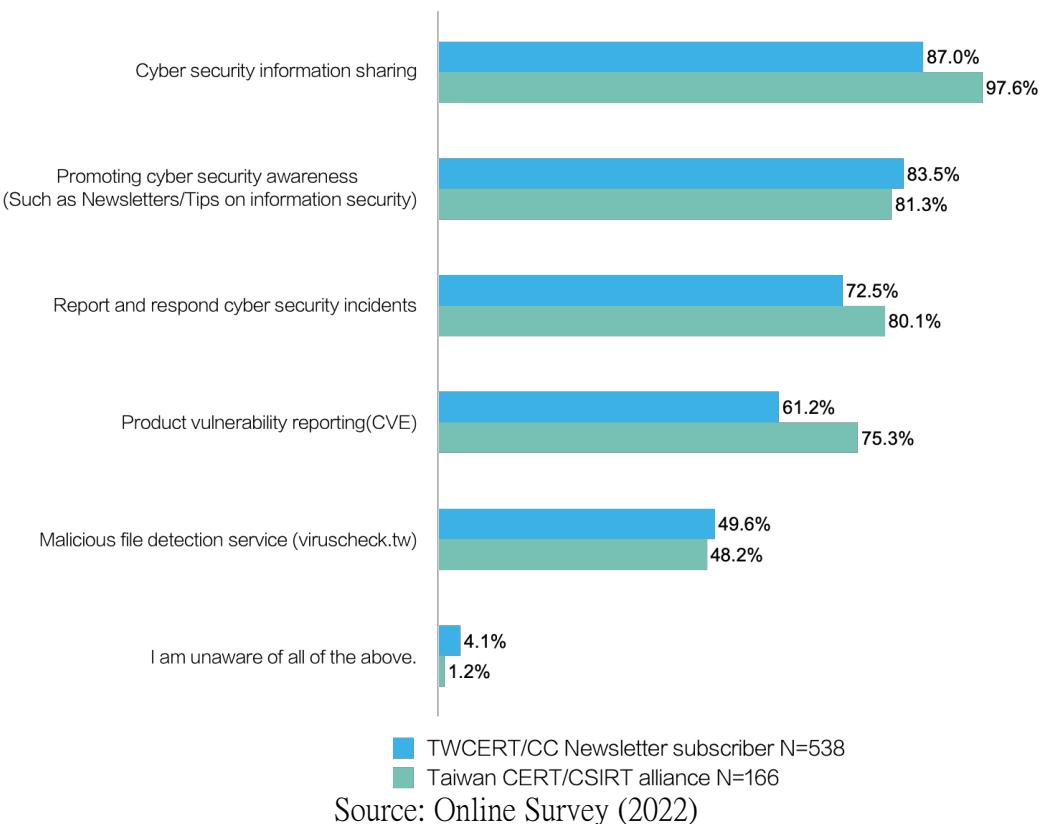
### III. Service Awareness

The service with the highest awareness of CERT/CC is "cyber security information sharing". The ratios of newsletter subscribers and alliance members are 87% and 97.6% respectively, indicating that almost all alliance members are well aware of TWCERT/CC cyber security information sharing.

Information sharing services, followed by "promoting cyber security awareness" (e.g. Newsletters/Tips on cyber security), whether it is newsletter subscribers or alliance members, more than 80% of the awareness, newsletter subscribers is slightly higher. The ratios of "report and respond cyber security incidents" newsletter subscribers and alliance members were 72.5% and 80.1% respectively. The awareness of "CVE" is the service item with the largest gap between newsletter subscribers and alliance members, 61.2% and 75.3% respectively. Alliance members are relatively more aware of "CVE" service.

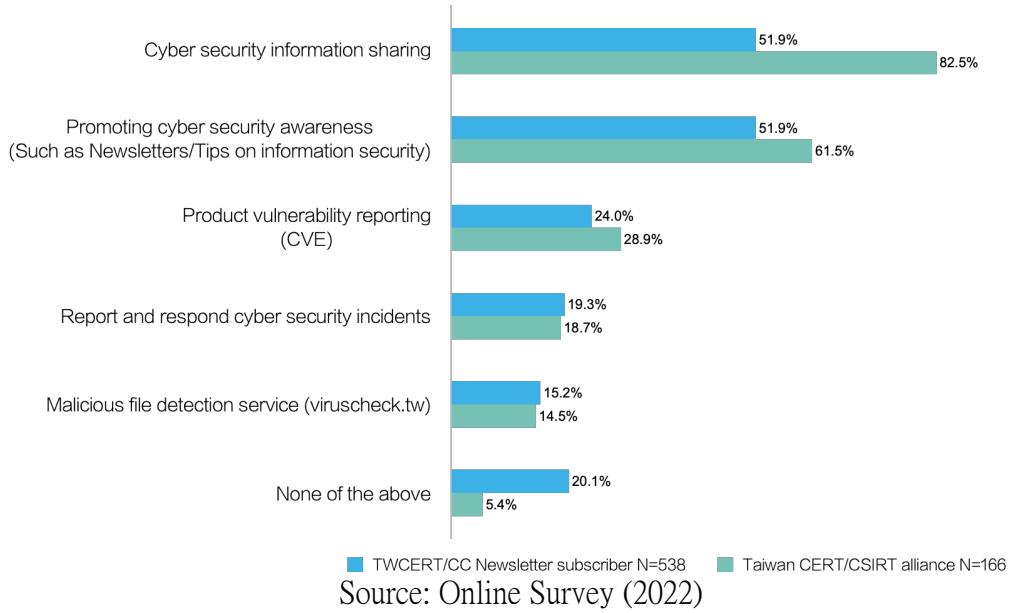
The awareness rate of "malicious file detection service" (viruscheck.tw) is close to 50%. It can be seen that the general awareness of the members of the alliance is relatively high, and there is a

clear gap with the newsletter subscribers in "cyber security information sharing", "promoting cyber security awareness" and "product vulnerability reporting (CVE)".



In terms of whether they have used or contacted TWCERT/CC, "cyber information sharing" has the highest usage rate, with 51.9% and 82.5% of newsletter subscribers and alliance members respectively. The next highest usage rate is "promoting cyber security awareness" with 51.9% and 61.5% respectively. The "report and respond cyber security incidents" ranked third in terms of awareness, but fell to fourth in terms of usage rate, lower than the "product vulnerability reporting" usage rate, while the "malicious file detection service" was less than 15% in terms of both awareness and usage rate.

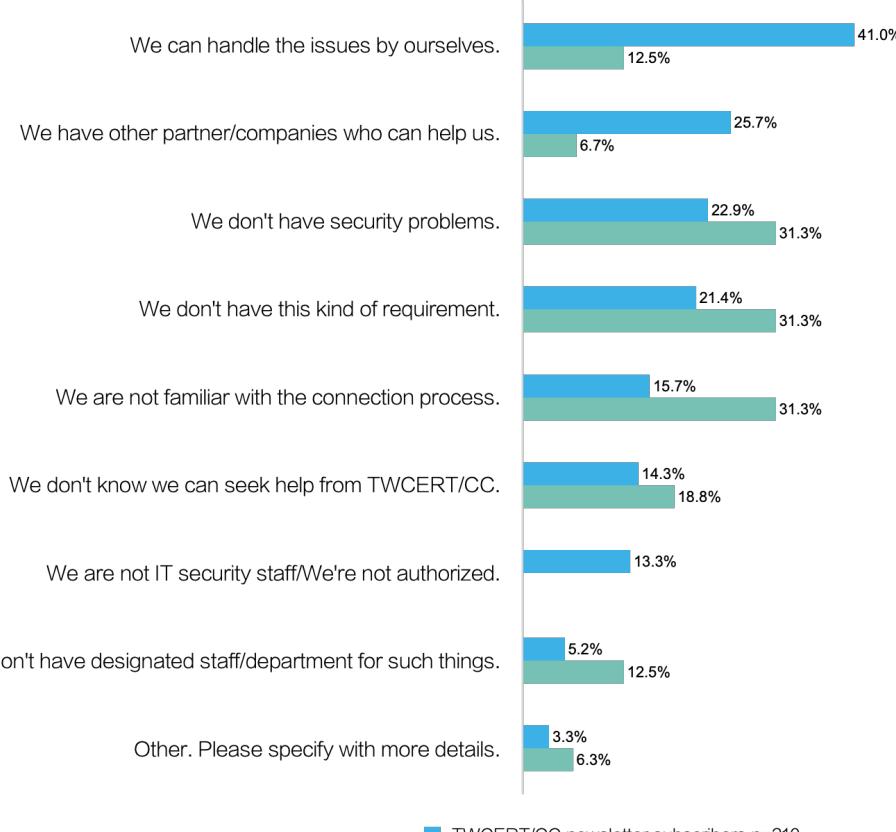
The usage rate of each service clearly shows that the TWCERT CERT/CSIRT alliance members are the stakeholders who are more closely related to TWCERT/CC interactive frequency.



Therefore, in this survey, we continue to ask respondents why they know about TWCERT/CC cyber security report service but do not use it in order to provide better services, and the highest percentage of newsletter subscribers is 41.0% who said they "We have other partner/companies who can help us", followed by 25.7% who said they "We have other partner/companies who can help us", and 22.9% who said they "We don't have security problems".

"We don't have this kind of requirement" with 21.4%, "We are not familiar with the connection processes" and "We don't know we can seek help from TWCERT/CC" are also about 15%.

Less than 20% of alliance members did not seek assistance from TWCERT/CC, mainly because of "We don't have this kind of requirement", "We don't have security problems" and "We are not familiar with the connection process" (31.3%).

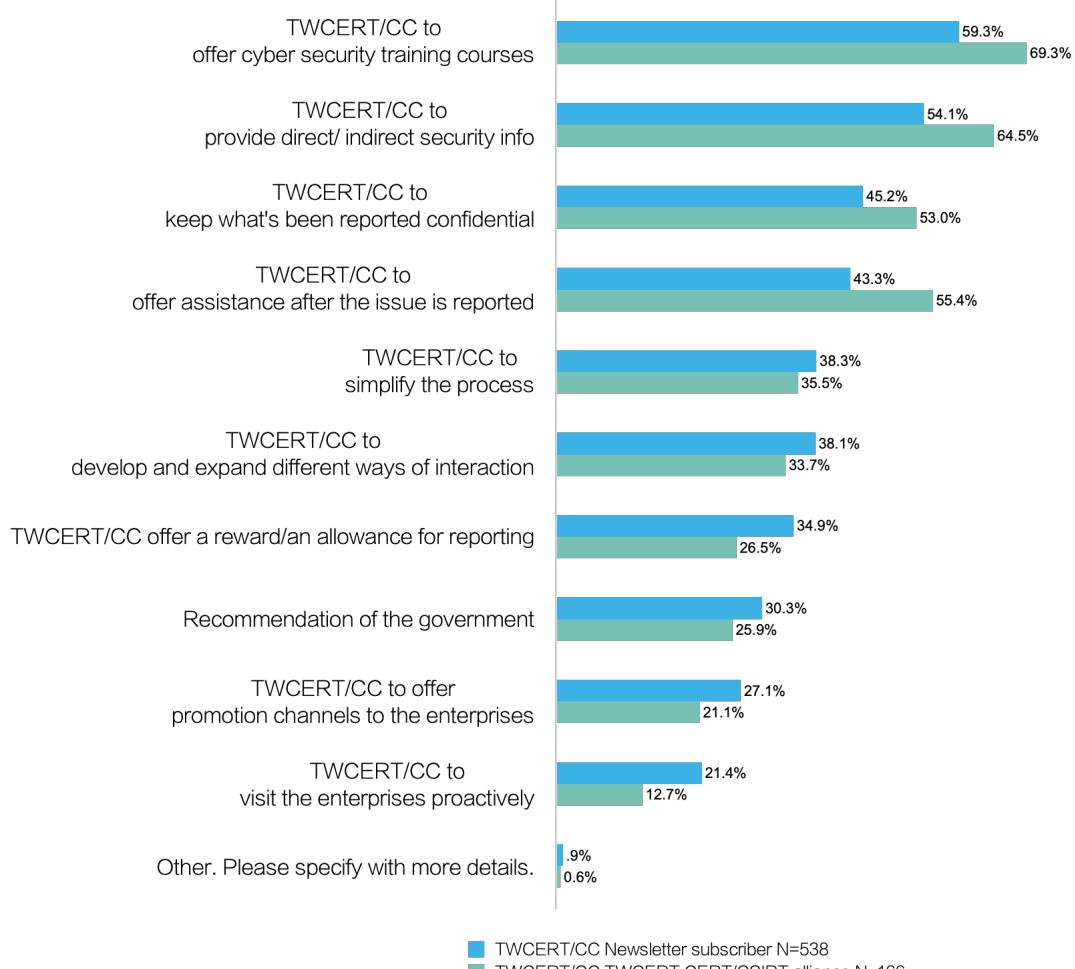


Source: Online Survey (2022)

With regard to increasing respondents' willingness to report/share cyber security issues, nearly 60% of newsletter subscribers indicated that they "provide corporate cyber security education and training", followed by 54.1% who "provide direct/ indirect security info". It is advisable to start with the provision of services to establish good interaction and trust with various companies/organizations. 45.2% said "keep what's been reported confidential", and 43.3% needed "offer assistance after the issue is reported". After the actual notification, each organization cares whether the content of the notification can be kept confidential, and needs TWCERT/CC to assist in handling cyber security incidents, not just receiving report information.

The order of the members of the alliance is similar, as "offer cyber security training courses" (69.3%), "provide direct/ indirect security info" (64.5%), "offer assistance after the issue is reported" (55.4%), and "keep what's been reported confidential" (53%).

The willingness of newsletter subscribers is generally higher than that of alliance members.

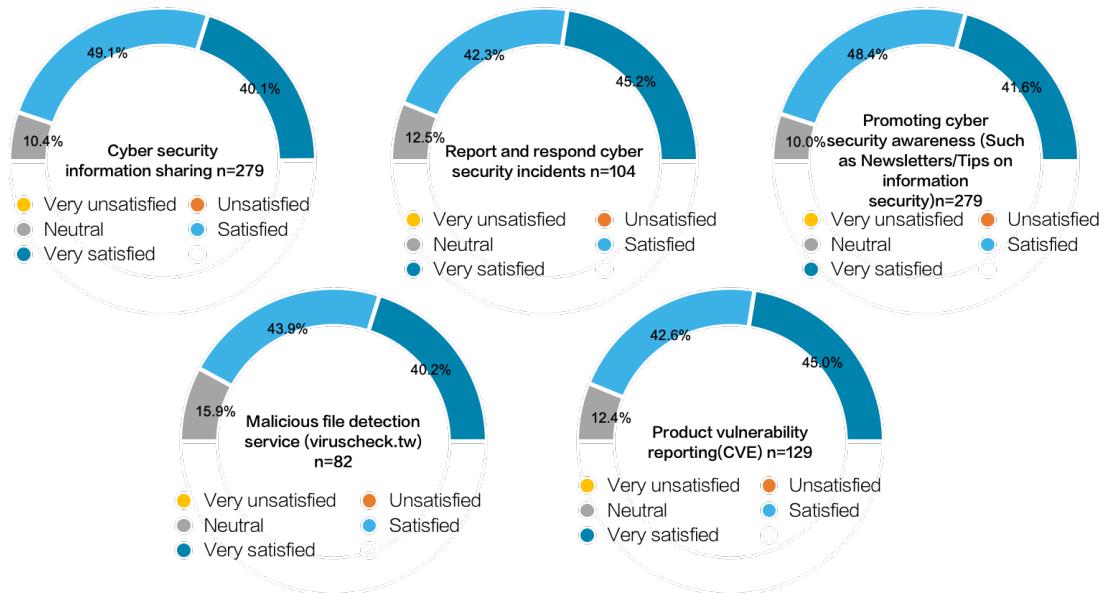


Source: Online Survey (2022)

#### IV. Service Helpfulness and Reasons

Respondents of e-newsletter subscribers were asked about their satisfaction with the services, and the highest average scores were given to "CVE" and "report and respond cyber security incidents" with 4.33 points.

The average score of "promoting cyber security awareness" was 4.32, ranking second in terms of satisfaction, with as many as 90% of the users rating the service as satisfactory. The average score for "cyber security information sharing" was 4.29, with 90% of users saying the service was satisfied. Even the "malicious file detection service", which has a lower average score, scored 4.24, with more than 85% of the respondents saying the service is satisfied.



A4. What is the satisfaction level of your company/organization in the important business of TWCERT/CC that you have used or contacted?

TWCERT/CC  
Newsletter subscribers N=538

Source: Online Survey (2022)

For Taiwan CERT/CSIRT Alliance, the highest mean score was 4.67 for "malicious file detection service", with as many as 75% of the respondents rating the service as very satisfied, but 4.2% of the users also rated it as unsatisfied. The average score of "promoting cyber security awareness" was 4.57, ranking second in terms of satisfaction, with as many as 95% of the users rating it as satisfactory. The average score for "cyber security information sharing" was 4.55, with 60% of users saying the service was very satisfied. The average score for "CVE" is 4.5, with over 90% of users rating the service as satisfied or very satisfied. Even the lowest average, "report and respond cyber security incidents n=31", has an average score of 4.26.

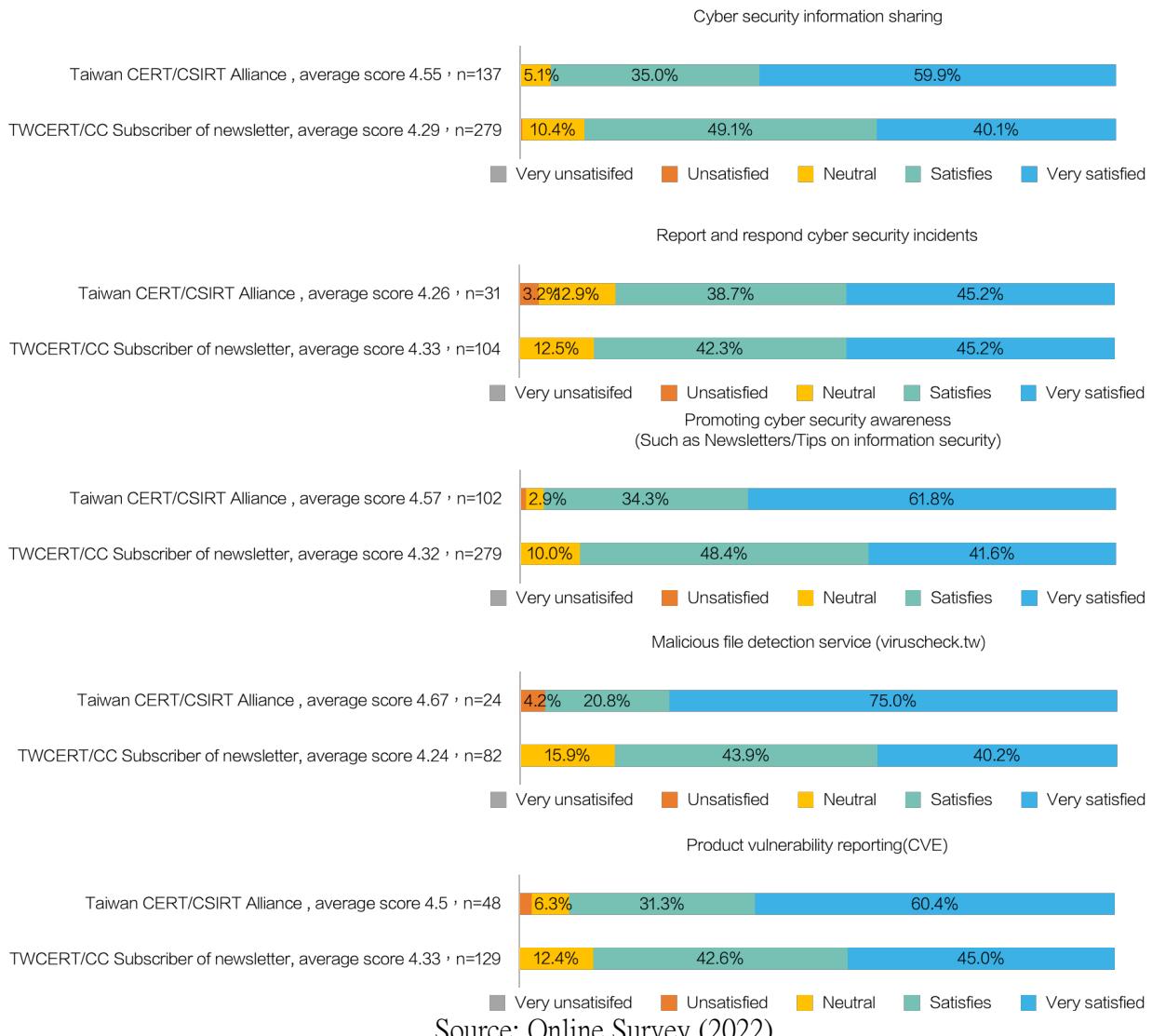


A5. What is the satisfaction level of your company/organization in the important business of TWCERT/CC that you have used or contacted?

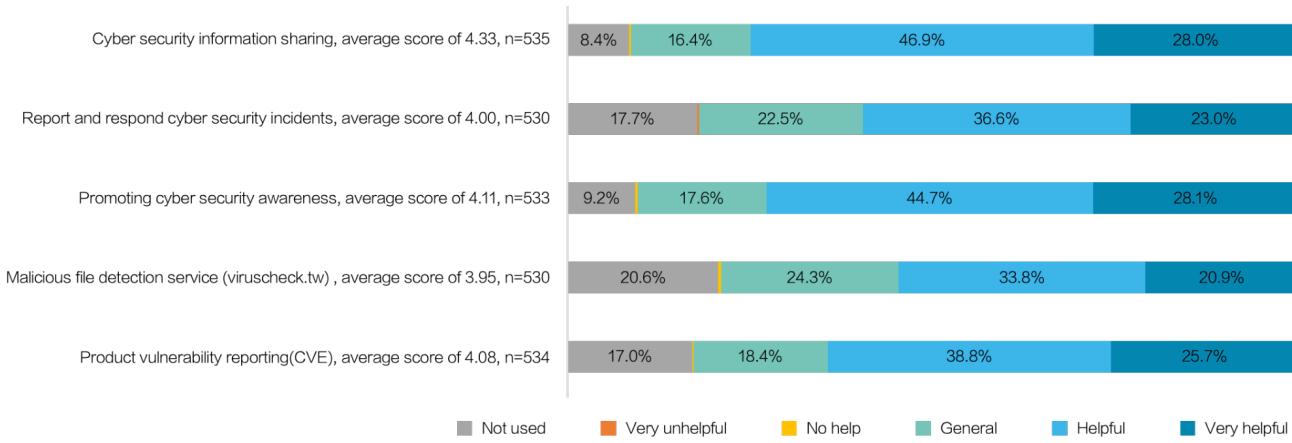
TWCERT/CC  
CERT/CSIRT alliance member N=166

Source: Online Survey (2022)

Overall, most of the members of Taiwan CERT/CSIRT Alliance have higher average scores or better than newsletter subscribers. Only the service of "report and respond cyber security incidents" is roughly the same as newsletter subscribers.



Among the service values, "cyber security information sharing" has the highest score of 4.33, with 74.9% of the respondents considering the service to be helpful. "promoting cyber security awareness" ranked second with an average score of 4.11, with 72.8% of the respondents rating it as helpful. The average score for "product vulnerability report" was 4.08, of which 64.5% found the service helpful. The average score of "report and respond cyber security incidents" was 4.0, and 59.6% of them thought the service was helpful. The average score of "malicious file detection service" is 3.95, with an overall help level of 54.7%.

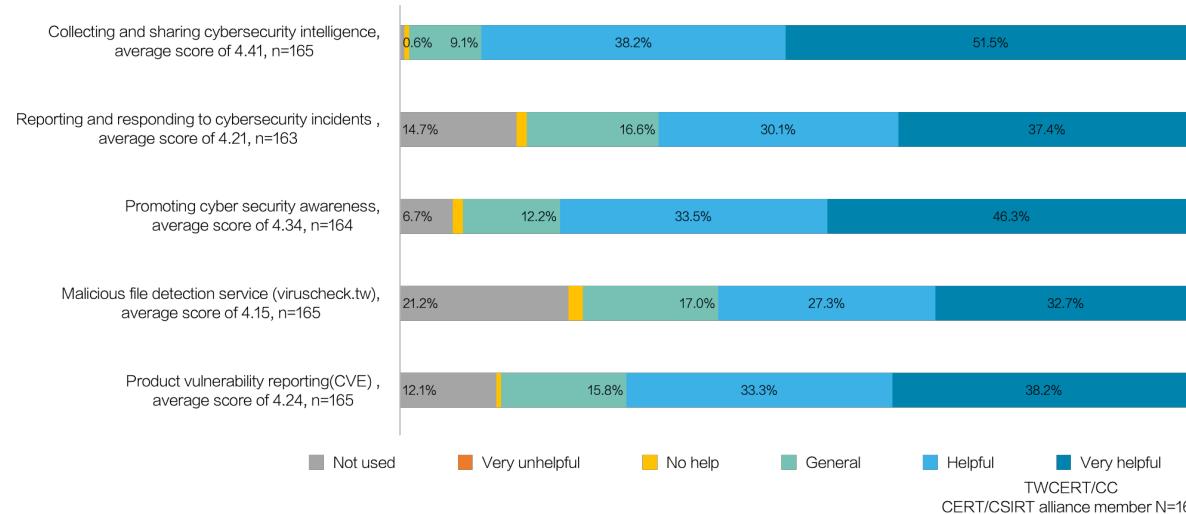


TWCERT/CC  
Newsletter subscribers N=538

Source: Online Survey (2022)

Among the service values, "collecting and sharing cybersecurity intelligence" has the highest score of 4.41, about 90% respondents considering the service to be helpful. "Promoting cyber security awareness" ranked second with an average score of 4.34, with 79.8% of the respondents rating it as helpful.

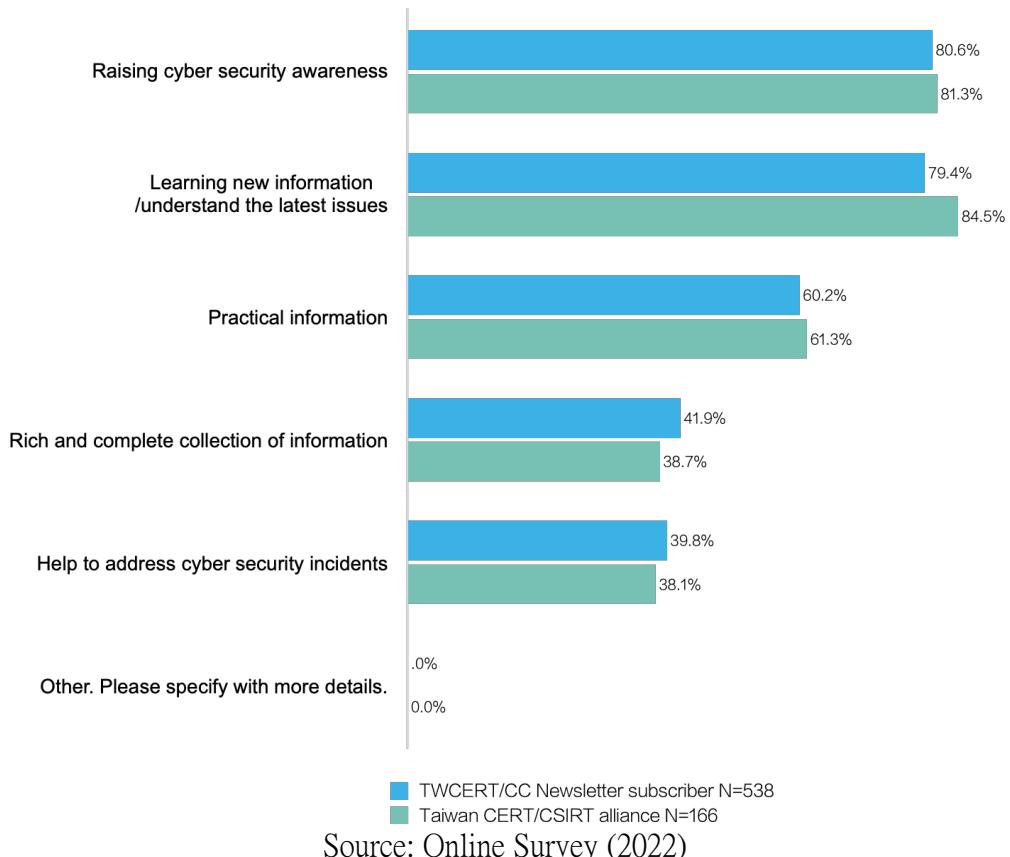
The average score for "product vulnerability report" was 4.24, of which 71.5% found the service helpful. The average score of "report and respond to cybersecurity incidents" was 4.21, and 67.5% of them found the service helpful. The average score of "malicious file detection service" was 4.15, and 60.0% of them found the service helpful overall.



Reasons for using the service, among newsletter subscribers, 80.6% of respondents found the TWCERT/CC service helpful for "raising cyber security awareness", 79.4% for "learn new knowledge/understand the latest issues", 60.2% for "useful information", 41.9% for "informative and complete" and 39.8% for "helping to solve cyber security incidents".

Among the respondents who found the TWCERT/CC service helpful, 84.5% said "learning new information/understand the newest issues", 81.3% said "raising cyber security awareness", 61.3% said "practical information", 38.7% said "rich and complete collection of information", and 38.1% said "help to address cyber security incidents".

Overall, there is not much difference between the reasons why newsletter subscribers and alliances find the service helpful.

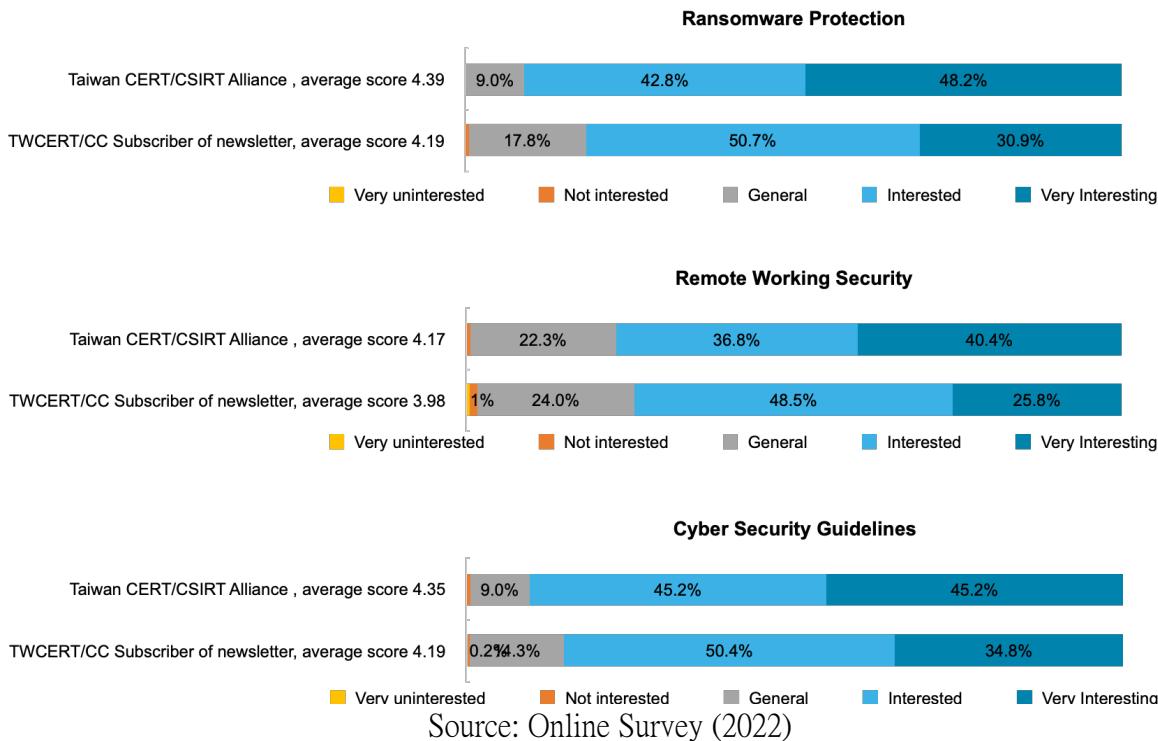


Source: Online Survey (2022)

Among the areas added to the official website of TWCERT/CC, the average interest score of newsletter subscribers in "ransomware protection" area and "cyber security guidelines" is tied for the first place with 4.19 points, and more than 80% of the respondents expressed their interest. The interest score for the "remote office working security" area was 3.98, with 74.3% of respondents expressing a preference for interest.

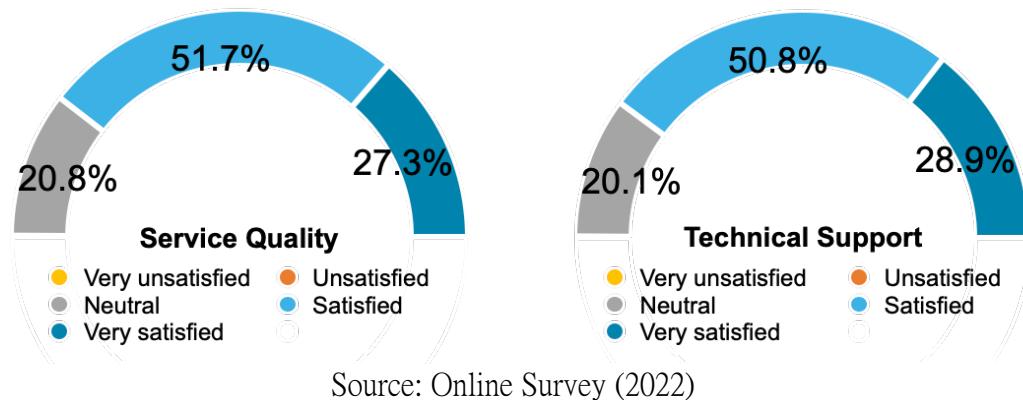
The "ransomware protection area" received the highest average interest score of 4.39, with more than 90% of respondents indicating a preference for interest. The interest score for "cyber security guidelines" was 4.35, with 90.4% of respondents expressing a preference for this area. The interest score for area "remote working security" was 4.17, with 77.2% of respondents expressing a preference for this area.

In general, the interest of TWCERT/CC members in adding a special area on the official website is much higher than that of newsletter subscribers.

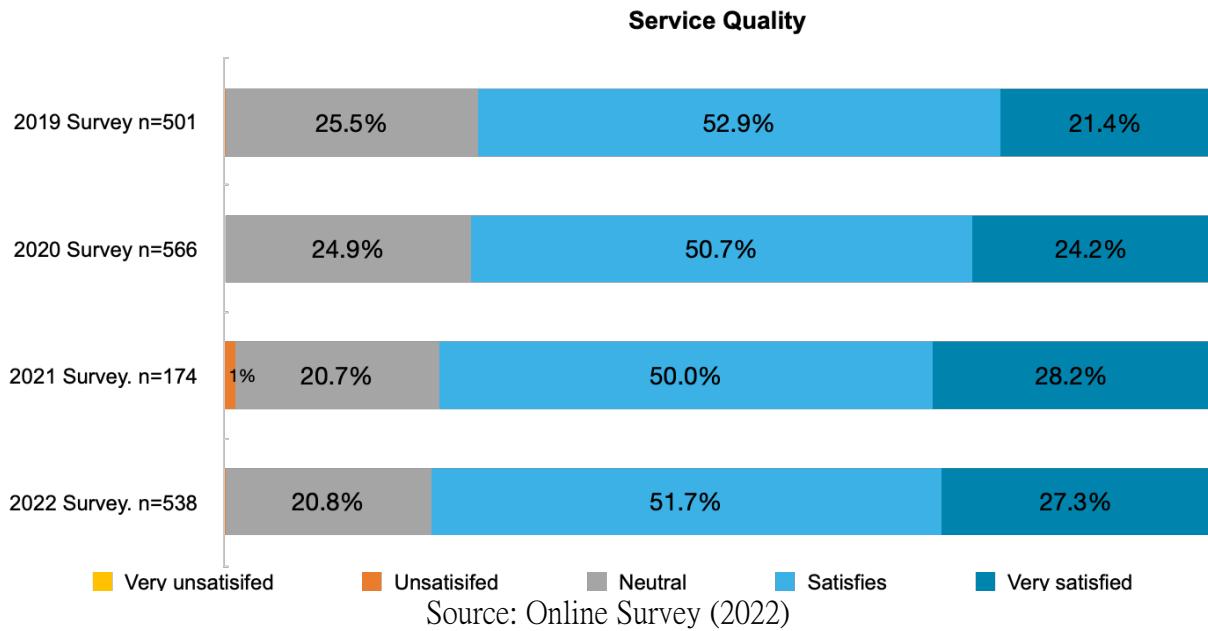


## V. Overall Satisfaction and Trust

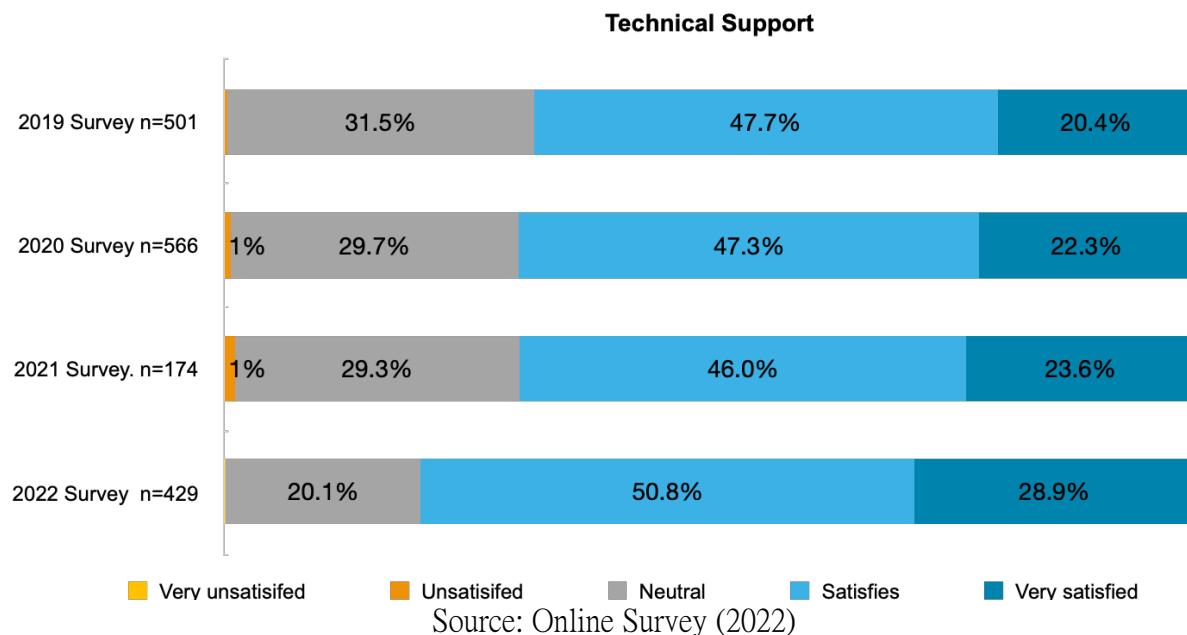
The average satisfaction score of newsletter subscriber respondents on the overall service quality of TWCERT/CC is 4.1, and 79% of respondents think the service quality of TWCERT/CC is satisfied or very satisfied. The overall satisfaction score for technical support was also 4.1, with 79.7% of the respondents considering technical support as a preference.

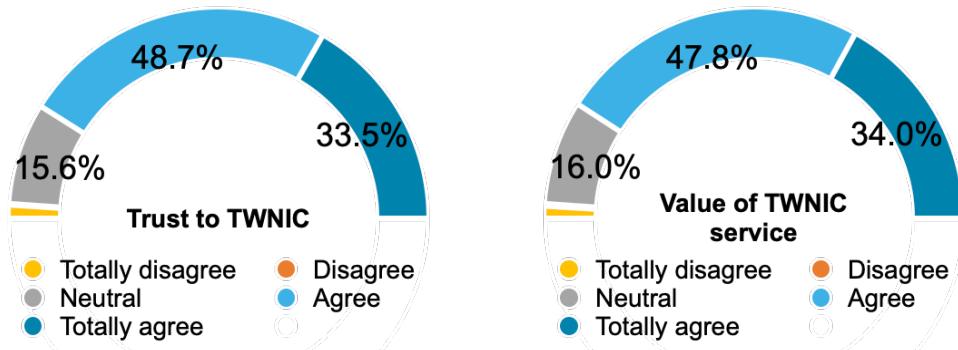


Last year, satisfaction of service quality was 78.2%, and this year it has increased by 0.8% to 79%, which is a continuous improvement in service quality compared to previous years.



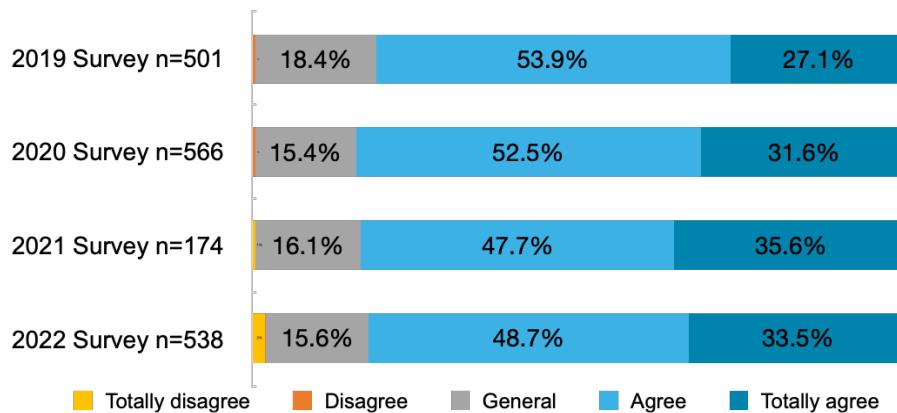
Last year, satisfaction of technical support was 69.6%, but this year, it has increased by 10% to 79.7%, which is a breakthrough growth compared to previous years' surveys.





Source: Online Survey (2022)

#### Trust to TWNIC



Legend: ■ Totally disagree ■ Disagree ■ General ■ Agree ■ Totally agree

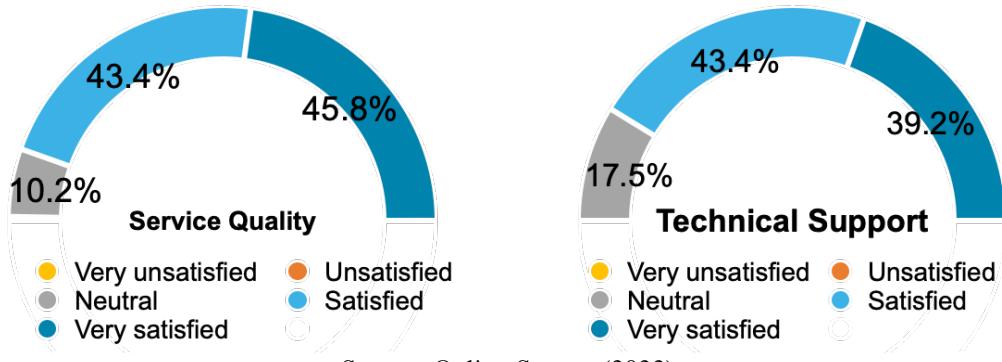
#### Value of TWNIC service



Legend: ■ Totally disagree ■ Disagree ■ General ■ Agree ■ Totally agree

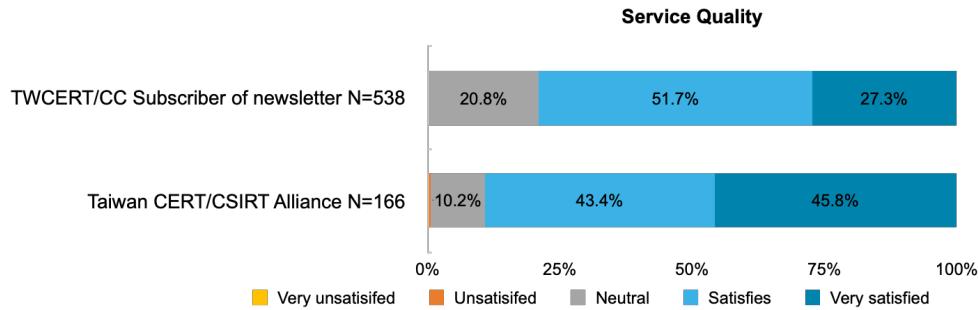
Source: Online Survey (2022)

The average satisfaction score of the overall service quality of TWCERT/CC among the respondents of the Alliance members is 4.34, 89.2% of the respondents think the service quality of TWCERT/CC is satisfied or very satisfied. The overall satisfaction score of technical support is also 4.22, and 82.6% of the respondents think technical support is preferred.



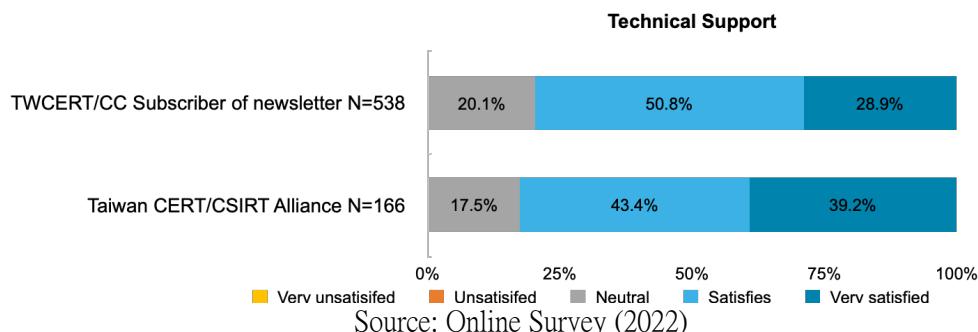
Source: Online Survey (2022)

Comparing newsletter subscribers and TWCERT CERT/CSIRT alliance members, it can be found that the satisfaction level of TWCERT CERT/CSIRT alliance members in terms of service quality is about 10% higher than that of newsletter subscribers, especially in the very satisfied proportion is nearly 20% higher.



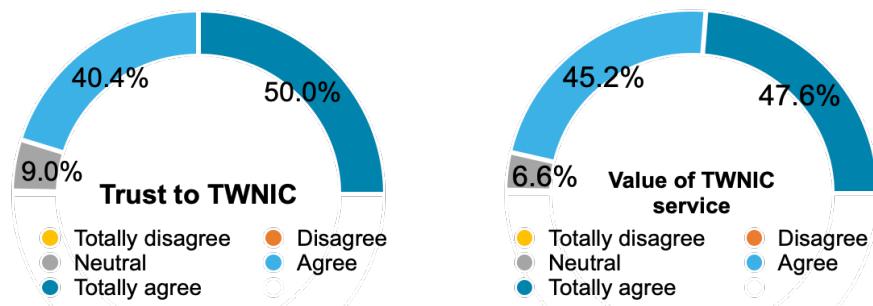
Source: Online Survey (2022)

In the technical support section, the alliance members are slightly higher than the newsletter subscribers, with a satisfaction rate of about 80% being satisfied or very satisfied.



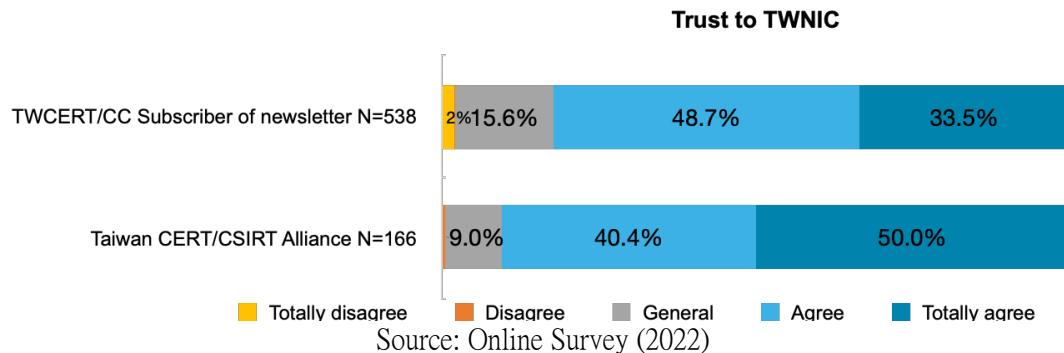
Source: Online Survey (2022)

The trust rating of TWCERT/CC is 4.4, and more than 90% of the respondents agreed that TWCERT/CC is trustworthy. The value of services also scored 4.4, and more than 50% of the respondents totally agreed that the services provided by TWCERT/CC are valuable, and 40.4% agreed that the services provided by TWCERT/CC are valuable.

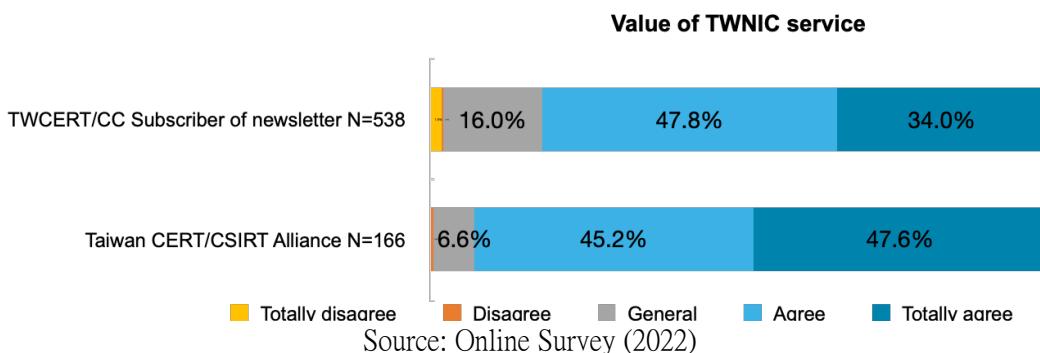


Source: Online Survey (2022)

Comparing newsletter subscribers and TWCERT CERT/CSIRT alliance members, it can be found that TWCERT CERT/CSIRT alliance members' satisfaction level of trust is about 6% higher than that of newsletter subscribers, especially in the very satisfied percentage is nearly 20% higher.

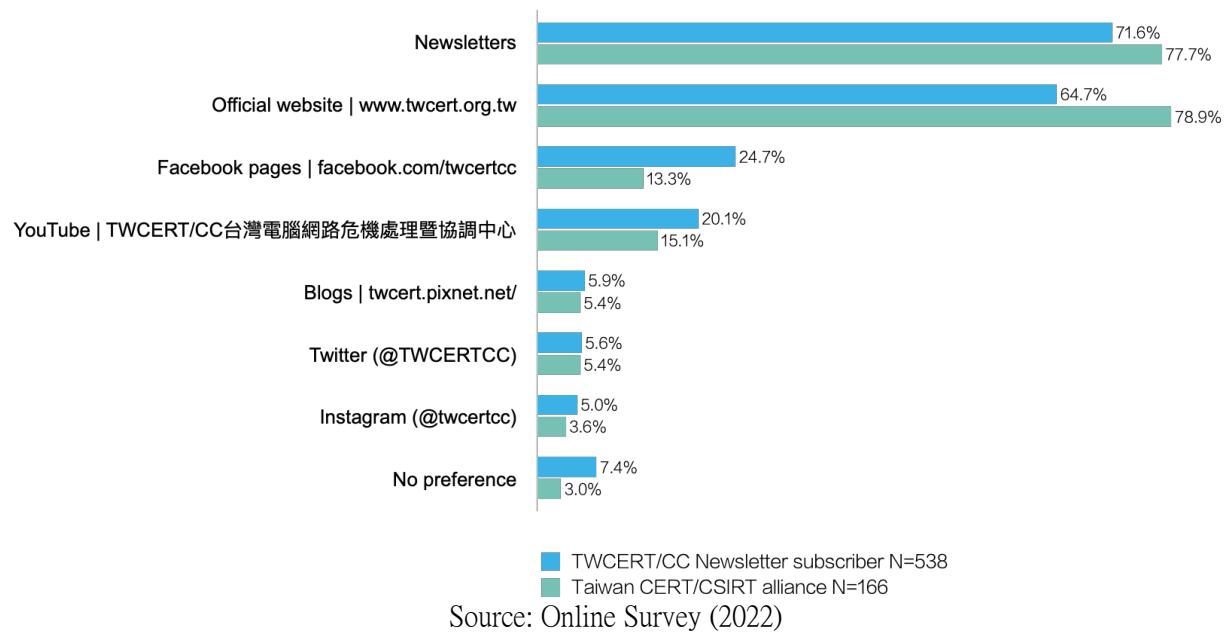


In the technical support part, the alliance members are 10% higher than the newsletter subscribers, and also nearly 90% of satisfaction is satisfied or very satisfied.



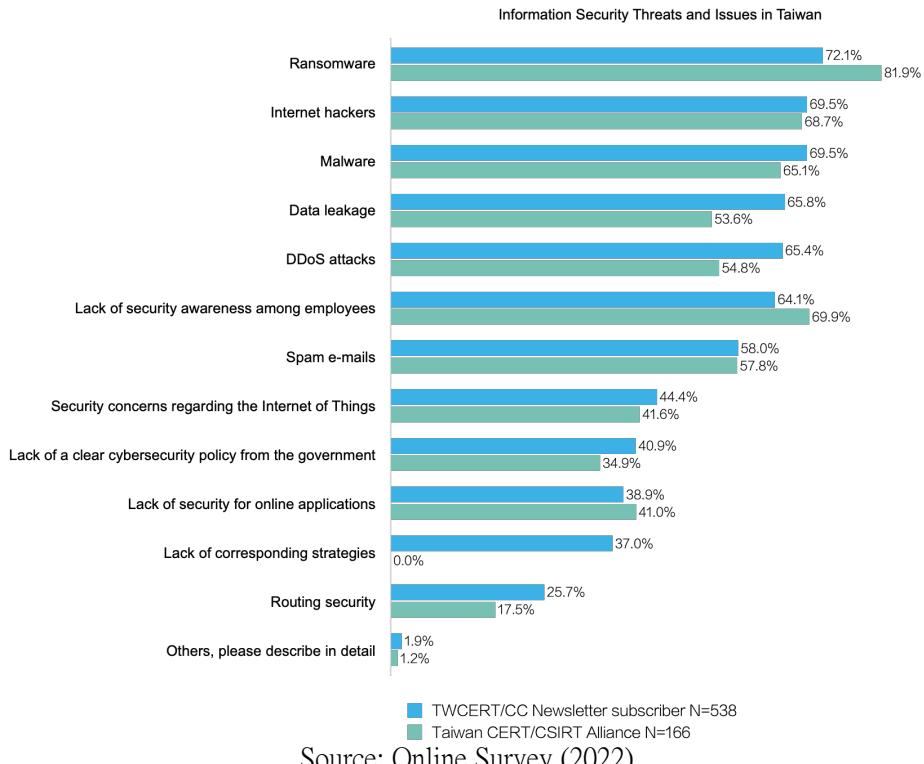
Newsletter subscribers preferred channel of TWCERT/CC information is "newsletter" with the highest percentage of 71.6%, followed by "official website" with 64.7%. "Facebook pages" have 25% of respondents preferring this channel. "YouTube" also has about 20% of the respondents.

Nearly 80% of subscribers of newsletter are more likely to get TWCERT/CC information through "newsletter" and "official website".



## VI. Cybersecurity Threats and Problems in Taiwan

Respondents who are newsletter subscribers prefer "ransomware" to have the highest level of awareness (72.1%) among Taiwan's cyber security threats, followed by 69.5% who think "Internet hackers" and 69.5% who think "malware", "data leakage" (65.8%), "DDoS attack" (65.4%), "lack of security awareness of employees" (64.1%) and "spam e-mail" (58%).



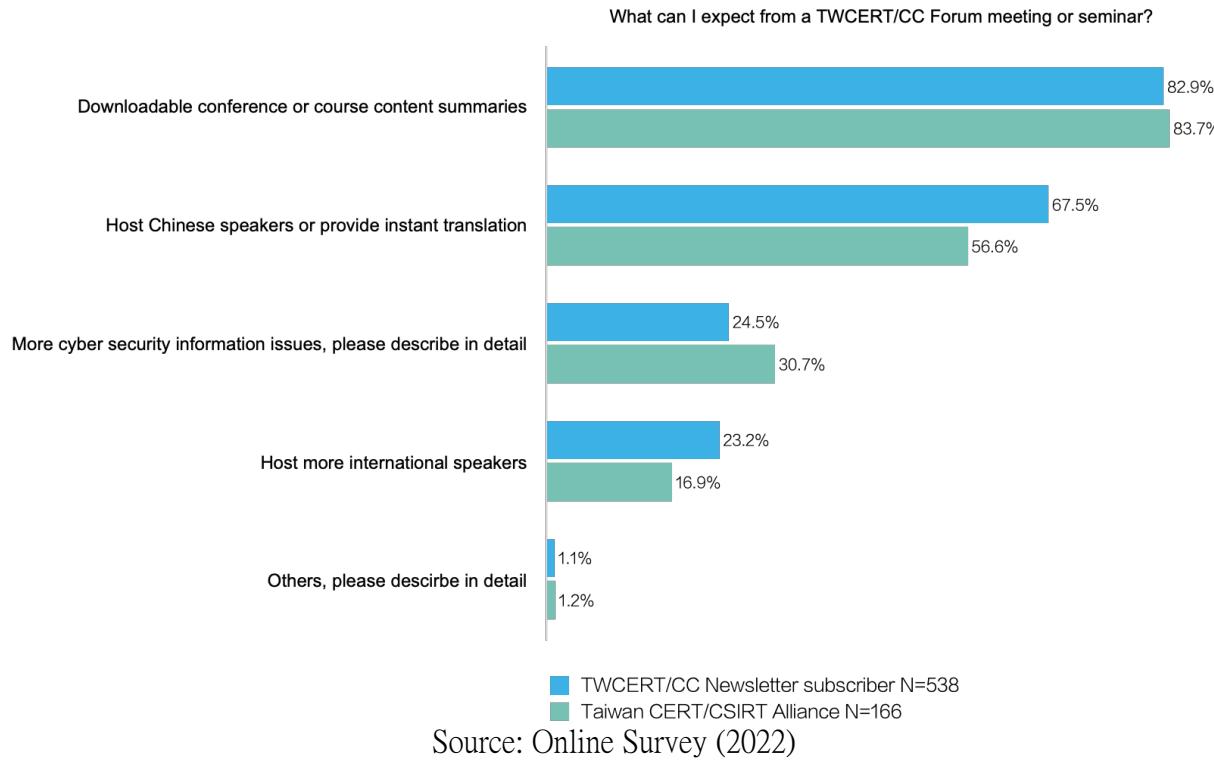
Source: Online Survey (2022)

The members of the alliance believe that the threat to Taiwan's cyber security is the same as the problem, and "ransomware" ranks first, as high as 81.9%, but the second highest is "lack of security awareness of employees" with 69.9%, and the other options are higher than 50%. There were "Internet hackers" 68.7%, "malware" (65.1%), "spam e-mail" (57.8%), "DDoS attack" (54.8%) and "data leakage" (53.6%).

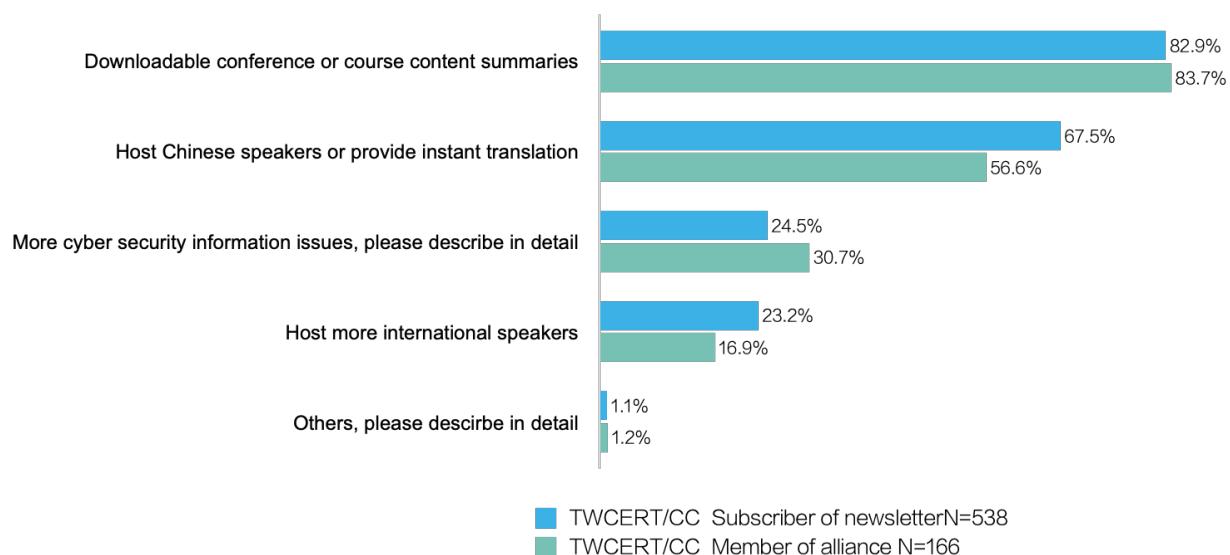
## VII. Expectations and Preferences for Training Courses

82.9% of the respondents who are newsletter subscribers look forward to "downloadable conference or course content summaries" in TWCERT/CC forum or training, and 67.5% expect "increased Chinese instant translation". There are also two About 50% of the respondents expect "increase cyber security issues" and "host more international speakers".

The proportion of alliance members who "increased Chinese instant translation" is about 10% less. Compared with newsletter subscribers, they also look forward to projects that can "more cyber security information issues".

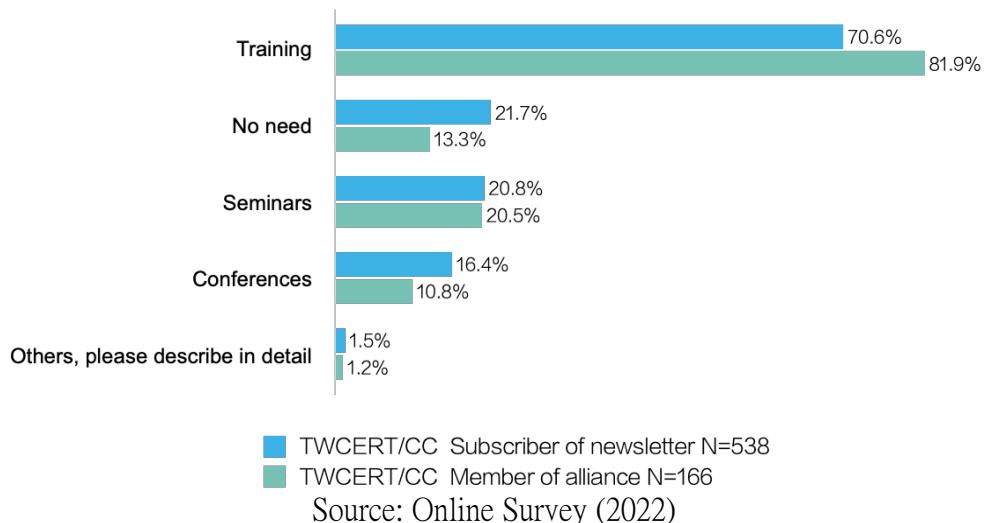


The percentage of the alliance members expect "host Chinese speakers or instant translation" was about 10% less than the newsletter subscribers, which is also expected "more cyber security information" than the e-newsletter subscribers.

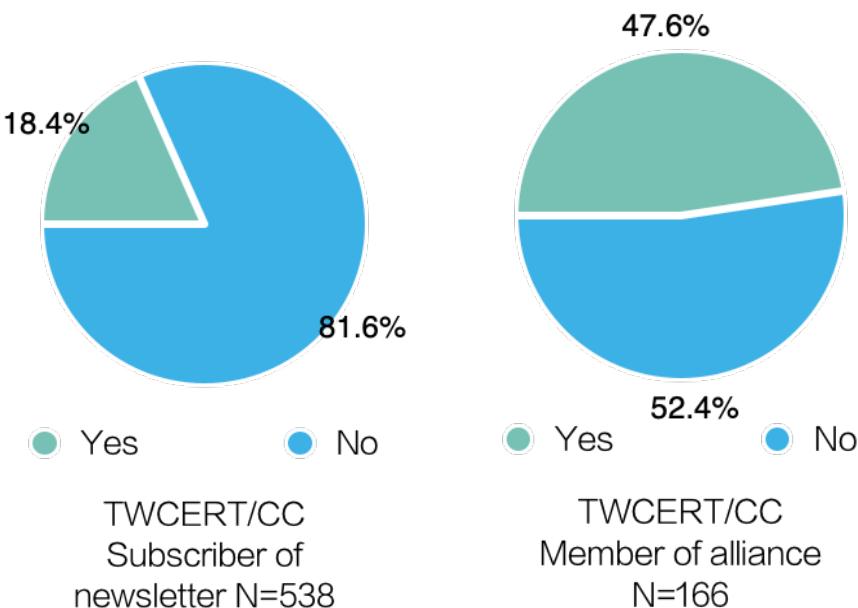


Overall, alliance members are relatively willing to pay for the services from TWCERT/CC, especially for education and training courses. 81.9% of alliance members is about 10% higher than 70.6% of newsletter

subscribers. About 20% of newsletter subscribers and alliance members are willing to pay for seminars and forum meetings.

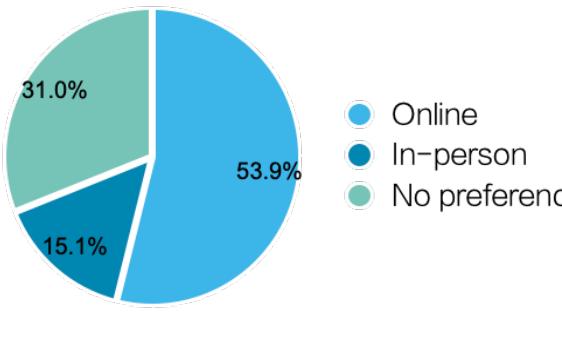


In the past year, the Alliance members were more active in TWCERT/CC's forum meetings or seminars than e-newsletter subscribers, with 47.6% and 18.4% respectively, a difference of nearly 30%.

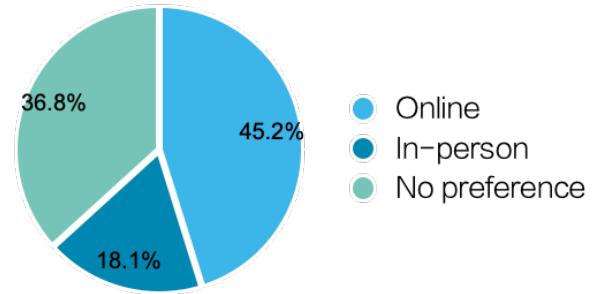


There is no significant difference in the form of participation in TWCERT/CC activities between alliance members and newsletter subscribers.

Nearly half of them said they prefer to participate in online activities.



TWCERT/CC  
Subscriber of  
newsletter N=538



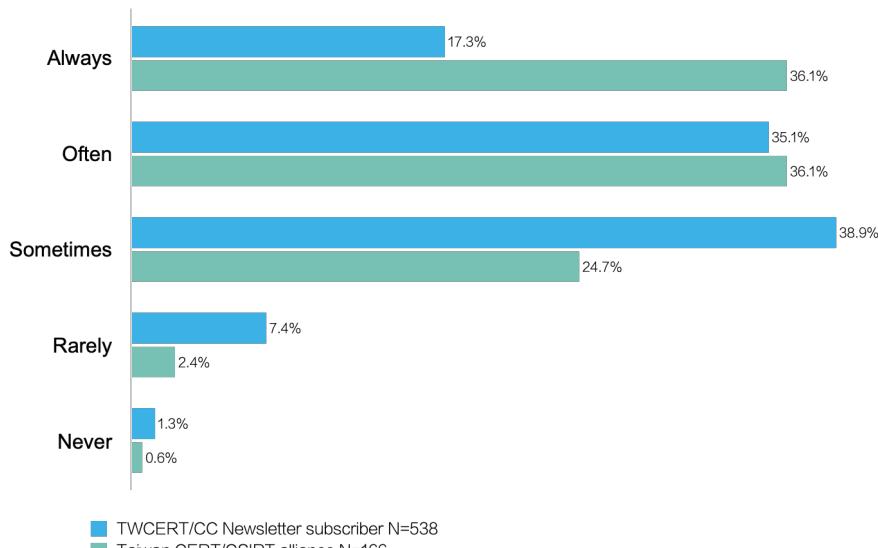
TWCERT/CC  
Member of alliance  
N=166

Source: Online Survey (2022)

### VIII. Information Service

For the information released by TWCERT/CC, the overall attention score of newsletter subscribers is 3.6 points, 17.3% of the respondents always follow the latest news from TWCERT/CC, and 35.1% of the respondents often focus on it, less than 10 % seldom or never concern about the TWCERT/CC's news.

The overall attention score of alliance members has increased by 0.4 points, reaching 4.05 points, and most of them are always concerned and often concerned (36.1%).



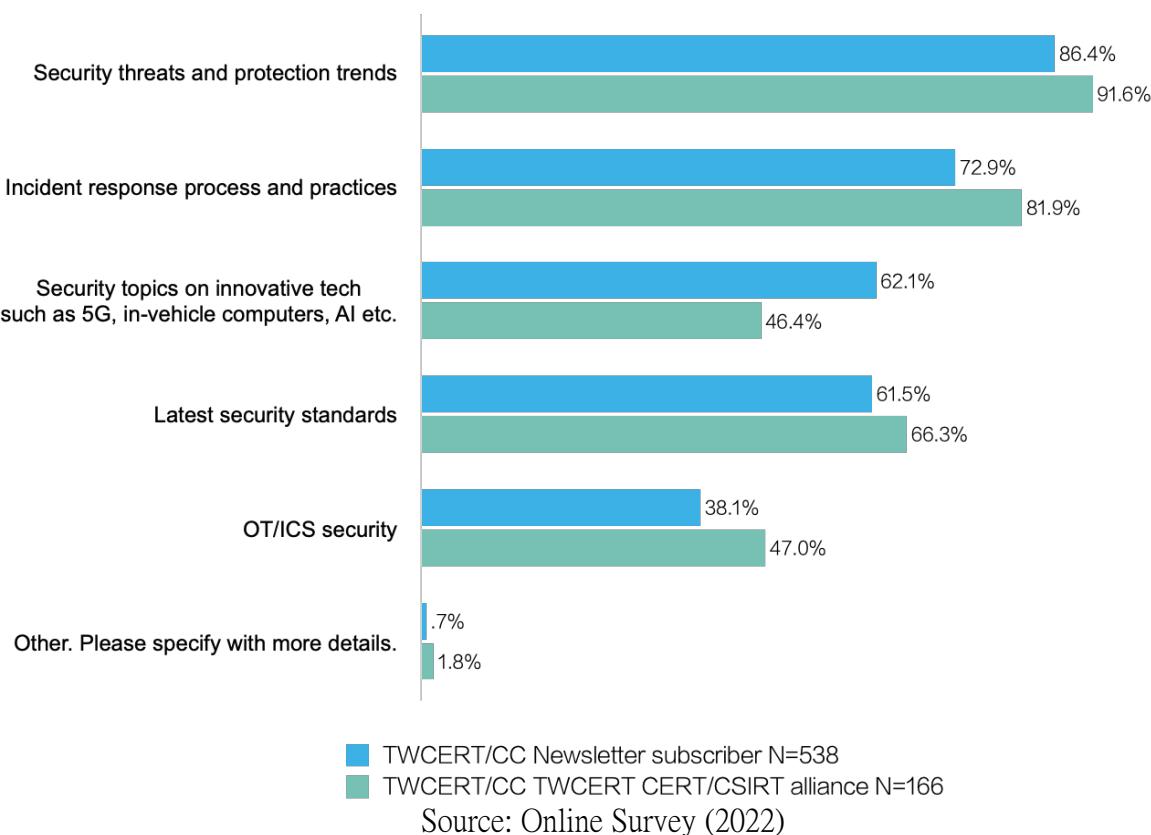
Source: Online Survey (2022)

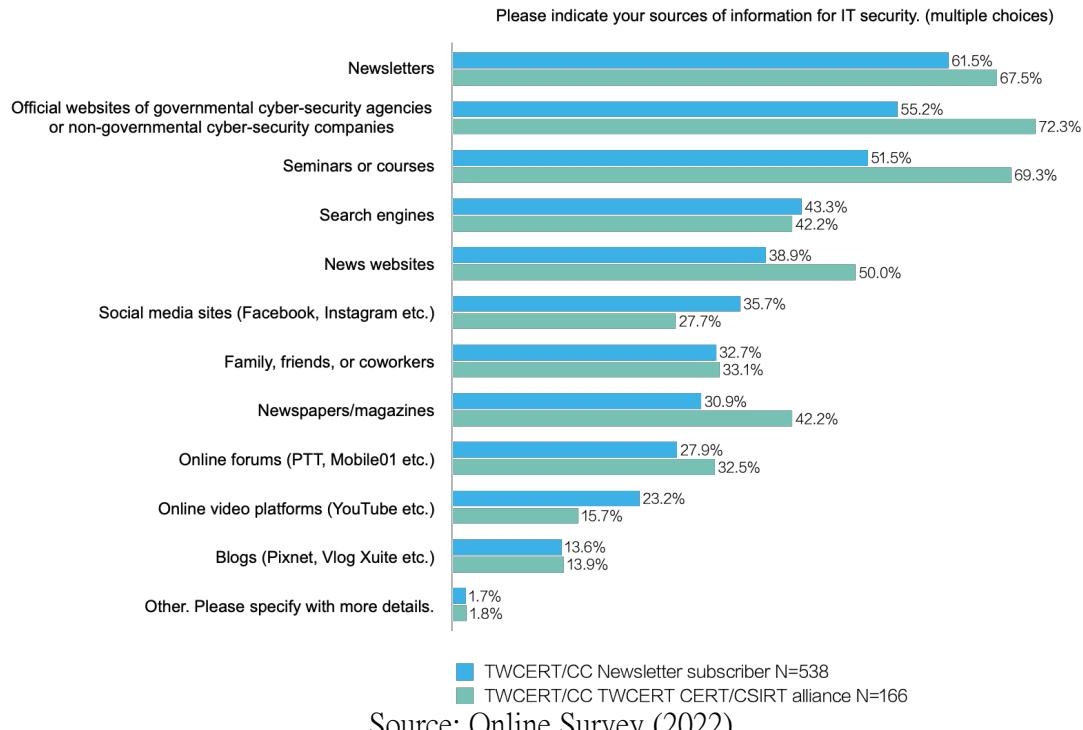
Newsletter subscribers want to learn more about cyber security issues, with the highest proportion of "security threats and protection trends" (86.4%). 72.9% of the remaining "incident response process and

practices" accounted for 72.9%, and about 60% of the respondents needed to introduce "latest cyber security standards" and "security topics on innovative tech (such as 5G, Vehicle, AI, etc.)".

They also indicated that they usually obtain information about cyber security through "newsletter" (61.5%) and "official website" (55.2%), and 51.5% through "seminars or courses".

For the alliance member, there is also a significant increase in the content of "security threats and protection trends" (91.6%), followed by "incident response process and practices" with 81.9%, and the official website is the first choice for them (72.3%) to follow the information from TWCERT/CC. Then would be 69.3% of seminars or courses and 67.5% of newsletters.

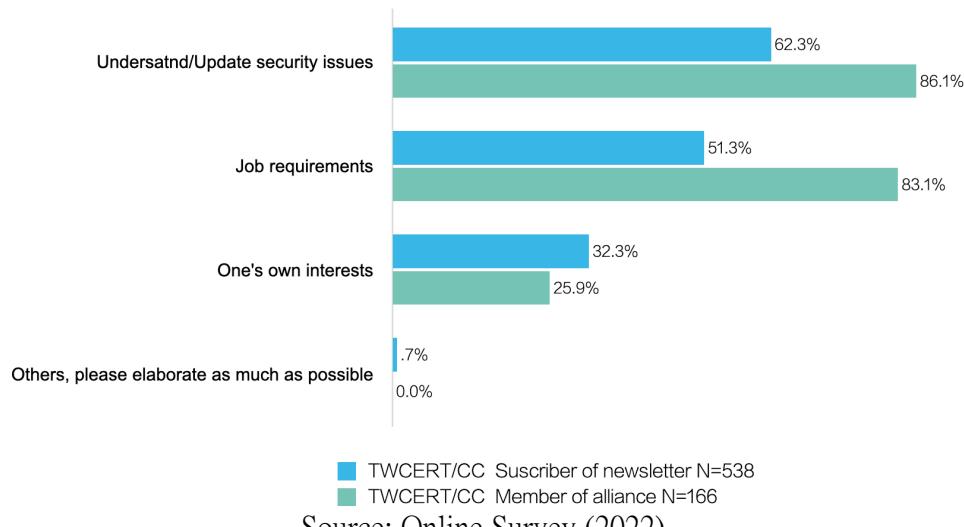




Source: Online Survey (2022)

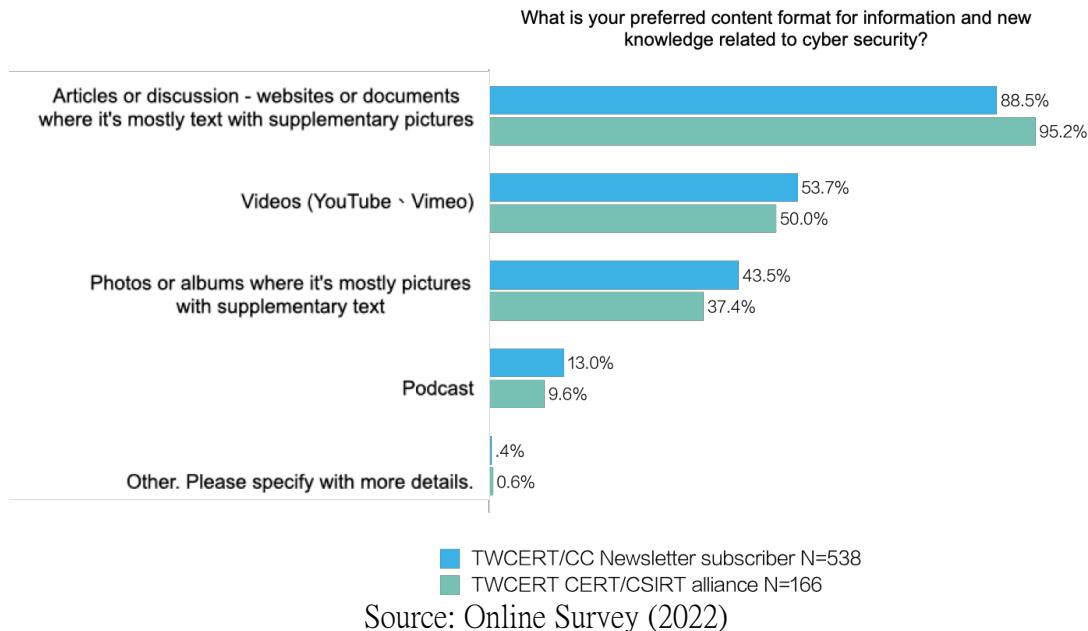
The main reason why e-newsletter subscribers would pay attention to relevant information is to "understand/update security issues" (62.3%), followed by 51.3% for "job requirements", and 32.3% for "one's own interests", which is 7% higher than the percentage of alliance members who are concerned about this reason.

The main reasons for respondents from the Alliance members to be concerned about the information are the same as "understanding cyber security issues" and "job requirements", but the percentages are significantly higher compared to e-newsletter subscribers, 86.1% and 83.1% respectively.

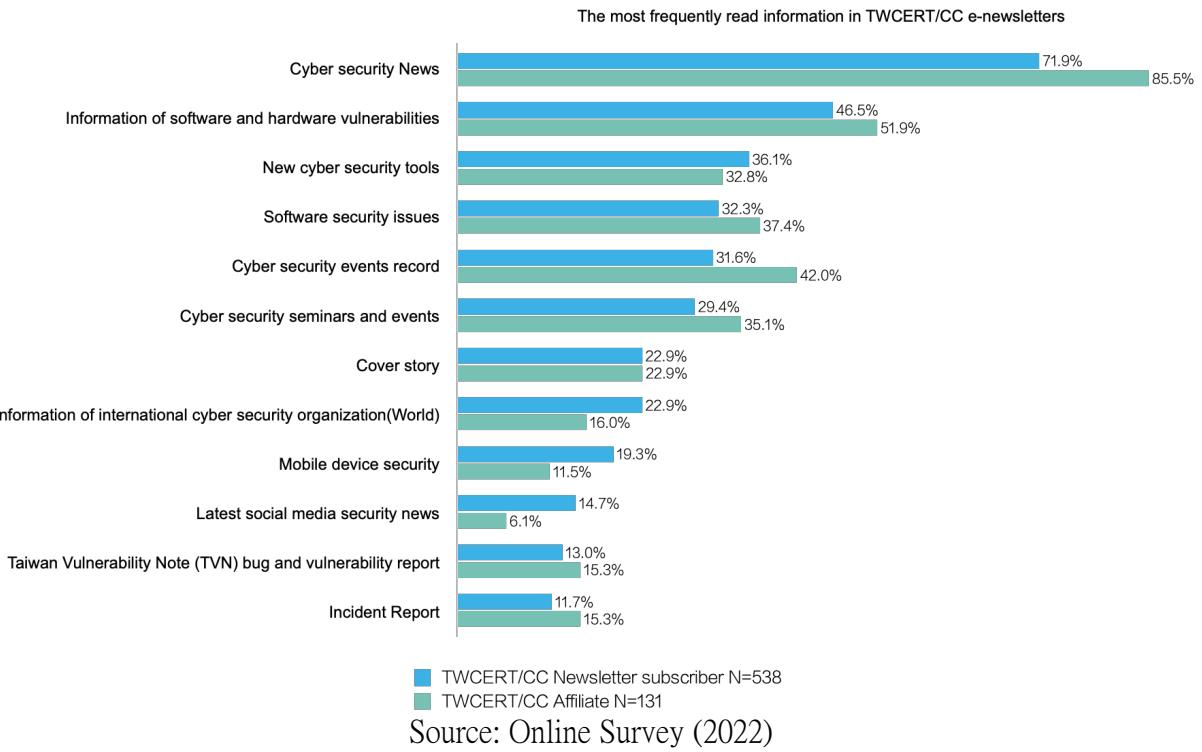


Source: Online Survey (2022)

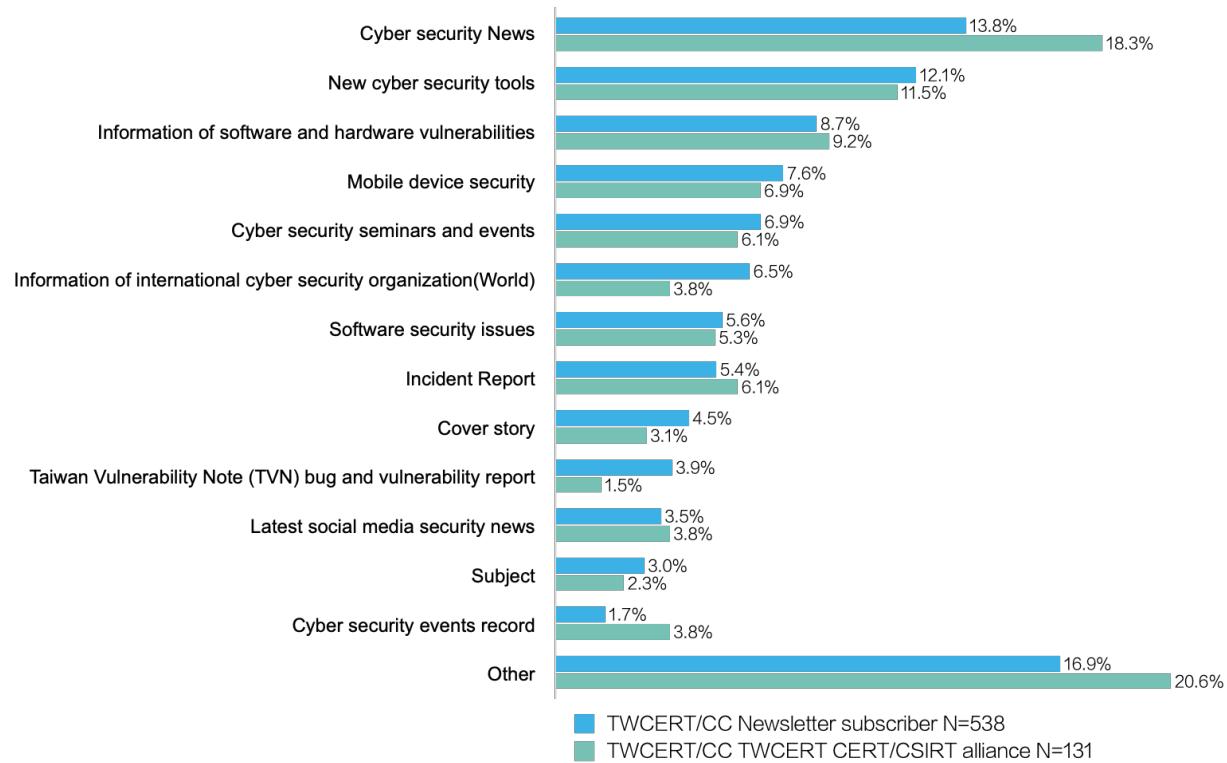
The main content format preferred by e-newsletter subscribers and member of alliance is "articles and discussions" (web pages and documents with text content as the main content, supplemented by pictures), with 88.5% and 95.2%, followed by about 50% preference for "videos" (YouTube, Vimeo).



Regardless of newsletter subscribers or the alliance members, the most frequently read topic In the TWCERT/CC newsletter are "cyber security news", but the proportion of Alliance members (85.5%) is significantly higher than the newsletter subscribers (71.9%), followed by "information of software and hardware vulnerability" have nearly 50% of the choice, the newsletter subscribers relatively more preferential "new cyber security tools", alliance members are "software security issues".



In the TWCERT/CC newsletter, the top three topics that can be improved are in the same order, which are "cyber security news", "new cyber security tools", and "information of software and hardware vulnerabilities".



Source: Online Survey (2022)

## IX. Expectations and Recommendations

Most of the e-newsletter subscribers and members of the alliance still hope that TWCERT/CC can provide more information sharing on cyber security cases, education and training, and even actual combat exercises so that they can better understand cyber security attacks and the results affected. At the same time, some members hope that Online courses can be held more frequently. The second is that everyone attaches great importance to information exchange and update speed, notification mechanism, etc. of cyber security. It is their expectation to increase the number of LINE official accounts so that officials can promote activities or publicize cyber security information. In addition, some members are worried about the cyber security dilemma faced by small and medium-sized enterprises, and hope that TWCERT/CC can provide more service assistance. In the end, we also hope that the information content provided by TWCERT/CC will become more and more diverse.

Expected content in the future	newsletter subscribers	alliance member
none	242	77
Increase cyber security case information sharing, education and training	24	5
positive encouragement	14	3
service items	12	6
Communication Channel/Notification Mechanism	7	3
Publicity Exposure Promotion/Industry Cooperation	5	3
Services for SMEs	3	2
More information and content	6	0
other	10	3

# Chapter VIII. Taiwan CERT/CSIRT Alliance

The stakeholder survey involved interviews with two members of the Taiwan CERT/CSIRT Alliance.

## I. The Alliance Strives To Grasp The Latest International Trends In Cyber Security

This year, stakeholders rated the services provided by the TWCERT/CC positively. They indicated that it provided efficient and instant messaging notifications. In addition, for communication and coordination operations involving cyber security affairs, the TWCERT/CC fulfilled its role in collecting and organizing the demands of multiple parties. Its assistance contributed substantially to the establishment of the High-Tech Cyber Security Alliance, and it provided considerable assistance in the planning of an overall direction. Furthermore, the stakeholders clearly highlighted the challenges faced by private enterprises. At present, cyber security monitoring platforms are scattered, and the cost of purchasing monitoring information is high. Consequently, individual enterprises cannot obtain comprehensive domestic and foreign information. The stakeholders suggested that existing cyber security alliances may be merged in the future. Through unified procurement and cost sharing among alliance members, the completeness of the domestic and foreign cyber security information network can be increased, and members can build trust among themselves and help each other.

*/ The immediacy with which information is provided is quite good. Alerts are in real-time, and I think the accuracy rate is okay. However, this type of [system] cannot avoid erroneous detection. I think the accuracy rate is relatively high when considering the error rate.*

*/ I'm really grateful to the platform provided by the advanced technology cyber security alliance. In the industry, when trying to establish such alliances, we have to find a fair third-party or entity that does not have a conflict of interest. We need the assistance of such an entity... We're thankful that the NIC assisted us in establishing the Alliance and providing much help during the establishment process.*

*/ It is similar to security ratings. I know that some security solution providers offer assistance to the government. Service providers who are commissioned to maintain security centers do not have sufficient information... they must combine threat intelligence provided by third parties. Such intelligence also contains information collected from the darknet. For example, if some information owned by specific or nonspecific governmental agencies is leaked, such as membership information leaked to the darknet, security solution providers must be capable of accessing the darknet and detecting the leaked information in advance of malfeasant use. They can also retrieve the information and inform us about the leak.*

## II. Willingness To Pay For Services

The stakeholders mentioned that various industries are currently facing a cyber security talent shortage. If the TWCERT/CC, which is experienced in policy promotion and technology education, can plan and organize training courses that are designed for a diverse range of professionals and cover diverse topics and content, then the number of people who sign up and pay for such courses would increase. This measure can help address the talent gap. For example, top-level managers can be provided with conceptual and directional guidance to help them to make top-down decisions within their enterprises. For middle-level managers, management training can be provided. Subsequently, technical content can be explored. The stakeholders hoped that enterprises can be provided with top-down cyber security training.

*/ The demand for cyber security services has skyrocketed in the past year or so. All industries need this type of talent, but the market cannot meet the demand. Therefore, many companies instead try to find suitable candidates from current employees and transfer them. Such employees might come from the auditing or QS department. They might have some interdisciplinary knowledge but still require relevant training. In the case of corporate governance, the NIC might need to communicate with executive members, who might not be familiar with cyber security. If such members have a basic understanding of cyber security concepts, it would be very helpful to the promotion of relevant measures in the organization. Regarding managerial members, I know they have been planning [cyber security measures]. If they can provide training in the areas of security literacy, technology, and management, the entire company can better aim for cyber security goals. Regarding the technical part you are working on now, some personnel might be transferred from the cyber management unit, and they will be familiar with some techniques. After they further develop their cyber security expertise, they will perform better when conducting routine maintenance. I think company units at all levels have such security needs.*

## III. Common And Clearly Defined Goals Increase The Willingness Of Companies To Report Cyber Security Problems

This interview also explored the experiences of interviewees with cyber security reporting to understand their views on such reporting. For both the interviewees who had reporting experiences and those who did not, a major factor that affected their willingness to report was the lack of clarity regarding the type of assistance received after reporting is made. Furthermore, for enterprises, the threshold for externally reporting internal cyber security incidents is affected by concerns regarding the related consequences. For example, they were concerned that they would be held responsible after the content of an event is leaked and reported, and they were unclear about the types of assistance that they could receive after reporting. So during efforts to promote



reporting services, the TWCERT/CC should not only explain the reporting process in detail but also the purpose of making cyber security reporting are suggested. By promoting the purpose of cyber security reporting, it can establish a shared goal with the stakeholders.

- / *The [Alliance] requires more advertisement. The organization we are joining now can be considered an Alliance. I feel that more advertisements can be made to explain the methods and procedures adopted by the Alliance. People would be interested in knowing how the Alliance can help them.*
- / *Currently, most problems are within a reasonable scope. For example, small-scale virus infections are dealt with directly, and no [reporting] is needed. We only initiate the reporting mechanism when a problem affects our operations… I have never reported a problem, so I am not really familiar with it. Generally speaking, a contact email exists for reporting problems.*

#### IV. Cyber Security Information Is Integrated To Perfect The Feedback System

Although the stakeholders were satisfied with the current instant message notification system, when information is released through multiple channels simultaneously, several problems may emerge (e.g. repeated information, incoherent and fragmented inheritance information, and the failure to provide updated and supplemented information). Through the use of TW-ISAC-type websites, information can be organized to facilitate subsequent information maintenance and API serialization.

- / *Because information is provided haphazardly, I suggest some sort of daily or weekly reports be created to compile relevant information. Intelligence does not need to be sent via email because that would require encryption and consumes more time when we try to open or manage the email. Intelligence can be posted on a website for us to directly access. Moreover, some information may be updated and differ slightly from the previous version, but such differences are generally not highlighted. I have to spend more time reading such information, which can cause confusion.*
- / *When new intelligence is uploaded, they still send an email to notify us. This is okay, but the integration of intelligence by companies should be improved to allow easier access. We hope that an API can be provided for us to link relevant information. This would allow us to handle intelligence at our own pace.*
- / *Currently, we communicate directly with the contact provided by TWCERT, and emails are the fastest communication method. However, if they want to properly manage the TW-ISAC platform, they should allow us to directly send feedback and share intelligence on the platform. This way would be okay for us too.*

Stakeholders expressed hope that in the future, operations such as the submission of CVE number applications, reporting of phishing webpages, and confirmation of threat sources can involve less manual communication via emails. Instead, a platform system could be constructed to send notification and confirmation.

*/ I hope that the efficiency of CVE number approval can be improved and that they can implement some sort of a system… As I have mentioned, most communication is via emails. When reporting a suspicious event, the process is mostly one-directional, meaning that we report a phishing webpage to the platform and then receive a notification reminding us that the platform has received the report. However, we know nothing about the subsequent treatment of the webpage or which teams have been notified of this problem. It's like our report has fallen on deaf ears. For instance, the platform told me that a website is risky, but blocking this website would cause some inconvenience for our work. I tried to reconfirm the situation [with the platform], but did not receive an immediate reply, and we were initially afraid of opening the website. In the end, we still had to open the website before receiving reconfirmation from the platform*

# Chapter IX. International Organization Stakeholders

## I. Current Organization Status and Partnership

The stakeholders of international organizations have praised the TWNIC for its ability to maintain its interorganizational and interpersonal communication and collaboration throughout the COVID-19 pandemic. Stable and real-time information exchange, along with effective maintenance of close partnerships, makes the TWNIC a trusted partner. Furthermore, in addition to monitoring internet governance in Taiwan, the TWNIC actively participates in regional network governance and forms favorable relations with the government, civil societies, and internet governance communities. The TWNIC exemplifies the successful management of the goals of multiple stakeholders among regional network organizations.

- / *Usually, like they have really good response on any time. Really, like being quick and also reliable. So we have a lot of trust.*
- / *They've always been a pleasure to work with and have had really, really productive and collegial relations between the organizations and between the counterpart, staff, and so on.*
- / *TWNIC is definitely a leader from our point of view, and really, really representing a channeling between the regional community and the local TW community.*
- / *TWNIC is a very good example of a body that works within a multi stakeholders within these multi stakeholder processes, so I think they've had very good relationships with the government, with civil society with the governance community.*
- / *And thanks to the fact that I know some people in TWCERT in person even before the pandemic… And that really makes our collaboration, like, survive as well. And knowing that I know those people and I can talk to them, or they can talk to us anytime we need. So yeah, that kind of connection is still in place. And I'm really happy about.*

Stakeholders have expressed that the collaboration quality has increased and collaboration fields have broadened when the TWNIC is involved in event management and technical support. The TWNIC has actively assisted in technical promotion, training, and technical service development. Moreover, TWNIC members have long been active in providing consultation and support to international organizations. These activities demonstrate the consistent diligence and leadership of the TWNIC as well as its role in facilitating communication between local communities in Taiwan and the Asia-Pacific region.

- / *I really do appreciate TWNIC of the work in the Internet governance sphere more broadly. So they have been involved with the TW Internet Governance Forum.*
- / *They're in a at a sort of a disadvantage in this in the sense that in the global Internet Governance Forum is a UN structure. and Taiwan doesn't have a standing there. So I think they, TWNIC is sort of compensating very well by assisting international activities.*

## II. Recommendation on Key Development Fields

In regards to collaboration, since last year, stakeholders from international organizations have been suggesting that the TWNIC continue constructing a multi-stakeholder network governance model and enhancing cyber security in network environments. The TWNIC is encouraged to continue sharing resources and information from Taiwan with the international community, reinforcing fundamental collaborative relations with internet governance organizations, investing in registration business stability, and promoting the development of technology and education and training support. During the COVID-19 pandemic, the TWNIC held hybrid online and offline events and forums, inviting international speakers to expand the scope of topics and increase Taiwan's international visibility. Organization leaders have also actively participated in and contributed to a wide international community, drawing international attention from local, small-scale concerns to broad regional topics and further strengthening the collaboration between regional network governance organizations.

*/ There's still a lot of collaboration to be done amongst the NIR. And so I mean, collaboration is two directional, I'm sure that, you know, even as a leader, we've all got something we can learn by collaborating with others. So I think the intersection between TWNIC and other NIRs is important, I'd encourage that.*

*/ I think TWNIC ranks first within our whole region. As you know, we really have many touch points, many common areas of relationship .....So as long as we continue down where we agreed, I think we are in a good place.*

The stakeholders also indicated that interorganizational collaboration has become increasingly stable over time, but this collaboration is limited by cost constraints. Sustainable resource management is a key short-term and medium-term factor for maintaining the quality of interorganizational collaborations. The stakeholders recommended comprehensively exploring the reasons why promoting internationalized domain names is such a challenge, encouraging more national internet registries to join the trusted notifier framework, and coordinating the promotion of cyber security measures, including those related to vulnerability disclosure, cyber hygiene, and cyber human rights. The stakeholders also provided their respective priorities for business development as a reference.

*/ Because as I say, the demands are increasing. So in order to carry this set of activities sustainably, we really need to be sure we've got a sustainable resource basis, which is a collaboration also between both organizations ..... That's sort of something of a challenge for the future that we need to work together ..... Across the whole NIR, and membership base as well.*

*/ Like what's exactly the problem behind people not wanting to register . Taiwan. And if we could look at whether there's any common threads within the region, then we can think of a strategy to address the common threads within the region itself.*

- 
- / TWNIC talks about this partnership they have with dot Asia, they launched a partnership called the trust notifier framework. Basically, they just met each other trusted notifiers to help with like, if they identify a particular website that is doing phishing.....So the issue now is, within the region, these are the only two organizations that's supporting one another.
  - / So yes, cyber norm has quite get a lot of attention. and probably another aspect will be online human rights.

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

The stakeholders affirmed that the TWNIC's strong performance in its exchange with local communities, governments, and international communities. From the perspective of international organizations, the stakeholders reminded the TWNIC to focus on core business objectives and to effectively allocate resources to meet the needs of multiple stakeholders. The TWNIC must also pay attention to the overall allocation of its task resources to ensure that organizations do not expand the scope of their tasks unrestrainedly, which could lead to increased multi-stakeholder demands and a subsequent imbalance between organizational goals and resource management. Thus, sustainable management must be achieved to ensure consistent organizational mission fulfillment and steady growth.

Language ability plays a key role in future organizational development. The stakeholders encouraged the TWNIC and the TWCERT to use their language advantages to increase opportunities for international exchange, thereby presenting their contributions to network governance on the international stage.

- / The next should be, for all the reasons I've said all of the growth in challenges in our core mission, the gradual growth in our sort of broader activities, and the increasing pressure from cybersecurity attacks, and threats and the sort of guarantees we need to make, we need to continually do our job better. We need to continue to reinforce, to make sure that it has the support of its community with the resources that it needs to do the work that is increasing amount of work, but it's doing so well.
- / There's one other point that I'd like to discuss there's something in TWNIC to some advantage and that's some English language capacities. I think Taiwan is very, very strong. One of the stronger economies in the East Asia region in terms of being very fluent and able to work in English .....That's a huge opportunity for Taiwan as well.
- / Encourage TWCERT/CC to probably actively participate in international discussions, international conferences and speak about themselves and share their insights and knowledge to different parts of the world.

# Chapter X. Government Agencies

In response to the establishment of the Ministry of Digital Affairs (MODA) and the effect of competent authority organizational adjustments, we invited two stakeholders from governmental units involved in the relevant operations to participate in this interview. One interviewee was from the Department of Resource Management of the Administration for Cyber Security, MODA, and the other was the contact person for the Information and Communications Security Office, National Security Council. Because of the time limit imposed with respect to interview dates, the interview results were amended in an appendix to maintain the completeness of the investigation as a reference. In addition, because of the attributes and content of the operations of the stakeholders and the need to avoid disclosing the work content of the stakeholders, the interview content was summarized, and various key information and key words were concealed depending on their level of confidentiality.

## I. Integrating Cyber Security Information In Real Time And Dedicating A Website Page To Hybrid Offices

During their interviews, the interviewees (stakeholders) acknowledged efforts of the Taiwan Computer Emergency Response Team/Coordination Center (TWCERT/CC) in establishing a distance working area on its website and to overcome the challenges of the pandemic. Because of the widespread adoption of work-from-home arrangements in the previous two years, numerous businesses were exposed to cyber security risks associated with the use of individual mobile devices or cloud service applications. The TWCERT/CC plays a pivotal role in cyber security reporting in Taiwan; thus, it must help businesses and the general public by monitoring cyber security incidents and providing crucial information on its website in a timely manner. Its efforts in preventing cyber security incidents and conveying authentic information have generated tangible results.

*/ I know that TWCERT/CC has launched a new page on their website for remote work in cyber security. Due to the Covid-19 pandemic, many people are now working from home or even working remotely using their phones or tablets, which involves multiple cloud and VPN services. These changes in how we work on and connect to the Internet have all become possible targets of cyberattacks for hackers, thereby posing a challenge to authorities, companies, and individuals alike.*

*/ We have some needs regarding remote work. I think it's a good thing that TWCERT/CC launched a dedicated page on their website... Maybe we will put more effort into promoting remote work. We hope that TWCERT/CC can help create an overview of the market dynamics for us.*

- 
- / We're focusing more on providing remote and commonly-used cloud services, including VPNs [for more secure Internet connections]. I think the pandemic has changed how we work and how we connect to the Internet. How should we present this message to our clients and how should we implement these services? Additionally, what services should we provide to individual users? We should give that some thought.
  - / In particular, we're currently focusing on cell phones. For example, whenever we're not at the office, we rely on our cell phones to do our job. Cell phones are just like a microcomputer, but people often overlook [the importance of] cyber security for their phones. Very few people have installed antivirus applications on their phones... This field of cyber security warrants extra attention.
  - / TWCERT/CC has strived to promote what it has developed and to increase public awareness of cyber security.

## II. Integrating Resources To Establish An Authoritative Technical Support Platform

The stakeholders rated the services Virus Check, and suggested that such services be expanded. These services not only meet the needs of governmental units with respect to the file distribution but also alleviate the concerns of general businesses. They can become a major highlight. However, the stakeholders also identified a problem, that is, these services are currently underbudgeted such that the timeliness and accuracy of detection are unfavorable. The stakeholder expected these services to be expanded and enhanced such that they become a service highlight of the TWCERT/CC.

- / We've witnessed a lot of ransomware attacks recently. TWCERT/CC has also launched a dedicated page on their [website] for ransomware attacks. I think that is a good thing.
- / TWCERT/CC offers this service called Virus Check... Users can upload software or files on it [to check for malware]. However, I think they should work more on this service, such as increasing the depth and breadth of the malware checks and encouraging more people to use the service. We have also been encouraging government agencies to use this service and upload their files on the platform for checks. I hope that TWCERT/CC can encourage more people to use the service and further expand on the capacity of the platform. Cyber security is a good sector [to focus on]. The platform is particularly useful for scanning malicious software or files that are not suitable for uploading to external platforms.
- / The Virus Check service needs improvements, such as the speed and accuracy of checks, to improve service quality and encourage more people to use it... This also helps TWCERT/CC develop a service of its own... There will always be files that we do not want to send to external platforms, so TWCERT/CC should address that, especially for government files.

### III. Enhancing The Cyber Security System For The Public And Private Sectors With A Cyber Security Alliance At The Core

The stakeholders noted that the number of members in the alliance CERT/CSIRT, which is promoted by the TWCERT/CC, increased rapidly to more than 600, and they expected the TWCERT to continue promoting active interactions among the organizations in the alliance and building mutual trust among members. After horizontal joint defense mechanisms were established, the response speed to cyber security incidents can be accelerated by gradually converting a one-way vertical information communication network into a real-time cyber security and information network that is linked through horizontal communications. Moreover, TWCERT/CC maintains close interactions with civil organizations and sufficiently understands the trends pertaining to cyber security threats; thus, the TWNIC provides timely risk-related reminders and promotes cyber security protection measures. When civil organizations actively report cyber security incidents to TWCERT/CC, the TWNIC can integrate and control useful information to exert its influence.

- / *TECERT/CC has launched an alliance in Taiwan called the CERT/CSIRT Alliance. The Alliance has worked quite well so far and has attracted more than 600 members…People are keen to join the Alliance.*
- / *In terms of collaboration and exchanges in the Alliance, information is mainly shared by TWCERT/CC. We hope that in the future, the Alliance or individual members of the Alliance could share information among themselves. This is a potential direction for improvement. It’s important to consider about how this [information exchange] mechanism can be further improved. If the Alliance works out well, it can allow different industries to share cyber security information in real time. This would be conducive for the joint protection against cyberattacks.*

### IV. Raise Brand Awareness, Fulfill Organizational Values, And Build Trust In Society

The stakeholders also suggested integrating brand management thinking into organizational marketing to increase the popularity of the TWERC/CC and strengthen its social image with respect to its organizational scope of operations and core values. Consequently, social trust in the TWNIC can be established to facilitate the effective implementation of existing operations and promotion of policy implementation by governmental agencies. The results reflect the statuses of the TWNIC and TWCERT/CC as not only trustworthy collaborative partners of administrative organizations but also fundamental channels that enable international exchanges and civil communication.

- / *For example, I think the TWCERT/CC (Taiwan Computer Emergency Response Team - Coordination Center) may have to start working on its branding. For cyber security*



*[services], it's important to build mutual trust [with clients]. How can TWCERT/CC make itself known to more people and build a healthy interaction with the private sector? I think it should start by building its trustworthiness and reputation.*

*/ Let me put it like this: I hope that CERT/CC can be the first thing that comes to mind for Taiwanese people whenever they talk about cyber security. By creating a brand image as the authority for cyber security matters, people or organizations will know who to turn to when they encounter problems in the promotion of cyber security education or new technologies such as 5G and AI. However, this will require mid-to-long-term effort rather than short-term effort.*

*/ I hope that by maintaining good rapport with the private sector in this area of work, we can obtain their assistance and acquire more information that we can share [with our partners]. I also hope that TWCERT/CC can act as a middleman [between us and our clients]. We had this experience where TSMC and our other clients experienced major incidents [of cyberattacks] but refused to let us help. TWCERT/CC's neutral role and its status as a foundation may make people less defensive toward it. Additionally, I hope that TWCERT/CC can collect some information from the private sector for us.*

*/ First of all, TWCERT/CC should act as Taiwan's point of contact for international communication. Second, its services should target mainly the private sector, including private businesses and individuals. A main challenge for it is how it can make people, including the general public and private businesses, trust it, share information on their experiences of cyber security incidents, and turn to it for help when encountering such incidents.*

*/ I hope that, first, TWCERT/CC can have a comprehensive perspective on cyber security threats so that it can help the private sector in responding to cyber security incidents. It should build mutual trust with people because the problem today is that it does not have a legal basis [for its actions]. But, by continuously improving its services and fostering strong mutual trust with people, people may start reporting [cyber security incidents] to it. Consequently, it will get a better overview [of cyber security threats and challenges]. So, although it may be difficult, I hope it can work on that.*

## V. Improve Overall Awareness Of National Cyber Security Status

Malicious cyber attacks have affected Internet users worldwide, and the entire network environment of Taiwan is also facing various challenges. The TWNIC and TWCERT/CC not only promote the progress of local and international information exchanges but also shoulder the responsibility of promoting cyber security to the people in Taiwan. The stakeholders believed that the TWNIC will achieve specific goals pertaining to information sharing, responsive coordination, and international exchanges. In addition, the TWNIC will adopt the “preventive measures” perspective to increase the public awareness of crises. Through continual interactions with the general public and active dialogue and communication, the TWNIC will educate the public on



cyber security protection concepts, and the public can then collaborate with governmental organizations to implement cyber security and protect the network environment in Taiwan.

- / *The US CISA launched a column titled Shields Up before the Russia – Ukraine war began. It goes beyond the guidelines and further into topics such as possible DDoS attacks. In Taiwan, we may simplify the discussion by highlighting common DDoS attacks and what the common targets of these attacks are. There is some open information available [on these topics]. Regarding education*
- / *I hope TWCERT/CC can diversify the topics it offers information on, and personally, I hope there will be some in-depth discussions. I am also hoping that maybe CERT/CC can work with the Administration for Cyber Security or government agencies on related matters, for example: early responses that people or businesses could take before crises occur.*

## VI. Identify Potential Risks In Technological Development To Mitigate Cyber Security Concerns

The stakeholders believed that with the advancements in Internet and information technologies (e.g., mobile cloud services and Internet of Things technologies), the TWNIC can achieve the effective evaluation and control of cyber security risks associated with digital technology applications and development. The TWNIC will monitor cyber security protection trends involving key technologies that are attracting international attention. It will also clarify the potential cyber security risks of emerging technologies and serve as a foundation for Taiwan’s transformation into a smart nation.

- / *New information or technological developments, be it mobile cloud services, 5G, or AI and big data—today’s hot topics—face numerous cyber security risks. Nowadays, many people are talking about the cyber security risks of the IoT, but I think maybe TWCERT/CC can provide a clearer picture of the trend in cyber security threats and the risks they pose and then provide timely reminders to people regarding what they should be extra attentive to and the kind of cyber security measures they need to adopt. It may also collect cases of cyberattacks around the world to share with everyone.*
- / *A lot of people are shifting to cloud services and cloud storage, which also involve a certain level of cyber security risk. I think that there are many things that we can attend to and work on to reduce the risk. One such new trend in cyberattack prevention is zero trust architecture. Although TWCERT/CC is quite understaffed, I hope that it can pay more attention to this emerging technology.*

## Chapter XI. Recommendations

### I. Enhancing The Speed Of New Knowledge Integration And Strengthening Talent Supplementation Are The Key Factors For TWNIC's Success

Stakeholders' satisfaction with TWNIC's performance in the past year is attributed to its active response to stakeholders' needs, influential integration between Taiwan and the international community, strong technical assistance, advanced deployment of cyber security issues, and its promotion of real-time communication about cyber security. All of the above show that TWNIC and TWCERT/CC not only do their best in their core business, but they also hold insights into trends and meet the needs of multiple stakeholders.

### II. Perfecting The Service Application Ecosystem Remains The Primary Expectation For The Future Trend Of The Domain Name Industry

Suggestions include planning innovative marketing programs, providing service values, and strengthening the connection with users. While enhancing the recognition of ".tw/.台灣" in the international domain name market, it is also crucial to streamline the process for the services offered in order to work toward more convenient services.

### III. Promotion Of A Collaborative Community That Coheres Trust For Cyber Security Has Started Smoothly

The overall cyber security protection not only relies on the promotion of policies and regulations, but it also needs to be combined with the practical experience of the industry to grasp the development and risks of digital communication transmission. Taiwan CERT and CSIRT alliance has successfully demonstrated the establishment of real-time and effective information transmission channels, which will help deepen the sense of trust gradually to open up the community interaction habit of multi-directional communication and active participation, as well as to gather energy for joint defense on cyber security across different units.