



Geneva Graduate Institute IHEID
Master in International and Development Studies Program

Project 24: Enhancing engagement levels in digital volunteering programs for positive social impact

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Abstract

This report aims to understand the key factors that impact digital volunteer engagement in a program run by the CyberPeace Institute. The CyberPeace does the work of connecting other non-governmental organizations with cybersecurity professionals, who volunteer their time so these organizations can have a protected digital infrastructure free of additional charges. In order to do so the authors conducted surveys and interviews and got insight on the perspectives of these professional volunteers, as well as other organizations that work with digital volunteering programs. These methods helped us grasp what factors and practices keep volunteers engaged and motivated to continue offering their help in a digital space. It was found that human connection is a very important aspect of keeping volunteers involved, this includes having constant communication and feedback. Another important finding is making sure the volunteer feels connected to the cause they are helping; it is important to communicate and show how their efforts have positively impacted the cause of the NGO. Maintaining volunteers successfully engaged in a digital environment is challenging because finding a sense of community while working through a screen is a difficult task. There is not much literature that addresses engagement in the digital volunteering space, making this research significant for organizations that want to further understand how to motivate, engage and maintain volunteers participative and aligned with their work.

Abbreviations

Bx - Block (number) referring to the 3 different blocks in the interview grid

CPI- Cyber Peace Institute

CPB - CyberPeace Builders, Professional virtual volunteers that work with the Cyber Peace Institute

NGO – Non-Governmental Organization

VFI - Volunteer Functions Inventory

Chapter I: Introduction

The CyberPeace Institute (from now on referred to as CPI) is a Geneva based organization protecting the most vulnerable in cyberspace. They help nonprofit organizations by identifying weaknesses in their cyberspace, helping them implement safe practices and offering training in cyber security to these NGOs. The CPI has a network of professional volunteers, otherwise known as CyberPeace Builders (CPB) that dedicate a portion of their work day to helping solve a cybersecurity issue of a nonprofit, through the CPI's portal. Currently, there is little research conducted on the motivations and engagement of digital volunteers. Cox et al. (2015) completed a well done, comprehensive study, which provides interesting insights on this topic. They conclude that online volunteering may be more concerned with human capital enhancement as well as knowledge creation than other traditional forms of volunteering. By doing that the focus is less on career based networking or in person social connections, which are usually in the forefront of traditional volunteerism (Cox et al., 2015).

This report addresses the question “*what are the key factors that influence engagement in digital volunteering programs?*” This has been responded to by conducting seven interviews with various organizations across different countries. Some of which are enrolled and have a relationship with the CPI, while others do not. What all these organizations had in common is that they all have, at some point in time, had to execute a digital volunteering program. Another question this report investigates is “*what is the current level of engagement among participants in digital volunteering programs?*”. To answer this second question the study relies on a survey presented to all the CPB through the CPI's platform. The basis of the survey is the Volunteers Functions Inventory (VFI) from Clary et al. (1996) which is revolutionary in its standardization of measuring volunteer motivation.

The final two research questions in which the survey as well as the interviews aim to answer are: “*what are the experiences, challenges, and needs of participants in digital volunteering?*” and “*how can engagement in digital volunteering programs be improved to maximize positive social impact?*”. These questions were also explored in detail in the authors' previous literature review.

To begin, we will summarize the main results of the authors' literature review which was conducted September to December 2023 and provides the basis of the research conducted for this report. The following section will then elaborate in detail the methods chosen, in regard to designing and conducting the interviews and the survey. In the results sections the results of these two methodologies will be presented verbally and visually. The results are then discussed in connection with other literature in the discussion and the answers to the research questions will flow through this discussion. Finally conclusions and limitations of the study, as well as recommendations for the CPI as well as any other organization working with digital volunteers will be presented.

Chapter II: Literature Review

The shortage of cybersecurity-trained personnel has highlighted the importance of long-term volunteer engagement in the field, especially with approximately 2 million cybersecurity job openings globally. However, research on participation in digital volunteer programs is limited, and there is a need to explore the factors that influence participation in both physical and digital volunteering. For NGOs, volunteer engagement increases organizational capacity by fostering collaboration between staff and volunteers. It transforms NGOs by increasing capacity, expanding reach, diversifying perspectives and skills, and fostering community engagement and partnership building.

Volunteer motivation, rooted in social and psychological goals, drives participation. Fostering intrinsic motivation, where volunteers find meaningful and impactful roles, is paramount. This includes creating a culture of "volunteer engagement" and connecting volunteers with activities that align with their passions. Clear role definitions and assignments, along with targeted outreach strategies and supportive leadership, further enhance engagement. Cultivating volunteers, providing access to information and training, and fostering a sense of community through recognition efforts all contribute to sustained engagement.

Participating in digital volunteering

Digital volunteering offers opportunities to build skills and contribute to causes. Although research on the motivations of digital volunteers is limited, studies suggest that online volunteering can prioritize human capital development and knowledge creation. Understanding volunteers' motivations, especially self-directed goals, is critical for participation in digital volunteering. Projects should provide clear learning incentives and growth opportunities, emphasizing personal and collective values to encourage engagement

Challenges and Opportunities

The COVID-19 pandemic has catalyzed the shift to virtual volunteering, requiring proactive measures to improve the volunteer experience. Communication, support, and flexibility are essential to effectively engage virtual volunteers. In addition, cybersecurity challenges facing NGOs highlight the need for innovative solutions and volunteer engagement strategies to protect digital infrastructure.

Recommendations for maximizing social impact

Successful digital volunteer programs prioritize personal values, community building, ongoing communication, learning opportunities, leadership development, recognition, and

long-term roles. By aligning activities with volunteers' passions, empowering volunteers, and fostering a sense of purpose, digital volunteering can maximize its positive social impact.

In conclusion, understanding volunteers' motivations, fostering intrinsic motivation, and implementing effective engagement strategies are critical for both physical and digital volunteering. By addressing challenges and capitalizing on opportunities, digital volunteering can become a powerful tool for social impact.

This summary presents the main aspects of the literature review, highlighting the key findings on participation in volunteer programs, both face-to-face and digital, in the various studies conducted, as well as in the successful cases found. However, for an exhaustive and detailed analysis, you are invited to read the full document on the appendix, which delves into the determinants of volunteer participation, as well as the effective practices and challenges inherent to these programs.

Chapter III: Methods

In February 2024 the interview questions for the NGO partners and the online survey for the CyberPeace Builders (CPB) was created in collaboration with the CPI. The interview grid consisted of three blocks that target different aspects that would inform us about digital volunteer engagement. The first block was focused on the current level of engagement the virtual volunteers of the organization were facing, the second block aimed to understand what key factors influence the level of engagement. Finally, the third block consisted of questions that could help provide recommendations to the CPI, taking into account positive and negative experiences the NGO’s had encountered.

The questionnaire for the NGO partners contained fourteen questions and was targeted at a staff manager, human resources team member, director, or other members with a solid understanding as to how virtual volunteers engage in different programs and activities at the NGO. In March 2024, several organizations in association with the CPI as well as other organizations who were known to the project team for their execution of digital volunteering programs, were asked to participate. Seven organizations were able to find availability for an interview. These organizations are based in Europe and South America. The interviews were between thirty minutes to an hour long, they took place virtually in March and April 2024 through Google Meet. We chose to do interviews online so that all organizations had the same experience, whether locally or on the other side of the world. We also wanted to provide the utmost flexibility with regard to the time of the interview. Doing the interviews virtually assisted us in this goal.

Table 1: The Interviewees

Name of the organization	Description
Adventure Volunteer	Adventure Volunteer, from Spain, is an organization committed to local and international volunteering. They work to raise awareness of development projects in 25 countries, where volunteers can share their knowledge and skills to make a positive impact. Through their volunteering programs, they provide the opportunity to contribute to public interest causes and collaborate with various organizations worldwide. (Adventure Volunteer, 2017)

Volies	Volies, from Spain, is an organization that assists companies, NGOs, and public institutions in driving social change through corporate volunteering. They provide consultancy services, training, and both online and in-person projects to support clients in their volunteer initiatives. (Volies, 2017)
Chamber of Commerce of Bogota	The Mentoring and Volunteering Network of the Chamber of Commerce of Bogotá, from Colombia, advises entrepreneurs and business leaders to foster business growth, job creation, and economic development. Mentors share experiences, skills, and insights to contribute to a thriving society built on continuous learning. (Bogotá, 2022)
Fonselp	Fonselp, from Argentina, is a non-profit organization that connects, measures and audits the social and environmental impact of different companies. They offer a platform called SFRM (Sustainability Flow Relationship Manager) to facilitate volunteer management, donations, responsible purchasing, impact measurement for teams, and connections with thousands of organizations making a difference in the world. (Fonselp, 2023)
Airwars	Airwars, from the United Kingdom, is a non-profit transparency watchdog dedicated to tracking, assessing, archiving, and investigating civilian harm claims in conflict-affected nations. They are a leading authority on conflict violence and aim to document the human cost of war independently and reliably. Their goal is to promote a more peaceful world where human lives are acknowledged and taken into account by militaries, policy-makers, and global citizens with dignity and empathy. (Airwars, 2014)
Foundation Forge	Forge Foundation, from Switzerland, offers the "Tu Futuro" Program to economically vulnerable youth in Argentina, Colombia, Chile, Mexico, Peru, and Uruguay. Their goal is to empower young people to access a better life through work, ongoing learning, and community engagement. They provide participants with experiences to develop essential skills for the job market, life planning, and goal achievement. (Forge, 2005)

Cordoba PeaceInstitute	The Cordoba Peace Institute, from Switzerland, is a non-profit organization dedicated to violence prevention and peace promotion. With expertise in conflict transformation, Cordoba Peace Institute works in West Asian and African contexts, utilizing methodologies embraced by local communities and peace actors. Inspired by Cordoba's interfaith dialogue and Geneva's international exchange, Cordoba Peace Institute has built unique networks since 2002. Recognized with Special Consultative Status by the United Nations, Cordoba Peace Institute remains committed to advancing peace through collaborative efforts. (Cordoba Peace Institute, 2002)
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In conducting the analysis, Atlas Ti software was employed to systematically evaluate responses provided during the interviews. This approach allowed us to identify constant patterns and determine any notable distinctions in the information shared by each interviewee. For the analysis, categories were created for each question based on responses that were repeated in at least two interviews. By utilizing this method, we aimed to ensure a comprehensive and objective assessment of the data collected.

The online survey for CPB to access engagement and motivations of the questioned volunteers consisted of thirty-eight questions. Thirty questions followed Clary et al.'s (1996) Volunteer Functions Index to make them quantifiable. Demographic questions and open questions about the volunteer's individual experience were added in cooperation with the CPI, to be qualitatively evaluated. The survey was created in the program HubSpot, due to its connection to the program that links CPI with its volunteers. It was sent out to over 700 volunteers through the platform on Friday March 8, 2024 and remained open until April 8, 2024. Forty-eight CPB responded to the survey. To calculate VFI the following standardized formula elaborated by Clary et al. (1996) was utilized (see Figure 1).

Figure 1: VFI formula (Clary et al., 1996)

		SCORING SHEET					Volunteer:
VFI Career	Item Response	1	10	15	21	28	
		___	+	___	+	___	=
						___	(SUM)
VFI Social	Item Response	2	4	6	17	23	
		___	+	___	+	___	=
						___	(SUM)
VFI Values	Item Response	3	8	16	19	22	
		___	+	___	+	___	=
						___	(SUM)
VFI Understd	Item Response	12	14	18	25	30	
		___	+	___	+	___	=
						___	(SUM)
VFI Enhance	Item Response	5	13	26	27	29	
		___	+	___	+	___	=
						___	(SUM)
VFI Protect	Item Response	7	9	11	20	24	
		___	+	___	+	___	=
						___	(SUM)

The formula in Figure 1 adds up points (between 1 and 7) scored by specific questions related to VFI variables in the survey. The higher the sum of points, the more motivated the volunteer appears to be in regard to the measured VFI function. The data was then analyzed through excel based on the VFI and gender, age, as well as volunteer satisfaction. The mean VFI was compared in relation to these variables.

Chapter IV: Interview Results

The responses taken into consideration for analysis correspond to question 3 onwards in Block 1. The preceding questions primarily focus on descriptive aspects of each organization, as well as icebreaker questions, and therefore, were not taken into account for the analysis.

Block 1. Question 3: What are the main types of activities or projects that volunteers typically engage in?

Codes: 1. Meaning or emotional motivation and 2. Attractiveness and ease.

Based on the answers, it was found that "meaning or emotional motivation" (Code 1) was mentioned in three interviews, while "attractiveness and ease" (Code 2) was mentioned in five interviews. From this perspective, it can be inferred that the activities or projects that volunteers typically engage in are those that evoke emotional motivations or hold significance for them. Moreover, these activities are primarily those that are attractive (fun, enjoyable) and easy to carry out (familiar to volunteers).

Block 1. Question 4: How do you measure or assess the success of digital volunteering initiatives in your organization?

Codes: 1. Impact, 2. Volunteer satisfaction and 3. Monitoring activities.

Based on the responses, it was found that "impact" (Code 1) was mentioned in four interviews, "volunteer satisfaction" (Code 2) was mentioned in five interviews, and "monitoring activities" (Code 3) was mentioned in three interviews. It is noteworthy that despite organizations having different ways to assess the success of their volunteer programs, the most common methodologies used are highlighted in the codes. From this perspective, it can be observed that the evaluation of volunteer satisfaction is the most commonly used methodology, followed by impact assessment or the outcomes of volunteering (in social, environmental, business terms, for instance.), and lastly, the constant monitoring of volunteer activities' fulfillment.

Block 1. Question 5: Have you observed any trends or changes in volunteer engagement levels over time?

Codes: 1. Pandemic, 2. Constant monitoring and 3. Feedback

From the analyzed responses, it was found that "pandemic" (Code 1) was mentioned in two interviews, and "constant monitoring" (Code 2) was also mentioned in two interviews. Considering the explanations provided by the interviewees, the pandemic marked a milestone in the engagement of digital volunteers. During the lockdown periods, there was a high level of commitment, which decreased as restrictions eased. Additionally, it was identified that constant monitoring of the work of digital volunteers, such as reviewing reported hours worked, motivates or increases the level of commitment of individuals.

Block 1. Question 6: Can you provide insight into the current level of engagement among participants in your digital volunteering programs? On a scale of 1-5 being 5 totally engaged - How engaged would you say your volunteers are?

Codes: 1, 2, 3, 4 and 5

Among codes 1 and 5, all interviewees positioned themselves around 4. However, one organization placed itself at 5, arguing that the constant monitoring system through volunteers' reported hours worked and constant team meetings are the most successful practices for maintaining high levels of commitment among digital volunteers. It is worth noting that for the analysis of this question, Atlas Ti was not utilized.

Block 2. Question 7: How does your organization approach volunteer recruitment and retention in digital volunteering initiatives?

Codes: 1. Online recruitment, 2. Interviews, 3. Well defined projects, and 4. Follow up
According to the identified and subsequently analyzed codes, code 1 "online recruitment" was repeated in four interviews, while codes 2 "Interviews", 3 "Well defined projects", and 4 "Follow up" were repeated in two interviews each. According to the results, it is evident that most organizations rely on online tools for recruitment processes, such as online forms, with some conducting interviews to strengthen the recruitment process and assess candidates' level of interest. Regarding retention, it was identified as crucial to maintain constant follow-up on volunteers' activities to ensure they feel their work is valued. Additionally, clearly defining the activities and objectives of the project they are working on is essential.

Block 2. Question 8: If any, what are the challenges or barriers that impact the level of engagement among digital volunteers?

Codes: 1. Lack of constant communication, 2. Visualization of impact, and 3. Trusted relationships between volunteers, beneficiaries and other team members.
According to the analyzed responses, it was found that "lack of constant communication" (Code 1) was mentioned in three interviews, "visualization of impact" (Code 2) was mentioned in four interviews, and "trusted relationships between volunteers, beneficiaries, and other team members" (Code 3) was mentioned in two interviews. The interviewees' answers show that the lack of visualization of the positive impact of activities due to virtuality, and the failure to show results to volunteers, are the main reasons for demotivation and decreased commitment levels. Additionally, the lack of contact between organizations and volunteers due to virtuality makes constant relationship-building difficult, consequently increasing the likelihood of decreased volunteer commitment. Finally, the difficulty in creating bonds between volunteers, beneficiaries, and other team members may lead to incomplete commitment from individuals. One prominent recommendation from the interviews is to have a dedicated person responsible for contacting all volunteers, tracking

hours worked, and organizing virtual meetings to facilitate more human interactions despite the virtual nature of digital volunteering.

Block 2. Question 9: Can you identify any strategies or practices that have been particularly effective in increasing volunteer engagement? Can you give us examples?

Codes: 1. Volunteer Community, 2. Training, and 3. Certification

The importance of building a “Volunteer Community” (code 1) was repeated in five interviews, “Training” (code 2) in two interviews, and “Certification” (code 3) in two interviews as well. Therefore, it was found that most organizations agree that building a volunteer community, where individuals feel part of a team, has been the most effective strategy to increase engagement levels in virtual volunteering. Various organizations mentioned practices such as group chats, newsletters, and virtual events to strengthen this community. Additionally, two of the interviewed organizations highlighted that training volunteers to develop their activities, including cultural information about beneficiaries and technical training, was a good practice. Finally, two interviewees emphasized the importance of recognizing volunteers for their work, recommending the use of certificates and the organization of events such as annual recognition ceremonies, as well as acknowledgments on social media and platforms where volunteers can share their work.

Block 2. Question 10: Are there any specific characteristics or attributes that make certain individuals more likely to engage in digital volunteering activities?

Codes: 1. Meaningful experiences, 2. Beneficiary focus, 3. Skills, and 4. Willingness to Learn

Based on the analysis of the responses, it was found that "meaningful experiences" (Code 1) was mentioned in three interviews, "beneficiary focus" (Code 2) appeared in four interviews, while "skills" (Code 3) and "willingness to learn" (Code 4) were each mentioned in two interviews. For this question, most organizations mentioned that when volunteers were focused on serving or supporting beneficiaries, they tended to have higher levels of commitment. Secondly, it was identified that the pursuit of emotionally meaningful experiences was an attribute that made volunteers more committed because it made them feel that their work was valuable and that their efforts could improve the conditions of others. Finally, interviewees mentioned that volunteers who had the skills or motivation to learn new tools showed a higher level of commitment than those who did not.

Block 3. Question 11: Are there any best practices or lessons learned from your organization's experience with digital volunteering that could be applied to the Cyber Peace Institute's program?

Codes: 1. Volunteer community, 2. Constant follow Up, and 3. Impact

Building a “Volunteer community” (Code 1) was mentioned in all seven interviews,

“Constant follow up” (code 2) was mentioned in four interviews, and “Impact” (code 3) was also mentioned in four interviews. It is important to highlight that for all organizations, the best recommendation to increase the level of commitment of digital volunteers is to create a community where everyone feels part of a team. Recommendations such as having chats and other communication channels, as well as virtual meetings to maintain human contact, were emphasized. Additionally, the importance of constant follow-up on volunteers' work was mentioned, with a recommendation to have a dedicated person solely responsible for tracking activity completion. Finally, it was emphasized that it is crucial to reiterate the importance of digital volunteers' work and show them the impact of their efforts so they understand the purpose of their activities.

Block 3. Question 12: What are the practices that you do not recommend implementing because they have not worked or lowered volunteer engagement?

The analysis of answers to this question showed that interviewers' responses varied greatly, making coding unnecessary. However, interviewees mentioned that it is not recommended to lack constant follow-up on activity completion, to neglect creating a supportive community environment, to define rigid schedules without flexibility, or to assign too many tasks to volunteers, as this may decrease their motivation and commitment.

Block 3. Question 13: In your opinion, what are the most important elements for creating a supportive and engaging environment for digital volunteers?

For question 13, there were no significant similarities in the responses of the interviewees, so no coding was conducted. However, Atlas Ti was utilized to identify recommendations. In terms of fostering a supportive and engaging environment for digital volunteers, the organizations emphasized the importance of building trusting relationships, acknowledging the work of volunteers and teams, maintaining constant follow-up, utilizing online messaging channels, organizing virtual meetings or calls, demonstrating to volunteers that they are valued and wanted, and establishing a network environment where volunteers can learn professional skills from one another, share their CVs, and even find job opportunities.

Conclusions Based on Interview Analysis:

1. Activities or projects that volunteers engage in are those that evoke emotional motivations or hold significance for them, primarily those that are attractive and easy to carry out.
2. Ensuring that volunteers are well-informed about the NGO they are assisting can enhance their commitment and connection to the cause, further understanding the mission and impact of their work can increase these emotional motivations.
3. Evaluation of volunteer satisfaction is commonly done by different organizations, followed by impact assessment or outcomes of volunteering, and constant monitoring of volunteer activities' fulfillment.
4. The pandemic marked a milestone in digital volunteer engagement, with high commitment during lockdown periods that decreased as restrictions eased. 5. Constant monitoring through reported hours worked is the most successful practice for maintaining high levels of commitment among digital volunteers. It's crucial to maintain constant follow-up on volunteers' activities to ensure they feel valued, with clearly defined project objectives being essential.
5. Lack of visualization of positive impact of volunteer activities due to virtuality and failure to show these results to volunteers is a major reason for demotivation, along with difficulties in maintaining relationships and creating bonds among volunteers, beneficiaries and team members.
6. Building a volunteer community, where individuals feel part of a team, is the most effective strategy, along with training volunteers and recognizing their work.
7. Volunteers focused on serving or supporting beneficiaries tend to have higher commitment levels, along with those pursuing emotionally meaningful experiences or having the skills/motivation to learn new tools.
8. Fostering a supportive environment involves building trusting relationships, acknowledging volunteers' work, maintaining constant follow-up, utilizing online messaging channels, organizing virtual meetings, and establishing a network environment for skill-sharing and career development.

Chapter V: Online Survey Results

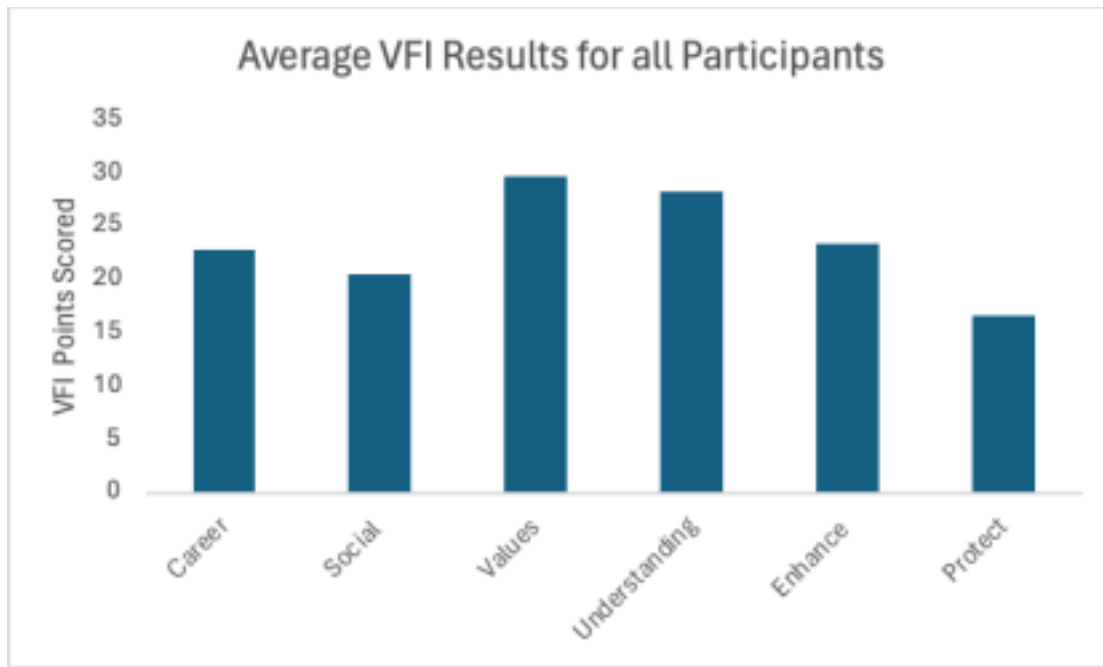
As discussed in the introduction, the Volunteers Functions Inventory (VFI) has six main functions. They are again displayed below in Figure.

Figure 2: Volunteers Functions Inventory (Clary et al., 1996)

Function	Description
Values	expressing or acting on important values, such as humanitarianism and helping those less fortunate
Understanding	seeking to learn more about the world and/or exercise skills that are often unused
Enhancement	seeking to grow and develop psychologically through involvement in volunteering
Career	goal of gaining career-related experience through volunteering
Social	volunteering allows the person to strengthen one's social relationships
Protective	volunteering to reduce negative feelings, such as guilt, or to address personal problems

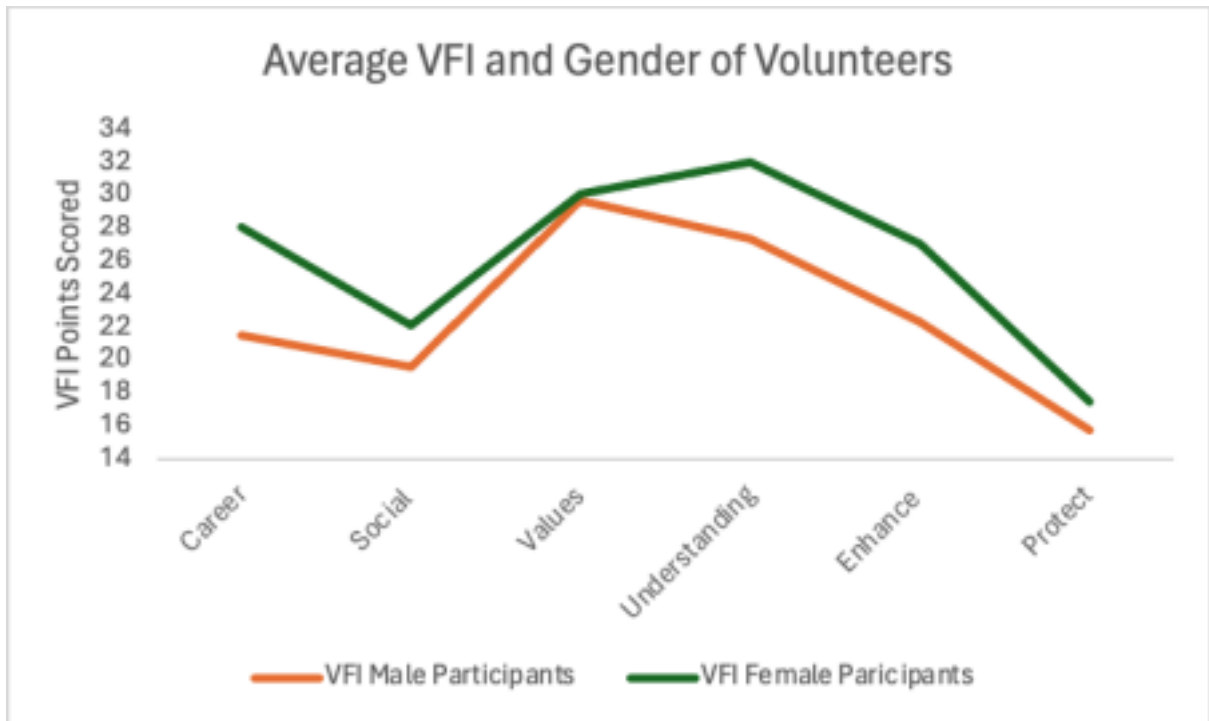
After analyzing the data according to Clary and colleagues (1996) formula found in the methods section the following mean VFI results for the CPB could be determined (Figure 3 below). The 48 CPB scored on average the highest points by “Values” (30 points) and “Understanding” (28 points). Therefore, expressing or acting on important values, such as humanitarianism, as well as helping those less fortunate and seeking to learn more about the world and /or exercise skills that are often unused, appear to be the CPB main motivations. The lowest points on average were scored by “Protect”. This means that volunteering to reduce negative feelings, such as guilt, or to address personal problems appears to be low among the CPB.

Figure 3: Average CFI Results for all Participants



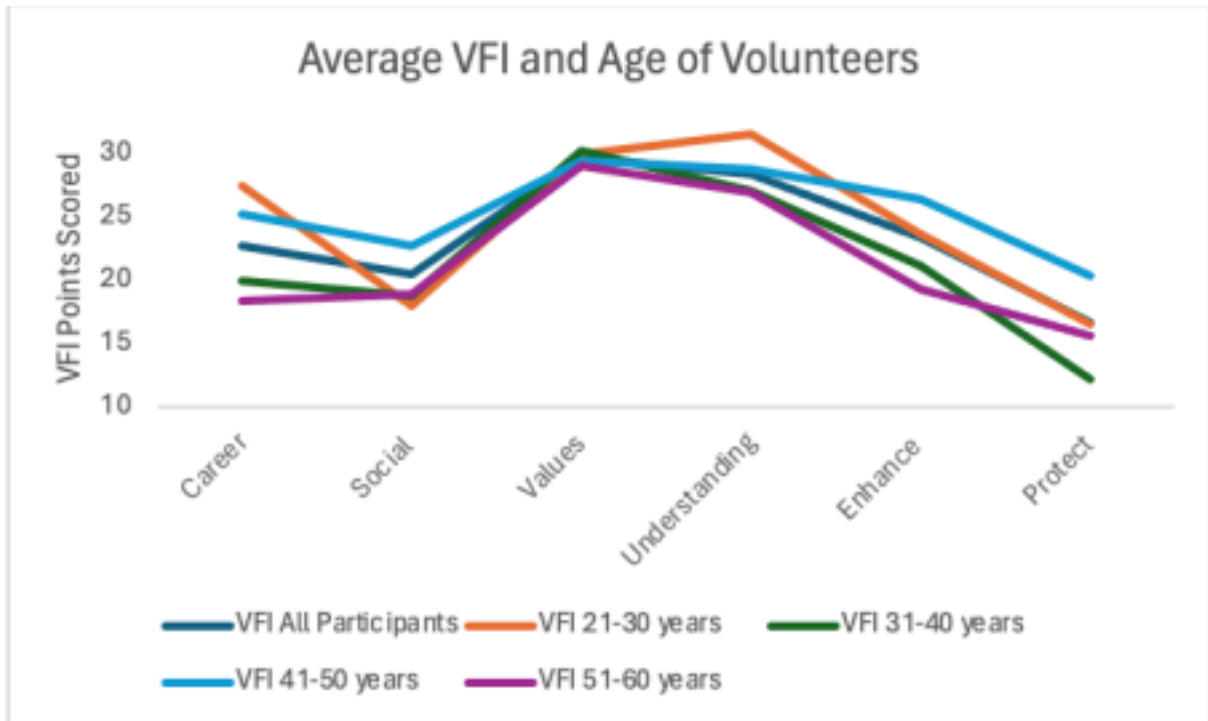
There were eight female and forty male CPB who took part in the survey. As seen below in Figure 4, when compared, the male participants have a clear peak (the highest average VFI points) by “Values”. On the other hand, the female participants peak by the VFI category “Understanding”. In general females scored more points than males, having higher motivation in every category.

Figure 4: Average VFI and Gender of Volunteers



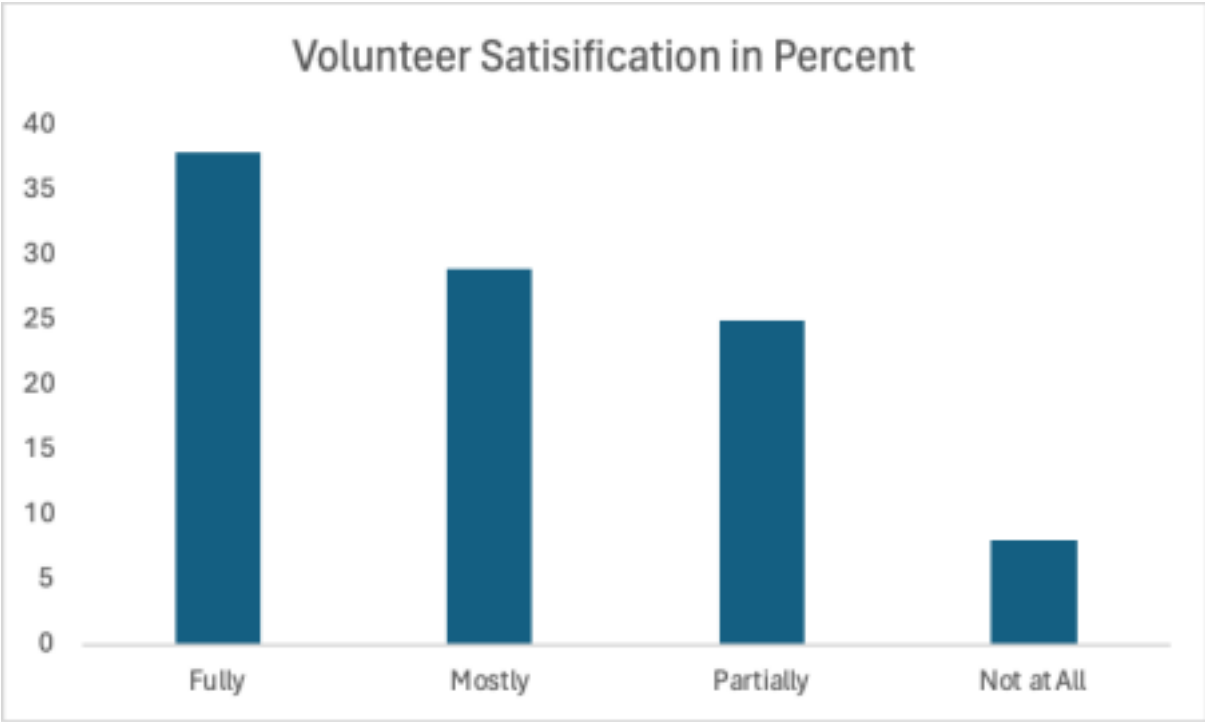
In regard to participant ages, there were CPB in the following age categories: 21-30 years, 31-40 years, 41-50 years and 51-60 years. When compared with VFI scores, it was found that the 21-30 year olds have a peak in “Understanding” (see Figure 5). All other age groups peak at “Values”. There appears to be a drop in the categories “Social” and “Protect” which are the lowest for all age groups. The 41-50 year olds have the least variation however, having the highest scores by the lower categories “Social” and “Protect”. This indicates that this age category has the highest motivation to volunteer to strengthen their social relationships and volunteer to reduce negative feelings, such as guilt, or to address personal problems.

Figure 5: Average VFI and Age of Volunteers



According to the survey, 38% of the CPB are fully satisfied with their work at the CPI. Another 29% of the CPB are mostly satisfied. 25% of the CPB are partially satisfied and 8% reported being not satisfied at all (see figure 6 below).

Figure 6: Volunteer Satisfaction in Percent



When comparing the volunteer satisfaction with the VFI scores the same pattern occurred as when comparing all average VFI scores, there was a peak in “Values”. In general, those who are fully satisfied with CPI scored higher points in all VFI categories, indicating a higher general motivation to volunteer (see Figure 7 below).

Figure 7: Average Volunteer Satisfaction



Open Questions in Survey

All answers to the open questions (32, 33 and 34) of the survey can be found in the appendix. To summarize:

Table 2: Suggestions to Better Meet Volunteer Needs

Involvement and Communication	Volunteers expressed a desire to be more involved, with improved communication channels among volunteers to reduce imposter syndrome (feelings of self doubt in intellectual skills). They also suggested that the CPI engage with individuals to match them with projects that align with their skills and interests.
Opportunities and Projects	Many respondents indicated the need for more diverse projects, especially those focusing on specific skills like Digital Forensics/malware reversing or advanced cybersecurity assessments like internal/external penetration testing. Some mentioned that it was difficult to find volunteer opportunities despite applying.

Training and Support	Volunteers suggested more comprehensive training and clearer task descriptions before committing to a project. This would help alleviate fears of appearing untrained when engaging with NGOs.
Time and Flexibility	Several responses noted the challenge of finding time to volunteer due to work commitments. Suggestions included consolidating organizational tasks and providing more flexible opportunities, including face-to-face and team-based volunteering.
Visibility and Collaboration	There were calls for more opportunities for volunteers to collaborate with each other, as well as a better mechanism to gain visibility for their work. The opportunity to meet with CyberPeace Institute members in person was also mentioned.

Table 3: Memorable Experiences While Volunteering

Learning and Interaction	Volunteers appreciated the opportunity to learn about NGOs and engage with teams. Some noted productive interactions and positive feedback from NGOs during missions.
Impact and Appreciation:	Respondents shared stories where their volunteer work had a direct and meaningful impact on NGOs, making them feel appreciated. This made the work feel rewarding and worthwhile

Table 4: Challenges Faced While Volunteering

Communication with NGOs	Several respondents reported issues with NGOs being unresponsive or not proactive in their communications, leading to delays in project progress.
Time Management and Work Commitments	Many volunteers found it challenging to balance volunteering with demanding jobs and personal commitments. This led to scheduling difficulties and a need for better time management.
Project Description and Resources	Some volunteers noted discrepancies between the expected mission and the actual tasks required. The lack of initial resources or

	templates for certain missions increased the time and effort needed to complete them.
Electricity and Infrastructure Issues	One volunteer faced power outages due to the national grid, prompting them to invest in solar power to continue volunteering.
Need for Guidance and Structure:	Volunteers suggested more guidance and clearer instructions to better understand the process and engage effectively. A video tutorial on the volunteer experience was recommended to provide a comprehensive overview.

Chapter VI: Discussion

The insight these results provide could guide the CPI in improving its volunteer engagement, project management, and support structures to better meet the needs and challenges of its volunteers. It approaches the four research questions:

- *What is the current level of engagement among participants in digital volunteering programs?*
- *What are the key factors that influence engagement in digital volunteering programs?*
- *What are the experiences, challenges, and needs of participants in digital volunteering?*
- *How can engagement in digital volunteering programs be improved to maximize positive social impact?*

The interviews gave perspective from the position of the organization that runs a virtual volunteering program, while the online survey shared insight from the position of the volunteer participating in the program.

Discussion of the Interviews

To summarize the results of the interviews and in line with the literature review the authors conducted prior to this study, a key point of ensuring volunteering engagement, seems to be encouraging the development of intrinsic motivation. This is done by generating a win-win situation for the volunteer and the organization. JFFixler Group (2015) says a win-win situation is encouraged by creating a culture of “volunteer-engagement” instead of “volunteer-management”. By connecting volunteers to activities which are in line with their personal passions, there is a feeling of meaningfulness. Regarding extrinsic motivations, a measurable result, where the volunteers experience high impact, also increases the feeling of meaningfulness (JFFixler Group, 2015).

When analyzing the question about strategies that increase volunteer engagement, creating a volunteer community was frequently mentioned. This means that creating a space where the volunteer feels like they belong and are also gaining something out of helping others is the best way to keep them engaged. Though this may be difficult in the digital space, some ideas that were shared to us during the interviews were forming chat channels, events online (or when possible in person) so the volunteers could meet each other as well as the organizations they are helping through their work.

Additionally, the literature review found that acknowledging and celebrating volunteers is found to be another essential aspect of maintaining engagement. Recognition efforts can be

both private and public, including volunteer spotlights and personalized thank-you notes. Organizing social events and gatherings, whether in-person or virtual, provides opportunities for volunteers to share their experiences and build a sense of community. Knowledge-sharing workshops and forums or social media groups can further enhance the community-building aspect of volunteer engagement (Cause Specialist, 2023). Two of the interviews mentioned providing volunteers with a certificate for participating in their programs, and that these certifications could be useful to advance the volunteer's careers. The interview with Fonselp shared a recommendation taking into consideration that the CPI's volunteers are professionals in cybersecurity, often software engineers or specialists in computer science. Given the frequent assumption that many people that choose this career are more often introverted and have their hard skills developed, it might be interesting to host workshops or certifications to further practice and develop their soft skills. Other ideas of certifications could also be related to furthering their hard skills in cybersecurity, for instance one of the CPB could hold a workshop and be certified by the CPI on a very specific topic.

Discussion of the Survey

To summarize the results of the survey, after analyzing the data according to Clary et al. (1996) VFI formula, generally the CPB scored the highest points in the categories "Values" and "Understanding", with "Values" being the highest. The lowest points were scored in the categories "Protect" and "Social", with "Protect" being the lowest. These patterns were seen in all age groups as well as all volunteer satisfaction categories. There was an inconsistency between genders, as males followed the discussed pattern, but female CPB instead scored highest in the VFI category "Understanding". Also, the youngest age group 21-30 peaks at "Understanding" instead of "Values". Although all other age groups follow the general pattern, there was notably less of a drop in points by "Social" and "Protect" for the age group 41-50 years.

Zooniverse is a web-based portal where volunteers can devote their time to science-based projects and contribute to the advancement of research (Cox et al., 2015). The results of our study converge with those of Cox et al.'s (2015) study with the digital volunteers of Zooniverse, showing that self-oriented motivations were more powerful predictors for the digital volunteers. This indicates that the digital volunteers are less motivated to participate out of a desire for interaction or to gain an advantage in the labor market. As these are otherwise key reasons people volunteer in the "real-world" they could be considered an important distinction between volunteers in general and digital volunteers (Cox et al, 2015). By the Zooniverse the motivation dimension "Understanding" was the most predominant in digital volunteers (Cox et al., 2015). This differs from our survey as the CPB, as in general "Understanding" came second after "Values". The Zooniverse had however, equal members of male and female survey participants and CPI predominantly male, the women CPB scoring highest in "Understanding". Cox et al. (2015) explain it could be recommended that projects with a form of science-based digital volunteering offer clear opportunities for learning

incentives, also in ways that are distinct from the main task being completed. This fulfills the “Understanding” motivation and therefore could directly improve volunteer motivation, retention and engagement.

Where there is a notable difference between CPB and Zooniverse digital volunteers is by the category “Protect”. Zooniverse volunteers showed that the desire to escape troubles and/or feel better about themselves plays a role for more committed digital volunteers (Cox et al., 2015). In our study, “Protect” was the lowest. However, it received the most points in the age group 41-50 year olds, when compared to all other age groups. It appears most Zooniverse volunteers are middle aged, so they may help explain the disparity. It could be that people moving towards the later half of their career feel more social pressure to have a positive social impact through other means such as volunteering, and this may help alleviate negative feelings and personal issues.

Conclusions and Derived Recommendations

The interviews revealed that many times people are drawn to volunteering when they are really connected to the cause of the organization. Volunteers liked to know what impact and importance their work had on the organization and its mission. This would be interesting to further work on for CPI, given that the survey results revealed that the CPB gained satisfaction with volunteering mostly through “values” which represents helping others, humanitarianism. Their volunteers care deeply about helping others, and the CPI’s program can greatly leverage the diverse amount of nonprofits and causes they attend. If there were a way to not only match CPB to nonprofits not only through tasks but also through the main mission of the NGO’s, but then to also teach the peacebuilder about the nonprofit they are currently helping, whether that be offering them material, spaces to connect, or even field trips where they can further learn about the nonprofit they are supporting, this would further the bonds and sense of fulfillment for the volunteers and motivate them to participate in the volunteering program.

An important aspect that interviewees shared is that providing volunteers with tools for them to access more knowledge, like for example skills workshops or certifications that would add value to the volunteer’s professional development. The survey revealed that another motivating function of the CPB was “Understanding” which relates to seeking to learn more about the world or using skills that are not often used. This is quite interesting seeing as it was the women (only 8 of them compared to 40 men), who had a peak in understanding. It is important to note that the field in which the CPI works is, cybersecurity is a field that is dominated by men. A study by Tulsa University showed that 1 out of every 4 global cybersecurity workers identifies as a woman (University of Tulsa, 2024). This is also revealed in the disproportionate amount of CPB that responded to the survey that were men.

It is interesting that women would care to further their skills in cybersecurity, and offering these volunteers with workshops and knowledge that could help them in this regard would maintain them engaged in the volunteering program.

Another key finding is that interviewees expressed that their greatest success with volunteers came to having open and constant communication with them, as well as monitoring their progress and offering them feedback, so that the volunteer can feel like their work is being valued. This was reflected by different organizations as either having events where volunteers won prizes and recognition or giving out certifications. Many lessons that were shared involved the nonprofit organization having to assign a team member solely to volunteer relations. This person would be in charge of monitoring, constant communication with the volunteers but also with fostering a sense of community, this makes volunteering feel like you are a part of something bigger, and in turn keeps them more engaged. In the survey, there were many CPB that expressed that communication with NGO's was not great, lack of guidance or structure. It could be interesting for CPI to have a team in which one person is in charge of managing relationships with the NGO's, while someone else manages the volunteer relations (as many of the interviewees recommended), and in having these two representatives from CPI, they could ease communication issues between nonprofit and peacebuilder and ensure thorough, clear and constant communication.

Limitations

It is important to note that while approximately 20 organizations were contacted for participation in the study, some of them did not respond within the expected timelines for data collection. Additionally, some organizations that did respond were unable to attend the scheduled interviews due to various reasons. Furthermore, a few of the contacted organizations did not have established virtual volunteering programs, hence they were not included in the interview analysis. These circumstances influenced the final composition of participating organizations in the study.

An important limitation in the surveys is that only 48 volunteers responded out of the 700 peace CPB, representing 6.86% of volunteers registered to the CPI. Ideally we had wanted to conduct the survey with at least 10% of the registered volunteers, which would represent 70 peace CPB. In order to mitigate this, various reminders were sent out inside the platform, and we even prolonged the survey availability, leaving it on the platform for a month. Despite our efforts, we were unable to reach a larger number of participants in the survey which would have made our conclusions more representative.

Chapter VII: Recommendations for the Cyber Peace Institute

1. Constantly monitor volunteer activities (worked hours report) to ensure they feel valued and their work is recognized.
2. Have a person dedicated to checking the accomplishments of the volunteers' activities.
3. Clearly define project objectives and activities for volunteers to enhance engagement.
4. Maintain a supportive community environment where volunteers feel part of a team.
5. Utilize online messaging channels and organize virtual meetings to facilitate communication and relationship-building.
6. Provide training opportunities for volunteers to develop their skills and knowledge.
7. Recognize volunteers for their contributions through certificates, acknowledgments, and events.
8. Focus on activities that trigger emotional motivations or hold significance for volunteers.
9. Highlight the positive impact of volunteers' efforts to boost motivation and commitment.
10. Foster trusting relationships between volunteers, beneficiaries, and team members.
11. Encourage volunteers to focus on serving or supporting beneficiaries to enhance commitment levels.
12. Provide opportunities for volunteers to engage in emotionally meaningful experiences.
13. Support volunteers in learning new tools and skills to enhance their engagement.
14. Avoid rigid schedules and excessive task assignments that may decrease volunteer motivation.
14. Actively involve volunteers in decision-making processes to empower them and increase their commitment.
15. Create a network environment where volunteers can learn from each other and find job opportunities.

References

- Adventure Volunteer. (2017). Volunteer NGO in Spain. *Adventure Volunteer*. <https://www.adventurevolunteer.org/en/volunteer-ngo/>
- Airwars. (2014). *Who We Are*. <https://airwars.org/about/team/>
- Bogotá, C. de C. de. (2022, February 1). *Cámara de Comercio de Bogotá*. <https://www.ccb.org.co/de-interes/comunicados/el-programa-de-voluntariado-empre-sarial-de-la-ccb-contribuyo-a-fortalecer-la-competitividad-de-pymes>
- Cause Specialist (Director). (2023). *Our Secrets to Volunteer Engagement Strategies*. https://www.youtube.com/watch?v=shy_vn7pu4E
- Clary, E. G., Snyder, M., & Stukas, A. A. (1996). Volunteers' Motivations: Findings from a National Survey. *Nonprofit and Voluntary Sector Quarterly*, 25(4), 485–505. <https://doi.org/10.1177/0899764096254006>
- Cordoba Peace Institute. (2002). *CPI-Geneva home*. Cpi-Geneva En. <https://cpi-geneva.org/>
- Cox, J., Oh, E. Y., Simmons, B., Graham, G., Greenhill, A., Lintott, C., Masters, K., & Woodcock, J. (2015). *Doing Good Online: An Investigation into the Characteristics and Motivations of Digital Volunteers* (SSRN Scholarly Paper 2717402). <https://doi.org/10.2139/ssrn.2717402>
- Fonselp. (2023, August 30). *Qué es Fonselp*. <https://fonselp.org/que-es-fonselp/> Forge, F. (2005). *Fundación Forge*. Fundación Forge. <http://fondationforge.org/> JFFixler Group. (2012). *Principles of Volunteer Engagement*. Xarxanet. <https://xarxanet.org/biblioteca/principles-volunteer-engagement>
- The University of Tulsa. (2024, January 4). *Gender Diversity in Cybersecurity: Why the Field Needs More Women*. <https://online.utulsa.edu/blog/gender-diversity-in-cybersecurity/>
- Volies. (2017, June 8). *Apuesta por la RSC: Responsabilidad Social Corporativa*. <https://volies.es/responsabilidad-social-corporativa-rsc/>

APPENDIX

Literature Review:

Description of the problem

The CyberPeace Institute (from now on referred to as CPI) is a Geneva based organization protecting the most vulnerable in cyberspace. They help nonprofit organizations by identifying weaknesses in their cyberspace, helping them implement safe practices and offering training in cyber security to these NGO's. The CPI has a network of professional volunteers, otherwise known as "builders" that dedicate a portion of their work day to helping solve a cybersecurity issue of a nonprofit, through the CPI's portal. The objective of this literature review is to answer the following questions: "what are the key factors that influence engagement in digital volunteering programs?" and "how can engagement in digital volunteering programs be improved to maximize positive social impact?", in order to further understand how to ultimately enhance engagement levels in digital volunteering for the CPI. Digital or virtual volunteering consists of a volunteer who completes unpaid tasks to help an organization, but does it remotely or through digital platforms on the internet (Cravens & Ellis, 2015), (Clary, 1996).

Engagement

Lasting engagement has a key role when it comes to cyber security volunteering due to the shortage of trained personnel in this field. Globally there is estimated to be around 2 million cyber security job vacancies (Mcdermott & Emery, 2023). As the research on engagement in digital volunteering programs is limited, to answer the research question "What are the key factors that influence engagement in digital volunteering programs?", the factors that influence volunteering engagement physically will also be explored. It will then be considered, how this relates to factors that influence digital volunteering. Finally, it will be explored what this could mean regarding promoting cyber security volunteering engagement.

Volunteer Engagement can be defined as enhancing organizational capabilities by fostering collaboration between employees and volunteers. It focuses on creating meaningful and impactful volunteer opportunities to generate a more significant influence and positive outcomes for the organization (JFFixler Group, 2012).

Volunteer Engagement can be transformative for NGOs because engaged volunteers enhance capacity and extend the reach of organization. They also increase

diversity in views and skill sets within an organization which enhance problem solving and even decision making within an NGO (Cause Specialist - Fundraising Tutorials, 2023). Volunteers can also act as ambassadors, building bridges between the NGO and the community it serves through trust and collaboration with community members. This can positively influence community engagement and future partnership building (Cause Specialist - Fundraising Tutorials (Director), 2023).

To consider volunteer engagement, it is important to talk about what motivates volunteers to offer their time and skills. Preliminary theories from Smith et al. (1956) and Katz (1960) suggested that a desire to satisfy various combinations of social and psychological goals motivates volunteers. Examples of these goals are acquiring understanding, expressing important values, protecting one's ego, forming social bonds and responding to rewards and punishments.

So, a key point of ensuring volunteering engagement, seems to be encouraging the development of intrinsic motivation. This is done by generating a win-win situation for the volunteer and the organization. JFFixler Group (2012) says a win-win situation is encouraged by creating a culture of "volunteer-engagement" instead of "volunteer-management". By connecting volunteers to activities which are in line with their personal passions, there is a feeling of meaningfulness. Regarding extrinsic motivations, a measurable result, where the volunteer experience high impact, also increases the feeling of meaningfulness (JFFixler Group, 2012). To achieve this, it is important for an organization to clearly define which tasks need volunteers and what the specific role of the volunteer would be. Details like time commitment enhance clarity. By having clear role and task assignment, it can be assured passionate volunteers are put into the correct roles which they can be fulfilled by (Cause Specialist - Fundraising Tutorials, 2023).

Secondly, to find motivated volunteers, it is found that having a targeted outreach and promotion is essential. Effective volunteer engagement begins with targeted outreach and promotion strategies. Utilizing social media platforms involves joining local online groups and forums. Here one can draft compelling messages to attract potential volunteers (Cause Specialist - Fundraising Tutorials, 2023). Establishing local partnerships within the desired setting of work can further enhance outreach efforts. Creating clear position descriptions with explicit roles and responsibilities, accompanied by an inspiring narrative, helps potential volunteers understand the purpose and impact of each role, illustrating how their contributions directly align with the organization's mission (Cause Specialist - Fundraising Tutorials, 2023).

Thirdly volunteers respond well to clear, but supportive leadership. Research

shows that nurturing volunteers is crucial for sustained engagement. This involves creating an environment (Cause Specialist - Fundraising Tutorials, 2023) maintained over time is important for volunteer satisfaction (Cause Specialist - Fundraising Tutorials, 2023). Providing access to all relevant information and conducting onboarding training sessions, for example through webinars, ensure that the mission of the NGO is effectively transmitted. Offering ongoing training and development opportunities also makes volunteers feel valued and contributes to their personal development. Fostering a sense of community among volunteers, contributes to their sense of belonging (Cause Specialist - Fundraising Tutorials, 2023).

Furthermore, it is important to celebrate the volunteers and their efforts. Acknowledging and celebrating volunteers is found to be another essential aspect of maintaining engagement.

Recognition efforts can be both private and public, including volunteer spotlights and personalized thank-you notes. Organizing social events and gatherings, whether in-person or virtual, provides opportunities for volunteers to share their experiences and build a sense of community. Knowledge-sharing workshops and forums or social media groups can further enhance the community-building aspect of volunteer engagement (Cause Specialist - Fundraising Tutorials, 2023).

Finally, when it comes to volunteer engagement, mobilize, and empower the volunteers. Volunteer engagement goes beyond task assignments; it involves empowering volunteers to take the lead and fostering a sense of ownership and responsibility. Volunteers become catalysts for change when given the opportunity to contribute their unique perspectives and ideas. Encouraging volunteer-led initiatives, granting autonomy in planning activities that align with the organization's values, further enhances their sense of empowerment and commitment (Cause Specialist - Fundraising Tutorials, 2023).

Engagement in Digital Volunteering

Digital volunteering is a tool used by many organizations around the world to increase their capacity to act on different issues. It also gives volunteers the opportunity to improve their professional skills and donate their time to causes they believe in. So, how can this be narrowed down to digital volunteering? Currently, there is little research conducted on the motivations and engagement of digital volunteers; however, Cox et al. (2015) completed a well done, comprehensive study, which provides interesting insights. They conclude that online volunteering may be more concerned with human capital enhancement as well as knowledge creation than more traditional forms of volunteering. To achieve these results socio-demographic as well as Volunteer Functions Inventory (VFI) questions were given to online volunteers of

the 'Zooniverse'. Zooniverse is a web-based portal where volunteers can devote their time to science-based projects and contribute to the advancement of research (Cox et al., 2015). VFI is a formal instrument for measuring volunteer motivations pioneered by Clary et al. (1998). It consists of six motivations: Protective (volunteering to escape from, or avoid, problems), Enhancement (volunteering to feel better about yourself), Social (volunteering to interact with others and grow your social network), Values (volunteering to express personal values and contribute to a cause you deem important), Understanding (volunteering to learn and gain new perspectives) and Career (volunteering to gain skills and connections which enhance your career) (Clary et al., 1996). The demographics of Zooniverse's volunteers were widely similar and there was a relatively equal number of men and women. The volunteers are predominantly university educated, white, affluent and living in cities (Cox et al., 2015). Therefore, the main conclusions on their engagement came from the difference in motivations based on the VFI.

The most significant positive VFI association between engagement level and motivation was connected to the "Understanding" motivation. The most active digital volunteers were

primarily motivated by a desire to enhance their own knowledge. The following most important motivations for volunteering engagement were Protective, Enhancement and Value. This means that the desire to escape troubles and/or feel better about themselves plays a role for more committed digital volunteers. Finally, Values seem to have played a bigger role in volunteer retention than volunteer engagement, but nevertheless of importance (Cox et al., 2015).

It appears that self-oriented motivations were more powerful predictors of motivations for digital volunteers than Career and Social motivations. This indicated that the digital volunteers were less motivated to participate out of a desire for interaction or to gain an advantage in the labor market. As these are otherwise key reasons people volunteer in the "real-world" they are an important distinction between volunteers in general and Zooniverse's digital volunteers (Cox et al., 2015). Considering that the motivation dimension "Understanding" was the most predominant in highly engaged digital volunteers, it could be recommended that projects for cyber security volunteering, a form of science-based digital volunteering, offer clear opportunities for learning incentives, also in ways that are distinct from the main task being completed.

A more recent study "Exploring Volunteer Motivation, Identity and Meaning-Making in Digital Science-Based Research Volunteering" confirms that motivational complexities of digital volunteering in science-based domains is still underexplored

(Naqshbandi et al., 2022). Their study examined the social-technical complexities of volunteers in the digital science-based research program Step-Up for Dementia revealing that the motivations were nuanced and much more complex than a desire to advance science. Naqshbandi et al. (2022) conducted a survey including qualitative and quantitative questions to gauge the history and experiences, motivations, well-being, and perceived psychological needs satisfaction of these volunteers. The findings agree with Cox et al. (2015) that “self-orientated” motivations are more relevant for digital volunteers than career or social motivations (Naqshbandi et al., 2022). Their demographic data was highly skewed towards white retired women who are highly educated. Using their findings on the well-being, intrinsic motivations and psychological needs of the volunteers, they made eight design recommendations for online science-based volunteering. “[The recommendations] focus on setting proper information and communication standards, providing flexibility in participation, promoting language diversity, involving identity-building social systems, including educational opportunities, fostering a community, improving information and communication with researchers, and showing the impact of volunteer work” (Naqshbandi et al., 2022). The table has been included below.

Table 1: Design recommendations for online science-based volunteering (Naqshbandi et al., 2022).

Recommendation	Rationale	Design strategy examples
Enhance information and communication	To provide clarity and reduce ambiguity	Regularity (e.g., reminders and updates), easy informational access (e.g., Help and FAQ), learnability (e.g., tutorial)
Promote linguistic diversity	The program should reflect the CALD found among the target users. That would improve consent seeking and participation of marginalized groups.	Language options and accessibility features, e.g., translation and definition
Provide flexibility in participation	Accommodate volunteering with life circumstances and available resources	Provide options for technology (e.g., mobile or laptop, applications) time (e.g., scheduling tools) and other aspects of participation (e.g., hybrid volunteering)
Involve identity building social systems, e.g., faith, professional, govt units and NGOs closely linked to the research cause	Help with initial recruitment of volunteers and their long-term well-being and engagement. This would potentially engage more CALD in volunteering	Highlight collaborations with relevant institutions, people and influencers in promotional campaigns and within the platform
Show impact of volunteer work	To highlight their achievement and acknowledge contribution to the cause	Feedback and acknowledgement features for volunteers to observe positive changes associated with their individual or collective work, e.g., through gamification
Foster a community of volunteers	They can form groups based on interests and shared experiences	Community features, such as forums, DMs, etc.
Build relationships with researchers and other key members	Resolve issues of science communication and build trust	Direct communication, e.g., chats, forums, etc., or indirect information, e.g., featured scientist associated with the program
Include educational and learning opportunities	Engagement of those who volunteer for growth and learning	Learning and informational features about relevant causes and associated information, e.g., wikis, webinars, informational blog posts, etc.

Digital Volunteering for Social Impact:

In order to build tools to strengthen cyber security through digital volunteering the following question will be answered: How can engagement in digital volunteering programs be improved to maximize positive social impact?

First, it is important to identify successful experiences of virtual volunteering and the good practices implemented by the organizations to keep their volunteers engaged. Second, it is necessary to identify how the pandemic has influenced virtual volunteering. Third, the challenges of cybersecurity for non-profit organizations will be identified. Finally, there will be an analysis of these successful experiences and challenges in order to intertwine the different aspects found in the literature and answer the main question.

1. Successful experiences and good practices in digital volunteering programs:

Virtual volunteering is one of the opportunities that technology and the Internet have brought to society. In general, virtual volunteering brings new opportunities to address different kinds of problems and creates benefits in diverse dimensions such as social development, climate change, human rights and cyber security. Here are some examples of these successful experiences and the good practices involved:

Cybersecurity in Estonia:

The origin of the term “cyber volunteering” started around 2002 in the United States after the Federal Emergency Management Agency's NET Guard program, promoted by Senator Ron

Wyden. The aim was to promote “the establishment of a national technology guard comprised of ‘local teams of volunteers with expertise in relevant areas of science and technology, to assist local communities to respond and recover from attacks on information systems and communications networks” (McDermott & Emery, 2023). Years later the Estonian government implemented and improved the American cyber volunteering initiative in reaction to Russian cyber-attacks (McDermott & Emery, 2023).

The initiative involved the creation of a voluntary cyber defense unit in Estonia consisting of citizens with experience in cybersecurity, as well as professionals from other fields, such as lawyers and economists. These volunteers, who are specialists in their respective fields, have been actively involved in protecting Estonian cyberspace.

The initiative has been very successful, and it has managed to keep its volunteers engaged by providing them with opportunities to use their skills and knowledge outside of their daily work. Volunteers are “patriotic” people who are committed to protecting Estonian cyberspace. The initiative has also managed to foster a sense of community and cooperation among volunteers as they work together to respond to cyber threats and ensure the security of the country's digital

infrastructure (McDermott & Emery, 2023).

Therefore, in the case of the Estonian volunteer cyber security force one of the good practices identified were the promotion of personal and collective values such as patriotism. Also, the creation of a community environment, according to the authors of "Creating a volunteer force: Strategy and Options", was a good practice implemented in order to keep the volunteers engaged with the virtual work (McDermott & Emery, 2023).

Global Land Restoration:

In the case of the environment, one successful experience is the United Nations Convention to Combat Desertification (UNCCD) using virtual volunteering as a tool to promote "innovative ways to combat climate change and its effects" (UN Volunteers, 2023). The UNCCD created the Global Land Restoration Information Hub with 126 volunteers around the world to include various data sets related to land and habitat restoration. To gather data at local and global levels, volunteers engaged through UNV and have collaborated with the UNCCD Headquarters in Germany since March 2023 (UN Volunteers, 2023). This methodology allowed the Hub to connect people from different parts of the world in order to build a database simultaneously and avoid excessive costs in transportation and other expenses.

According to the UNCCD, this experience was successful thanks to the commitment and hard work of the volunteers. In the publication "Supporting land restoration and preservation through online volunteering with UNCCD" (2023), it can be seen that volunteers expressed a sense of purpose and fulfillment in contributing to the UNCCD mission. This means that their values and recognition of the purpose of their work keep them engaged in the volunteer work they do.

It is also possible to see the importance of maintaining close interaction with Online Volunteers from the training sessions to the end of the project. Online Volunteers expressed that feeling part of the organization kept them more engaged. For example, when they were added to the UNCCD mailing list to stay informed about upcoming webinars and events, and the celebration of their contributions. This practice creates a sense of community and fosters mutual trust and interaction. Finally, volunteer work has helped the UNCCD make progress in protecting the environment, restoring degraded lands, preventing habitat loss and promoting sustainable land management.

Ribbon App

Ribbon is an App that looks to “bring people together from different cultures, backgrounds and races. – To - overcome racial discrimination and improve human relationships” (Ribbon, 2023). In the paper “Digital Volunteering Through Social Innovation: The Ribbon Case Study” the authors wanted to identify the factors that lead to volunteer engagement and donations with this social innovation platform that contributes to sustainable development (Pinochet et al., 2022).

Throughout the study, the authors use different methodologies to identify the elements that promote donations and volunteering. In terms of volunteer engagement, they found that: Flexible opportunities, recognition and appreciation, clear communication and feedback, training and skill development, creating a sense of community, providing meaningful and impactful work, and opportunities for leadership and growth, are the most important actions to take (Pinochet et al., 2022).

In these terms, by implementing the good practices highlighted in the paper, organizations can create a positive and attractive volunteer experience that leads to long-term engagement, and greater impact in the projects supported by the volunteers. Categorizing the elements found it is possible to say that organizations should build volunteer programs that allow professional growth, a sense of community and a clear purpose on the activities (values) with the aim of engaging volunteers.

2. The Pandemic of Covid-19 and Digital Volunteering

The pandemic that began in 2019 was a biological catastrophe that claimed the lives of millions of people around the world and changed the way we work in many areas. In the case of volunteering, the possibility of donating one's time to a cause became almost impossible due to the risk of getting infected or spreading the virus. Therefore, one of the effects of Covid-19 is that it worked as a platform to increase the opportunities of virtual volunteering around the world, because it was one of the ways to work in different causes without being in danger.

Covid-19, being a clear threat to all humanity and releasing one of the worst global crises, motivated millions of people to look for ways to mitigate the negative effects of the pandemic and help those who needed it most. Likewise, a "large amount of free time created among a large part of the population due to being laid off from work or being put on unpaid leave" (Kulik, 2021) was generated. Part of the population found in volunteering ways to interact socially with other people, occupy their free time, and "preserving their self-image as being essential and contributing to the community in a time of emergency" (Kulik, 2021).

According to Kulik (2021) and his paper “Multifaceted volunteering: The volunteering experience in the first wave of the COVID-19 pandemic in light of volunteering styles” we can highlight the importance of communication and support both externally (with the public/beneficiaries) and internally (with volunteers) in the context of volunteering. The paper recognizes the evolving nature of volunteering, especially with the advent of virtual and hybrid approaches due the pandemic and suggests proactive measures to improve the overall volunteering experience for both volunteers and the community they serve.

The study “COVID-19 and its Impact on Volunteering: Moving Towards Virtual Volunteering” by Erik Lachance (2020) gives a very interesting perspective of the influence of the Pandemic in virtual volunteering and gives some recommendations in terms of engaging volunteers. Lachance (2020) affirms that the challenges in engaging virtual volunteers include issues such as delayed responses, volunteers leaving roles without notice, and the added barrier of technological communication for leisure practitioners. Despite these challenges, volunteers have expressed a need for increased communication and task load. Therefore, to address engagement issues, it is recommended that weekly virtual meetings be held with virtual volunteers and that their tasks would be modified based on their feedback. In addition, in terms of retention, it is recommended to establish long-term roles that could include activities such as policy development, project management, and editing, benefiting organizations by retaining experienced individuals (Lachance, 2020).

3. Challenges of cybersecurity for non-profit organizations:

Charitable, not-profit organizations and foundations around the world play a fundamental role in our society, complementing the actions of the public and private sectors in promoting economic and social development, protecting human rights, combating climate change, among many other causes. Despite the fundamental nature of these types of organizations, they can face many vulnerabilities from organized crime, thieves, and terrorists. The threats they face have moved from the physical to the digital spectrum. Many actors seek to exploit the vulnerabilities of NGOs to steal resources, databases, and commit various crimes.

The challenges that may affect more the goals of NGOs have not been widely studied by the academy as long as it is not very easy to find literature about it. Nevertheless, according to the Cyber Peace Institute, the risks that NGOs may face are phishing, stolen or accidentally leaked information, threats, attacks, and others (CyberPeace Institute, 2023).

4. How can engagement in digital volunteering programs be improved to maximize positive social impact?

Integrating virtual volunteering into cybersecurity is a great opportunity to support and protect the work of NGOs on social, economic, humanitarian, environmental, etc. issues. However, given the challenges of engaging volunteers to fulfill missions and achieve goals, there is a need to develop strategies that enable engagement. Looking at the successful models analyzed above, such as Estonia's Cyber Defense Initiative, UNCCD's Global Land Restoration Information Hub, the Zooniverse platform, and the Ribbon app, it can be highlighted that in almost all cases, the importance of continuous communication, recognition, clear ethical and moral values (patriotism, common causes), learning and growth opportunities, and community building are good practices to effectively retain and engage virtual volunteers. In summary, the best practices identified in the literature are:

1. Promote personal and collective values: Emphasize project values such as patriotism, social justice, climate resilience, safety, etc. to implant a sense of purpose and commitment in virtual volunteers.
2. Create a community environment: Foster a community atmosphere to increase engagement and collaboration among virtual volunteers. Execute webinars, events, celebrations, etc.
3. Provide ongoing communication: Establish regular communication channels, such as weekly virtual meetings, to provide updates and maintain engagement. Maintain clear and open communication channels, provide feedback to volunteers, and ensure a transparent process.
4. Learning and skill development: Provide opportunities for ongoing learning and skill development to keep volunteers motivated. Design assignments that match volunteers' skills and interests to ensure meaningful engagement.
5. Leadership and Growth Opportunities: Provide opportunities for leadership, networking and personal growth within the volunteer experience.
6. Recognition and Appreciation: Acknowledge the contributions of virtual volunteers through recognition and appreciation efforts.
7. Establish long-term roles: Create roles that extend beyond short-term projects to encourage volunteer retention and sustainable impact.

Overall, in response to the first research question posed, “what are the key factors that influence engagement in digital volunteering programs?”, research has found that volunteers are

more engaged when a program is able to stimulate intrinsic motivation. Therefore, volunteer programs are more appealing to the volunteer when the activities align with

their personal passions and their help feels meaningful. It is also important to note that how the program is promoted, how leadership intends on managing the program, and how volunteers are celebrated and empowered for their help are also key factors in keeping volunteers engaged. In regards to the second research question, “how can engagement in digital volunteering programs be improved to maximize positive social impact?” research showed many success stories that have made an impact like for example the UNCCD and their findings on innovative ways to combat climate change. Digital volunteering programs promote social impact when NGOs of different causes are benefited by the work of the virtual volunteer. In the case of the CPI specifically, the platform they have created helps assure that different causes and nonprofits worldwide have a safe cyberspace in order for them to continue to make a positive impact in their respective fields. In the coming months, the authors will research with the CyberPeace builders. It will be examined if the demographics and motivations of the CyberPeace builders’ line up with those of the digital volunteers at Zooniverse and / or Step Up for Dementia. Then further discussions and possible recommendations for increasing volunteer engagement through this platform and specifically in the area of cyber volunteering

References Literature Review

- Cause Specialist - Fundraising Tutorials (Director). (2023). *Volunteer Engagement: Strategies for Loyal and Motivated Volunteers*. Retrieved from YouTube: https://www.youtube.com/watch?v=shy_vn7pu4E
- Clary, E. G. (1996). Volunteers' motivations: Findings from a national survey. *Nonprofit and Voluntary Sector Quarterly*.
- Cox, J., Young Oh, E., Simmons, B., Graham, G., Greenhill, A., Lintott, C., . . . Woodcock, J. (2018). *Doing Good Online: An Investigation into the Characteristics and Motivations of Digital Volunteers*. Retrieved from SSRN Electronic Journal, 16: <https://doi.org/10.2139/ssrn.2717402>
- Cravens, J., & Ellis, S. J. (2015). *The Last Virtual Volunteering Guidebook*. Retrieved from <https://www.coyotecomunications.com/vvwiki/definition.shtml>
- CyberPeace Institute. (2023). *FREE SERVICES & TOOLS FOR NGOS*. Retrieved from <https://cyberpeaceinstitute.org/services-and-tools/>
- Emery, & McDermott, W. (2023). *CREATING A CYBER VOLUNTEER FORCE : STRATEGY AND OPTIONS*. Retrieved from <https://www.mwe.com/pdf/creating-a-cyber-volunteer-force-strategy-and-options/JFFixler>
- Group. (2012). *Principles of Volunteer Engagement*. Retrieved from https://xarxanet.org/sites/default/files/jffixler_principles_of_volunteer_engagement.pdf
- Kulik, L. (2021). *Multifaceted volunteering: The volunteering experience in the first wave of the COVID-19 pandemic in light of volunteering styles*.
- Lachance, E. (2020). *COVID-19 and its Impact on Volunteering: Moving Towards Virtual Volunteering*.
- Naqshbandi, K. Z., Jeon, Y.-H., & Ahmadpour, N. (2022). *Exploring Volunteer Motivation, Identity and Meaning-Making in Digital Science-Based Research Volunteering*. Retrieved from *International Journal of Human-Computer Interaction*, 0(0), 1–22. :<https://doi.org/10.1080/10447318.2022.2109246>
- Pinochet, L. H., de Freitas, H. B., Pardim, V. I., & de Azevedo, M. C. (2022). *Digital volunteering through social innovation: The Ribbon case study*. *Revista Pensamento Contemporâneo Em Administração*. Retrieved from <https://doi.org/10.12712/rpca.v16i2.53571>
- Ribbon. (2023). *Ribbon APP*. Retrieved from <https://www.ribbon.my/>
- UN Volunteers. (2023). Supporting land restoration and preservation through Online Volunteering with UNCCD.

The Interviews Grid:

In alignment with the research objectives, the following semi-structured interview guide was developed to facilitate consistent data collection across all interviews. This guide was used to ensure uniformity in assessing responses and gathering relevant information.

	Question	Objective
Block 0: Introduction and Icebreaker questions		
1	We have checked your interesting CV / tell us how you got into X organization	To let the interviewee talk a little bit about themselves
2	Are you living in X city?	To have a more informal question to let the interviewee talk about something general
3	Introduction to the interview: Interviewers presentation, general questions, Grid blocks and objectives	To give the interviewee the general information of the interview.
Block 1: Current Level of Engagement		
1	Can you tell us about the programs you have for virtual volunteers?	To know the activities they do
2	How long have you had these programs with virtual volunteers running?	To know the experience they have in terms of time
3	What are the main types of activities or projects that volunteers typically engage in?	To identify the activities that are more attractive for virtual volunteers
4	How do you measure or assess the success of digital volunteering initiatives in your organization?	To identify how the actors evaluate the level of success of their volunteer programs
5	Have you observed any trends or changes in volunteer engagement levels over time?	To identify good practices or lessons learned
6	Can you provide insight into the current level of engagement among participants in your digital volunteering programs? On a scale of 1-5 being 5 totally engaged - How engaged would you say your volunteers are?	To identify the actors that have more engaged volunteers

Block 2: Key factors that influence level of engagement		
7	How does your organization approach volunteer recruitment and retention in digital volunteering initiatives?	To define different recruitment and retention practices for virtual volunteers
8	If any, what are the challenges or barriers that impact the level of engagement among digital volunteers?	To identify challenges that actors have faced during their virtual volunteer programs
9	Can you identify any strategies or practices that have been particularly effective in increasing volunteer engagement? Can you give us examples?	To identify practices that have been effective in increasing volunteer engagement
	Are there any specific characteristics or attributes that make certain individuals more likely to engage in digital volunteering activities?	To identify characteristics in virtual volunteers that make them more likely to engage
Block 3: Recommendations to the Cyber Peace Institute Volunteer Program: The CPI has a volunteering program with professionals in cyber security, and they aim to help other nonprofit organizations protecting their cyber space for free.		
11	Are there any best practices or lessons learned from your organization's experience with digital volunteering that could be applied to the Cyber Peace Institute's program?	To learn any recommendations they may have
12	What are the practices that you do not recommend implementing because they have not worked or lowered volunteer engagement?	To know what practices have not worked previously
13	In your opinion, what are the most important elements for creating a supportive and engaging environment for digital volunteers?	To identify elements that enhance engagement

Interview transcriptions:

Survey Results Closed Questions

Record ID	Sentiment	Date	Source	Survey ID	Survey Type	CPB-survey-question-1	2. My friend is a volunteer on a project, and I wish to be a volunteer on a project also.	3. I am concerned about cyber security issues for NGOs.
3.18094E+11	Not Applicable	04.04.2024 16:27	Shareable Link	3	Custom Survey	5	7	7
3.17568E+11	Not Applicable	03.04.2024 10:49	Shareable Link	3	Custom Survey	1	1	7
3.15002E+11	Not Applicable	27.03.2024 11:27	Shareable Link	3	Custom Survey	5	6	7
3.15397E+11	Not Applicable	27.03.2024 02:21	Shareable Link	3	Custom Survey	6	1	5
3.15373E+11	Not Applicable	27.03.2024 00:54	Shareable Link	3	Custom Survey	3	5	7
3.15352E+11	Not Applicable	26.03.2024 23:25	Shareable Link	3	Custom Survey	5	6	7
3.15112E+11	Not Applicable	26.03.2024 11:34	Shareable Link	3	Custom Survey	3	1	7
3.15103E+11	Not Applicable	26.03.2024 10:13	Shareable Link	3	Custom Survey	3	3	5
3.15093E+11	Not Applicable	26.03.2024 09:17	Shareable Link	3	Custom Survey	7	1	7
3.15095E+11	Not Applicable	26.03.2024 09:15	Shareable Link	3	Custom Survey	7	7	7
3.14895E+11	Not Applicable	25.03.2024 19:11	Shareable Link	3	Custom Survey	2	2	6
3.14899E+11	Not Applicable	25.03.2024 18:34	Shareable Link	3	Custom Survey	7	1	7
3.14882E+11	Not Applicable	25.03.2024 17:55	Shareable Link	3	Custom Survey	6	4	5
3.14879E+11	Not Applicable	25.03.2024 17:29	Shareable Link	3	Custom Survey	6	6	7
3.14822E+11	Not Applicable	25.03.2024 14:44	Shareable Link	3	Custom Survey	4	7	7
3.14817E+11	Not Applicable	25.03.2024 13:47	Shareable Link	3	Custom Survey	6	6	6
3.14789E+11	Not Applicable	25.03.2024 12:34	Shareable Link	3	Custom Survey	5	7	7
3.1479E+11	Not Applicable	25.03.2024 12:28	Shareable Link	3	Custom Survey	7	7	7
3.14769E+11	Not Applicable	25.03.2024 12:19	Shareable Link	3	Custom Survey	7	6	7
3.14772E+11	Not Applicable	25.03.2024 11:38	Shareable Link	3	Custom Survey	1	6	6
3.14773E+11	Not Applicable	25.03.2024 11:36	Shareable Link	3	Custom Survey	1	1	7
3.12373E+11	Not Applicable	15.03.2024 11:57	Shareable Link	3	Custom Survey	7	3	7
3.12311E+11	Not Applicable	15.03.2024 04:19	Shareable Link	3	Custom Survey	1	1	7
3.12031E+11	Not Applicable	14.03.2024 06:38	Shareable Link	3	Custom Survey	6	7	5
3.11946E+11	Not Applicable	13.03.2024 23:19	Shareable Link	3	Custom Survey	1	1	7
3.11911E+11	Not Applicable	13.03.2024 20:38	Shareable Link	3	Custom Survey	7	6	7
3.11906E+11	Not Applicable	13.03.2024 20:11	Shareable Link	3	Custom Survey	1	1	7
3.1185E+11	Not Applicable	13.03.2024 17:21	Shareable Link	3	Custom Survey	6	1	5
3.11845E+11	Not Applicable	13.03.2024 16:55	Shareable Link	3	Custom Survey	1	1	5
3.11828E+11	Not Applicable	13.03.2024 15:47	Shareable Link	3	Custom Survey	1	1	7
3.11823E+11	Not Applicable	13.03.2024 15:22	Shareable Link	3	Custom Survey	2	2	5
3.11825E+11	Not Applicable	13.03.2024 15:21	Shareable Link	3	Custom Survey	3	1	6
3.11821E+11	Not Applicable	13.03.2024 15:15	Shareable Link	3	Custom Survey	3	3	7
3.11798E+11	Not Applicable	13.03.2024 14:26	Shareable Link	3	Custom Survey	1	1	7
3.11362E+11	Not Applicable	12.03.2024 06:12	Shareable Link	3	Custom Survey	1	1	7
3.11318E+11	Not Applicable	12.03.2024 03:28	Shareable Link	3	Custom Survey	5	6	6
3.11304E+11	Not Applicable	12.03.2024 01:15	Shareable Link	3	Custom Survey	7	7	7
3.11268E+11	Not Applicable	11.03.2024 23:54	Shareable Link	3	Custom Survey	5	6	7
3.11158E+11	Not Applicable	11.03.2024 17:38	Shareable Link	3	Custom Survey	7	2	7
3.1112E+11	Not Applicable	11.03.2024 15:39	Shareable Link	3	Custom Survey	3	1	5
3.11111E+11	Not Applicable	11.03.2024 15:15	Shareable Link	3	Custom Survey	5	1	3
3.11095E+11	Not Applicable	11.03.2024 14:19	Shareable Link	3	Custom Survey	3	3	7
3.1109E+11	Not Applicable	11.03.2024 13:39	Shareable Link	3	Custom Survey	7	7	7
3.11074E+11	Not Applicable	11.03.2024 12:22	Shareable Link	3	Custom Survey	3	1	7
3.11067E+11	Not Applicable	11.03.2024 11:59	Shareable Link	3	Custom Survey	3	3	5
3.11066E+11	Not Applicable	11.03.2024 11:46	Shareable Link	3	Custom Survey	4	1	6
3.11064E+11	Not Applicable	11.03.2024 11:27	Shareable Link	3	Custom Survey	1	1	4
3.1107E+11	Not Applicable	11.03.2024 11:26	Shareable Link	3	Custom Survey	4	4	6

4. People I am close to want me to volunteer.	5. Volunteering makes me feel important.	6. People I know share an interest in cyber security service.	7. No matter how bad I've been feeling, volunteering helps me to forget about it.
5	7	7	7
1	1	5	1
4	7	7	7
1	4	4	1
3	5	5	7
4	7	7	4
2	4	3	5
1	5	7	6
7	7	7	7
4	7	7	7
5	5	6	3
1	7	7	7
2	4	5	2
7	7	7	6
7	7	7	7
6	6	6	6
6	7	7	7
5	7	7	4
7	7	7	7
1	4	4	1
3	3	3	3
1	3	3	3
1	3	6	3
3	5	6	5
1	7	5	1
4	7	6	6
1	1	4	1
6	6	6	3
1	6	6	2
1	4	7	4
3	3	5	1
1	6	6	3
5	5	3	4
1	4	5	3
1	4	4	1
4	6	6	5
5	7	7	7
4	5	6	6
1	4	6	5
1	2	1	1
1	7	2	5
5	4	5	5
7	7	7	7
1	5	7	3
2	2	5	2
1	4	1	1
1	5	1	1
2	5	4	6

8. I am genuinely concerned about the particular NGO I am helping.	9. By volunteering I feel less lonely.	10. Through CyberPeace volunteering I can make new contacts that might help my business or career.	11. Through CyberPeace volunteering I can make new contacts that might help my business or career.
7	7	7	4
1	1	1	1
5	3	7	6
1	1	7	1
5	5	5	3
7	3	7	3
4	2	3	5
4	1	5	1
7	7	7	7
7	7	7	7
3	4	6	1
4	1	7	7
4	4	4	3
7	7	3	6
7	7	7	3
6	6	6	6
7	7	5	3
7	3	7	3
7	7	7	7
4	1	4	4
5	1	1	1
2	4	6	2
7	1	2	1
3	3	7	3
6	1	1	1
7	1	7	1
7	1	7	1
5	6	7	3
4	1	5	1
5	1	4	1
5	1	4	1
6	2	2	6
7	4	5	4
6	1	2	3
3	1	3	1
6	4	6	4
3	6	7	6
7	5	5	2
7	4	7	1
4	1	6	1
1	2	3	4
6	3	3	3
7	7	7	7
7	2	4	2
2	1	4	1
5	1	4	1
3	1	5	1
5	6	6	5

12. I can learn more about the cause for which I am working through cyber peace volunteering.	13. Volunteering increases my self-esteem.	14. Volunteering allows me to gain a new perspective on things.	15. Volunteering allows me to explore different career options.
7	7	7	7
3	1	7	2
5	6	6	7
6	5	6	7
5	6	7	5
7	7	7	7
5	5	6	2
3	3	7	3
7	7	7	7
7	7	7	7
5	5	7	5
7	1	7	7
4	4	5	3
7	6	7	5
7	7	7	1
6	6	6	6
7	7	7	7
7	4	7	7
7	7	7	7
6	1	6	1
3	1	4	1
5	4	7	5
5	2	5	1
6	6	7	7
5	1	6	3
7	7	7	7
7	1	1	1
6	7	7	7
6	3	6	4
5	2	7	4
4	3	5	2
6	6	7	3
6	6	6	5
5	4	6	2
1	1	4	1
5	6	6	4
6	7	7	7
5	4	5	5
7	4	6	7
7	2	7	6
6	7	6	3
5	5	6	4
7	7	7	7
7	5	7	4
5	3	5	2
3	4	5	2
3	4	4	1
5	4	6	4

16. I feel compassion toward the NGOs in need of cyber security.	17. Others with whom I am close place a high value on cyber peace.	18. Volunteering lets me learn through direct "hands on" experience.	19. I feel it is important to help (preserve) cyber peace.	20. Volunteering helps me work through my own personal problems.
7	7	5	7	5
3	1	6	5	1
6	5	7	6	5
6	1	6	6	1
7	2	5	5	3
7	7	7	7	4
7	2	4	7	2
7	5	6	7	2
7	7	7	7	5
7	7	7	7	7
5	6	5	6	4
7	4	7	7	7
5	5	5	7	4
7	6	5	7	5
7	7	7	7	7
6	6	5	6	4
7	7	7	7	7
7	7	7	7	4
7	7	7	7	7
6	6	4	7	1
4	3	1	6	1
5	4	7	6	2
6	1	2	6	1
3	4	7	7	3
6	1	3	6	1
7	7	7	7	1
7	1	4	7	1
5	7	7	7	3
5	2	6	6	2
1	7	6	7	1
6	4	5	6	1
7	3	6	7	2
5	4	5	4	2
5	1	4	7	1
4	4	6	7	1
6	6	6	6	5
7	7	7	7	7
7	4	5	7	3
7	3	7	7	5
2	1	6	7	1
5	1	6	7	2
7	6	6	6	3
7	7	7	7	7
7	2	7	4	2
5	4	3	6	1
6	1	5	6	2
3	1	5	4	1
6	4	7	6	3

21. Volunteering will help me succeed in my chosen profession.	22. I can do something for a cause that is important to me.	23. Volunteering is an important activity to the people I know best.	24. Volunteering is a good escape from my own troubles.
7	7	7	7
2	2	1	1
5	7	7	6
4	6	4	1
5	6	5	4
7	7	7	5
2	6	3	2
5	7	6	1
7	7	7	5
7	7	7	7
6	5	4	4
7	7	7	1
4	5	4	4
5	7	7	5
7	7	7	7
6	6	6	6
7	7	6	4
7	7	7	4
7	7	5	5
1	4	4	1
1	1	3	1
6	7	2	1
2	3	1	1
7	5	6	3
1	6	7	1
7	7	7	1
1	7	1	1
5	6	3	3
4	6	2	2
4	7	6	4
2	7	4	1
3	7	2	1
2	6	3	2
4	7	4	1
1	4	1	1
6	6	6	4
7	7	7	4
4	6	5	3
7	7	4	3
3	7	1	1
6	5	1	3
3	6	5	5
7	7	7	7
5	5	5	2
2	6	3	1
4	7	1	1
3	3	1	1
4	7	3	4

25. I can learn how to deal with a variety of people.	26. Volunteering makes me feel needed.	27. Volunteering makes me feel better about myself.	28. Volunteering experience will look good on my résumé/ CV.
7	7	7	7
4	1	1	1
7	5	7	4
6	4	4	5
6	4	7	4
7	6	7	4
5	5	5	3
6	6	6	7
7	7	7	7
7	7	7	4
5	5	5	5
5	1	1	7
5	4	5	4
7	7	7	5
7	1	1	7
6	6	6	6
7	7	7	5
7	7	7	7
7	7	7	7
6	4	1	4
3	1	1	4
6	2	4	2
1	1	1	2
7	5	7	7
1	5	6	1
7	4	7	7
1	1	1	4
7	7	4	7
2	2	2	2
5	4	4	2
5	3	1	2
6	5	5	3
6	4	5	5
5	4	4	4
3	1	4	1
5	6	6	5
7	7	7	7
5	4	4	5
7	4	4	7
6	1	1	2
5	7	7	7
5	5	5	6
7	7	7	7
7	4	5	5
4	2	2	5
3	1	3	3
1	1	3	7
6	6	4	6

29. Volunteering is a way to make new friends.	30. I can explore my own strengths while/through volunteering.	31. Are your (volunteering) needs currently being met through the CyperPeace Institute?
6		7 Yes - fully
2		3 Yes - fully
5		6 Partially
5		6 Mostly
5		6 Not at all
7		7 Yes - fully
2		4 Partially
4		4 Partially
7		7 Yes - fully
7		7 Yes - fully
5		7 Not at all
7		7 Yes - fully
5		5 Partially
5		5 Mostly
7		7 Yes - fully
6		6 Mostly
6		7 Yes - fully
7		7 Yes - fully
7		7 Partially
4		6 Mostly
1		3 Mostly
6		6 Partially
2		4 Yes - fully
7		7 Yes - fully
2		2 Not at all
7		7 Yes - fully
7		6 Mostly
7		7 Partially
5		5 Partially
5		6 Mostly
3		4 Partially
3		6 Yes - fully
3		5 Mostly
4		5 Mostly
5		6 Yes - fully
5		6 Mostly
7		7 Yes - fully
4		5 Mostly
7		7 Not at all
4		5 Mostly
3		6 Partially
5		5 Mostly
7		7 Yes - fully
3		7 Mostly
3		4 Partially
1		4 Yes - fully
4		1 Yes - fully
7		6 Partially

35. What is your age?	36. What is your highest degree?	37. What is your gender?
41-50	Bachelor	Male
31-40	Master	Male
51-60	Bachelor	Male
41-50	Mandatory schooling	Female
41-50	Bachelor	Male
31-40	Master	Female
51-60	PhD	Male
41-50	Master	Male
41-50	Master	Female
21-30	Bachelor	Male
41-50	Master	Male
41-50	Bachelor	Male
31-40	Master	Male
41-50	Master	Male
51-60	Master	Male
41-50	Bachelor	Male
41-50	Master	Male
31-40	Bachelor	Male
41-50	Master	Male
41-50		Male
41-50	Bachelor	Male
21-30	Bachelor	Male
31-40	Bachelor	Male
21-30	Bachelor	Male
41-50	Master	Male
31-40	Bachelor	Male
31-40	Master	Male
31-40	Master	Female
31-40	Bachelor	Female
41-50	Bachelor	Female
31-40	Master	Male
31-40	Master	Male
31-40	Master	Male
31-40	Master	Male
51-60	Master	Male
31-40	Bachelor	Other/ prefer not to say
41-50	Master	Female
31-40	Bachelor	Male
21-30	Bachelor	Female
51-60	Bachelor	Male
41-50	Bachelor	Male
51-60	Master	Male
41-50	Bachelor	Male
21-30	Bachelor	Male
51-60	Mandatory schooling	Male
21-30	Master	Male
41-50	Master	Male
41-50	Master	Male

Survey Results Open Questions

32. If your needs were not 100% met, do you have any suggestion on how the CyperPeace Institute can better meet them?

- I need to be more involved
- Based in Asia-Pacific region, we need more projects to tackle and support.
- I want to hear from other volunteers to reduce concerns of imposter syndrome to support the NGO and CyberPeace.
- I've been applying, but it appears that there's no available opportunity yet.
- I'd prefer candidacy to be unrelated with employer. This is a purely personal, individual and independant engagement.
- It's not clear what a task looks like before I commit to one. For example, is there any training on how to complete an OSINT search, or access to the presentation for NGO cyber skills? I am nervous to commit to a task then appear untrained to the NGO.
- Hard to find time between work commitments.
- Have not started any volunteer work, question not applicable for me
- I would love more opportunities in the field of Digital Forensics/malware reversing which is my main area of interest
- Opportunity to meet Cyberpeace Institute members in person and have photographs together
- Difficult to estimate the added value for the NGO. Was my help really helpful ?
- I would like the ability to do more face to face volunteering, however I understand this can be difficult to achieve with the distributed nature of NGOs
 - consolidate organizational and project management tasks to reduce waiting/blocked missions to increase focus (See answer to question 33.)
 - Create a platform that allows independent / self-employed cybersecurity practitioners to join the Cyber Peace Builders (I am going to transition to self-employment soon)
- You can talk to each individual and make them useful for the projects, most people dont know how to get in the project or how to support in others project, so try to look into individuals and ask to join for some random project as a support
- Expand the types of missions being offered
- Guideline and hard to align schedule to meet or work together
- Other, more interesting and advanced cyber security assessments like external/internal penetration testing for NGOs. For bigger ones maybe red/purple teaming - I am happy to assist here because I do that in the private sector!
- Maybe ensure that NGOs that request help are responsive. No particular suggestion.
- For experienced builders, provide more possibilities to contribute to other topics or projects of the CPI outside the standard Builders missions, such as research, investigations, program development, policy, etc.
- I haven't gotten started volunteering with institute. I applied but I'm yet to hear back.
- Requestors were not very timely with their answers, they request, you offer, then disappear for months...
- go beyond security and into practical use recommendation for the great platforms Microsoft, Google, Amazon etc. provide to NGOs
- more opportunities for volunteers to collaborate with eachother.
- I want to volunteer working in a team and not alone by myself. No real team work feeling.

- more ways to assist volunteers gain more visibility for the good work they do.

33. Would you like to share an experience you have had during your time volunteering for CyperPeace Insitute? If yes please do so below.

- Have been learning about NGOs
- Knowledgable
- Experienced good and productive interaction with the team
- I did an Email Security Mission. I learned that the NGO was in need of information about past missions' state and their follow ups, and that the best way I could help sustainably was to loop in a Cyber Peace Institute Member. As part of the mission, I did my best to also address potential email security issues in a short report that I Emailed to the NGO.
- It was a amazing experience because I had the opportunity to share my knowledge with a NGO that is helping people through education with a meaningful purpose.
- My first experience volunteering with the CPI was memorable. I had the initial conversation with the client, and at they end they mentioned how just speaking to me made them feel safer already. It was a great thing to hear;though I have been doing penetration testing for a while already, seeing this direct impact made me appreciate the value of the work I provide.

34. Would you like to share a challenge you have faced while volunteering for the CyperPeace Institute? If yes please do so below.

- NGO responding is a challenge
- Electricity failure on the national grid in Nigeria led me to purchase a solar power system so I can continue working on the project
- Main issue is finding time to volunteer...
- Some of the NGOs are not proactive/responsive in their communications
- I find it hard to consistently and regularly block time for volunteering here. I am planning to transition to self employment in hopes of partially addressing that obstacle, but I am currently unsure if that might conflict with the Cyber Peace Institutes policy for Cyber Peace Builders' required employment situation.
- My biggest challenge is juggling the volunteer work with an extremely demanding job. Both are important to me.
- It would have been nice if you can talk to each individual and assign them in any project as support so they can understand whats actually happening inside and they to know the knowledge and they start taking up projects
- It isn't easy to align schedules to meet or work together with the NGO with a full time job.
- I spend a lot of time in my regular job looking at individual compromises at a very technical level. I don't deal with policy or initial setup as we're already in an established area in a large organization. This gives me a fresh perspective on where some small organizations are that need help just getting started and hearing their plans and how to help them implement lasting cybersecurity practices.
- I am just getting started and it has been slightly hard just knowing how this all works. It would be nice to have a 10-15 minute video showing how this all works from a volunteer perspective and actually work through the entire process, including even an overview of what was presented.
- Trying to give clients the level of service i want to provide them is difficult when doing this in my free time. Because of my job, I typically use a weekend or out of hours time to deliver

services. I don't want to sacrifice the quality of the service so it means engagements can take a lot of my free time. I am happy doing it regardless and it is more of a time management challenge rather than a problem which needs to be solved.

- Time estimate for the mission was too low (only 2 hours!) and I found myself with no more time available to finish
- Mission expected from NGO was different than the description
- NGO wanted to prioritize other mission and not the one I selected
- The lack of initial resources for some types of missions (i.e. a template, boilerplate material etc) means that I have to allocate more time than the "estimated" for the first time doing this mission. After the first mission, it's no problem, since I have my own material as a "template".