ISAO 200-1

Foundational Services and Capabilities

Draft Document—Request for Comment

ISAO SO—2018 v0.2

ISAO Standards Organization

March 14, 2018

Acknowledgments

This publication was developed by the Information Sharing and Analysis Organization Standards Organization (ISAO SO) with representatives from the private, professional, and government communities in an ongoing effort to produce a unified voluntary set of guidelines for information sharing. The ISAO SO and the Working Group leadership are listed below.

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The ISAO SO leadership and authors of this document also would like to acknowledge those individuals who contributed significantly to the development of this publication, including the following:

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Special thanks from the authors go to the ISAO SO advisors and staff who provided amazing support and guidance in the development of this document: Josef Klein, James Navarro, Allen Shreffler, and Jeremy West.

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Revision Updates

Item	Version	Description	Date
1	0.1	Initial draft publication	
2	0.2	Revised and released for second request for comment period	

1 Executive Summary

Building a new Information Sharing and Analysis Organization (ISAO) can be very challenging. There are multiple complexities to overcome before the ISAO can become operational. Many of these issues were addressed in ISAO 100-2, "Guidelines for Establishing an Information Sharing and Analysis Organization," which was published October 14, 2016. ISAO 100-2 introduced an initial set of guidelines for establishing an ISAO, with the purpose of providing guidance to those looking to establish an ISAO or to those newly formed ISAOs. The 100-2 document introduced a list of several services and capabilities, which were categorized into "Foundational," "Advanced," and "Unique." The Capabilities and Services Working Group (WG2) felt that it would be beneficial to go into more detail about those services and capabilities outlined in Appendix A of ISAO 100-2. The outcome of this document is to assist the ISAOs so they can provide immediate value to their membership.

2 Introduction

Appendix A of the ISAO 100-2 publication introduced a list of several services and capabilities that an ISAO could perform as baseline offerings. Those services and capabilities were categorized into Foundational, Advanced, and Unique. The purpose of this document is to assist ISAOs by providing a more in-depth review of the foundational services and capabilities of an ISAO: collection and dissemination, facilitate member sharing, analyze information, and surveying members. This in turn will give ISAOs a better understanding of how they can operationalize the technical, analytical, and personnel that are built around those capabilities and services. The structure of this document is framed to begin with the simpler capabilities and services, and progress to those that are more challenging. This will facilitate a natural progression for ISAOs that are further along in their evolution to navigate to the area within the document that is appropriate for their current situation. Additionally, collection and dissemination have been split as separate services and capabilities, and thus each will have its own chapter. After evaluating the processes and technologies for collection and dissemination, WG2 felt that each was distinct enough to be independent services and capabilities.

3 Member Surveys

3.1 Introduction

Surveying members is a highly effective way of obtaining an understanding of the member's needs and evaluating how you are meeting those needs. A survey is defined as "the selection of a relatively large sample of people from a predetermined population (the "population of interest"; this is the wider group of people in whom the researcher is interested in a particular study), followed by the collection of a relatively small amount of data from those individuals (Kelley, Clark, Brown, & Sitzia, 2003)." Surveys are conducted as a part of descriptive research. They enable organizations to get feedback about specific products or programs, as well as more

general input into an organization's mission or objectives. Surveys can be used in determining how the other four foundational capabilities and services are designed and implemented. There are several ways to survey members. These surveys can be either formal or informal. Conducting a survey can be as simple as talking with your members to see what is working or not. Organizations are free to choose what is most appropriate for them, or to develop their own method of surveying members. However, there are a few considerations to keep in mind when choosing to conduct a survey.

First, know what you are trying to accomplish with the survey. There should be a clear vision to what the purpose of the survey. This is done by clearly defining what information or knowledge you are trying to gain from your members? The questions should be specifically designed to pull that information from the respondents. It is also important to understand what discussions will be made from the results. A word of caution, the design and wording of the questions can skew the results of the survey.

Second, identify who the target audience will be. You will not get useful input if you ask physical security specialists questions on advanced cyber-security issues. Likewise, polling executives only will likely end up with different results than polling the membership at large. Knowing who the right community is, for the specific topics you want input on, will yield the most useful and valuable results.

Third, when developing the survey, you should have a good understanding of the overarching questions you are trying to answer. The specific survey questions will need to be designed to ensure that you are collecting the right data. The way the questions are worded, ordered, structured, and sequenced can have a major impact on how they are answered.

Finally, it is important to understand the best method of reaching the target audience. There are a few different types of surveying methods, including phone conversations, online surveys, and face to face. You want to use the method that will get you the best results based on the preference of the ISAO membership base. Additional details about the different survey methods will be discussed in a later section. If these few things are not kept in mind when designing the survey, the results could be skewed or end up providing little value.

3.1.1 Advantages

There are several advantages for why an ISAO would conduct a survey of its membership:

1. It can be developed in a short amount of time.
2. It produces data based on real-world observations (Kelley et al.).
3. It can produce data that reflect the larger population (Kelley et al.).
4. It can produce large amounts of data in a shorter time span (Kelley et al.).
5. It provides a mechanism for the membership to gain buy-in to the ISAO.
6. It provides a mechanism for the membership to provide meaningful input.

3.1.2 Disadvantages

There are several disadvantages of conducting a survey:

1. It can be time-consuming.
2. Response rates can affect the significance of the data.
3. The significance of the data can be negatively affected if the questions are too focused on the range of coverage (Kelley et al.).
4. The data may lack detail or depth on the topic being investigated (Kelley, Clark, Brown, & Sitzia, 2003).
5. Survey participation is a challenge.

3.2 Survey Methods

Depending on what best meets the needs of the ISAO's members will determine which method will best work at capturing the relevant data. For those new and emerging ISAOs this process can be very simple and still provide very valuable information. There are several types of survey methods that can be designed. The following section discusses several of those methods. During the process of selecting a specific method, there are other factors to take into account. As mentioned above, several elements in the survey design will have a direct effect on the survey's outcome. Regardless if the survey is formal or informal, there are three principles to keep in mind when designing a survey: Principle of Wording, Principle of Measurement, and General Appearance (Sekaran & Bougie, 2009). One important advantage of implementing these principles is that bias is minimized. Once the method and design of the survey are complete and the development of the specific questions has started, there are 11 elements to take into account (Sekaran & Bougie, 2009):

- Language and wording of the question
- Open-ended questions vs. closed-ended questions
- Positively and negatively worded questions
- Double-barreled questions
- Ambiguous questions
- Recall-dependent questions
- Leading questions
- Loaded questions
- Social desirability
- Length of the questions
- Sequencing of the questions

Note: In addition to the advantages and disadvantages listed above, each survey method may have its own unique or additional advantages or disadvantages.

3.2.1 Postal Questionnaires

In general, the questionnaire method is best used when there is a specific question to be answered and when there is a known measure of the variables of interest (Sekaran & Bougie, 2009). There are a couple of different means to deliver questionnaires, mail or web based. A disadvantage of this method is the low response rates, which in turn requires a larger sample size. An advantage of postal questionnaires is that they are usually more cost-effective and less time consuming (for both the researcher and the respondent), anonymity is high, and it's a very efficient means to collect data. With this method, a 30 percent response rate is considered a satisfactory rate (Sekaran & Bougie, 2009), and the design of the questionnaire is extremely important.

3.2.2 Web Based/Electronic

The most obvious way to survey members is to create an actual survey using a survey website. Under this method, an organization identifies a specific set of questions it wants its members or partners to answer, and it places those questions into an online survey functionality. The advantage of this method is that the organization can send the survey to specific people electronically or to a large group of people, the surveys are very inexpensive and easy to administer, there is fast delivery, and all the responses are captured in one place for review and analysis (Sekaran & Bougie, 2009). One of the biggest advantages to web-based surveys is there often is the ability for members to participate in online survey without attribution, so they may be more likely to be willing to provide honest input. Disadvantages include requiring Internet connectivity, respondents must be willing to take the survey, and requiring a large sample population (Sekaran & Bougie, 2009). Examples of web-based survey tools include Survey Monkey, SurveyGizmo, Google Forms, Typeform, SurveyLegend, and Polldaddy (*note*: these are not recommendations of these products).

3.2.3 Telephone Interviews

Another way to survey members is through individual one-on-one phone calls. This is the most time-consuming method but also has the potential to provide the most useful feedback. It is important to ask all members the same questions during the survey, but one-on-one conversations can enable an organization to engage in specific topics in more detail. This detailed information can provide additional useful context and ideas and can lead to a clearer understanding of a member's needs. The individual contact is also an excellent way to build relationships with members. Telephone interviews can be conducted through computer-assisted telephone interviews (CATI), which are easy to use and manage (Sekaran & Bougie, 2009). Another advantage of using CATI is that the interviews gather more accurate data and provide faster analysis. Some disadvantages are that non-verbal cues cannot be read and that the interviews have to be kept short (Sekaran & Bougie, 2009).

3.2.4 Online Webinar

A third method of surveying members is through a common webinar or group call. Under this method, members are invited to attend a single call or webinar with other members to respond to your survey questions. A survey could also be included at the end of each webinar. This has the advantage of saving time, there are no individual phone calls, but it can be less effective in gaining feedback as members might be reluctant to speak honestly with others on the call. Similarly, one company or person who provides constant feedback on the call might dominate the discussion and skew the input. However, having multiple members discuss the survey on a common call can also lead to an effective "brain storming" session where individual ideas are explored in more detail among the group.

3.2.5 Face-to-Face Interviews

This survey method involves the ISAO conducting face-to-face interviews. These interviews can be either structured or unstructured. For unstructured interviews, there is no planned sequence of questions. An example of an unstructured interview could include having coffee with a member. Structured interviews are when there is a known set of what data and information is needed and there is a predetermined set of questions (Sekaran & Bougie, 2009). Face-to-face interviews could involve the ISAO conducting the interview at the ISAO's office, its member's office, or other locations.

An advantage of this method is that the response rate is higher than other methods—due to the fact that the ISAO can sell the survey to the individual members (Kelley, Clark, Brown, & Sitzia, 2003). Before deciding to conduct a face-to-face interview, consider the advantages and disadvantages. The biggest advantage to face-to-face interviews is that the interviewer is able to pick up on nonverbal cues and body language. These cues could show whether or not the respondent understands the questions. Face-to-face interviews also allow the respondents to clarify any of the survey questions they do not understand (Sekaran & Bougie, 2009). There are a few disadvantages to face-to-face interviews: they are time consuming, there are geographic limitations, interviewer bias can affect how the response is interpreted, and there's the cost for interviewer training (Sekaran & Bougie, 2009).

(See Appendix A for an example survey.)

3.3 Chapter Summary

Surveys can be a powerful tool that will allow an ISAO to collect a large amount of data in a short amount of time. This information can be used to understand how their products and services are being received by their membership, can be used to determine future direction of the ISAO and give the membership an opportunity to be engaged with the ISAO. Each survey method has its own advantages and disadvantages. When first implementing this service, it can be a conversation with your members over a cup of coffee or it can be an email to a distribution list. When making that selection on which survey method to be utilized, it is important for the ISAO to take into account the challenges, limitations, expected outcomes and benefits of conducting that specific survey method. As noted, the above represents some ideas and methods

an ISAO can use to survey their members. Organizations are encouraged to adopt whatever methods work for them. As with most initiatives, there will be some trial and error involved as organizations learn how best to engage with their members.

4 Collection

4.1 Description

The goal of this chapter is to assist ISAOs in understanding the operational, technical, analytical, and personnel capabilities for the collection of cybersecurity threat information (CTI) or other information that is deemed important by the membership base (this could include physical threats, weather, etc.). Specifically speaking to CTI, as defined by National Institute of Standards and Technology (NIST) SP 800-150, "Guide to Cyber Threat Information Sharing," CTI includes "indicators of compromise, tactics, techniques, and procedures used by threat actors," as well as any information that an organization can use to "identify, assess, monitor and respond to cyber threats (Johnson, Badger, Waltermire, Snyder, & Skorupka, 2016)." Data and information can come from a variety of sources: sensors, by scrapping open-source reporting, from sites such as cybersecurity vendors, media articles, cybersecurity blogs, white papers, other ISAO or ISACs, government sources, reports, and directly from the ISAO's members. Collection of CTI or other data sets is an important service and/or capability that an ISAO can perform. According to NIST, organizations "should identify tools, sensors, and repositories that collect, produce, or store cyber threat information (Johnson, Badger, Waltermire, Snyder, & Skorupka, 2016).

4.2 Advantages

- There are a large number of closed and open sources to pull from.
- Collection from outside sources can enrich existing internal information to make it more actionable to the ISAO (Johnson, Badger, Waltermire, Snyder, & Skorupka, 2016).
- By providing centralized resources, the ISAO can reduce costs to its members.
- Collecting information from multiple sources, this service and capability can provide the ISAO with a better understanding of the threat landscape.
- Information that comes directly from members is often easier to trust and verify. Member sharing also encourages sharing and fosters an environment other member feel safe to share.

4.3 Challenges

- There are a large number of products and data sources to choose from.
- Vetting and trust of open-source feeds is an issue.
- There can be an extremely large volume of data to sort through.
- There is a high rate of false positives.
- Depending on the level of data desired, the format, and the frequency of dissemination, the process may require talent, time, process, and technology.

- Finding a format that is easy for members to use and determining what is relevant or desired by membership can also take time and understanding of the constituents.
- The technology, services, and methods can be expensive.

4.4 Sources and Methods

The number of different sources and methods for collecting data can be overwhelming for new ISAOs. The potential approach to solve this problem is to start small and only choose a few sources and methods first. Only after getting those set up and verifying that the information is providing the desired value, should you consider adding additional sources or methods. This section will cover ways to vet sources and list how to collect information.

4.4.1 Sources

Data sources or feeds can come from either internal or external sources. First, identify what information is important. Second, determine what information you are legally allowed to share as well as determine what information the membership wants to share and with whom. From there, identify which systems or sources contain that information. Collecting information from a variety of sources can quickly move to a more advanced level.

4.4.2 Formats

There are several types of "standardized" formats for sharing indicators of compromise. Appendix C references a list of formats. An ISAO may choose to ingest all, some, or none of these formats, depending on what works best for its membership.

4.4.3 How to Collect

There are several methods for collecting data. Depending on the capability level of the ISAO, some of these methods will be more advanced. The purpose for listing the methods here is for general awareness, although understanding these methods early in the planning stages may help with the strategic development of the ISAO. These methods include the following:

- Internal sources (electronic)
- Analysts (Internal or External)
- Emails
- Scripts
- Web spiders\Crawlers
- Multimedia capture and indexing
- OCR scanning
- Tools
- Automated technologies
- Other resources

4.4.4 Vetting and Validation of Sources

It is very important that members of the ISAO can trust the information, alerts, and notifications they receive. Bottom line: garbage in/garbage out. As mentioned previously, information exchange from the members can build trust between the ISAO and the members and from member to member. Vetting and validating the information is an important piece to that process. This requires that the methods, means, and sources be vetted by the ISAO. There could be considerable doubt placed on the information shared by the ISAO if the sources are questionable or if the data turns out to be unreliable. It is highly recommended that ISAOs evaluate and vet their sources of information, including their partner organizations. This section discusses ways to vet data sources and help ensure high integrity and fidelity of the information collected.

When it comes to vetting a data from a new source, there are several considerations: First, who is contributing to that source or who the particular source is? Second, which systems are contributing information? Third, what is the process or method that was used to develop that information? Who contributed to that source? Finally, what is the context of the data? At the basic level vetting and validating sources can be reaching out to a known group or individual and verifying with them.

1. One of the first ways to vet an open-sourced data feed is to ask other ISACs and ISAOs.
2. Connect to the data feed and conduct an audit of the feed. Check for false positives and false negatives.
3. Develop a process and standard procedure for sanitizing the information collected.
4. Conduct random audits and set periodic reviews of the data feed.
5. Develop a reputation or confidence score for the data feeds.
6. Develop a process for members to rate and comment on data feeds. These reviews can be used to determine the reputation and confidence scores.
7. When considering collecting information from another organization, it may be prudent to establish a data-sharing agreement, memorandum of understanding, or non-disclosure agreement.

4.5 Post-Collection Steps

Some organizations have proven guidance for the process of collecting data. One such organization is NIST. This guidance can be found in NIST Special Publication 800-150, which provides steps on how to consume and use indicators of compromise from external feeds. These steps are validation, decryption, decompression, content extraction, prioritization, and categorization. ITIL (Information Technology Infrastructure Library) has a similar process for incident management that could be used post collection: identification, logging or registration, prioritization, initial diagnosis, escalation, investigation and diagnosis, resolution and recover, and closure. These processes provide a workflow for how the ISAO could handle data in collection, analysis and dissemination.

4.6 Collection Tools and Resources

ISAOs have a considerable number of tools and resources available to them. Some of these tools are completely free to use, some require only a one-time payment, while others require a subscription (monthly or yearly). A list of tools and resources can be found in Appendix C; it is not an all-inclusive list and is not an official endorsement of the products. The list is to illustrate some of the tools and resources that are available for ISAOs to explore.

4.7 Chapter Summary

The process of collection, as mentioned previously, is a valuable service and capability that an ISAO performs. As a core competency, this service should be planned out and implemented carefully. For those new and or emerging ISAOs that are just starting out, it is important to choose one or two methods, tools, and sources to get a baseline prior to adding on more. Starting out with too many methods, tools, and sources can complicate the process and in turn reduce the level of service that the ISAO can provide to its membership. It is important to start small, concentrating on collecting information from a few known and trusted sources. However, those ISAOs that have the knowledge or expertise may be able to ingest or consume information for a large variety of sources. The ISAO may also choose to forgo storing this information and simply be a pass-through of information, enable sharing of best practices or other cyber related information.

5 Analyze Information

5.1 Introduction

Even at the most basic level, there are different ways to analyze cyber threat information. This process can come in the form of having a system, tool, or human conduct an analysis on data sets. At the most basic level, analysis can be as straightforward as determining that a piece of information should be shared with the ISAO membership. For those new and emerging ISAOs, the process of analysis does not have to be as advanced as determining the destructiveness of a piece of malware. This chapter of this document will not delve very deep in to this foundational service and capability. For additional information, please refer to the ISAO 700-1 "Introduction to Analysis" document. The purpose of the document is to introduce information analysis to ISAOs and provide members with a foundation for organizations attempting to understand information analysis as it pertains to ISAOs. The document will establish a conceptual framework for the analytical process including establishing requirements, collecting relevant data, processing and exploiting the data, analyzing results, and generating products to support internal and external sharing of the findings.

It is important to mention in this document a couple of important aspects about information analysis. First, this process can be time-consuming and can require a special skill set to be accomplished correctly. Second, through the analysis process, the ISAO can provide useful actionable information for members in the form of lessons learned, threat warnings, and trends analysis. An example of the analysis process providing actionable information can come in the form of the ISAO identifying a pattern of reconnaissance attempts of multiple member networks and as a result issuing a notice to all members, warning of a possible targeted campaign, and providing guidance on how to identify the threat. One of the highest values an ISAO can provide to its membership can be in its analytical processes.

5.2 Advantages

Participation in an ISAO organization allows members to pool both their data and their resources, increasing the amount of information available for the analysts to review, and it enables them to obtain a broader view of the threat environment. Generally, with more data feeds coming from the ISAO members, it can be easier to develop trends and correlations. Additionally, supplying relevant analysis makes information and situational awareness more efficient. The information gleaned from an affective analysis can add an extreme amount of value that the ISAO provides to its members.

5.3 Challenges

Members can face numerous difficulties when it comes to participation in an organizational analysis effort. From a manpower perspective, training or hiring competent analysts can be expensive, and increases in requirements and amounts of data will only increase the personnel

requirements. Individually, members may be unwilling or unable to provide some data sets to the organization due to concerns about compromising proprietary data or potentially revealing information that could be detrimental to the member organization.

5.4 Chapter Summary

If the ISAO is to provide this particular foundational service and capability, it is very important that it be done correctly. Effective analysis can provide the ISAO membership with timely and actionable intelligence. However, poor analytical skill and processes can be a major risk to the ISAO. For more details and a deeper look into the analysis process, please refer to ISAO 700-1, "Introduction to Analysis."

6 Dissemination of Information

6.1 Introduction

Dissemination is defined as “the act of spreading something, especially information, widely” (Oxford Dictionaries). Sharing information one of the ways and ISAO can create value among its members. It enables organizations to receive current news and communications that may have an impact on their business.

At the most basic level there are several ways to easy ways to disseminate information. To ensure information is both timely and relevant, it is highly suggested that the ISAO work with their members to establish those specific mechanisms for sharing information, identify the types of information to be shared, determine which information will be shared with whom and determine the frequency for which the information will be disseminated. The possible reasons for sharing information include eliciting immediate action, promoting behavior change, requesting support, and educating on a specific topic or situation. The follow sections provide additional details about the different information sharing considerations. As with the other services and capabilities, the specific means and methods chosen are determined by the needs of the ISAO membership.

6.2 Advantages

There are a few advantages of properly disseminating information:

- Alerts and advisories provide members with time-sensitive awareness of recent and active incidents, threats, and reported vulnerabilities.
- An improved understanding of the threat environment can help an organization with prioritizing its cyber-security resources.
- Specific topics can be shared that facilitate partnership building, increase knowledge of community members through training communication, or create an avenue for members to request assistance from others within their ISAO community.

6.3 Challenges

There are several challenges to overcome when disseminating information:

- Members may not see the value of time-sensitive products.
- Creating actionable products may require an operational background, which can be hard to attract, retain, or fund.
- An unfiltered flow of content could lead to information fatigue and overwhelm members, thereby reducing readership and value.
- Depending on the level of data desired, the format, and the frequency of dissemination, the process may require talent, time, process, and technology.

- Security and control must be maintained as the information is redistributed.
- The cost, level of effort, and resource needs for creation, management, and sustainment may be high, particularly to meet urgent deadlines.

6.4 Implementation Guidelines

6.4.1 Dissemination Methods

There are several types of information-sharing methods that ISAOs can use to distribute information to their membership without much technical setup:

- Telephone
- Email (broadcast or ListServ)
- Computer scripts
- In-person
- Website

Each method has its own specific advantages and disadvantages. ISAOs are not limited to only implementing one type of method. Having redundant methods is suggested, especially for the purpose of continuity of operations.

6.4.2 Dissemination Content

There are several types of content an ISAO could distribute to its membership. Good and meaningful distributed content provides the greatest value to the ISAO membership. The following are various types of content:

- Alerts and advisories
- Regular publications
- Regular reports
- Training opportunities
- Requests for help or information
- Education, training, and awareness to ISAO members
    - Webcasts
    - Onsite/in-person
    - Online resources

As with the different methods for dissemination, each format has its advantages and disadvantages. However, no matter which format is chosen, a couple of things to keep in mind are the spamming affect and alert fatigue. A way to combat alert fatigue is to determine the rate at which information is disseminated to the members by determining the impact, urgency, and importance of the information. A potential strategy to consider is a push-pull method—an example of this is an item that requires an immediate response or action to be taken, pushing the information out via an email or alert notification. For the informational-only items, post those things to a shared drive, website, or common area, where the members can pull that information

down at their convenience. Another way strategy is to develop a system to label emails so that the members know the urgency of the information being shared.

6.4.3 Dissemination Format

Providing information in an easily digestible format can support the ISAO membership obtaining the most value from the information. The following are considerations regarding format:

- A brief overview of the information
- Identifying urgency and criticality
- Recommending response actions and best practices.

6.4.4 Additional Dissemination Considerations

There are a number of additional considerations an ISAO should review:

- Encryption
- Storage and retention periods
- Frequency
- Traffic Light Protocol (TLP) for handling and re-dissemination.

6.5 Chapter Summary

There are a few important aspects to take into consideration when building up this capability and service. First, similar to collection and analysis, there are a large number of tools and means to disseminate information. It is necessary to start out with a few simple means to disseminate information to the ISAO membership. Second, ensure the information is distributed in a velocity and cadence consistent with its tactical and strategic value. Third, not only does the information need to be timely, it also needs to be actionable. Fourth, it is important that the format of the information be in a consistent format, written professionally, and the material geared to the proper audience. Last, it is important to consider the sensitivity of the information, how it is to be handled, and how long the receiving party should retain it.

7 Facilitating Member Sharing

As defined in publication 100-2 (Appendix A), facilitating member sharing is the process of enabling members to share information, with or without attribution, with each other and with the ISAO. In short, the most important outcome of an ISAO in this service and capability is to facilitate and maintain trust among its membership. If the members of the ISAO community are familiar with each other, then creating trust is easier. This chapter discusses the foundational principles for an ISAO to facilitate sharing among its members.

7.1 Advantages

As stated in the introduction to this chapter, an ISAO facilitating member sharing has many advantages. The ISAO becomes the trusted and neutral medium for its members to share cyber threat information and other potential sensitive data.

7.2 Challenges

As with the other foundational services and capabilities, there will be challenges that ISAOs face in operationalizing this service and capability. The first challenge is in creating a trusted environment. This is very challenging for an emerging ISAO, the primary reason being that members within the community may be unfamiliar with each other. A second challenge is in creating a secure environment (if desired). The process and technology required for creating a secured environment is expensive. For an ISAO just starting out, finances will probably be limited. The third challenge, if required, is creating an anonymous environment, and this challenge also is expensive. The fourth challenge will come about if one of the members violates the trust. Creating trust among the membership can take a considerable amount of time to build, but it can be destroyed in an instant. Finally, getting members to share and simply participate is also a challenge. There are many reasons why a member would not to share or participate: It can come down to the processes to share are too cumbersome, the membership does not see the value in sharing, or there's simply a lack of caring.

7.3 Methods for Implementing Facilitating Member Sharing

There are several basic methods that an ISAO can use to facilitate information sharing among its members. Many technologies that support this foundational service or capability are not cost prohibitive. Using cloud or other online services at the beginning will not only help in cost savings, but will allow for a quicker ramp-up time for the ISAO to start delivering these services and capabilities.

- Creating email list serves is a quick and easy approach for an emerging ISAO to implement this service and capability.
- Creating or using an established sharing protocol like TLP is an easy way to get members to agree to sharing.
- Executing a document such as an NDA can also be very simple and can help engender trust.
- Necessitating a memorandum of understanding (MOU) between the ISAO and members can be helpful. A MOU is a document that outlines the intent of action. It is not necessarily a legally binding document, but it can be helpful in defining expectations.
- Communicating the value of how sharing enhances situational awareness across the constituency can inform risk-based decision making.
- Developing multiple channels to communicate with the membership can be useful. Examples include creating weekly or monthly newsletters and holding monthly or quarterly briefings. These briefings can rotate from one member's office to the next.

7.4 Chapter Summary

The ability for ISAOs to support, encourage, and facilitate their members to interact with one another is a key indicator in how successful the ISAO is. Once all of the technologies are in place and running as designed, the success of the program will be determined by how engaged the ISAO membership is. The ISAO's leadership and staff (if available) need to be constantly communicating with its members. This interaction will help keep the membership involved. This will also go to build and maintain trust between the ISAO and its members as well as among the members.

Appendix A. Survey Example

Survey Example 1
The information from this survey will be used to improve future events.

1) **Overall, how satisfied are you with the ISAO**:

 Excellent Very Good Good Fair Poor

2) **How useful did you find the information from the ISAO**:
Home: Excellent Very Good Good Fair Poor **Work**: Excellent Very Good Good Fair Poor

3) **Rate the overall service of the ISAO:**

 1 2 3 4 5

4) **How actionable is the information from the ISAO:**

 Extremely Good Very Good Poor Extremely Poor

5) **Is the information disseminated in a timely:**

 Yes No

6) **Are you representing a Business or Individual**

a. If business, what industry: Finance Education IT Manufacturing
 Government Health Other: _____
b. Size of company Small (50 or less) Medium (51 to 249) Large (250+)

7) **Which method do you prefer to receive information?**
 Twitter Friend Website: _____
 Facebook LinkedIn Other: _____

How would you rate the different methods?

Twitter	Excellent	Very Good	Good	Fair	Poor
Email	Excellent	Very Good	Good	Fair	Poor

Automated	☐ Excellent	☐ Very Good	☐ Good	☐ Fair	☐ Poor
Web Alerts	☐ Excellent	☐ Very Good	☐ Good	☐ Fair	☐ Poor

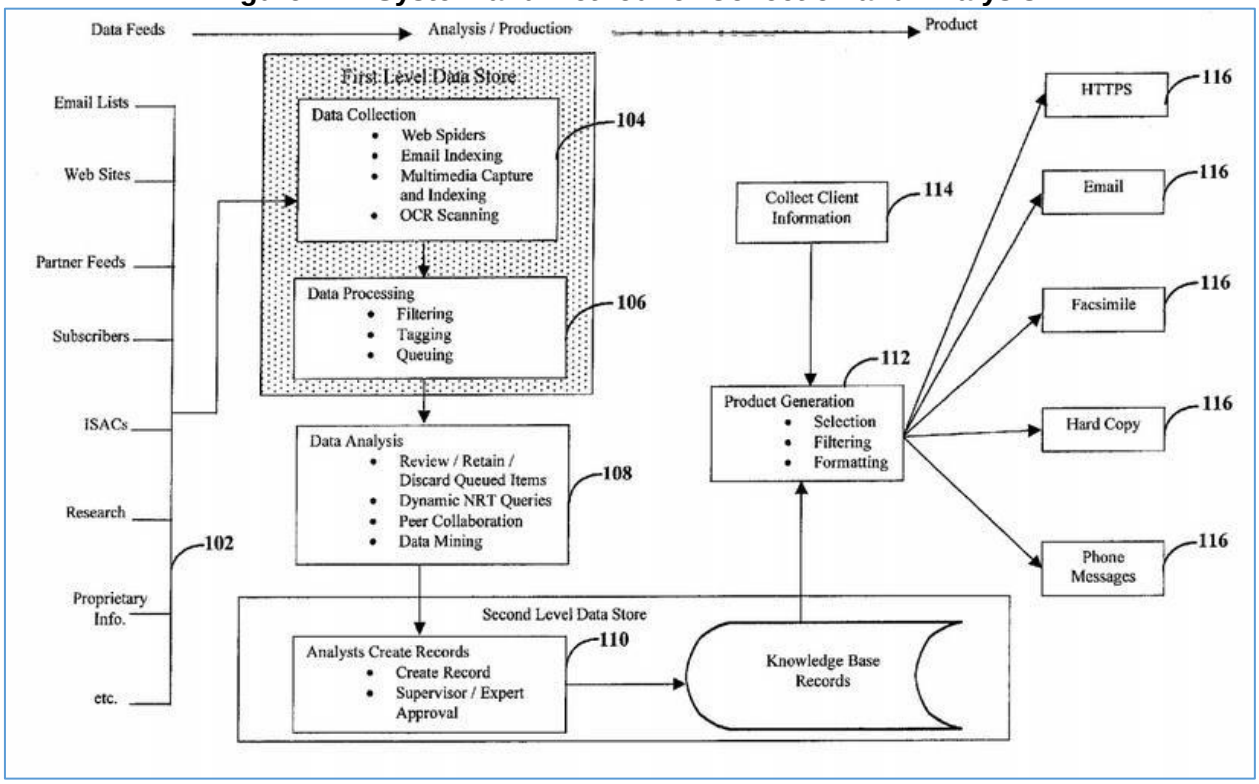
Interested in signing up for Cybersecurity News & Alerts?
Leave your contact information below.
Name:_____
Email:_____

Comments or Suggestions?
_____
_____
_____

Appendix B. Example System and Method for Collection and Analysis

The system and method for collection and Analysis below is just one potential model illustrating processes.

Figure B-1. System and Method for Collection and Analysis



(United States Patent No. US 2002/0038430 A1, 2002)

Appendix C. Standardized Formats

Table C-1. List of Standardized Formats

Format	Description
CAPEC	The objective of the Common Attack Pattern Enumeration and Classification (CAPEC™) effort is to provide a publicly available catalog of common attack patterns classified in an intuitive manner, along with a comprehensive schema for describing related attacks and sharing information about them (https://capec.mitre.org/about/index.html).
CybOX	Cyber Observable eXpression (CybOX™) is a standardized language for encoding and communicating high-fidelity information about cyber observables (http://cyboxproject.github.io/about/).
IODEF (RFC5070)	The Incident Object Description Exchange Format (IODEF) defines a data representation that provides a framework for sharing information commonly exchanged by Computer Security Incident Response Teams about computer security incidents (http://cyboxproject.github.io/about/).
IDMEF (RFC4765)	*Experimental*. The purpose of the Intrusion Detection Message Exchange Format (IDMEF) is to define data formats and exchange procedures for sharing information of interest to intrusion detection and response systems and to the management systems that may need to interact with them (https://tools.ietf.org/html/rfc4765).
MAEC	Malware Attribute Enumeration and Characterization (MAEC™) (pronounced “mike”) is a community-developed structured language for encoding and communicating high-fidelity information about malware based upon attributes such as behaviors, artifacts, and attack patterns (http://maecproject.github.io/about-maec/).
STIX	Structured Threat Information Expression (STIX™) is a structured language for describing cyber-threat information so it can be shared, stored, and analyzed in a consistent manner (http://stixproject.github.io/about/).
TAXII	Trusted Automated eXchange of Indicator Information (TAXII™) is a free and open transport mechanism that standardizes the automated exchange of cyber-threat information (http://taxiiproject.github.io/about/).

VERIS	The Vocabulary for Event Recording and Incident Sharing (VERIS) is a set of metrics designed to provide a common language for describing security incidents in a structured and repeatable manner. VERIS is a response to one of the most critical and persistent challenges in the security industry—a lack of quality information (http://veriscommunity.net/index.html).