Global Resource Management

Vol.10

Journal for Information, Study and Discussion of Global Resource Management, Doshisha University
同志社大学リーディング大学院　グローバル・リソース・マネジメント ジャーナル

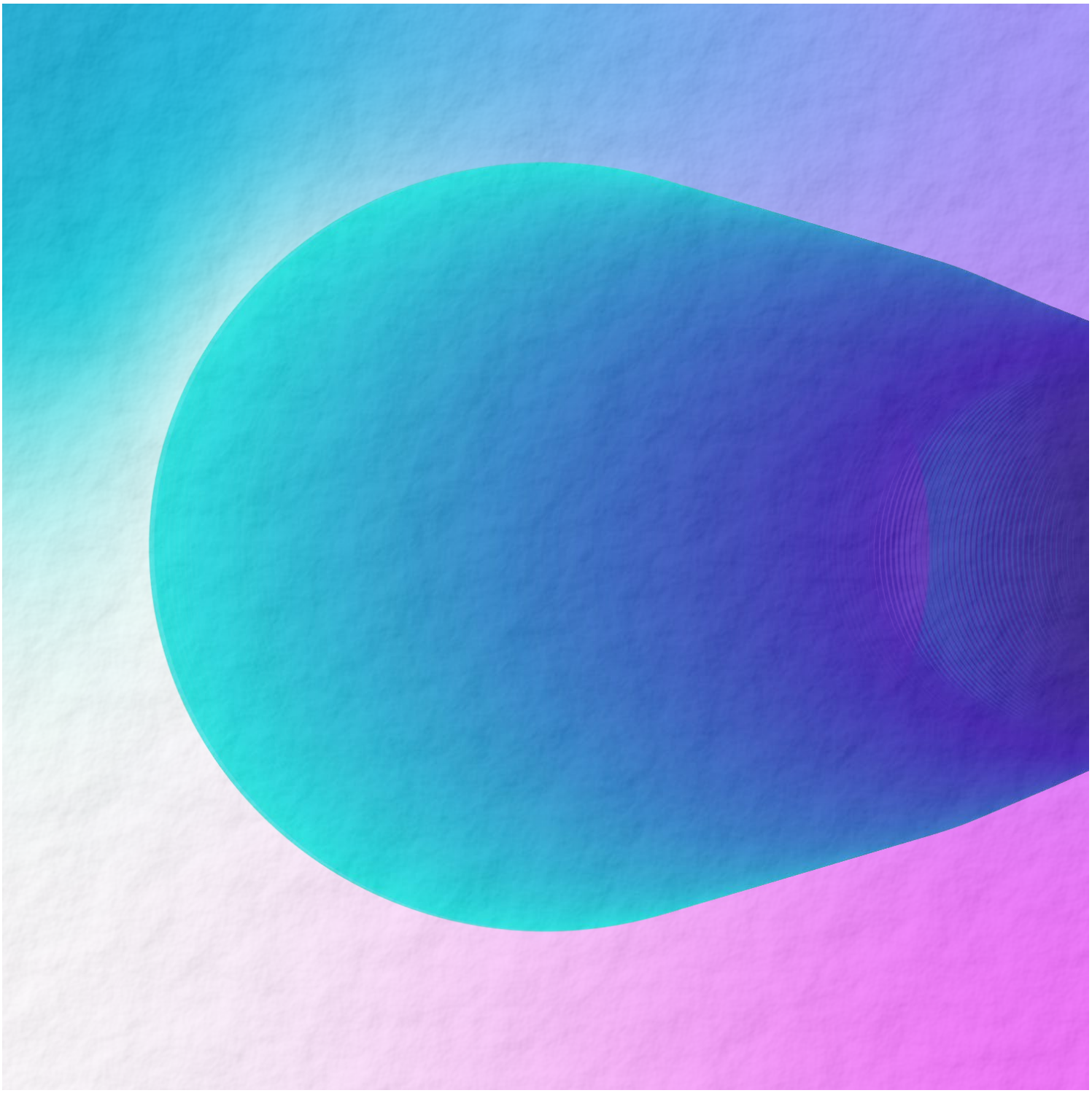


Table of Contents

Vol.10 issued March 2024

I. Editor's Preface 1

II. Articles

1. Xinyue Sun
   Possibilities and Challenges of Care Management for Elderly in Urban China: Based on the Experience of Care Management Models in Developed Countries 3

2. Maksym Yaroshenko
   Expansion of NATO and Ukraine Cyber Dimension and Role of Informational Technology (IT) 20

III. Special Content: Reports on the Group Work in the Philippines

1. GRM Course Work Report 43

2. GRM Students' Report 44

3. Report of GRM Recent Activities 47

4. Report of UPLB-Doshisha symposium 52

I. Editor's Preface

Akira Hayashida
Chief Editor, GRM Journal
Professor, Graduate School of Science and Technology, Doshisha University

It is my great honor and pleasure to announce the publication of the tenth volume of the Global Resource Management (GRM) Journal. This volume includes GRM course work reports of the On-site Group Work offered in the Spring Semester 2023 and two articles related to the issues of welfare for the elderly in China and to the cooperation between NATO and Ukraine in cyber-space, respectively. I am deeply grateful to all the contributors, the reviewers, and the supporting staff, for energizing the GRM Program by publicizing new findings and achievements.

The GRM On-site Group Work in 2023 featured a field trip to Luzon Island, Republic of the Philippines, in collaboration with Daikin Industries, Ltd., Daikin Airconditioning Philippines, Inc., University of the Philippines Diliman, and University of the Philippines Los Baños. This trip was the first overseas activity in 4 years, after the restrictions imposed by the COVID-19 pandemic, since our on-site training in India in March 2019. This experience reminded us of the importance of overseas practices and exposure to local realities in the GRM Program.

While the prevalence of COVID-19 was decreased conspicuously in 2023, our society continue to be threatened with natural disasters including the 2023 Turkey–Syria earthquakes and the 2024 Noto Peninsula Earthquake, expanding impact of climate change, and geopolitical risk and tragedy such as the Russian invasion to Ukraine and Israel's war on Gaza. It would be desperately hard to wipe out such risks and crises, and it is not easy even to take effective countermeasures. It is clear, however, that we must keep trying to overcome difficulties by acquiring the wisdom and literacy in both science and engineering, and the humanities and social sciences. I wish the GRM Journal continues to provide a space for discussion on resource management for sustainable development, coexistence and cultural diversity.

II. Articles

1. Xinyue Sun
Possibilities and Challenges of Care Management for Elderly in Urban China: Based on the Experience of Care Management Models in Developed Countries

2. Maksym Yaroshenko
Expansion of NATO and Ukraine Cyber Dimension and Role of Informational Technology (IT)

Possibilities and Challenges of Care Management for Elderly in Urban China: Based on the Experience of Care Management Models in Developed Countries

Xinyue Sun

Graduate School of Social Studies, Doshisha University

Abstract

This study examines the necessity of care management in the supply system of community-based elderly care services and investigates the current state and trends in care management in China, thereby identifying its challenges. Based on these findings, the development and models of care management in different countries are reviewed to provide insights into their potential implementation in China.

To effectively implement care management in China, three key points are emphasized. First, defining clear objectives for care management and conducting assessments and care plan development based on the needs of the elderly and their families. Second, ensuring reliable access to services aligned with care plans, through the coordination and maintenance of care service continuity and consistency. Finally, establishing a sustainable care management system by involving all relevant services and agencies, and developing strategic plans within the broader community service system.

Based on international experience and theory, this study proposes the involvement of all services and relevant organizations in formulating a strategic plan based on the overall service system in the community. The suggestion is to establish the service center as the base and form a team consisting of professionals, administrative agencies, residents' committees, and other representatives. This team would implement care management through regular joint meetings, ensuring collaboration among various organizations for comprehensive assessment and individualized care plan development.

The successful implementation of these points would enable the development of an effective care management model catering to the needs of elderly individuals and caregivers in China. Additionally, the establishment of a care management system would foster connections among service providers, forming a network centered around community-based elderly care services.

Keywords: Care Management Model, Elderly Care, Fragmentation, Integrated care, Network

I. Introduction

A. Problem Statement

Since 2000, the socialization of elderly care has been promoted in China, leading to the diversification of care providers. As a result, home-based care for the elderly has been shared among family members and professionals based on their individual needs. However, there has been a lack of continuity and consistency in care, resulting in fragmented care for the elderly. Therefore, it is necessary to focus on resolving the issue of fragmented care experienced by the elderly and set up a user-friendly approach to service delivery. To achieve this, it is essential to address the challenges in the service delivery system from a practical perspective.

Currently, in China, the concept of "integrated care" has been proposed as a response to fragmentation, and the establishment of networks for community-based elderly care services is expected based on this concept. However, Sun (2022) has examined the trends and challenges of previous studies on integrated care in China and found the following challenges when introducing integrated care in China. The challenge is to not solely emphasizing governance by the government to coordinate and integrate various stakeholders in the community, such as residents, service providers, and social organizations, but rather exploring a method that can complement government governance by coordinating various practical social resources. To find ways to coordinate these social resources, it is necessary to consider how to connect appropriate social resources to users within the community. That means "care management" from a user-oriented perspective should be discussed when considering the solution to the fragmentation problem.

B. Research Objectives

This paper discusses the reasons why care management is necessary in the supply system of community-based elderly care services and examines the current state and trends of care management in China to find the challenges. Based on that, the development and models of care management in various countries are organized to provide insights into the framework for implementing care management in China.

C. Methodology

This is a literature study. Section II discusses the reasons why care management is necessary in the supply system of community-based elderly care services. Section III examines the current state and trends of care management in China to find the challenges. To facilitate the trends and find the challenges in research on care management in China, this study conducted searches (details are in Section III. B) for literature on care management using the "China National Knowledge Infrastructure (CNKI)[1] " database.

Next, it is valuable to refer to the practices and previous studies on care management in various countries outside of China. Therefore, in section IV, the models and developments of care management in other countries will be analyzed to examine the framework for the future introduction of care management in China.

II. Why Care Management

A. Background of care management

In 2021, China introduced the 14th Five-Year Plan, which determined the direction of development for various sectors across the country. Within this plan, the establishment of a network for community-based elderly care services to enhance the elderly service system was explicitly stated. This initiative was prompted

[1] An electronic platform created to integrate significant Chinese knowledge-based information resources. CNKI is the most authoritative, comprehensive, and largest source of China-based information resources in the world, reflecting the latest developments in Chinese politics, economics, humanity and social science, science and technology (www.cnki.net/index/).

by the challenge of fragmentation in the current supply system of community-based elderly care services in China.

Fragmentation refers to a situation in which diverse providers, such as the government, private companies, and non-governmental organizations, offer services with different objectives, pursuing their own interests and convenience. As a result, services become disjointed, lacking information exchange, collaboration, and cooperation.

This lack of coordination leads to a decline in the quality and efficiency of services, resulting in the fragmentation of principles and practices concerning user-centric care (Sun, 2022). Therefore, existing community-based elderly care services in China have been unable to provide comprehensive and integrated care, and do not effectively meet the needs of elderly individuals.

Care management is being utilized in various countries as a means to address the fragmentation of care and to provide the most appropriate services to individual care recipients, thereby reintegrating care. The practical aspect of care management aims to coordinate and collaborate services and resource support systems with a focus on user-centeredness (Kono 2021, 36). Therefore, it is believed that care management, with such characteristics, can lead to resolving the current state of fragmentation in community-based elderly care service supply system.

In order to address the state of fragmentation, it is necessary for care recipients to coordinate the available services and social resources from a user-centered perspective. As demonstrated by Challis et al. (2002, 142), comprehensive and coordinated service planning significantly impacts the well-being of the elderly. Service coordination enhances the quality of life for the elderly and contributes to the provision of accessible services.

On the other hand, providing services to the elderly without any limitations can impose a financial burden, making it difficult to achieve in both China and other advanced countries. Especially in China, where the phenomenon of "aging before affluence" is observed. Therefore, from a policy perspective, when support beyond the scope of services is needed for the elderly, it is necessary to consider cost-effective methods of service coordination.

Care management is considered an effective means to strike a balance between the necessary services or resources for the elderly and limited funding. Therefore, considering the two aspects of service coordination to provide user-friendly services and cost management for cost-effectiveness, it has been deemed necessary to establish a care management system. This study focuses on examining the establishment of a care management system within the supply system of community-based elderly care services in urban areas of China, addressing the challenges of network development.

B. What is Care Management

"Care management" originated from the United States in the late 1970s. In the United States, the term "case management" was initially used as a systematic approach to promote community care for individuals with mental disorders. It later expanded as a method of community living support for the elderly, individuals with disabilities, and abused children. Subsequently, the concept and practices of "case management" were introduced from the United States to the United Kingdom, where it was institutionalized within the National Health Service and Community Care Act (NHS), and the term "care management" was adopted. Currently, care management has been introduced in countries such as Canada, Australia, Germany, and Japan.

The reasons for changing the term from "case management" to "care management" include: (1) the term "case" had a derogatory connotation, while "care" carries a warmer nuance, (2) "care" is seen as managing the care itself rather than the "case" (Individual user) (Shirasawa 2018, 3). In China, the term "个案管理" (individual case management) has been adopted as a translation of "case management." However, in this study, relying on the reasons for the change in terminology and maintaining consistency in the text, the term "care management" is used.

Regarding the definition of care management, it has been redefined over the years as a method to achieve more integrated and coordinated services. Since each country adopts different practical approaches

and perspectives, there is no universally accepted definition. Kono (2021) organized the concept of care management in research conducted in Japan and other countries and associates care management as one method of social work and examines its uniqueness by comparing it with case work, group work, community organization, and other methods. Care management is defined as follows:

"Care management is a social work repertoire that involves the effective and efficient coordination and provision of services and resources tailored to the user's needs. It utilizes groups and teams to achieve effective institutional management, coordination of services and resources, and efficient operation of institutional programs that align with the user's needs. Furthermore, it aims to solve community problems related to user needs and improve systems and policies by providing feedback from micro to macro levels. It forms a user-centered support system." (Kono 2021, 51)

While there is no universally accepted definition of care management, there is a certain consensus on the process it entails. As shown in Figure 1, the care management process consists of seven stages (Department of Health, 1991): (1) Publishing information, (2) Screening or case finding, (3) Accessing need, (4) Care planning, (5) Implementation of the care plan, (6) Monitoring, and (7) Reviewing. Some studies combine the first two stages into one.

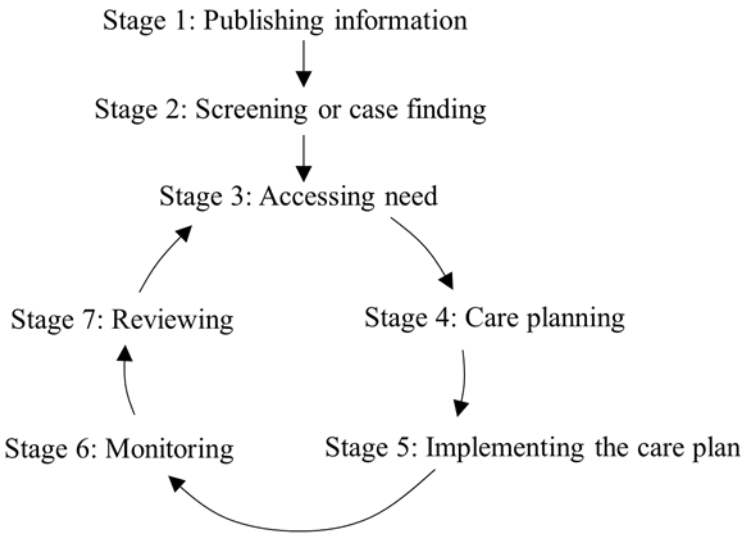


Figure 1 Process of care management (Source: Department of Health, 1991)

However, although the purpose of this paper is to explore care management in the field of the elderly, it should be emphasized that case management originated in the United States and is often applied to the mentally disabled.

Therefore, adapting care management theory to the elderly field involves recognizing the unique characteristics and needs of elderly individuals. Unlike the application of care management to the mentally disabled, caring for the elderly requires a tailored approach that considers various factors such as physical health, cognitive function, social support, and lifestyle.

For example, elderly individuals need to consider issues related to mobility and safety. Therefore, during the assessment stage, it is necessary to assess the home environment for potential hazards and provide recommendations for modifications to ensure a safe living space. Then, like Germany and Japan, there are long-term care insurance systems for the elderly, so it is necessary to consider the national system when formulating care plans and explore how to integrate and adjust the resources of formal and informal care.

III. Current State, Trends and Challenges in Care Management Research in China

In the previous section, this study discussed the need for care management in building networks for community-based elderly care services and clarified the definition and process of care management. Building

upon that, this section will examine the current state and trends of care management in China and identify the challenges.

A. Current State of Care Management in China

Regarding the current state of care management practice in China, Shirasawa (2018, 7) points out that “in China, home care services for the elderly are implemented in community centers on an individual basis, but the concept of providing packaged services through care management have not been realized.” As Shirasawa notes, there is still a lack of practical initiatives and efforts related to care management in China.

At present, care management has not officially started to be implemented in China, and there is no national government document mentioning the implementation of care management systems. However, care management, as a method of social work, has been experimentally explored in folk practice in the medical field.

In 2013, the State Council of China released a document called "Seven Opinions of the State Council on Accelerating the Development of Elderly Care Service" and proposed the concept of combining medical resources with elderly care resources. To explore the mechanism of combining medical care and elderly care resources, care management is often experimented on in the medical field.

For example, according to Liu et al. (2022), in September 2017, Shenzhen People's Hospital began to introduce two professional social workers through purchasing positions to provide continuing services to hospitalized and discharged patients together with other medical staff in the Continuing Services Department. The social workers of the Continuing Services Department have played a more professional role as resource integrators and communication coordinators, providing patients with more humane medical services by coordinating internal and external resources.

However, in the field of elderly care, although there are studies suggesting the introduction of a care management system in the elderly care field, care management still remains at the suggestion stage and has not been extensively experimented on in communities or elderly care facilities.

Therefore, to address the state of fragmentation and integrate care resources, Shanghai is promoting the establishment of an integrated care service center (integrated service center for the elderly, hereafter “service centers”) concentrating on each service that can meet the needs of the elderly in the living area within 15 minutes' walk from home. This service center includes an on-site service center, day care center, short-term custody and so on. In addition, in order to connect various services with users, the elderly care consultant system was launched in 2018. The role of the elderly care consultant is to provide service information to the elderly and users and so-called "private customization" for the elderly (Qian, 2018). That is to say, in terms of linking users and services, elderly care consultants may be expected to undertake some of the care management functions.

On the other hand, about the policies related to elderly services, in 2016, the General Office of the Ministry of Human Resources and Social Security issued the "Guiding Opinions on Pilot Implementation of Long-Term Care Insurance System" and released the first batch of 15 pilot cities for Long Term Care Insurance. In 2020, 14 additional pilot cities were added. In Japan, care managers who are responsible for care management were positioned in the Long-Term Care Insurance Law.

However, China's long-term care insurance does not include a care management system. Regarding the implementation of Long-Term Care Insurance, Sun (2023a) clarified the user’s utilization process of the Long-Term Care Insurance system in Shanghai, China. As a result, the process until the elderly received the service was divided into four stages: "service use", "application and use of the Long-Term Care Insurance system" and "service selection and application". In those four processes, although there is an assessment investigation on the physical condition of the elderly, this is only as a basis for judging the payment of long-term care insurance, not the comprehensive assessment of customers' lives as emphasized in care management (Sun, 2023a). In addition, the Long-Term Care Insurance service is currently limited to home visit care. The home visit service content table (for users' choice) is understood as a care plan, and therefore some administrative agencies claim that care management has been introduced (Sun, 2023b).

To sum up, there is still a lack of discussion on care management in China at this stage, both in policy and practice. Therefore, the following will explore the trends in research on care management in China.

B. Trends in Research on Care Management in China

Research on the concept of care management was introduced in China in the 1990s. However, due to the delayed development of specialized social work, related papers discussing care management as a technique in social work were first published in the CNKI in 2003 (Ma & Liu 2019, 111). Ma & Liu (2019, 106-112) conducted a content analysis of literature on care management published in CNKI between 2003 and 2018, excluding care management in the medical clinical field. The results showed that there were only 61 papers discussing care management as a technique in social work. That indicates that research on care management in the field of social work is insufficient. Furthermore, regarding the content of those studies, they pointed out that "due to inadequate communication and collaboration between practical fields and academic domains, research on care management is scattered, and research in practical settings is lagging" (Ma & Liu 2019, 111).

Based on Ma's research, it is evident that there is a lack of research on both the theoretical and practical aspects of care management in China. Furthermore, the specific types of research conducted have not been clearly addressed. Therefore, this chapter aims to reexamine the research trends of care management in China, specifically focusing on its application in the supply of community-based elderly care services.

To elucidate the trends in research on care management in China, the next searches were conducted for literature on care management using the CNKI database.

First, as of March 7, 2023, a search was conducted on the CNKI database using the theme of care management, resulting in a total of 3,223 published papers. When examining the distribution of these papers by academic disciplines, the top discipline was "Clinical Medicine," with 1,407 papers, accounting for 42.1% of the total. The next most common discipline was "Sociology and Statistics," with 379 papers, accounting for 11.34%. Other fields, such as Political Science, Education, and Economics, also conducted research, but their proportions were each below 5%. From these results, it can be inferred that care management is predominantly studied in the field of medicine.

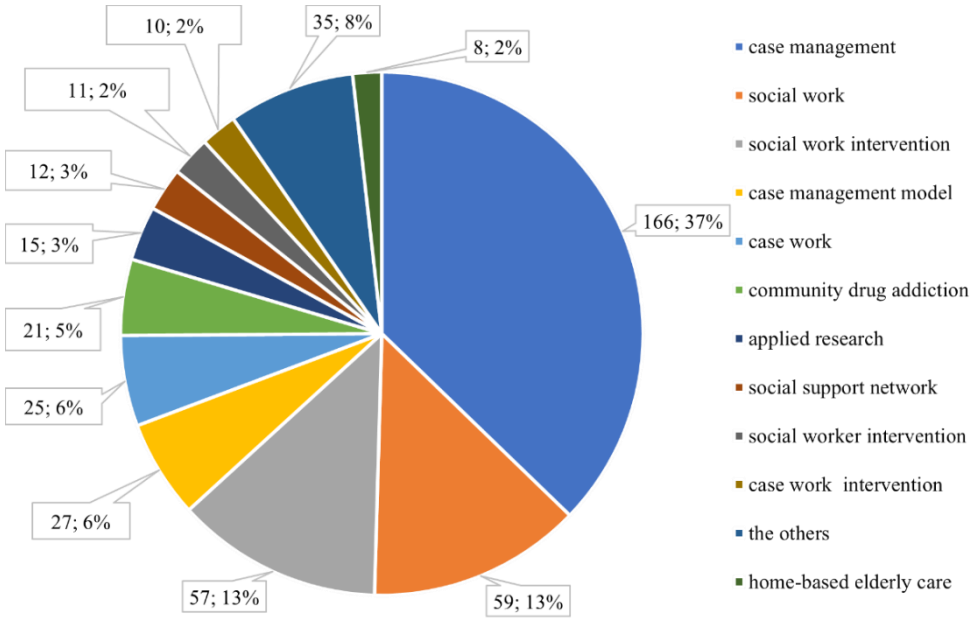


Figure 2 Distribution of the main themes in the literature search on 'case management' and 'social work' (Number of literatures; Ratio)

Next, to analyze the previous studies that have discussed care management in the field of social work, a search was conducted using the CNKI database with the keywords “case management” and “social work”, resulting in a total of 437 relevant articles. The distribution of the main themes in these articles is shown in Figure 2. The previous studies suggest the utilization of care management methods such as assessment, service planning, monitoring, and evaluation to address the challenges faced by individuals in various contexts, including drug addiction, mental disorders, domestic violence (DV), and child abuse. These studies primarily focus on the techniques of social work, often overlapping with case work.

Regarding the application of care management, the previous studies primarily focused on the field of drug addiction, with a significant number of studies. Research related to mental disorders, children, DV, and other fields is also observed, but there were only eight articles specifically addressing “home-based elderly care”.

So, in order to clarify the relevant research on care management in home-based elderly care, a search was conducted using the keywords “care management” and “elderly care” in the CNKI database, and a total of 117 articles were found. After excluding conference records and newspapers, 73 articles from academic journals and research papers were extracted. Among these 73 articles, 12 were deemed irrelevant to the purpose of this study, and eight focused on rural areas. As a result, 53 articles were extracted for further analysis.

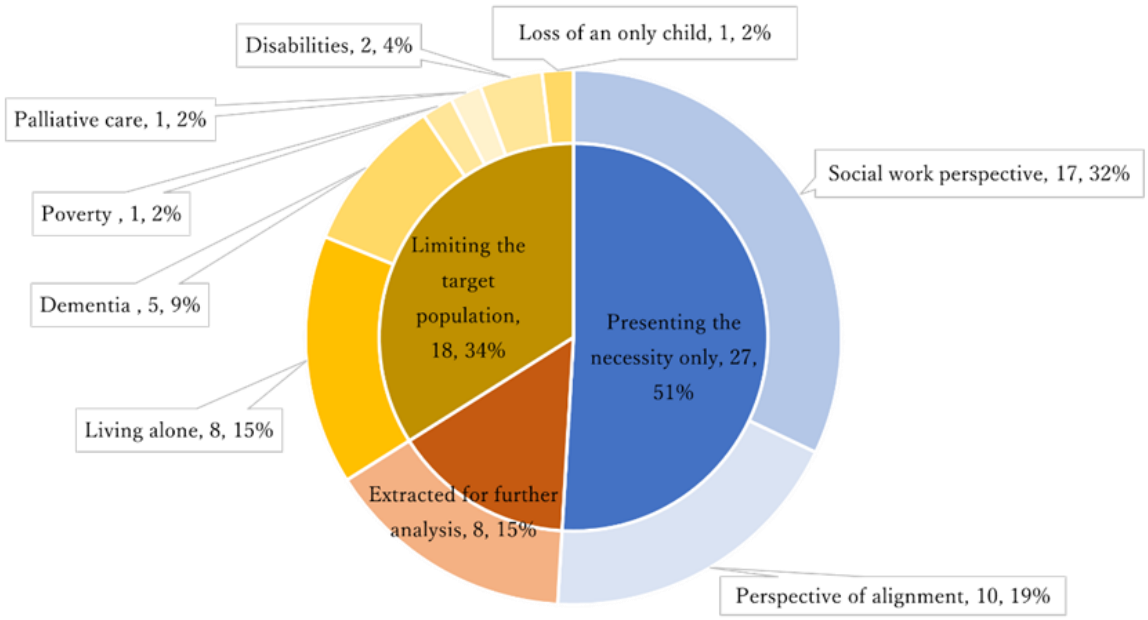


Figure 3 Distribution of 53 literatures extracted for further analysis.

(Number of literatures; Ratio)

Among the 53 articles, 27 of them presented the necessity of establishing care management in their conclusions. However, they did not discuss specific methods or practices for implementing care management. 17 studies focused on the methods of intervention in the operation of elderly services from the perspective of social work, while 10 studies focused on aligning social resources in constructing service systems.

The remaining 26 studies focused on the implementation and practical aspects of care management. However, among these, 18 studies specifically targeted certain groups, such as elderly individuals living alone or those with dementia. Only 8 studies discussed the functions and roles of care management in service operation without restricting the target population. Furthermore, these 26 studies mainly analyzed practical examples of implementing care management from a micro perspective, discussing how social workers apply care management when supporting the elderly. In these studies, care management was employed as a technique of case work, and its usefulness in coordinating resources for the elderly was demonstrated.

C. Challenges in Care Management Research in China

As mentioned earlier, care management research in China views care management as an individual support technique, integrated within casework. However, these studies do not provide reasons or theoretical justifications for incorporating care management within casework. Consequently, even if the effectiveness of care management is demonstrated through individual cases, its universality cannot be ensured.

To address this issue, there are studies in Japan that discuss the relationship between care management and casework from a theoretical perspective. For example, Kono compares the characteristics of care management with those of casework and community organization, positioning care management as one of the methods in social work (Kono, 2021). Furthermore, Nakamura argues for placing care management at the core of social work and considering casework and community organization as components of care management (Nakamura, 2009).

Therefore, there is no definitive consensus on the relationship between care management and methods such as casework, but it is necessary to consider care management in conjunction with methods like casework and community organization.

Furthermore, the challenges identified in the practical examples described in the previous studies indicate the need to consider care management from meso-macro levels, in addition to micro-level perspectives. Specific challenges in the process of implementing care management include difficulties in acquiring sufficient social resources, lack of coordination and collaboration with various institutions, lack of comprehensive integration of resources, and a lack of trust in care managers as professionals (Zhao 2022, 28; Wu 2021, 41-42; Liu 2020, 69; Wei 2016, 43; Zhao 2013, 25). The fundamental cause of these challenges is the absence of cooperative systems among service providers and social resources, as well as the lack of a network formed within the community, making it difficult for social workers to coordinate resources.

Therefore, from a practical perspective, it is necessary to examine the requirements and directions for introducing care management from a meso-macro level, such as the organization of various related agencies. To address these issues, it is valuable to refer to the practices and previous studies on care management in various countries outside of China.

In recent years, the concept of care management in other countries has expanded to include not only direct service provision at the micro level but also reforms in support systems at the macro level (Kono 2021, 38). In the next section, the models, and developments of care management in other countries will be analyzed to examine the framework for the future introduction of care management in China.

IV. Care Management Models in Other Countries

As discussed in the previous section, care management has been introduced in many countries around the world, resulting in diverse approaches and models influenced by factors such as healthcare systems and the direction of community care. Therefore, it is not possible to simply introduce care management in China by following a single model or the practices of a specific country. It is necessary to comprehensively analyze the approaches and models of care management from various countries' diverse practices and initiatives.

A. Care management models

In this section, based on the care management models organized by Banks (2004), the trends in care management from specific examples in various countries will be examined. The respective models are presented in Table 1.

Table 1 Care Management Model

Model	Advantages	Disadvantages	Practice Case
Intensive care management model	Holistic approach to needs. Targeted at people with complex needs	Success is dependent on strength of inter-agency, inter-professional arrangements. Single agency models may restrict access to wider services and resources	Castlefields Health Centre in Runcorn, United Kingdom
Shared core tasks model	Allows for key tasks of care management – assessment, care planning and review – to be built into organizational procedures for large number of service users with less severe needs	Lack of continuity of staff for individual service users and less appropriate for older people with complex needs	Care management implemented by local authorities in the United Kingdom
Joint agency model/ key worker model	Good access to multi-disciplinary services	Nominated key worker may have difficulty balancing that role with their own professional input or service deliver	Government-regulated Elderly Care Assessment Team serves as a standard model for elderly care
Independent brokerage model	Strong advocates for older person and carers	Likely to lack influence in service system	Care management project conducted by an organization called 'Social Work Berlin' in the northern region of Berlin
Older person or carer co-ordinates care using direct payments	Older person able to control and choose own package of services	Support may be needed for older people who prefer to self-manage	Practice in the Netherlands

(Source: 'Practice Case' in Table 1 is added by the author based on Banks (2004, 106) 's Table 4)

(1) Intensive Care Management Model

In this model, care managers target elderly individuals with complex needs and aim to adjust service times and locations based on individual needs. Care managers are employed through agreements between a single institution (provider or service purchasing organization) or inter-agency agreements, regardless of budget availability, to coordinate services.

An example of this model is Castlefields Health Centre in Runcorn, United Kingdom (Banks 2004,103). The center serves as a base where care managers are stationed. They target high-risk elderly individuals or those who frequently use services and assess their needs according to the following steps, working in collaboration with the elderly: (1) Focus on the elderly person's opinion on how they want to improve their own life; (2) Identify problems; (3) Plan interventions; (4) Organize support; (5) Monitor and evaluate outcomes.

In this way, the concentrated care management model can provide comprehensive care management by assessing complex needs and focusing on the identified issues. However, since the execution of the care plan is delegated to other institutions, there is no guarantee that the plan will be implemented as intended. The continuity between care plan creation and execution relies heavily on the collaborative relationship between the involved institutions, and there is a possibility that access to a wider range of services and resources may be limited.

(2) Shared Core Tasks Model

In this model, systematic procedures ensure the reliable execution of core tasks such as assessing the needs of the elderly, developing individual care plans, and conducting regular evaluations. As a result, care management can be universally implemented for all elderly individuals, not just selected users. The United Kingdom and Sweden are indeed typical examples of the model where social workers employed by local authorities with budgetary authority serve as care managers.

An example of care management can be seen in the implementation by local authorities in the United Kingdom. While originating in the United States, a systematic care management system was established in the early 1990s in the UK, known as “arrangements,” to provide standardized services (Huxley 1993, 366). In this process, local authority care managers conduct comprehensive assessments of individuals requiring care, consult assessments made by other professionals, develop personalized care plans that prescribe the most suitable combination of services (care packages), and coordinate the provision of various health and welfare services according to the care plan (Nishimura 2000, 92). Over time, care management in the UK has evolved into a means of managing service provision for all elderly individuals, rather than exclusively targeting those with complex needs. However, the “shared core tasks model” delegates different core tasks to different departments, which may not be suitable for providing intensive therapeutic support in care management for elderly individuals with complex needs.

(3) Joint Agency/Key Worker Model:

In this model, care management is supported by a multidisciplinary team composed of professionals dispatched from various agencies. One member of the team functions as a care manager or key worker.

An example of this model can be found in Australia. In Australia, the government-regulated Elderly Care Assessment Team serves as a standard model for elderly care. This team comprises geriatric physicians, nurses, social workers, and other professionals (Ma-fi-, 2000). Elderly care is primarily managed through care management by the assessment team. Collaboration and teamwork with professionals from various disciplines are emphasized, and the case manager holds budgetary authority within this framework.

In this model, the services provided to the elderly are comprehensively coordinated based on individual assessments, and families are also provided with support, education, and skill training. One advantage of this model is that it enhances access to various services through the involvement of a multidisciplinary team, including nurses, physicians, and social workers. However, in a multidisciplinary team, collaboration and decision-making can be affected by differing perspectives and priorities among individuals with different specialties. Therefore, the care manager or key worker responsible for coordination may face challenges in balancing the values and ethics of each profession while providing services from a neutral standpoint. Additionally, in this model, care management primarily focuses on achieving clinical outcomes, with financial management playing a minor role.

(4) Independent Brokerage Model:

In this model, care managers are employed by independent agencies and act as service brokers. This allows them to serve as powerful advocates for users, but their influence within the service system may be diminished. In some cases, care managers primarily offer advice and information to users and their families.

For instance, in Germany, there is no formal care management system or procedure in place. However, there is an exemplary care management project conducted by an organization called “Social Work Berlin” in the northern region of Berlin (Okazaki, 2000). This project focuses on needs assessments by professionals and the provision of services based on care plans, with the goal of supporting independent living in the community. Moreover, German long-term care insurance provides benefits within certain limits, and there is a financial management system in place to ensure the effective utilization of limited resources.

(5) Older person or carer co-ordinates care using direct payments:

This is not a traditional “model,” but rather refers to a situation where elderly individuals or their caregivers take charge of and coordinate their own care and services. Specifically, instead of service coordination by external agencies, the elderly person (or caregiver) is provided with a care budget, which is a budget allocated for service utilization fees. This allows them to directly purchase services that align with their specific needs.

For example, in the Netherlands since 2003, elderly individuals who qualify for home care have the

option to receive care through direct cash payments instead of receiving in-kind care. “Elderly advisors” offer support by guiding the individuals through the necessary procedures and providing information about service availability. This empowers the elderly to arrange their own customized care packages. Some of these “elderly advisors” are elderly volunteers who aim to support the self-determination of elderly individuals by offering essential information, advice, and assistance in self-management.

B. The Need for Combining Different Models of Care Management

Among the five care management models mentioned, Models (1) and (3) are suitable for older adults with complex needs, while Models (2), (4), and (5) are more appropriate for older adults with milder needs or those who have self-care abilities and their families.

Models (1) and (3) share common features such as intensive and close involvement with older adults, comprehensive needs assessments, collaborative creation of care plans by multidisciplinary teams, and targeted support. These models focus on providing intensive care management for older adults with complex needs. On the other hand, Models (2), (4), and (5) incorporate care management functions into organizational procedures, allowing for service management while ensuring care for older adults with milder needs. They also leverage the strengths of older adults and support their self-determination to maximize autonomy in achieving self-care goals.

Overall, these models offer a range of approaches to cater to the diverse needs of older adults and their families, whether they require intensive care management or support for maintaining their independence in self-care.

However, it is important to recognize that a single model is insufficient to meet the needs and living situations of different groups of elderly people. Challis suggests the importance of distinguishing between providing “intensive care management” to users with complex needs and implementing “formal procedures” such as assessment, care planning, and regular reviews for all users (Challis, 1999). Therefore, Model (1) or (3) are optimal for older adults with complex needs, while implementing Model (2) that incorporates systematic procedures like assessment, care planning, and regular monitoring is more efficient and effective in meeting the needs of older adults with milder needs.

Therefore, when implementing care management, it is ideal to combine different care management models while considering the following six elements pointed out by Banks (2004, 111) that rely on the advantages and effectiveness of care management models: (a) the target group chosen, (b) clarity of objectives, (c) supporting organizational infrastructure, (d) budget control, (e) relationships with other organizations in the service system, and (f) availability of a range of local services.

V. Challenges in the Development Framework of Care Management in China

This paper established a foundation for discussion by referencing the five care management models outlined by Banks (2004) (mentioned in Section IV) and the seven-stage care management process based on the Department of Health (1991) (mentioned in Section II). However, it is crucial to acknowledge the dynamic evolution of care management over the past 20-30 years, both in theory and practice.

Despite significant changes in the field, this paper continues to utilize the six elements influencing the five models and the seven stages of the care management process. The rationale behind this choice lies in the recognition that while care management models have evolved, certain fundamental elements have maintained their relevance and applicability across changing contexts.

For example, over the past 20 years, the system of care management for the elderly in Japan still retains seven stages of care management. In addition, Japan has institutionalized care management under a long-term care insurance system, similar to Model (2), while also establishing mechanisms similar to Model (3) by actively participating in local care conferences to address cases requiring support.

Therefore, the six elements and seven stages encompass core principles and concepts that are foundational to effective care management. These enduring elements include aspects such as comprehensive assessment, collaborative teamwork, and ongoing evaluation, which are considered essential irrespective of

changes in the broader landscape. While care management models have evolved, these elements and stages can provide a consistent framework for care delivery, ensuring that fundamental aspects of customer management are not overlooked. This consistency is important when adapting care management practices to diverse cultural, organizational, or systemic contexts. This is particularly crucial when implementing care management in the context of China, which has unique healthcare challenges and cultural considerations.

A. Challenges in the Development Framework of Care Management

Based on the aforementioned information, introducing care management in China requires exploring a care management framework that is suitable for the Chinese context. This exploration should consider the six elements mentioned earlier, as well as reference practices and models from other countries. The following will provide suggestions for the development framework of care management in China based on the six elements that influence the 5 models mentioned in section IV, and the seven stages of the care management process outlined in section II (B. What is Care Management). The relationship between the seven stages and the six elements is presented in Table 2.

Firstly, it is crucial to clarify the purpose of introducing care management in China, as emphasized in point (b). As discussed in the previous section, care management serves as an effective means of balancing service coordination from the user's perspective and cost management from a financial perspective. However, achieving a perfect balance between these two aspects is challenging. Hence, the emphasis on different points and the models to be applied may vary depending on the purpose for which each country adopts care management.

In this study, the purpose is to provide services that are easily accessible to users, with a primary focus on service coordination from the user's perspective. With the purpose clearly defined, let us now consider the key aspects to be considered when implementing care management in China, based on each stage of the care management process.

Table 2 Relationship between the seven stages and the six elements

The stage of the care management process (Mentioned in section II. B.)	The elements should be considered. (Mentioned in section V.A.)
(1) Premise	(b) clarity of objectives
(2) publishing information screening or case finding	(a) the target group chosen (d) budget control
(3) Accessing need	(c) supporting organizational infrastructure
(4) Care planning (5) Implementing the care plan	(c) supporting organizational infrastructure (e) relationships with other organizations in the service system
(6) Monitoring (7) Reviewing	(f) availability of a range of local services

(Source: Compiled by the authors from the following sources: Department of Health (1991); Banks (2004, 111))

In the initial stages of (1) publishing information and (2) screening or case finding, two key elements should be clarified: “(a) the target group chosen” and “(d) budget control”. Considering the substantial elderly population in China, providing intensive care management to all elderly individuals is not feasible. Moreover, with the current “aging before becoming affluent” situation in China, it becomes imperative to exercise budget control when allocating resources for service provision.

To effectively address the challenges posed by the large elderly population, it is essential to categorize elderly individuals into different groups based on their specific needs and direct them to institutions or procedures that implement different care management models. For instance, elderly individuals who are self-reliant and have relatively simple needs could receive information-only services, which falls under the

purview of “(a) the target group chosen”.

Let's further elaborate on the reasons for implementing “(a) the target group chosen” in this context. According to Shirasawa, care management involves developing care plans and providing ongoing monitoring, which requires substantial support and incurs costs. To optimize the use of resources and achieve cost reduction, it is crucial to differentiate between care management and information providers (Shirasawa 2018, 443). Drawing from Shirasawa's perspective, during the stage of (1) publishing information, it becomes feasible to identify elderly individuals who may potentially encounter difficulties in managing their own lives. In such cases, only these individuals can be referred to institutions that implement “heavy-duty” care management models, akin to Model (2) and (3). This approach ensures that resources are optimally allocated to those who require more intensive care management, while still providing valuable support to other elderly individuals based on their unique requirements.

Moving on to the stage of (3) Accessing need, it is necessary to establish the element of “(c) supporting organizational infrastructure.” Specifically, in order to implement care management with “heavy equipment” like Models (2) and (3), it is crucial to determine the institutions responsible for assessing the needs of the elderly and the base where the assessment team operates. These institutions or bases should be established and developed accordingly. For example, if adopting Model (3), it becomes imperative to determine the extent of involvement of relevant institutions, such as service providers, residents' committees, streets, civil affairs departments, hospitals, etc., in the assessment of the elderly. The decision needs to be made whether to include all these institutions or only select ones. Subsequently, a leading institution or care manager should be designated, and a collaborative teamwork mechanism for conducting assessments should be established among these institutions. This mechanism must encompass clear assessment criteria and team rules to effectively resolve conflicts.

The implementation of such a process necessitates the establishment of a strong organizational foundation to support the comprehensive assessment of the elderly's needs. This foundation would facilitate a coordinated effort among various stakeholders, ensuring a holistic approach to elderly care management and service delivery.

In the stages of (4) Care planning and (5) Implementing the care plan, two elements need to be clearly defined: “(c) supporting organizational infrastructure” and “(e) relationships with other organizations in the service system”. To illustrate this, the example of Model (3) will be used again.

When implementing (4) Care planning, it is necessary to determine the relevant agencies and leaders. However, it is also essential to ensure continuity with the subsequent stage (5) Implementing the care plan. Therefore, it is important to discuss the methods to secure continuity based on the feasibility of care plans, which refers to the availability of services and social resources identified during the (4) Care planning stage and the actual access of the elderly to these resources during care plan implementation.

The feasibility of care plans heavily relies on the team's ability to effectively coordinate services and the extent of collaboration with various organizations within the service system. This interdependence is supported by Tsutsui (2003), which highlights the correlation between collaboration and service utilization. When teams engage in effective collaboration, there is a positive impact on service utilization, making care plans more feasible and successful (Tsutsui, 2003). This underscores the importance of fostering strong teamwork and cooperation among various organizations within the service system to enhance the overall effectiveness of care management.

Therefore, for the smooth progress of (4) Care planning and (5) Implementing the care plan, it is essential to constantly work on interagency collaboration and strengthen interagency coordination. This will help maintain cooperative relationships among the various institutions and organizations within the service system.

In the stages of (6) Monitoring and (7) Reviewing, it is essential to verify “(f) availability of a range of local services”. This entails evaluating the implemented care management models and mechanisms at both the individual and system levels. At the individual level, evaluation aims to determine whether the specific needs of each elderly person have been addressed and if the care plan objectives have been achieved.

At the system level, the assessment focuses on evaluating the suitability of the models and mechanisms in line with the common culture and characteristics of the community. If there is a wide availability of community services, it opens the possibility of expanding these successful models and mechanisms to a broader region and potentially even nationwide.

One effective method to verify the "availability of a range of local services" is to collect feedback from elderly individuals, their caregivers, and relevant organizations. By utilizing feedback as a means of monitoring and evaluation, it becomes possible to gain valuable insights into the realities of care management and to reevaluate its mechanisms. Through feedback, the availability and effectiveness of current care management mechanisms within the community can be assessed, and any shortcomings can be continuously addressed and improved. This process ultimately leads to the formulation of a strategic plan for enhancing the entire service system in the community.

By sharing and disseminating successful care management practices through this feedback-driven process, the possibility of introducing an effective care management system in China becomes more feasible.

B. Suggestions for the introduction of Care Management in China

Through the above analysis of the development framework of care management, the following three points need to be considered for the introduction of care management in China from the perspective of the development framework:

1. Clearly define the objectives of care management and conduct assessments and care plan development based on the needs of the elderly and their families.

2. Ensure that the elderly can access services based on their care plans by attempting to coordinate and maintain the continuity and consistency of care services.

3. To establish care management, involve all services and relevant organizations and formulate a strategic plan based on the overall service system in the community.

By addressing these three crucial points, an effective care management model can be developed in China, aligning with the needs of the elderly and their caregivers. Moreover, through the establishment of a care management system, various service providers can be connected, forming a robust network for community-based elderly care services.

Finally, this paper will also provide some specific recommendations based on the Chinese context and international experiences and theories.

Firstly, it is considered that the integrated care service center mentioned in Section III can be the base for care management, and the elderly care consultants at service centers can act as care managers.

At present, service centers in China actually administer all its operations. In that case, the authority to decide the service is given to private corporations. Therefore, when a care plan is created by the service center, the elderly can quickly use the service. However, it is necessary to pay attention to the fact that the care management is operated from the standpoint of the consultant and the user, not the service supplier or the administration, when care management is carried out by the service center.

Secondly, when care management is introduced in China, it is necessary to emphasize that this is not only to develop care plans for managing long-term care insurance services but also to provide a comprehensive support to the elderly.

As described in Section III, the current situation in China is that the content of home visit care services (selected by users themselves) is understood as a care plan. One of the reasons is that care management has not been fully understood. But in China, where government leadership is emphasized, care management may be used in financial administrative institutions such as the long-term care insurance system and the service subsidy system. In other words, in the name of care management, it may only realize the function of cost management. To avoid this possibility, before introducing care management, it becomes very important to confirm that the purpose of care management is comprehensive support for users. This is similar to the first point mentioned above.

Finally, as mentioned in the third point based on international experience and theory, it is necessary to

involve all services and relevant organizations and formulate a strategic plan based on the overall service system in the community. Therefore, based on the current state of elderly care services in China, this paper proposes a suggestion for implementing care management. It is suggested that the service center be the base, and a team consisting of professionals, administrative agencies, residents' committees, and other representatives who are prepared at the center should be formed to implement care management through regular joint meetings. It is necessary to ensure collaboration among various organizations and representatives to implement a comprehensive assessment. Then, hold regular joint meetings where the team discusses community health issues and focuses on the specific needs of elderly residents. The team collaboratively develops individualized care plans for the elderly, maximizing the utilization of community resources to provide comprehensive support.

VI. Conclusions

This study explored the need for care management in the supply system of community-based elderly care services in China. It investigated the current state and trends of care management, highlighting challenges. Drawing insights from the developments and models of care management in different countries, this study aimed to provide guidance for its potential implementation in China.

To effectively implement care management, based on international experience and theory, three key points are emphasized. First, clear objectives for care management are defined, conducting assessments and care plan development based on the needs of the elderly and their families. Second, reliable access to services aligned with care plans is ensured through coordination and maintenance of care service continuity. Finally, a sustainable care management system is established by involving all relevant services and agencies, developing strategic plans within the broader community service system.

It is hoped that by combining these suggestions, an effective care management system based on service centers can be achieved. However, regarding how to form a team to implement care management, and how the team will divide labor, these need to be discussed in depth based on the specific state of the community through a survey of the current state.

In addition, this paper only provides directional suggestions for the introduction of a care management system in China based on international experience and theory. Due to significant differences of China's political system, economy, and culture from the countries listed in this paper, it is necessary to conduct an in-depth investigation into Chinese communities in the future. And based on that investigation, to propose specific methods for implementing a care management system based on the specific state and issues of the community.

References

1) Banks, P. 2004. “Chapter 6: Case management.” in Nies, H. & Berman, P. (Eds), Integrating Services for Older People: A resource book for managers, European Health Management Association.
2) Challis, D. 1999. “Assessment and care management: developments since the community care reforms.” in the Royal Commission on Long Term Care (Eds), With Respect to Old Age: Long term care – rights and responsibilities, London: Stationery Office.
3) Challis, D.; Chesterman, J.; Luckett, R.; Stewart, K.; Chessum, R. 2002. “Care Management in Social and Primary Health Care: The Gateshead community care scheme.” Canterbury: PSSRU, University of Kent.
4) Department of Health. 1991. Care Management and Assessment: Manager's Guide. The Stationery Office Books.
5) Huxley, P. 1993. “Case management and care management in community care.” British Journal of Social Work,365－381.
6) Kono, T. 2021. Concept and development of care management as social work - Micro-to-macro practices seen in comprehensive community care systems. Mirai. (in Japanese)
7) Liu, Y. 2020. “Case Management Intervention in the Stress of Elderly Family Caregivers in Large Cities——Based on the Case Management Practice of X Elderly in Z Community of Wuhan City.” M.S. thesis, Huazhong University of Science and Technology. (in Chinese)
8) Liu, Y.; Li, C.; Luo, W. 2022. “Integrated Medical and Care-Based Continuity Services Practice in the Case Management Model—A Case Study of Shenzhen People's Hospital.” China Social Work, 2022(27), 17-21. (in Chinese)
9) Ma, Y. & Liu, H. 2019. “Trends of Study on Care Management of Social Work in China: An Exploration via Bibliometrics and Content Analysis.” Science, Economy, and Society, 38(161), 106-112. (in Chinese)
10) Ma-fi-, Y. 2000. “Chapter 2, Part 4: Care management in Australia.’ in Hashimoto, Y.; Takeuchi, T.; Shirasawa, M. (Eds), Care Management in Japan and Overseas, Chuo Hoki. (in Japanese)
11) Nakamura, T. 2009. “Care management methods as the core of social work practice: The concept of well-being as the fundamental viewpoint of the social work practice.” Social Relationship Research, 14(1), 87-111. (in Japanese)
12) Nishimura, J. 2000. “Chapter 2, Part 1: Care management in the United Kingdom.” in Hashimoto, Y.; Takeuchi, T.; Shirasawa, M. (Eds), Care Management in Japan and Overseas, Chuo Hoki. (in Japanese)
13) Okazaki, H. 2000. “Chapter 2, Part 5: Care management in German.” in Hashimoto, Y.; Takeuchi, T.; Shirasawa, M. (Eds), Care Management in Japan and Overseas. Chuo Hoki. (in Japanese)
14) Qian, B. 2018. “104 policy pop ups customized pension planning.” Wenhui Po. December 14, 2018. (in Chinese)
15) Shirasawa, M. 2018. Essence of care management - Approach and practical methods for life support. Chuo Hoki. (in Japanese)
16) Sun, X. 2022. “Study on Fragmentation on Home Services in Urban China.” Kansai Journal of Social Welfare, 8, 25-37. (in Japanese)
17) Sun, X. 2023a. “Requirements for Establishing a Care Management System in Shanghai, China: From the Process of Service Utilization for the Elderly.” social science review, 146, 167-190. (in Japanese)
18) Sun, X. 2023b. “Research on the development process of care management in Japan: Suggestions for introducing care management in China”, Collection of social welfare studies, 37, 47-59. (in Japanese)
19) Tsutsui, T. 2003. “Actual conditions of collaboration activities by ‘specialists’ involved in community welfare rights protection projects and the development of the ‘collaboration activity evaluation scale’- Part 2.” Social Insurance Monthly, 2184, 24-28. (in Japanese)
20) Wei, Y. 2016. “The Case Management Study on the Living Adaption of Elderly in Nursing Home—— Based on H Case in Nanjing A Nursing Home for Example.” M.S. thesis, Nanjing Agricultural University, 2016. (in Chinese)

21) Wu, G. 2021. “Case Management Research of Family Caregivers' Support for Severely Disabled Elderly in Urban Communities.” M.S. thesis, Beijing University of Civil Engineering and Architecture. (in Chinese)
22) Zhao, X. 2013. “Study on Applying Case Management to Community Home-based Care Services——Take Haerbin Pinggong Community for Instance.” M.S. thesis, Changchun University of Technology. (in Chinese)

Expansion of NATO and Ukraine: Cyber Dimension and Role of Informational Technology (IT)

Maksym Yaroshenko

Affiliation: Doshisha University, Graduate School of Global Studies

Abstract

The Russo-Ukrainian war started in 2014 and culminated in the full-scale invasion of Ukraine in 2022. It will have significant consequences for the future of international relations and the global security architecture. However, as the kinetic fighting is ongoing and only intensifying, it is still too early to analyse and draw conclusions. Contrarily, even though conflict continues in the cyber dimension, its nature has changed from massive destructive cyber-attacks to espionage and informational warfare. This allows us to analyse initial stage outcomes. This article scrutinises the development of cooperation between NATO states and Ukraine in cyberspace, particularly the build-up of cyber defence capabilities. Ukraine's ability to effectively protect its networks and critical infrastructure in the early months of the full-scale invasion was widely unexpected. The historical background, the current international situation around cyberspace and prevailing opinions in academic and professional circles were analysed. This article concludes that decade-long cooperation and assistance provided by Western states to Ukraine was a primary factor that contributed to the limited effect of Russian offensive cyber-attacks in 2022. Furthermore, this cooperation benefits both parties and can be replicated in other countries.

Keywords: NATO, CCDCOE, Cybersecurity, Russo-Ukrainian War, The Theory of Lateral Pressure

I. Introduction

Cyberspace is newly emerging and the first ever manmade realm. The well-known Moore's Law (Moore, 1965) defines its fascinatingly rapid development. Till now, the number of transistors on a microchip has doubled every two years. Hypponen M., a prominent cyber expert and author, described the upcoming 3 nanometres chips as state-of-the-art technology. This is followed by his prediction that ever-further increasing connectivity and AI will benefit humanity. However, it possesses significant risks and challenges. During the opening keynote at CodeBlue, an international cybersecurity conference, he defined the growing importance of cybersecurity as "Not to secure computers, but to secure society", with a prediction that the current trend would continue over the next 10 to 20 years (Hypponen, 2023). Dr. Ali Alavi (2023), in his article, highlighted the shortcoming of not taking into consideration the increased role of *homo individualis,* particularly in assessing stakeholders' interactions within cyberspace.

While cyberspace has composed one of the key realms of contemporary international conflicts and wars, conventional warfare remains dominant. Here, the concept of hybrid warfare is significant. Hybrid warfare is defined by Frank G. Hoffman as follows: "hybrid war incorporates a range of different modes of warfare, including conventional capabilities, irregular tactics and formations, terrorist acts including indiscriminate violence and coercion, and criminal disorders" (Hoffman, 2007, p.14). For example, the Russo-Ukrainian war started with a hybrid aggression in 2014 and has been ongoing until now. It is an international conflict with an ever-increasing scale in land, sea, air, and cyber domains.

On the other hand, a senior consultant fellow from Chatham House noted that cyber warfare has not become a dominant feature of the Russo-Ukraine War that started in February 2022 (Giles, 2023). A question is why Russia has focussed more on kinetic than cyber warfare. The author considers that a certain level of cooperation between Ukraine and the North Atlantic Treaty Organisation (NATO) between 2014 and 2022 holds a key to answering this question.

Objectives of this Study

This article sheds light on the historical and geopolitical development of the relationship between NATO and Ukraine, focusing on cooperation in cyberspace from 2007 to 2022. This research addresses the following two questions. What role have NATO states played in establishing Ukraine's IT sector? What changes emerged in Ukraine's cyber defence capabilities from 2007 to 2022?

The rapid changes in the world require additional assessments and the need to consider new dimensions and realms of influence of key actors in global politics. To assess the major changes from the period of the Cold War to today, a theory called "lateral pressure" has explained the development of these changes. According to Choucri, lateral pressure refers to 'any tendency (or propensity) of states, firms, and other entities to expand their activities and exert influence and control beyond their established boundaries, whether for economic, political, military, scientific, religious, or other purposes' (Choucri & Agarwal, 2017; p1). By categorizing the changing international politics into six phases from the 1970s to the present, Choucri considers the sixth phase as a newly emerged realm in which cyberspace is a ubiquitous space (Choucri, 2017).

Until recently, cyberspace was considered a matter of low politics. However, due to the further growth of IT and its increased role in our daily lives, scholars have started to recognise cyberspace and its relationships as a matter of high politics (Choucri, 2012). The author of this article chose this theory for the reasons explained later.

Before addressing research questions, it is necessary to delve into the purpose of the creation and history of NATO from its formative period until 2022. This will shed light on the foundation and basic principles of US foreign policy in post-WW2 Europe and the conflict of interest with the RF. Finally, the development of Ukraine's cyber defence capability and the involvement of the NATO states are analysed.

From 2007-2022, several conflicts between Russia and the US and between the US and China happened in cyberspace. Informational operations, espionage, and state-launched cyber-attacks on critical infrastructure are among them. Estonia in 2007 and, more recently, Ukraine have served as major battlegrounds. World powers consider cyberspace a grey zone, as they think that the attribution of cyberattacks to a particular state is difficult and thus that it remains as grey. States such as Russia have exploited this ambiguity by allowing force against rival states without triggering the conflict into kinetic, conventional warfare.

As a result, the NATO Cooperative Cyber Defence Centre of Excellence (CCDCOE) was founded in 2008 in Estonia. Subsequently, NATO recognised cyberspace as a domain of operations during the summit in Warsaw in 2016. The EU, the UK, the US, China, Ukraine, and many other states have started to develop, publish, and regularly update their cybersecurity strategies. Other states, like Russia, have refrained from publishing a centralised white paper but have incorporated related norms into existing strategic policy documents. All the countries mentioned above have started to develop cyber defence capabilities and establish institutions responsible for them.

The above-mentioned background leads us to question what level of cyber defence capabilities Ukraine has developed with its interaction with NATO states, particularly the US. There is an ongoing debate about Ukraine's cyber defence capabilities in the West. Thus, the next section reviews the existing literature.

Literature Review

Several studies have argued that Ukraine's cyber defence capabilities increasingly developed after 2014. Pundits, for example, mentioned that Western states heavily assisted Ukraine in developing cyber defence capability between 2014 and February 2022. Microsoft reports also stated that Ukraine could not effectively withstand Russian cyber-attacks during 2014-2017. M. Willett (2022) and G. F. Treverton and P. Esfandiary (2022) held a view that Ukraine overcame persisting weaknesses of having an outdated legislature, underdeveloped organisational structure, endemic corruption, and bureaucratic obstacles (Microsoft Security Intelligence annual reports, 2012-2017; Oiker et al., 2016; O'Neill, 2022).

On the other hand, some scholars like A. Brantly et al. (2017) have maintained that Ukraine's defence capabilities were enhanced but limited in their success even though Western IT corporations and the North Atlantic community have continued their efforts in strengthening its cyber defence capabilities. Furthermore, conclusions were made that Western assistance to Ukraine had a negative effect on the Western countries'

cyber security capabilities and had led to financial losses (Kostyuk and Brantly, 2022). C. Watts (2022) from Microsoft contemplated that Ukraine demonstrated substantial progress in improving cyber defence capabilities during real-time hybrid warfare in the limited time frame from 2017 to 2022.

Due to the nature of cyberspace, Ukraine's cyber defence capabilities are significant not only for Ukraine but also for the US, EU, and the UK. Russia may target the West beyond Ukraine, or Russian cyberattacks on Ukraine may cause extensive damage to the West under the current circumstances. Within this context, another view is to be noted. Some scholars and practitioners argue that Ukraine's cyber defence capabilities surpassed those of Russia and thus caused the limited success of Russian cyber offences against Ukraine (Willett, 2022; Treverton & Esfandiary, 2022; Watts, 2022). Regarding this argument, there are two camps. One advocates the competency of Ukraine's cyber defence capabilities. Therefore, they argue that Russia did not launch full-scale cyber offences in the ongoing war (Kostyuk and Brantly, 2022). The second view is that Russia's cyber offence capabilities were not sophisticated enough to reach its objectives. This is important in the discussion of the prevalence of cyber offence versus defence and vice versa in the context of considering the foundation of the discipline of cybersecurity.

Cyberspace has four interlinked layers: physical, logical, information and people (Clark, 2010). A central characteristic of cyberspace is the lack of sovereignty in international relations, due to its nature. This is an important aspect of the background of this research, and it is discussed in detail in the paragraphs below. Independent computers worldwide are connected through the Internet, creating a physical layer. Civil society is responsible for programming and protocol, providing a logical layer. The US-based non-profit organisation, Internet Corporation for Assigned Names and Numbers (ICANN), is responsible for most day-to-day management. This is known as the multistakeholder approach. Nazli Choucri (2012) underlines three types of cyber conflicts, relating two of them to low politics and the last one as a matter of high politics:

- About the architecture of the internet and the management of cyberspace;
- Pursuing political or economic advantage (legal and illegal);
- Cyber threats to national security.

In December 2012, there was a meeting of the World Conference on International Telecommunications (WCIT) meeting in Dubai. What was supposed to have been a matter of low politics, contention over the management of cyberspace ended up as a split of the world into two camps: Western democracies plus India supported the existing multistakeholder approach, and most of the Developing countries headed by China and Russia advocated for cyber sovereignty. The media dubbed the meeting as an 'Internet Yalta' (A. Klimburg 2013). On the 28th of April, 2022, the Declaration of the Future of the Internet, supporting and strengthening the multistakeholder approach, was signed by 60 countries (B. Smith, 2022).

The concept of cyber (digital or network) sovereignty was introduced only recently. It can have different meanings for various states and actors. This is due to the borderless nature of cyberspace and the absence of a clear location of data. Furthermore, tech-dominant states can exercise law enforcement across borders. Building and developing cyber capabilities for less tech-savvy states can be challenging, as they are recipients of legal and tech environments. In summary, when different states mention network sovereignty, they mean such things as digital monetary sovereignty, global control of the Internet, defence against 'cyber

hegemony', protection of data sovereignty against foreign law enforcement, regulation of the Internet nationally, increasing technological capabilities, and protection of territorial sovereignty (P. Roguski, 2023). This list can be further extended following technological progress, particularly the development of Artificial Intelligence (AI) and political debates about the future of the Internet.

Put simply, the world is moving towards the further division of the Internet into multistakeholder managed (existing approach) and governed by the International Telecommunication Union (ITU) (newly introduced by Russia and China and supported by the Global South). Further and intensified confrontation among key interested parties is highly probable. This will have significant economic and political consequences and limit the ability of people around the world to exchange information freely. After this review of the existing literature, it is logical to discuss the theoretical framework applied for this research.

Theoretical Framework: The Theory of Lateral Pressure

To understand the evolution of the relationship between NATO, the RF and Ukraine, it is vital to shed light on the propensity to expand (Why?). For this purpose, an assessment of capabilities and power is required to scrutinise the intersections of spheres of influence, and for this, the Lateral Pressure Theory has been selected for this study. There are several reasons behind applying the abovementioned theory to the confrontation between the RF and Ukraine in cyberspace. First, it was originally developed during the peak of the Cold War. The US, Soviet Union, and the People's Republic of China's propensities to expand were assessed. Hence, data related to the RF and US is comprehensive and has a long history of observation. Secondly, the theory had 6 stages of development, with the last addition related to cyberspace published in 2015. The RF and the US were assessed, in correspondence with the world's political contentions over Internet governance and intensified confrontation in Ukrainian cyberspace. Finally, the cyber dimension for the theory was developed in cooperation with prominent scientists from the Massachusetts Institute of Technology (MIT) and Harvard. Research institutions host the world's most influential and knowledgeable minds in Internet studies and International Relations, allowing synergy from a multidisciplinary approach.

The Theory was formulated in quantitative and qualitative terms, where the strength of a specific country's lateral pressure positively correlates with its capabilities and power. The theory explains the sources and consequences of lateral pressure tendencies and corresponding actions while tackling the problem of the intersection of spheres of influence of various states. The intersection of spheres of influence is a crucial point characterised by competition, hostilities, conflict, military competition, violence and warfare.

State propensity to expand is a function of the aggregated demand of individuals of the state. The individual is seen as an information-processing and energy-consuming entity (*homo individualis)*. This is one of the main differences between conventional (classical) IR studies and the novelty introduced by the abovementioned theory. Moreover, the described *homo individualis* are not entering an impersonal market from time to time but is located in overarched social, natural and cyber environments. States rely on existing capabilities to meet demands, leading to external behaviour. The master variables are population (P), resources (R) and technology (T). Interactions among these three master variables are the critical drivers of social activity. Different combinations of the master variables are used to draw six state profiles with

distinctive patterns of international behaviour. State profiles can change throughout their development and differ for traditional and cyber realms.

In general, traditional views on IR cannot be applied to the cyber realm due to the nature and ambiguities discussed earlier. Moreover, the new role of private entities in the securitisation of cyberspace is a distinctive feature and consequence of globalisation. However, the logic behind the theory still stands and enables pundits to address new realities. Different indicators to construct master variables were used for traditional and cyber realms. Population: total population vs number of internet users. Resources: surface area vs Internet users, fixed-telephone subscriptions, mobile-cellular telephone subscriptions, fixed (wired)–broadband subscriptions, wireless-broadband subscriptions. Technology: GDP vs ICT goods and exports (Choucri & Agarwal, 2017).

Premise of this Study

For the year 2014, the US profile was mapped as follows, with master variables arranged from the dominant to the least significant: Technology>Resource>Population in the traditional (5th profile) and Resource>Technology>Population (4th profile) in the cyber domain. The RF respectively had Resource>Technology>Population (4th profile) in traditional and Population>Resource>Technology (2nd profile) in the cyber domain. Scholars further processed data and developed a lateral pressure index (LPI) for real and cyber domains. Countries are mapped in Figure 1 below according to their propensity to expand beyond their boundaries in cyber and conventional realms (Choucri & Agarwal, 2017).

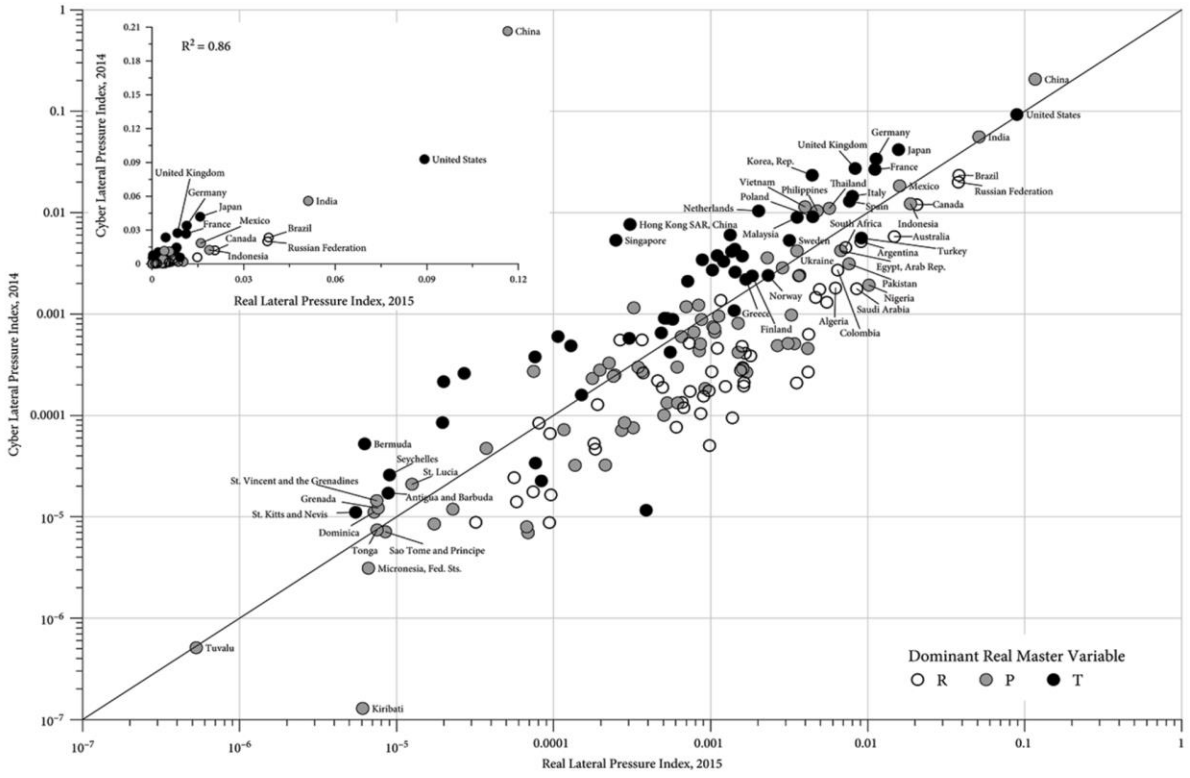


Figure 1 Lateral pressure in real and cyber domains (Choucri & Agarwal, 2017)

As seen in Figure 1, the US has dominance in technology in the real domain and a high level of lateral pressure (leading role) in cyber. The RF, with resources as a dominant real master variable, demonstrates a higher propensity towards expansion in the real domain. The propensity to expand for the US and the RF in 2015 corresponds to the geopolitical events from 2014 to 2022, which is the timeframe for this research. It is worth pointing out, from Figure 1, that Russia is rather an underdog on the global geopolitical landscape. It lacks the conventional military capabilities to oppose NATO states. Hence, it opts for asymmetrical warfare methods and the cyber realm.

On the contrary, the RF is in its development stage. Despite a copious number of cyber-attacks against Georgia, Estonia, US elections, and Ukraine, the scope of which went worldwide several times, they mostly failed to achieve strategic goals and lacked strategic utility. The RF considers cyber operations part of informational and electronic warfare rather than an independent domain. Strategically, they see them as a reincarnation of the reflexive control strategy and attempt to integrate them into all other means of kinetic warfare. The reflexive control strategy was prominent in the USSR and aimed to gain control over adversaries by influencing their decision-making with information for an advantage to the initiator.

Before moving to the next part of the research, this theoretical framework will be supplemented and balanced with empirical findings. D. Moore (2022), in his well-received book, “Offensive Cyber Operations” points out the overall maturity and sophistication of US cyber capabilities. The main reasons are more than 20 years of investments in developing cybersecurity and technological leadership. Cyberspace is defined as a distinct domain of operation in the US military doctrine. However, the lack of integration with kinetic operations and the over-classified capabilities prevent the US from utilising an advantage. Russia is described as a country strongly willing to contend over resources and has an overdeveloped perception of the threat from NATO. With a sober understanding of its traditional military capacities being incomparable to NATO, it perceives an asymmetrical warfare strategy. RF operational activity is focused on neighbouring countries, conducting informational operations and attacks against critical infrastructure (D. Moore, 2022). These empirical findings published in 2022 directly correspond to the assessments made in 2015 under the Lateral Pressure theory.

II. Foundation and Enlargement of NATO

Physical Expansion of NATO in Europe and Ukraine (1990 -2023)

Poland joined NATO in 1999 (Ministry of National Defence, 2020) and the Baltic states in 2004 (Banka, 2019). Both enlargement waves had different diplomacy behind them but similar requirements from the West. What is most important is that the main driver was behind the candidates. Countries that re-established their independence after the collapse of the USSR were seeking security guarantees and assessed the open window of opportunity due to a weaker Russia. They had not been lured into NATO but had diligently done their homework on reforms in civil and military sectors to meet the requirements.

Relationships between NATO and independent Ukraine are a complex blend. It consists of Europe's enlargement, Ukraine as a state and its basic function as a security guarantor, citizens of Ukraine and their political and development choices, and geopolitics between Ukraine and the RF, and the RF and the West. Below, the key moments are concisely highlighted (composed from open sources from the Internet):

- Ukraine and the Baltic states re-established independence in 1991, Poland in 1989;
- In 1994, Ukraine, the US, the UK and the RF signed the Budapest Memorandum. Ukraine received security guarantees and started nuclear disarmament;
- In 1994, Ukraine joined the Partnership for Peace (PfP) initiative;
- In 1996, the Constitution of Ukraine was ratified by the parliament with basic principles of non-coalition and future neutrality (non-aligned status);
- In 1997, after the division of the Black Sea fleet and the Russian claim of the city of Sevastopol, the NATO-Ukraine Commission was established;
- In 2002, the NATO-Ukraine Action Plan was adopted at the NATO enlargement summit. Ukrainian President L. Kuchma stated ambition for Ukraine to join the EU and NATO;
- In 2004, L. Kuchma's decree stated joining NATO was no longer a goal;
- In 2005-2008, following the Orange Revolution, the goal to join NATO was restated. In 2008, Ukraine's President, head of parliament and Prime Minister signed and sent an official letter to apply for the Membership Action Plan;
- In 2008, at the NATO summit in Bucharest, the decision was made not to offer membership to Ukraine and Georgia;
- In 2014, after the Revolution of Dignity and unilateral annexation of Crimea, the Ukrainian parliament renounced non-aligned status;
- In 2016, after a Heads of States meeting in Warsaw, NATO published the Comprehensive Assistance Package for Ukraine (CAPU);
- In 2019, the Ukrainian parliament, with a constitutional majority, backed amendments to the Constitution on Ukraine's path to NATO;
- In 2021, at the Brussels summit, NATO made a statement about the 'open door policy' and requirements to follow the Membership Action Plan (MAP);
- In 2022, Ukraine applied for NATO membership;
- In 2023, at the Vilnius summit, the requirement of MAP was abolished.

In conclusion, NATO did not aim to include Ukraine in the alliance, contrary to what the RF mentions as a major security threat. Furthermore, even now, NATO is not willing to accept Ukraine, still adhering to deterrence. The use of proper language is important to counter propaganda. It is not NATO that is including (conquering) countries, rather it is those countries applying for membership in the alliance. It would be naïve to state that the enlargement of NATO was only driven by the desire of certain states to join the alliance. Certainly, geopolitics and competition through diplomacy played a vital role. As an alliance of independent countries, with the US as a main stakeholder, NATO envisioned benefits from expansion. However, the central role in ensuring security since WW2 and during the Cold War was assigned to the deterrence theory.

The key moments in relations between NATO and Ukraine mentioned above demonstrate this. When the RF stated this as a red line, plans for further enlargement were halted. Instead, the EU continued doing business as usual, buying gas from the RF, even after the events of 2014. The security concerns voiced by the Eastern European and Baltic countries were ignored. The RF considered this a weakness and continued its expansion, culminating in the war of 2022, the biggest military conflict since the end of WW2. Although the war continues, NATO countries still consider certain red lines when making decisions on military aid to Ukraine. These red lines are constantly drawn and re-drawn by the RF. The adversary exploits adherence to deterrence. V. Putin, during an interview with M. Kelly from NBC TV in March 2018, stated that 'Russia could not be deterred in the traditional nor in the cyber realm'[1]. Active debates on the failure of deterrence are ongoing in political and academic circles.

Development of Ukrainian IT Sector Innovation and Growth

Aside from hard power, economic and social development assistance (soft power) is an important tool of the US and a significant instrument of geopolitical influence. This was discussed earlier in the theoretical framework. Therefore, it is appropriate to discuss the growth of Ukraine's IT sector, driven by assistance and FDI from the US, a process resembling the influx of FDI in the Baltic States and Eastern European states in the 1990s. At that time, private capital, not government funds, was the primary funding source of FDI into recently independent Baltic states and Eastern European countries. Moreover, Western European countries and companies provided excellent support and investments to the region excluded from the initial ERP for political reasons (OECD, 2008). This will help address this article's research questions and bring the argument to its conclusion.

In post-industrial societies with service-orientated economies, the importance of the Information and Communication Technology (ICT) sector is generally recognised. ICT powered by private capital can be seen as an essential growth driver, the same role played by industry after WW2. P. Guerrieri and P. C. Padoan argue that the overall economic slowdown of EU countries results from a lack of innovation and negligence of the IT sector, which are the main drivers of growth in the 21st century. The GDP growth and Total Factor Productivity (TFP) growth rates in the Eurozone had drastically slowed during 1996-2005, after three decades of post-war growth (Canuto & Leipziger, 2012). Catherine L. Mann underlines three channels through which ICT products may affect economic growth: terms of trade, economies of scale, and variety. Her research paper explores metrics and research methods that help assess the impact of ICT on economic growth (Canuto and Leipziger, 2012).

[1] Interview with American TV channel NBC, President of Russia, March 10, 2018. [http://kremlin.ru/events/president/news»/57027] (accessed, February 2, 2024). See also, NBC News March 11, 2018. [https://www.nbcnews.com/video/watch-megyn-kelly-s-extended-interview-with-russian-president-vladimir-putin-in-moscow-1182777923615] (accessed, January 5, 2023)

ICT Sector in the Economy of Ukraine

However, compared to the Eurozone, Ukraine enjoyed rapid growth in the ITC sector of the economy. As a background, it is worth mentioning that Ukraine experienced a great deal of political turmoil, culminating in two revolutions in 2005 and 2014. It steadily became a country where the propensity to expand and the geopolitical ambitions of the US and RF have met. This is visible from the relationships between NATO and Ukraine that were discussed earlier. Cooperation and the development of joint activities were often used as political leverage against one another by all the involved parties: Ukraine, the RF and the US. In the next paragraph, the development of ITC in Ukraine is briefly portrayed in quantitative and qualitative terms. Notable progress happened in periods starting from 2005 and after the second revolution in 2014. In 2005, after pro-western reformist President V. Yushchenko was elected, Ukraine became a destination for FDI from the US. Before the revolution of 2014, when the country was under the control of pro-Russian, ousted president V. Yanukovich, IT was neglected by the regime. ITC became a foothold for US soft power. Facebook and other American-based social media were important tools for communication between protesters in the winter of 2013-2014. After the RF unlawfully annexed the Crimea peninsula and waged war in the Eastern industrial part of the country, ITC became a new driver of economic growth. Furthermore, IT was used to strengthen civil society and to battle corruption.

Concurrently with soft power and smart power applied by the US, US-based MNEs were the primary source of inward capital flows fuelling the growth of the software development market in Ukraine. While the actions of the state and MNE(s), which are driven by the interests of stockholders, are independent of each other and often have different trajectories, their behaviours are often interconnected (N. Choucri, 2012). This was observed in Ukraine and is analysed in detail in the last part of this section. Since the second half of the 20th century, Ukraine has demonstrated high endogenous cyber capacity, producing decent students with engineering, cybernetics and computer science backgrounds. The software development market's notable progress happened in the years 2005-2006; the growth of the volume of services provided were 51% and 56%, respectively (Ukrainian Hi-Tech Initiative, 2012). Over the last ten years, IT services export from Ukraine increased from 0.7 billion USD (3.1% out of total services exported) in 2011 to 6.8 billion USD in 2021, which is 37% of total services exported and corresponds to over 4% of Ukraine’s GDP. Most services were exported to the US (40%), the traditional leader among consumers of Ukrainian IT services since 2000. Most companies are small and medium-sized due to the legal environment in Ukraine, where most IT specialists are registered as individual entrepreneurs (independent contractors) for tax optimisation purposes. 51% of Ukrainian IT companies are only service providers, 33% are service provider companies that have their own product(s), and the remaining 16% of companies work exclusively on their product(s). Ukraine has the largest labour market in Europe, with 18.1 million people. In 2011, 25,000 people were employed in IT (Ukrainian Hi-Tech Initiative, 2012), and the estimated amount for the year 2021 is 285,000 people, with 75% of workers being males and 60% having at least three years of related work experience (IT Ukraine report, 2021). After the last decade of exponential growth with an average rate of 25%, the export of IT services became an established and essential part of the Ukrainian economy, with fiscal revenues increasing

more than three times over the last six years. It still enjoys an environment lacking regulation and an extremely lucrative taxation system.

The Ministry of Digital Transformation of Ukraine is developing a unique legal framework (Diia City) for the IT sector, planning to incorporate it into the government with the smartphone app, 'Diia' (OECD, 2022a). Not all market participants support the government's current direction of regulation. Debates to find the balance between the state's interests, IT companies and independent contractors (employees) are ongoing. The emerging regulatory and taxation framework shall consider minimising an inevitable future 'brain drain' (OECD, 2022c). P. Aghion and J. Cagé stress the importance of the role of a state in investing in knowledge and trust, as well as being a guarantor of a viable social contract for the sustainable growth of the economy. Through the analysis of various studies, the authors proved the importance of trust on the firm level for growth and innovation (Canuto & Leipziger, 2012).

Digital Governance and Civil Society; Development and Reforms

There was a significant milestone in developing digital governance (e-government), the tech sector of the economy and related infrastructure in 2014. After the 'Revolution of Dignity', civil society was mobilised and had high expectations from the newly elected president, P. Poroshenko. D. Shymkiv, ex-CEO of Microsoft in Ukraine, agreed to join the presidential team, was appointed as a Deputy Head of the Presidential Administration and launched an ambitious set of reforms for the Ukrainian tech sector. Reforms aimed to develop e-government in Ukraine and improve business conditions and infrastructure in the ICT sector. Jaanika Merilo, an Estonian 'business angel' in the past, was appointed an advisor to the Minister of Economic Development and Trade in 2015. The Department of the Digital Economy was created inside the Ministry of Economic Development and Trade of Ukraine, headed by Lena Minich, ex-CEO of a telecommunication company. Several important laws were adopted on the legislative level, and central government decrees were issued (Nasadiuk, 2015). In 2019, Ukraine's State Agency for e-Governance was transformed into The Ministry of Digital Transformation of Ukraine. The ministry's responsibility is to form and implement the state policy on digitalisation, open data, digitalisation of state services (e-government), development of digital literacy, and access to broadband internet and telecommunication networks (CMU website). The pinnacle and the 'front end' of the ministry's services is launching a 'government in a smartphone' (e-Government) web portal 'Diia' in 2020 (Diia website). In March 2022, shortly after its launch, the 'Diia' application had 13 million users (Iosat & Large, 2022). Ukraine is ranked 1st among lower middle-income countries and 46th overall in the 2022 UN E-Government Development Index (UN website).

US universities contributed to the development of civil society in Ukraine with numerous study exchange programs for journalists and civil society activists. A vivid example is a fellowship program at the Centre on Democracy, Development and the Rule of Law (CCDRL) at Stanford University (2016). Its alum members S. Zalishchuk in 2011, S Leshchenko in 2013 and M. Nayeem in 2014 were elected as members of the parliament of Ukraine in 2014. They are still actively participating in political and social development in Ukraine. As mentioned above, top management from Western IT MNE(s) joined the government in 2014. Their efforts were supported with financing from UK aid and USAID. As a result, the electronic procurement platform 'Prozorro' was launched in 2015 (TAPAS, 2021). Its launch helped to bring transparency to

government procurements and significantly reduced corruption in this critical sector of the economy (USAID, July 2023). The next step was the launch of the earlier mentioned 'Diia'. It was developed with financial, legal and technical assistance from USAID. After its launch and recognised success, Ukrainian expertise has been exported abroad to several countries, with notable advances in technology transfer to Estonia. Moreover, further initiatives from USAID, with a total budget of 203 million USD, were announced in 2023 (USAID, September 2023).

Digital Infrastructure and the Adoption of ICT

Infrastructure development was mainly internally driven and funded. It was facilitated by increased demand from the overall digitalisation of Ukraine. An interesting feature is the large number of small to medium-sized companies providing access to the Internet. This had a positive impact on resilience during the first months of the full-scale Russian invasion of Ukraine because it made it difficult to shut down the Internet in the country entirely. Below, data related to digital infrastructure and the adoption of ICT services will be discussed. Similar data is used for the cyber dimension by N. Choucri for lateral pressure index components, as mentioned earlier. A comparison was made with neighbouring Poland, which is similar in size and population.

Table 1 Digital infrastructure and adoption, key indicators

Country	Poland	Ukraine	Poland	Ukraine
Indicator/Year	2005		2020	
Internet users, % of population	39	4	83	75
Mobile cellular subscriptions, per 100 people	76	64	128	129
Fixed broadband users, per 100 people	2.45	0.28	21.78	18.62
Indicator/Year	2010		2020	
Number of secure Internet servers per 1 million people	155	12	25181	8952

Source: World Bank website

During the last decade in Ukraine, digital infrastructure and the adoption of ICT have significantly improved. However, it still lags behind neighbouring EU countries. Even though affordability is relatively high, as subscription fees and cellular tariffs are among the lowest in Europe, the quality of services needs improvement, particularly the implementation of 4G technology and the subsequent move to 5G networks. Unequal distribution and a lack of connectivity in rural areas persist.

III. Emergence of Ukraine's Cyber-defence Capabilities (2014-2022)

Development in the IT sector of the economy, digital governance and infrastructure helped Ukraine's economy weather the negative impact of the Russian attacks on its sovereignty in 2014. However, the back side of this was a newly emerging cybersecurity vulnerability. As mentioned earlier, cyberspace is considered

to be a grey zone. Governments around the globe started to recognise matters related to it as a matter of high politics only 10 years ago. With the acknowledgement of the importance of information in the 21st century, confrontations have steadily intensified. Methods and choice were not limited, allowing opportunistic actors to seek the upper hand in employing cyberattacks. Ukraine was subject to the highest number of significant-scale cyber-attacks from around the world from 2014 to 2022 (Cyber Peace Institute NGO, 2022; CCDCOE, 2023; Greenberg, 2022; Mandiant, 2023). Below is a timeline highlighting the most significant of these.

- 2014, Malware attack on the Ukrainian Presidential elections, informational operation, attribution unclear, pro-Russian hacktivist group Cyber Berkut claimed responsibility, suspected ties to Russian Main Intelligence Directorate (GRU), cyber group APT28 (Fancy Bear);
- 2014-2016, X-Agent malware implanted in an app for coordination of artillery fire, cyber espionage led to significant battlefield losses, attributed to APT28 (Fancy Bear);
- 23rd December 2015, BlackEnergy and KillDisk malware attack against Ukrainian critical infrastructure, power grid (substations), SCADA was compromised causing blackouts, first ever publicly acknowledged totally remote cyber-attack against power grid, attributed to The Sandworm Group;
- 17-18 December 2016, CRASHOVERRIDE (Industroyer) malware attack against critical infrastructure, Industrial Control Systems (ICS) of substations, functioned as a 'logic bomb' (fully automated) similar to Stuxnet, aimed at industrial hardware, namely circuit breakers and protection relays, attributed to ELECTRUM group Directly linked to Sandworm, strong link to TeleBots group;
- 2017, Petya and NotPetya infamous attacks against Ukrainian public and private sector and MNE(s) outside Ukraine, ransomware cryptoworm WannaCry, EternalBlue exploit (possibly developed by NSA and leaked in 2017, repurposed by GRU), XData worm, Mimikatz, estimated global economic losses over 10 billion USD, attributed to the RF executed by TeleBots;
- 2022, just before the full-scale invasion and during the initial months, HermeticWiper (FoxBlade) destructive malware attack on the Ukrainian government, banking sector, defence, IT, aviation and other websites, the attack was prepared in advance and access to networks was gained in December 2021, the attack and its impact is still under the investigation by threat analysts, possibly attributed to IRRIDIUM GRU Main Center for Special Technologies (Unit 74455);
- 24th February 2022, attack on the Viasat KA-SAT satellite network, rare wiper malware similar to VPNFilter attributed to APT28 (Fancy Bear) and Sandworm groups by FBI and NSA, AcidRain generic wiper malware interrupting service without compromising the KA-SAT satellite itself or supporting ground infrastructure with no evidence of access to user data or personal equipment, aimed at Ukrainian military Command and Control, 'facilitation of a military action' attack, resulted in a major loss of internet communication for users in Ukraine, Poland, Germany, the UK, France, and the Czech Republic, the attack is still under the

investigation by cybersecurity firms hired by Viasat, Ukraine, the US, the UK and the EU officially attributed the attack to the RF.

These mentioned cyber-attacks are the most visible part of the unprecedented cyber offence launched by the RF against Ukraine. The strategy of the RF in the cyber dimension is launching copious numbers of small-scale attacks with the same objectives. It is reported that during peak periods, hundreds of cyber-attacks per month against Ukraine were detected. Most of them were repelled, and the consequences were mitigated. However, this was different in the years 2014-2016. Despite the robust and developing IT industry, Ukrainian cyber defence capabilities were undermined by many persistent problems. An illustrative turning point was the NotPetya attack. The US and the UK governments attributed it to the Russian state, and severe international consequences were promised.

There have been distinctive stages in the development of Ukrainian cyber defence capabilities. During 2014-2016, the problem was recognised. However, Ukraine needed more financing and expertise as it could not defend itself against its stronger adversary. Ukraine was seen as a sandbox for testing and developing Russian cyber offence capabilities. The ambiguity and novelty of cyberspace allowed the aggressor to harden competition with NATO countries without escalation towards kinetic warfare. Western states and NATO recognised this and started to help Ukraine. The Wales summit established the NATO-Ukraine Trust Fund on Cyber Defence (NATO-UKRAINE TF CD) in 2014. Romania was appointed to lead the Programme (NATO watch, 2014). The Fund was designed for 30 months and aimed to support the development of Ukraine's cyber defence capabilities. The main instruments included the provision of hardware and software, technical assistance, advisory services, and training (Cocolan, 2018). 1.7 million USD of financial aid was provided during these years. As a result, a strong foundation was established for the Ukrainian cybersecurity system. The first Ukrainian Cyber Defence Strategy was approved in 2016 as an important milestone. The parliament voted on relevant laws, the government issued resolutions, and the president signed decrees. Responsible institutions were assigned or created and equipped among the different branches of the Ukrainian government, security and armed forces. Scholars generally agree that Ukrainian legislation was made in line with the legislation of NATO members.

During the period from 2017 to 2022, confrontations in cyberspace intensified not only in Ukraine but globally. At the summit in Warsaw in 2016, NATO recognised cyberspace as a separate domain of operations along with land, sea and air (NATO, 2016). Russia and Ukraine were among the invited states to the summit. However, Russia ignored the invitation and continued cyber offensive activities worldwide on an unprecedented level. After the Not Petya attack, NATO states significantly increased their contribution to strengthening Ukraine's cyber defence. As a leading country, the USA alone contributed over 40 million USD to Ukraine. In 2020, the EU imposed sanctions against the masterminds of the previously discussed major cyber-attacks.

In this context, the Ukraine-EU cyber dialogue (2021) was established. Ukraine steadily cooperated with NATO's Cooperative Cyber Defence Centre of Excellence (CCDCOE). Ukraine was accepted as a contributing participant in 2022 (European Parliament Think Tank, 2022). CCDCOE was established in Estonia in 2008 after the Russian cyber-attacks of 2007. Its mission is to 'support member nations and NATO

with unique interdisciplinary expertise in the field of cyber defence research, training and exercises covering the focus areas of technology, strategy, operations and law' (CCDCOE website). After the RF invaded Ukraine, NATO partnering countries strengthened their support for Ukraine's cyber defence capabilities. USAID alone announced 60 million to provide funds for Ukraine in years to come (USAID 2023, February 10). The UK and the EU are strengthening their support and designating funds (millions of USD) to support Ukraine's cyber defence (The UK Government, 2022, November 1; EEAS, 2022, December 2).

The following is analysis of an interview with Illia Vitiuk, the Head of the Department of Cyber and Information Security of the Security Service of Ukraine (SBU). The duration of the interview is 50 minutes. It was published in the iTunes podcast 'Geopolitics Decanted by Silverado' hosted by D. Alperovitch in August 2023[2]. Below are the key points:

- SBU is responsible for cybersecurity, critical infrastructure protection, counter cyber intelligence, information security, law enforcement, detection, incident response, attribution, and investigation; functions similar to the FBI and NSA;
- The department was well-prepared for full-scale invasion because of accumulated knowledge and experience from previous attacks, praised improved legislation, newly adopted a Cyber Security Strategy (2021), newly developed tools and techniques to counter the Russian cyber offensive, and had valuable real combat experience during the first months of the full-scale invasion;
- In 2020 there were 800 cyber-attacks and cyber incidents; in 2021, 1400; in 2022, 4500, including psychological and disinformation campaigns, with 10-15 serious events per day;
- As attacks on Ukraine intensified, so did the amount of help provided by Western states;
- The RF pays significant attention to psychological, disinformation and informational operations; the main threat agents are APT 28 and Sandworm (GRU) and Armageddon and Turla (FSB);
- Many attacks were left unknown to the general public as they were stopped at the initial stage; for instance, recently (2023) the RF launched an attack against one out of three of Ukraine's main telecom companies;
- Since 2014 they have been strengthening and developing synergy and cooperation with cybersecurity units in other parts of the government and armed forces;
- The RF lacks skilled human resources and a consistent strategy; it is not that the RF is simply trying to spread chaos with its cyber offensive, but it lacks substantial effects because of excessive bureaucracy in its military chain of commands;
- The RF made a strategic mistake by launching a cyber offensive against Ukraine back in 2014 and intensifying it until now, as it allows learning, building up capabilities and deepening cooperation with international partners;

[2] How Russian Intelligence operatives have attacked Ukraine in cyberspace: Interview with Ukrainian Security Service, Apple Podcast. [https://podcasts.apple.com/jp/podcast/geopolitics-decanted-by-silverado/id1614010500?i=1000625071187] (accessed, February 5, 2024)

- The RF did not expect such a prolonged confrontation in Ukraine, which is confirmed by the operations in cyberspace; they designed it as a part of kinetic warfare, not an independent domain;
- In 2015, Ukraine demonstrated significant resilience in cyber and real domains; the RF lacked strategic leadership and vision; after the unilateral annexation of Crimea and war in the Eastern part of Ukraine, it did not anticipate Ukraine could cope with these difficulties;
- The difficulties faced by Ukraine include being a large country, having a vast IT infrastructure and the strengths of its adversary;
- Reasons behind the success of cyber defence in Ukraine: experience; policies, action algorithms, strategies and laws, robust cooperation with partner states, non-state actors and special services agencies, abundant financial, hardware, software, and knowledge assistance;
- Highly praised support in intelligence and capabilities from Western cybersecurity firms and special services agencies on what types of malware can be used on what infrastructure and in identifying possible victims in Ukraine;
- In Dec 2021, the US Cyber Command team visited Ukraine with Ukrainian counterparts, inspected possible attack targets, provided Ukraine with necessary hardware and software capabilities, and inspected objects that were actually attacked by the RF at the beginning of 2022.

To conclude, cooperation between Ukraine and NATO states in cyberspace was productive and robust. Russian cyber-attacks intensified, and their sophistication increased throughout the observed period. However, Ukraine was able to continue to develop its defence capabilities and, contrary to the majority of expectations, successfully repelled the unmatched scale of cyber offences in 2022. Furthermore, the effect of successful attacks was not long-standing and failed to meet the objectives of the aggressor. Ukrainians acknowledge the paramount importance of external help provided. During 2014-2017, the total amount of help accounted for less than 2 million USD. From 2017 to 2022, it was already tens of millions of US dollars. CCDCOE highly appraised the capabilities and valuable experience of Ukraine, which resulted in accepting Ukraine as a contributing partner. This became possible only 6 years after the summit in Warsaw, where Ukraine and Russia were invited, and there were still hopes for a dialogue. This radically differs from how the relationship and cooperation between Ukraine and NATO in the traditional domains has been ongoing over the last 20 years.

IV. Conclusions

The roots of the ongoing Russo-Ukrainian war existed in the dynamic situations under which Russia invaded Crimea with a hybrid aggression in 2014. It is an international conflict with ever-increasing stakes in all operations domains: land, sea, air, and cyber. However, as pointed out by policymakers of the West, the current war tilted more toward kinetic warfare, contrary to the earlier prediction of the nature of hybrid warfare. This study examined why cyber warfare has not become dominant by analysing the outcome of 10

years of cooperation between Ukraine and NATO states in developing sovereign state cyber defence capabilities.

Ukraine opted for a different way, trying for balance between the RF and the West. After the country's nuclear disarmament in 1994, its security was guaranteed by the Budapest memorandum. This ceased to exist after one of the signing countries and guarantors that launched military aggression in 2014. The other two guarantors, the UK and the US, who are the key NATO states as well nuclear powers, refrained from firm action. The conflict was frozen under the Minsk and Minsk II agreements. The red lines stated by the RF are behind this decision. The overdeveloped and exaggerated perception of threats from the West generally guided Russian politics. Despite NATO's post-Cold War attempts to harmonise relations with the RF, further confrontation unfolded in the late 1990s.

Starting from the early 2000s, Russia has been driven by imperialistic revanchism. Ukraine as an independent state is a major obstacle to this. Without Ukraine, any new/old Russian empire would lack a historical and religious legacy. Tsar Russia and the Soviet Union widely acknowledged this. Moreover, as the war intensified in 2022, the RF overtly challenged the global dominance of the US. The RF unilaterally announced that it was in a state of war with NATO. After the hybrid hostility in 2014, the RF expected Ukraine to fail as a state. However, its economy and society demonstrated unanticipated resilience by finding new markets and drivers of growth. IT, supported by Western MNE(s), developed rapidly, providing an influx of foreign currency and job opportunities nationwide.

USAID, assessing its competitive advantages and foreseeing opportunities, launched the digitalisation of Ukraine's civil sector support initiatives since 2015 up to the outbreak of the War in 2022. Ukraine benefitted from this and increased efficiency in bureaucratic apparatus, reducing costs, and tackling corruption, which helped the development of civil society. All these situations in Ukraine preceded the full-scale invasion of 2022: Ukraine has had the highest number of experienced IT engineers across continental Europe. Moreover, Ukraine was ranked first among lower middle-income countries, and 46th overall in the 2022 UN E-Government Development Index.

After cyber-attacks against Estonia in 2007, the NATO states marked certain red lines, and CCDCOE was established. Cyberspace was recognised as a matter of high politics, and confrontation became evident after the 'Internet Yalta' meeting of the ICU in 2012. Russia intensified the development of its cyber offence capabilities and Ukraine was a perfect testing ground with its newly established digital private and public sectors. Furthermore, this was in accordance with Russian military doctrine. The doctrine incorporated cyber operations as a supporting part of kinetic and newly emerging hybrid warfare, not an independent capability. Launching cyber offensive operations did not violate the Minsk agreements and hence did not obstruct gas and oil trade, as cyberspace is considered a grey zone. Russian dominance was evident despite early international efforts to build up Ukraine's cyber defence capabilities.

However, lack of expertise and overall clumsiness often led to the impact spreading beyond the initially targeted objects. This culminated in the NotPetya attack in 2017, which caused the highest-ever recorded worldwide economic losses. Debates about the adequacy of investment in Ukraine's cyber defence started to develop in Western academic and professional circles. The first real cyber-war was forecasted and

anticipated. With Russia launching a full-scale attack in 2022, the international cybersecurity and IT community were closely monitoring the cyber dimensions of it. However, to the surprise of the majority, despite earlier unseen sophistication and the amount of cyber offensive actions, the effect was limited and mitigated quickly. Ukraine not only demonstrated its well-known resilience but managed to repel a significant part of the offensive and even start a counter cyber offence.

The reasons behind this are still debatable. It would be short-sighted to believe there would not be further attacks and that a "cyber war" has been won. However, this article concludes that, at this point, we have two equally capable sides. Ukraine has demonstrated decent cyber defence capabilities to stand against a bigger aggressor. On the other hand, the RF might have made a strategic mistake by starting its cyber offensive against Ukraine back in 2014. Doing so revealed their offensive capabilities and resulted in them losing an important element for warfare, that of surprise. Finally, it indirectly contributed to and incentivised Western countries to assist Ukraine during the observed decade-long period.

This brings several important suggestions to policymakers worldwide. Borderless is one of the core and distinctive features of cyberspace. Strengthening Ukrainian networks positively contributes to the overall security of the Internet, which can continue to grow and innovate to support the well-being, human rights and prosperity of all of us. The ability of Ukraine to protect its critical civil infrastructure networks is an argument for the primacy of Western technology and the approach to the government of the Internet. As most of the technology is owned and controlled by Western MNE(s), the increasing role of private-public partnerships in developing cyber defence capabilities is evident. Successful cyber defence is a focal point in ongoing discussions about the prevalence of offence versus defence, the currently dominant opinion. Finally, Ukrainian ITC sector and cybersecurity development cases can be exported and shared, further contributing to global cybersecurity. Increasing cooperation between Ukraine and NATO, particularly in CCDCOE, benefits both parties and can deliver important outcomes for non-member countries supporting the multistakeholder approach to Internet governance.

References

Alavi Ali. (2013). The Karabakh Conflict and its impacts on Iran's national and Diplomatic Debates in the Age of Cyber Space. Journal for Information, Study and Discussion of Global Resource Management, 9, 57-74. [https://grm.doshisha.ac.jp/assets/pdf/journal9.pdf] (accessed, February 3, 2024).

Banka, A. (2019, October 4). THE BREAKAWAYS: A RETROSPECTIVE ON THE BALTIC ROAD TO NATO. War on the Rocks. [https://warontherocks.com/2019/10/the-breakaways-a-retrospective-on-the-baltic-road-to-nato/] (accessed, February 3, 2024).

Brantly Aaron F. (2022). Cyber Security Politics, Routledge. London.

Brantly Aaron F., Cal Nerea M., Winkelstein Devlin P. (2017). Defending the Borderland, Ukrainian Military Experiences with IO, Cyber and EW, Army Cyber Institute at West Point.

Canuto Otaviano and Leipziger Danny. (2012), Ascent After Decline: Regrowing Global Economies After the Great Recession, World Bank.

Choucri Nazli. (2012). Cyberpolitics in International Relations. Cambridge: MIT Press.

Choucri Nazli. & Agarwal Gaurav. (2017). The theory of lateral pressure: Highlights of quantification and empirical analysis. In W. R. Thompson (Ed.), The Oxford Encyclopedia of Empirical International Relations Theory. Oxford University Press.

Choucri Nazli. & North, Robert. (1972). Dynamics of International Conflict: Some Policy Implications of Population, Resources, and Technology. World Politics, 24: 80.

Clark David. (2010). Characterizing cyberspace: past, present and future, Cambridge: MIT.

Cocolan, M. M. (2018, October 1). International Cooperation for Critical Information Infrastructure Protection: NATO-UKRAINE Trust Fund on Cyber Defence [Publication RASIROM]. [https://www.cipre-expo.com/wp-content/uploads/2018/10/Cocolan%20M%20NATO-UKRAINE%20Trust%20Fund%20on%20Cyber%20Defence.pdf] (accessed, February 3, 2024).

Cyber Peace Institute NGO (2022, December 16). Cyber Dimensions of the Armed Conflict in Ukraine. Cyber Peace Institute. [https://cyberpeaceinstitute.org/research-and-investigations](accessed, February 3, 2024).

Cybersecurity Strategy of Ukraine. (2016). [https://zakon.rada.gov.ua/laws/show/96/2016#Text] (accessed, February 3, 2024).

Cybersecurity Strategy of Ukraine. (2021). [https://www.president.gov.ua/documents/4472021-40013] (accessed, February 3, 2024).

EEAS (2022, December 2). Ukraine: EU Sets Up a Cyber lab for the Ukrainian Armed Forces. [https://www.eeas.europa.eu/eeas/ukraine-eu-sets-cyber-lab-ukrainian-armed-forces_en] (accessed, February 3, 2024).

European Parliament Think Tank (2022, June 21). Russia's war on Ukraine: Timeline of cyber-attacks. [https://www.europarl.europa.eu/thinktank/en/document/EPRS_BRI(2022)733549] (accessed, February 3, 2024).

Giles, K. (2023, December 14). Russian cyber and information warfare in practice. Chatham House. [https://www.chathamhouse.org/2023/12/russian-cyber-and-information-warfare-practice/03-distinctive-features-war] (accessed, February 3, 2024).

Greenberg, A. (2022, April 12). Russia's Sandworm Hackers Attempted a Third Blackout in Ukraine. The Wired. [https://www.wired.com/story/sandworm-russia-ukraine-blackout-gru/] (accessed, February 3, 2024).

Hypponen Mikko. (2023). If It's Smart, It's Vulnerable. CodeBlue, November 8 2023, Tokyo. Opening Keynote.

Hoffman, Frank G. (2007). Conflict in the 21st Century: The Rise of Hybrid Wars. Arlington, VA: Potomac Institute for Policy Studies.

IT Ukraine association. Ukraine IT report. [https://itukraine.org.ua/en/] (accessed, February 3, 2024).

Klimburg Alexander. (2013). The Internet Yalta, Center for a New American Security.

Kostyuk Nadiya and Brantly Aaron. (2022) War in the borderland through cyberspace: Limits of defending Ukraine through interstate cooperation, Contemporary Security Policy, 43:3, 498-515.

Mandiant (2023, November). Sandworm Disrupts Power in Ukraine Using a Novel Attack Against Operational Technology. [https://www.mandiant.com/resources/blog/sandworm-disrupts-power-ukraine-operational-technology] (accessed, February 3, 2024).

Ministry of National Defence. (2020). Poland in NATO - more than 20 years. Website of the Republic of Poland. [https://www.gov.pl/web/national-defence/poland-in-nato-20-years] (accessed, February 3, 2024).

Moore Daniel. (2022). Offensive Cyber Operations. C. Hurst & Company. London.

Moore, Gordon E. (April 19, 1965). Cramming more components onto integrated circuits. Electronics Magazine. Volume 38, [http://cva.stanford.edu/classes/cs99s/papers/moore-crammingmorecomponents.pdf] (accessed, February 3, 2024).

NATO Cooperative Cyber Defence Centre of Excellence (CCDCOE), the Czech National Cyber and Information Security Agency (NÚKIB), the International Committee of the Red Cross (ICRC), the University of Exeter, United Kingdom, the U.S. Naval War College, United States, and Wuhan University, China. (2023, December 15). The Cyber Law Toolkit. [https://cyberlaw.ccdcoe.org/wiki/Special:Search?go=Go&search=attacks+on+ukraine] (accessed, February 3, 2024).

NATO watch (2014). Romania leads NATO project on cyber-defence for Ukraine. [https://natowatch.org/newsbriefs/2014/romania-leads-nato-project-cyber-defence-ukraine] (accessed, February 3, 2024).

Nasadiuk Iryna. (2015). ICT-related Industry Development in Ukraine in 2005-2013: Report on the recent developments in the Internet economy, Warszawa, University of Warsaw.

OECD, Edited by Sorel Eliot and Padoan Pier Carlo (2008), The Marshall Plan: Lessons Learned for the 21st Century.

Oliker Olga, Davis Lynn E., Crane Keith, Radin Andrew, Gventer Celeste Ward, Sondergaard Susanne, Quinlivan James T., Seabrook Stephan B., Bellasio, Jacopo, Frederick Bryan, Bega Andriy, and Hlavka Jakub. (2016). Security Sector Reform in Ukraine, RAND Corporation.

O'Neill Patrick Howell. (2022). Russia hacked an American satellite company one hour before the Ukraine invasion, MIT Technology Review. [https://www.technologyreview.com/2022/05/10/1051973/russia-hack-viasat-satellite-ukraine-invasion/] (accessed, February 3, 2024).

Roguski Przemysław. (2023). Digital sovereignty - shaping regulatory responses to technological dominance. CodeBlue. Tokyo.

Stanford University (2016, April 29). Former fellows comment on Ukraine's continuing struggle for political change. The Fisher Family Summer Fellows on Democracy and Development. [https://cddrl.fsi.stanford.edu/summerfellows/news/former-fellows-comment-ukraines-continuing-struggle-political-change] (accessed, February 3, 2024).

Smith Brad. (2022). A vital step at a critical moment: The Declaration for the Future of the Internet. [https://blogs.microsoft.com/on-the-issues/2022/04/28/declaration-future-internet-cybersecurity-governance/] (accessed, February 3, 2024).

The UK Government (2022, November 1). UK boosts Ukraine's cyber defences with £6 million support package. [https://www.gov.uk/government/news/uk-boosts-ukraines-cyber-defences-with-6-million-support-package] (accessed, February 3, 2024).

Transparency and Accountability in Public Administration and Services (2021, May 11). Prozorro gives opportunities for young entrepreneurs. TAPAS. Retrieved [https://tapas.org.ua/en/all/news/prozorro-gives-opportunities-for-young-entrepreneurs/] (accessed, February 3, 2024).

Treverton Gregory F. and Esfandiary Pari. (2022). Will the Ukraine War Reshape the Internet?, Center for Strategic and International Studies (CSIS).

Ukrainian Hi-Tech Initiative. (2012). Exploring Ukraine IT Outsourcing Industry

USAID (2023, February 10). USAID Announces Up To $60 Million to Bolster Ukraine's Cybersecurity. [https://www.usaid.gov/news-information/press-releases/feb-10-2023-usaid-announces-60-million-bolster-ukraines-cybersecurity] (accessed, February 3, 2024).

USAID (2023, September 6). United States Announces $203 Million in Additional Democracy, Human Rights, and Governance Assistance to Support the People of Ukraine. [https://www.usaid.gov/news-information/press-releases/sep-06-2023-united-states-announces-203-million-additional-democracy-human-rights-and-governance-assistance-support-people-ukraine] (accessed, February 3, 2024).

USAID (2023, July). Digital Development Awards 2020 Digital Booklet. [https://www.usaid.gov/sites/default/files/2023-06/2020_Digital_Booklet.pdf] (accessed, February 3, 2024).

Watts Clint. (2022). Preparing for a Russian Cyber Offensive Against Ukraine This Winter, Microsoft, [https://blogs.microsoft.com/on-the-issues/2022/12/03/preparing-russian-cyber-offensive-ukraine/] (accessed, February 3, 2024).

Willett Marcus. (2022). The Cyber Dimension of Russia–Ukraine War, Survival, 64:5, 7-26

III. Special Contents

On-site Group Work in the Philippines

1. GRM Course Work Report
   Eiji Oyamada,
   Professor, Graduate School of Global Studies, Doshisha University

2. GRM Student Reports
   Hidekazu Nagamura
   Zhang Zhiling
   Huang HuiJuan

3. Report of GRM Recent Activities

4. Report of UPLB-Doshisha symposium
   “Co-existence (Kyousei) and Co-creation in Developing Countries: From the Perspective of the Next Environment”

GRM Course Work Report (April-September, 2023)

Group Work Practice I & III, On-site Group Work

Eiji Oyamada,

Professor, Graduate School of Global Studies, Doshisha University

The GRM program has conducted, with the support of DAIKIN and the University of the Philippines (Diliman and Los Banos), a joint fieldwork in the Republic of the Philippines under the theme "Co-existence and Co-creation in Developing Countries: From the Perspective of 'The Next Environment'" from August 29 to September 2, 2023. It was the highlight of group work sessions in the GRM courses offered in the Spring Semester 2023: Group Work Practice I and III, and On-site Group Work. A total of eleven MA/PhD students from social sciences and engineering were joined by four junior staff from DAIKIN and were divided into three working groups to pursue the given topic.

The sessions commenced with pre-departure activities including a DAIKIN Technology Information Center visit in Osaka, and a series of lectures by several experts in the area of natural resources, national development, heat and fluid flow, and water resource in the Philippines. Upon arrival in the Philippines, field visits were organized to La Mesa Dam, the East La Mesa Treatment Plant, the Local Government Unit (LGU) in Batangus City and the Lima Industrial Estate. An international symposium was held as a closing event on September 1st, hosted by the University of the Philippines (Los Banos), where distinguished members of the central and local governments, academicians and DAIKIN senior management, including the President of DAIKIN gave talks and shared views and opinions of the next environmental agenda in the Philippines.

Students from the University of the Philippines attended the group work on the final day in Los Banos, giving remarkable insights on environmental and development matters which definitely added value to the work. Below are completion notes prepared by the three participants, namely Hideaki Nagamura, Zhan Zhiling, and Huan HuiJuan. In addition, detail reports on these activities and the symposiumare found in the last section of this journal.

We would like to extend its gratitude to DAIKIN and the University of the Philippines for the generous support in the planning and implementation of this group work, offering a most valuable opportunity to the participants.

GRM Student Reports

On-site Group Work (Group Work Practice I&III) in the Philippines

I. Hidekazu Nagamura, Graduate School of Life and Medical Sciences

I joined the GRM Group Work Program to experience different cultures, as I had not traveled abroad much. I wanted to see the world from a broader perspective and broaden my understanding of the world. I believed that by experiencing the situations in other countries, I could gain a more relative perspective on societal issues such as societal divisions, the stagnation of economic growth, and environmental concerns such as global warming and global resource depletion. Furthermore, with the increasing emphasis on the Sustainable Development Goals (SDGs), I was curious to understand the initiatives being taken and the gap between the ideal and the reality of creating a sustainable society by attending lectures by experts and learning about the actual initiatives.

During my visit to the Philippines, I observed various initiatives to achieve a sustainable society. My activities included visiting water treatment facilities; being introduced to cutting-edge research, industrial facilities, and waste management efforts; attending international symposia on sustainable societies; and engaging in group discussions with local university students. These experiences provided a broad perspective on the nation's approach to sustainability and the challenges it faces.

One of the most striking observations was the coexistence of skyscrapers and huts in the same landscape. I rarely see this in Japan and realized that rapid social growth is causing this phenomenon, as well as the disparity of wealth that leads to deteriorating safety. I was also struck by the differences in water management; despite being an archipelagic nation like Japan, which means it has a lot of water resources, the Philippines had water purification plants that did not operate 24 hours a day, and the tap water was not potable, indicating that the value of purified water is high in the Philippines. It was interesting to see how the scarcity of potable water, despite the abundance of water, would affect attitudes toward conserving water resources. Furthermore, Daikin Philippines' commitment to the SDGs seems to be an ideal form of SDGs and corporate social responsibility in a way that is appropriate for a capitalist economy. This is because the company aims to contribute to society in terms of SDGs and job creation by helping and developing national standards for energy efficiency of air conditioners and qualifications for air conditioner installation, while at the same time expanding sales channels for its products. While the initiatives at the corporate and university level were commendable, I felt the need to bridge the gap with the general public. Most of the people I interacted with during the group work in the Philippines were from the elite class, which made me wonder how sustainability initiatives were perceived by the majority of middle- and lower-class citizens. For people who are busy living in the present, it seems intuitively difficult for them to accept policies that sacrifice the present for the future. To avoid creating such social divisions, we in academia, business, and government should work towards the realization of a better society by providing feedback on the benefits while outreach to the public on the direct benefits of maintaining a sustainable society, and I would like to contribute to this.

II. Zhang Zhiling, Graduate School of Social Studies

I am very satisfied with my five-day trip to the Philippines, and I am grateful for such an unforgettable experience. Next, I would like to give back the three points I have learnt from this study.

Firstly, it was my first time to go to the Philippines, and after experiencing the Filipino people and society, I realized the gap between many developing and developed countries. As a student of social welfare, in Japan, we usually discuss social welfare in terms of welfare systems for the elderly, children, and people with disabilities. However, after going to the Philippines, I realized that the meaning of social welfare in the Philippines is a bit broader. It may be related to life, such as access to pure water and clean toilets. On the issue of water security, an important topic of social well-being for developing countries is access to clean water. I reviewed the WHO report on the burden of disease due to unsafe drinking water, sanitation and hygiene and found that the Philippines has thousands of diarrhea, acute respiratory infections, malnutrition, and soil-transmitted helminths due to unsafe water in 2019. Also, I found that there is a big gap between the bathrooms in the Philippines and Japan. Clean bathrooms have many impacts such as reducing the transmission of intestinal helminths, schistosomiasis, and trachoma, neglected tropical diseases that cause suffering to millions of people; and promoting dignity and safety, especially for women and girls.

Secondly, I was able to experience the future development of a new type of community in the Lipa neighborhood, which is very different from the ordinary communities that I have seen in the Philippines, with the advantage of integrating business, living, technology, and innovation. It provides residents with a convenient and healthy life. In addition, it has a strong impact on attracting investment and enhancing the economic efficiency of the region. However, I believe that this model also has certain disadvantages, that is, the cost of construction is expensive, this resource is only a small part of the Philippine people, and there is no way to popularize it to more residents. I think it is worthwhile for me to think deeply about the issue of redistribution of social resources and equity and the economic efficiency of enterprises.

Thirdly, in the lectures and subsequent panel discussions at the UPLB, I reflected on the topic of the environmental challenges of government, society, and business. Often governments will set an environmental goal and take the lead. Companies, on the other hand, produce environmentally friendly products based on economic efficiency. However, I believe that Chinese consumers are more concerned with cost-effective products and services than with the so-called environmental protection concepts, which puts pressure on companies caught between the government and consumers. Whether the company's production of environmentally friendly products with the government's environmental protection concepts because environmental protection products are more expensive to produce, whether consumers are still willing to pay the bill has become a tripartite problem to consider.

Finally, I want to thank this trip to the Philippines, which allowed me to experience Filipino culture, make Filipino friends, and learn a lot through cultural exchange and collaboration within the group work.

III. Huang HuiJuan, Graduate School of Social Studies

From this trip, we considered about how to develop the Philippines sustainably from perspective of "The NEXT Environment". To achieve the goal, the collaboration with the local Government, Industry and Academe is required. So that we visited the Philippines local government office (Batangas), Daikin Philippines (Manila), Lima Technology Center (Batangas) and attended the international Symposium, communicated with the University of the Philippines (Los Banos)'s students by the group work.

I found that, although the local government, industry, and academe, have a strong environmental awareness, but the sustainable environmental development in the Philippines is still on the beginning stage. The connection between the government, industry, and academe is still very weak, because of the lack of goal cohesion. The government lacks sufficient funds to drive and advocate for environmental development, despite their strong desire for it. The industry prioritizes profit over the environment. And the Academe is weak in practice although they have the knowledge about how to make the environmental development.

In my opinion, I think that the government, industry, and academe should have a closer communication with each other, and make a consensus about the key environmental development priorities for the next decade.

Furthermore, they should also consider the balance between the economic development and environmental development. Because that the poverty issue in the Philippines is also pressing. So that, learning from the successful development experiences of other countries while finding a development path that suits the Philippines' unique situation is crucial.

To find their own development path, the first thing to do is that the local Government, Industry and Academe should have a clear understanding of each other's current situation and needs. The coping things from other countries without adaptation is not a viable solution, although that the Philippine people are good at English.

The above reports are available on the GRM website: https://grm.doshisha.ac.jp/en/report.php

GRM Recent Activities

On-site Group Work (Group Work Practice I&III) in the Philippines

I. Visit to Daikin TIC on July 21,2023

A pre-lecture for the "On-site Group Work" of the GRM course was held at Technology Innovation Center (TIC), Daikin Industries, Ltd. in Settsu City, Osaka.

This course emphasizes the importance of "Learning from the issues faced by the local community in Japan or overseas." It is a fundamental course of the GRM program. For this academic year, the target field was set in the Philippines, which is expected to see significant development in the air conditioning market, particularly in the ASEAN countries. The project is being carried out in collaboration with Daikin Industries, Ltd., University of the Philippines Diliman and Los Baños, Daikin Philippines, and local governments in the Philippines.

In this program, 11 graduate students from Doshisha University and 4 young researchers from Daikin Industries collaborate and study together, across the boundaries of humanities, sciences, and their specialty fields. The aim is to integrate knowledge from humanities, social sciences and natural sciences, and to cultivate the wisdom to identify and solve issues. Moreover, it seeks to promote the practice and cultivation of "3C (Critical thinking, Creativity, Conscience)" through collaboration.

At Daikin TIC, after the presentations in English about the company overview, global expansion of air conditioning business, and efforts to address environmental challenges, a tour of the first-floor museum and the third-floor open lab was held. The students learned about the history of the company's products and technologies, as well as its corporate culture.

It was the first time for the students and Daikin researchers to meet each other. At first, some looked little nervous, but the tour of TIC eased their tension. Many questions were raised during the interaction, such as "What are the typical air conditioners used in the Philippines?", "How much is the overseas market expected to expand?" It turned out to be a great opportunity for productive exchange.

II. Preparatory Lectures on July 22, 2023

Following the visit of Daikin a day before, Doshisha University and Daikin jointly conducted preparatory lectures at Shiko-kan, Karasuma Campus, Doshisha University.

In addition to the university professors, two Filipino guest lecturers were invited to teach about various aspects of the Philippines, such as its natural environment, water resources, environmental issues, as well as cultural and social aspects, including regional development by the government. The students also learned about the mechanisms of air conditioning, particularly the heat exchange process including some basic calculations. At times, Daikin researchers provided additional explanations, making it a practical learning experience. All lectures and Q&A sessions were conducted in English. Although some found it challenging to learn in English about topics outside their expertise, it served as good preparation for the on-site practice in the Philippines.

Having met each other for two consecutive days, the Doshisha students and Daikin researchers seemed to have established a friendly atmosphere. At the end of the two-day pre-learning session, Professor Oyamada announced the groups and the assigned tasks. Three diverse groups were formed, consisting of students from different academic years, nationalities, fields of study, affiliations, and native languages. The core theme of the upcoming Philippines on-site practice is "Collaboration and Co-creation in Developing Countries from the Perspective of the 'Next Environment.'"

During the 5-day practical training starting at the end of August, each group will discuss from different perspectives and approaches based on what they observe and experience on-site. They will identify the challenges faced by the Philippines and work collaboratively within their groups to find solutions, considering the local circumstances.

III. On-site Group Work in the Philippines from August 29 to September 2, 2023,

We conducted the joint On-site Practice by GRM and "Environment" Collaborative Creation Course in the Philippines.

Under the theme of "Co-existence (Kyousei) and Co-creation in Developing Countries: From the Perspective of 'The Next Environment", we visited local universities, companies, and municipalities to learn about their initiatives in environmental issues such as air conditioning, water resource management, and waste treatment, as well as the problems facing the Philippines. A total of 14 participants, including students of the GRM "On-site Group Work" and "Group Work Practice Ⅰ &Ⅲ," and young employees from Daikin, took part in this fieldwork. They also engaged in collaborative learning and exchanged experiences with employees of Daikin Airconditioning Philippines, Inc. and students from Philippine universities.

On the final day, we invited speakers from Philippine government agencies and companies to conduct an international symposium jointly organized by the University of the Philippines Los Banos (UPLB), Doshisha University, and Daikin. To conclude the on-site practice, they worked on a group work with UPLB

students to exchange ideas about collaboration between industry, government, and academia to achieve sustainability.

Many participants were impacted by the reality of the Philippines, where poverty and environmental pollution are persistent despite development. The outcomes of this fieldwork will be presented by group at the final presentation session in September 15th.

Date: Aug.29-Sep.2, 2023
Place: Manila and Los Banos, the Philippines
Theme: Co-existence (Kyousei) and Co-creation in Developing Countries: From the Perspective of "The Next Environment"

Cooperating agency:
Daikin Industries, Ltd.
Daikin Airconditioning Philippines, Inc
University of the Philippines Diliman (UPD)
University of the Philippines Los Banos (UPLB)

Schedule:

Aug.29 (Tue)
AM) Kansai Airport to Manila Airport
PM) Visit La Mesa Dam and East La Mesa Treatment Plant

Aug.30 (Wed)
AM) University of the Philippines Diliman (UPD)
Lectures:
"Parameters affecting life cycle cost analysis" Prof. Motoi Wada (Doshisha University)
"Plasma coatings for environmental protection applications" Prof. Magdaleno R. Vasquez Jr. (UPD)

PM) Visit to Daikin Airconditioning Philippines, Inc.
"The problems of air conditioning and the training of engineers in the Philippines"
Lectures and visit of TESDA-Daikin HVAC Training Center: Training facility for technicians for installation and maintenance of air conditioners.

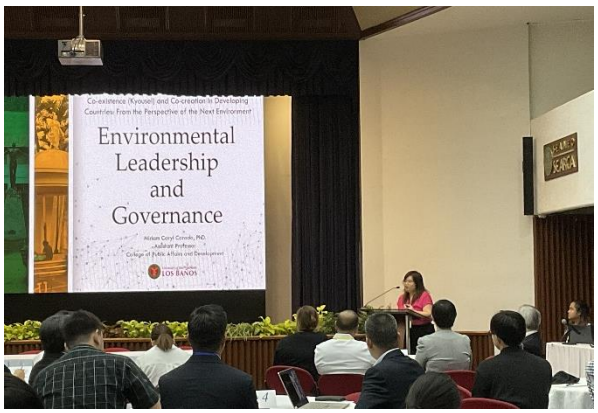
Transfer from Manila to Los Banos

Aug.31 (Thu)
AM) Municipal Hall of Malvar, Batangas
"Overview of the City of Malvar and its waste management initiatives"
Lectures and visit to the Municipal Hall
PM) Visit to Lima Technology Center

Sep.1 (Fri)
AM) UPD-Doshisha University Joint Symposium
“Co-existence (Kyousei) and Co-creation in Developing Countries: From the Perspective of "The Next Environment”

PM) Group Work by participants from Doshisha University, University of the Philippines and Daikin
“Collaboration between industry, government and academia to realize Sustainability”

Sep.2 (Sat)
Early morning) Transfer from Los Banos to Manila
Manila airport to Kansai Airport



IV. Final Presentation on September 15,2023

On September 15th, group presentations for the joint On-site Practice by GRM and "Next Environment" Collaborative Creation Course were held in the Common Room of Shikokan.

The GRM students and Daikin employees who participated in the fieldwork in the Philippines from August 29th to September 2nd divided into three teams, and conducted group presentations in English, focusing on issues facing the Philippines and solutions from the perspectives of resource management and the environment.

In addition to learning from lectures and symposiums, the students visited local companies and municipalities to gain hands-on experience, and also exchanged opinions with local students. Based on these experiences, they conducted research utilizing their own expertise, and each group gave a 20-minute presentation followed by a Q&A session. The participants, who came from different nationalities and backgrounds, discovered the diversity of perspectives on the collaboration between government, industry, and academia in development.

There were some tough questions posed from the professors, but the participants could gain new insights by listening to the presentations and the Q&A sessions of other groups. Additionally, we were able to have employees from Daikin Industrial Technology & Innovation Center (TIC) and Daikin Philippines watch the presentations via Zoom.

With the cooperation of Daikin, the University of the Philippines, and Doshisha, the program turned out to be very fulfilling, with the preparatory lectures in July, the visit to TIC, the 5-day on-site practice, and this presentation session.

The above reports are available on the GRM website: https://grm.doshisha.ac.jp/en/activities.php

Co-existence (Kyousei) and Co-creation in Developing Countries:

FROM THE PERSPECTIVE OF THE NEXT ENVIRONMENT

A Joint Symposium between the
University of the Philippines Los Baños,
Doshisha University, and
Daikin Industries, Ltd.

DOCUMENTATION REPORT

1 September 2023 | 8:30am – 12:00pm

A. SYMPOSIUM BACKGROUND

1. TITLE

Co-existence (Kyousei) and Co-creation in Developing Countries:
From the Perspective of the Next Environment

2. ORGANIZERS

2.1. University of the Philippines Los Baños – College of Public Affairs and Development (UPLB CPAf)
2.2. Doshisha University – Global Resource Management Program (DU GRM)
2.3. Daikin Industries, Ltd.

3. DATE, TIME, AND VENUE

1 September 2023, 8:30am – 12:00pm, Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) Umali Auditoriu, Los Baños, Laguna

4. PARTICIPANTS

The symposium was attended by 56 participants, mainly comprised of students, researchers, and professors. This diverse group represent various institutions of the industry, academe, and government, including Daikin Osaka, Daikin Philippines, Kilojoule Consultants, the Department of Science and Technology, the Los Baños Local Government Unit, Doshisha University, and the University of the Philippines Los Baños.

B. SYMPOSIUM PROCEEDINGS

1. OPENING PROGRAM

1.1. Introduction (8:32am – 8:36am)
Emcee: Maria Kristina G. Alinsunurin

During the symposium, Dr. Alinsunurin, a professor at the UPLB CPAf and International Relations Officer at the UPLB Office of International Linkages, introduced the event and expressed gratitude to Doshisha University and Daikin for their collaborative efforts. The symposium marked the culmination of a 5-day joint visit involving Doshisha University and Daikin, fostering collaborative international learning between UPLB CPAf, DU GRM, and Daikin.

1.2. Welcome Remarks (8:36am – 8:40am)
Dean Rowena dT. Baconguis

UPLB CPAf Dean Baconguis delivered the welcome remarks, emphasizing the symposium's goals of strengthening connections between the academe, government, and the private sector, and highlighting their longstanding partnership. The symposium featured the ongoing online joint learning sessions organized by the College of Public Affairs and Development (CPAf), with a focus on the coexistence of partnerships and collaborative knowledge building. It addressed the intricate outcomes arising from compounded issues such as climate change, underlining the importance of interdisciplinary integration.


1.3. Welcome Remarks (8:40am – 8:43am)
Vice Chancellor Rolando T. Bello

UPLB Vice Chancellor Bello, representing Chancellor Camacho, greeted the guests and welcomed them to the UPLB campus. He emphasized the significance of collaboration between industry, academe, and government, highlighting that such partnerships in science and technology will contribute to empowerment and development that is resilient to future challenges, benefiting communities and the nation. Vice Chancellor Bello commended the organizers for their efforts in hosting the symposium, emphasizing the importance of open dialogue on crucial topics.

1.4. Message from the Daikin President (8:43am – 8:46am)

Miki Takayoshi

Miki Takayoshi, the President of Daikin, delivered a brief message during the symposium. He highlighted the importance of the discussions and noted that while Daikin is a well-known global company in Japan, it may not be as recognized in the Philippines. He pointed out the significant contribution of Daikin air conditioning to lessen pollution. He expressed the hope that this symposium would serve as a valuable opportunity to address these challenges.

PHOTO OPPORTUNITY (8:46-8:48am)

2. SYMPOSIUM TOPICS

Symposium Overview (8:48-8:50am)

The symposium featured six speakers representing various sectors, including Agriculture and Natural Resources, Environmental Leadership and Governance, International Agreements, a presentation from Daikin, and a synthesis of the discussions. This diverse lineup of speakers provided a valuable learning opportunity for all participants, fostering knowledge exchange and collaboration across different fields of expertise.

2.1. Topic 1. DOST-PCAARRD's Climate Change Adaptation, Mitigation, and Investment Initiatives to Address CC Impacts in the AANR Sector (8:52am – 9:26am)
Speaker: Dr. Marcelino U. Siladan

Dr. Marcelino U. Siladan, DOST-PCAARRD's Industry Strategic S&T Program Manager for Climate Change, discussed DOST-PCAARRD's Climate Change Adaptation, Mitigation, and Investment Initiatives to Address Climate Change Impacts in the AANR (Agriculture, Aquatic, and Natural Resources) Sector. He provided insights into how PCAARRD approaches the symposium theme from its perspective, emphasizing its role as one of three sectoral councils of DOST, besides PCHRD and PCIEERD. He highlighted the history of PCAARRD's evolution and its current role in handling the AANR sector.

The presentation delved into the greenhouse effect, greenhouse gases (GHGs), and climate change. Dr. Siladan emphasized that these gases, including carbon dioxide (CO2), water vapor, methane, and nitrous oxide, trap heat radiating from the Earth toward space due to their vibrational properties. Most of the atmosphere comprises nitrogen and oxygen, which cannot absorb heat and contribute to the greenhouse effect.

The presentation highlighted the global impacts of climate change on food security, water supply, and ecosystems, particularly in the Philippines. Evidence of climate change-driven disasters included increased flooding during the wet season and prolonged droughts during the dry season, affecting agriculture and aquatic production. The Food and Agriculture Organization's report in 2015 showed a significant increase in climate-induced disasters, with floods, droughts, and tropical storms severely impacting the agriculture sector. The annual value of damages to the agriculture and aquatic sector in the Philippines increased from PhP 2.6 billion in 2000 to PhP 25.5 billion in 2010.

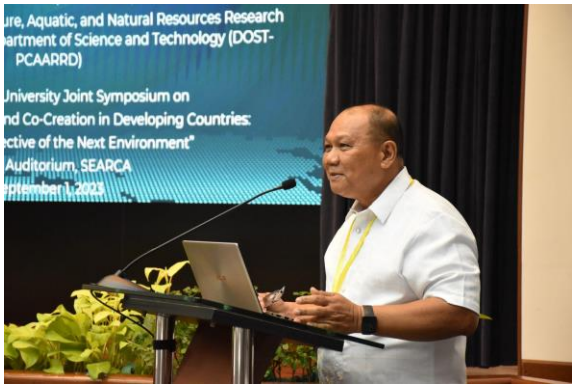
Dr. Siladan introduced PCAARRD's Climate Change S&T Program Framework, emphasizing the Ridge to Reef approach, balanced nature approach in planning, and sustainable basin/watershed approach. He presented the Climate Change and DRRM R&D Technology Chain Framework, illustrating how PCAARRD supports stakeholders in addressing CC and DRRM issues. The presentation included an overview of significant CC and DRRM-related R&D projects, such as SARAI, which focused on Smarter Approaches to Reinvigorate Agriculture as an Industry in the Philippines. SARAI components, including the Water Advisory for Irrigation Scheduling System (WAISS) and the Community-level SARAI Enhanced Agricultural Monitoring System (CL-SEAMS), were explained in detail. These systems aimed to provide site-specific information to aid farmers.

The Integrated Crop Management (ICM) System for garlic and other agri-food condiments' productivity was discussed as an effort to improve crop productivity in the

face of climate variability. The aquashade technology for tilapia, which reduced water temperature during hot seasons, was presented as an innovation enhancing seed production. The study on coastal acidification and its effects on marine environments and resources was outlined, emphasizing the impacts on organisms in the food chain and the development of scenario models. Dr. Siladan introduced the Decision Support System for Enhancing Climate Change Resiliency of Smallholder Upland Farmers, focusing on early warning estimates and agroforestry land capability mapping. The ReforeStable project assessed soil organic carbon in reforested soils under the National Greening Program and examined their resilience to climate change. The project included stable isotope techniques to measure carbon dynamics. The Integration of Traditional and Modern Bioproduction Systems for a Sustainable and Resilient Future aimed to assess the impacts of traditional and modern bioproduction systems on ecosystem services influenced by climate and land use changes.

The eDNA metabarcoding project monitored fish and benthic macroinvertebrates in mangrove areas using environmental DNA and species distribution modeling. Dr. Siladan highlighted DOST-PCAARRD's SAFE Program, focusing on emergency response and technology transfer to address emergencies in the AANR sector. The Technology Transfer Model called S&T Based Assistance to Calamity-Stricken Communities was also discussed.

The presentation concluded with an overview of the CC/DRRM 2022-2028 R&D and S&T Roadmap, emphasizing PCAARRD's banner programs and priority areas. The roadmap aimed to enhance resilience in vulnerable AANR communities and ecosystems, accelerating recovery from climate change impacts and natural disasters. In closing, Dr. Siladan reaffirmed DOST-PCAARRD's commitment to implementing programs and projects addressing climate change and disaster risk. The way forward included generating adaptation and mitigation technologies for resilient communities and ecosystems, guided by science-based solutions to tackle climate change's global impacts.



2.2. Topic 2. Environmental Leadership and Governance (9:28am-9:51am)
Speaker: Dr. Miriam Caryl DL. Carada

Dr. Carada, a development management and governance professor from UPLB CPAf, presented leadership and governance within the context of climate change. The presentation began with a concise overview of what was typically taught in Management 101, emphasizing fundamental management functions such as planning, organizing, controlling, and leading.

The focus then shifted to the concept of leadership, which was defined as the capacity and process of guiding, inspiring, and influencing individuals or groups to collectively achieve shared objectives. Leadership entailed taking initiative, making informed decisions, setting a clear direction, and motivating others to collaborate effectively.

The presentation proceeded to introduce the concept of climate governance. This encompassed the combined efforts, mechanisms, policies, and processes implemented by various stakeholders, including governments, international organizations, institutions, businesses, and civil society, to address climate change and its consequences. Climate governance involved the coordination of actions and strategies across different levels, aiming to mitigate greenhouse gas emissions, adapt to changing climate conditions, and promote sustainable development.

Key components of climate governance were detailed, including policy formulation and implementation, the significance of international agreements such as the Paris Agreement, the role of multilateral institutions like the United Nations Framework Convention on Climate Change (UNFCCC), the importance of research and data collection, financial mechanisms like the Green Climate Fund, stakeholder engagement, public awareness and education, adaptation strategies, technology and innovation, and monitoring and reporting.

The presentation then transitioned to the concept of environmental leadership. Environmental leadership was defined as the proactive and influential practice of addressing environmental challenges and advocating for sustainability. Environmental leaders could be individuals, organizations, or communities committed to prioritizing environmental protection and conservation. The key aspects of environmental leadership were outlined, including the development of a clear vision and values, the promotion of innovative solutions, the fostering of collaboration among diverse stakeholders, the raising of public awareness, setting an example as role models, adaptability to changing conditions, a focus on long-term perspectives, advocacy for shaping environmental policies and regulations, and a strong commitment to ethical responsibility.

In summary, Dr. Carada's presentation elucidated the concepts of leadership, climate governance, and environmental leadership. It recognized their critical roles in addressing climate change and environmental challenges, emphasizing the pivotal role of leaders in guiding and inspiring others towards a sustainable and resilient future.

2.3. Topic 3. Latest and Future Alternatives to ODS and HFCs in Refrigeration (9:52-10:03am)
Speaker: Engr. Cesar Luis dL. Lim

In his presentation, Engr. Lim, who serves as the managing partner of Kilojoule Consultants and a fellow of the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), organized his discussion into various categories of refrigerants. These categories represent alternatives to HFCs, which are currently gaining recognition for their environmentally friendly attributes. These categories included natural organic refrigerants like R-717, R-718, R-744, and R-723, as well as natural hydrocarbon refrigerants such as R-290 and R-600a. Engr. Lim also mentioned natural cryogenic refrigerants like R-702, R-702p, R-704, R-728, R-729, R-732, and R-740. While discussing absorption solutions like NH4/H2O and H2O/LiBr, he pointed out their eco-friendliness but noted their high cost and relatively short two-year lifespan. Additionally, he highlighted halocarbon refrigerants like R-123, R-134a, R-245fa, R-404a, R-407c, R-410a, and R-507a, which are subjected to a 10% reduction in importation in the Philippines starting 2028.

Engr. Lim also delved into the realm of new halocarbon refrigerants considered as alternatives to HFCs, aligning with the Kigali Agreement under the United Nations. He referenced an article that questioned the significance of measuring Global Warming Potential (GWP) over 20 years instead of 100, emphasizing the need to evaluate the real impact of GWP in the short term versus the long term.

In summary, Engr. Lim's presentation revolved around the exploration of various alternatives to ozone-depleting substances (ODS) and HFCs in the field of refrigeration.

The presentation highlighted the significance of environmentally friendly refrigerants and their implications for Global Warming Potential (GWP).

2.4. Topic 4. Developing the Local Energy Efficiency and Conservation Plan (LEECP) Guidebook for Local Government Units (LGU) (10:07am-10:25am)
Speaker: Ms. Pamela Cabacungan

In her recorded presentation, Ms. Pamela Cabacungan, manager of the Low Emission Development Strategies at the International Council for Local Environmental Initiatives (ICLEI) Southeast Asia Secretariat, discussed various aspects related to partnership initiatives and energy efficiency in the Philippines. She began by highlighting ICLEI Southeast Asia, a network of Local Government Units (LGUs) that collaborates with the Department of Energy (DoE) and the Department of the Interior and Local Government (DILG). One of their significant endeavors was the development of the Local Energy Efficiency and Conservation Plan (LEECP) Guidebook for LGUs, which aimed to enhance energy efficiency practices at the local level.

Ms. Cabacungan also introduced ICLEI, an international organization comprising 2,500 local and regional governments, with a strong presence in Germany and Southeast Asia, including the Philippines and Indonesia. The organization primarily focuses on Sustainable Urban Development and provides various services such as technical support, financial assistance, knowledge platforms, dialogues, and partnerships, all geared towards advancing sustainable practices.

She discussed the Low Emission Event Pathway, which promotes energy efficiency through nature-based solutions and the Clean Energy Living Laboratories Project (CELLs). CELLs, in partnership with universities and funded by the European Union (EU), aimed to provide access to sustainable energy programs, establish knowledge hubs across the Philippines hosted by universities, and gather information to enhance nature-based solutions in national policies and planning.

Ms. Cabacungan touched upon the Energy Efficiency and Conservation Act of 2019 (RA 11285), which mandates the establishment of an office led by an energy conservation officer to ensure LGU compliance with the law. The law also requires the submission of monthly electricity and fuel consumption reports by LGUs, with focal persons assisting in generating these reports and monitoring projects.

She explained the concept of a Local Energy Efficiency and Conservation Plan (LEECP), emphasizing its collaborative and multistakeholder approach. The LEECP Guidebook assists LGUs in complying with mandatory requirements, providing a template for outlining priorities and initiatives in four sections: Preparatory compliance, Strategic Assessment of the Energy Profile, Planning and Operationalization, and Monitoring, Evaluation, and Improvement.

Furthermore, Ms. Cabacungan discussed the importance of rolling out the LEECP Guidebook in LGUs, emphasizing its relevance during the pandemic to promote efficient energy use and decarbonization. She highlighted that the LEECP can serve as a basis for collaborative partnerships between LGUs, industries, and the academe, fostering technical assistance, joint ventures, and public-private partnerships.

In conclusion, Ms. Pamela Cabacungan's presentation highlighted the significance of partnership initiatives and energy efficiency measures for LGUs in the Philippines. It emphasized the role of LGUs in adapting to evolving energy landscapes, the importance of universities in supporting LGUs, and the capacity of NGOs/CSOs in facilitating communication and feedback between local governments and stakeholders in energy planning.

COFFEE BREAK AND NETWORKING (10:27am-10:57am)

2.5. Topic 5. Introduction of Daikin Industries (10:57am – 11:22am)
Speaker: Mr. JR Lacdang

Mr. JR Lacdang, the Senior Sales Supervisor at Daikin Airconditioning Philippines, provided an overview of Daikin Industries and their operations in the Philippines. Daikin Airconditioning Philippines was established in June 2009 and had a turnover of 7.5 billion pesos. They operate 14 warehouses nationwide to support their operations. Their product lineup includes residential, light commercial, and commercial air conditioning systems. For residential use, they offer six series with 32 models, while their light commercial range includes three series with 14 indoor unit types and a total of 59 models. In the commercial sector, Daikin offers nine series with 20 indoor unit types.

Daikin is committed to after-sales service with a basic policy that includes a 24-hour response time, 2-day service dispatch, and a 12-year supply of spare parts. They also provide training through their Step-Up program and VRV Open School, offering free training programs to all Daikin Authorized dealers, including NC2 accreditation by TESDA. Mr. Lacdang mentioned some project references, including Clark Midori Hotel and Casino, Dusit Thani Davao, PICC, and Ateneo de Davao.

In the second part of the presentation, Mr. Lacdang discussed the importance of energy efficiency in air conditioning systems in the Philippines. He emphasized the significance of efficiency, especially for residential units, and how Daikin is actively working to develop energy-efficient products.

He introduced the concept of CSPF (Cooling Seasonal Performance Factor) as an accurate and reliable rating that allows consumers to evaluate the energy efficiency of products. He highlighted that CSPF labeling became mandatory in August 2022, aiming to help consumers make informed choices. Mr. Lacdang discussed the challenges, including MEPS (Minimum Energy Performance Standards) value set at 3.08, which

could be unclear for consumers, and the issue of self-declared efficiency values, which raised suspicions of false declarations.

To address these challenges, the Department of Energy (DOE) in the Philippines is planning a second phase of CSPF with a higher MEPS of 3.56. As a result, window-type air conditioners will no longer be available in the Philippines. Daikin's initiatives for 2024 and beyond include addressing user concerns with air conditioning, conducting Training of Trainers (ToT) programs with TESDA, promoting energy efficiency in commercial buildings, and measures to control carbon dioxide emissions.

They are actively participating in initiatives like the Joint Crediting Mechanism (JCM) and the Green Investment Scheme (GIS) to reduce greenhouse gas emissions and improve the environment. Daikin is also cooperating in the refrigerant recovery business, contributing to the recovery and destruction of Freon in the Philippines for a more sustainable approach.

3. DISCUSSION

3.1. Synthesis (11:23-11:34am)
Speaker: Prof. Wilfredo B. Carada

Professor Wilfredo B. Carada, an Adjunct Professor at UPLB CPAf who has also held served as University Professor at Doshisha University, provided a synthesis of the symposium, expressing that this discussion is held due to the hatred/discontentment with the current environmental situation. He emphasized the crucial role of environmental leaders in driving sustainable development, using the framework of the "5Ps" - peace and order, partnership, prosperity, people, and the planet.

Prof. Carada stressed the importance of mobilizing society, including all stakeholders and actors, to transition from a problematic state to a more desirable one. He believed that environmental leaders should not only advocate for change but also actively engage in state and business development. He identified key factors such as pressure,

trajectory, information, people, and global networks as essential components of this transformation.

Within his focus on air conditioning efficiency to reduce greenhouse gas emissions in the freezing industry, Prof. Carada mentioned the efforts of the College of Public Affairs and Development (CPAf) in championing environmental leaders. He echoed an earlier point made by Dr. Miriam Caryl DL. Carada about the necessity of transformational leaders who can propose innovative solutions and challenge conventional thinking.

Prof. Carada raised a question about whether this change should be the responsibility of Local Government Units (LGUs) alone or shared among all stakeholders. He concluded by highlighting the importance of collaboration among industry, government, and academe to build competencies, regulate and manage greenhouse gases, and integrate environmental initiatives into business models.

In his vision for sustainability, Prof. Carada defined it as the ability to maintain or support a process continuously over time. He introduced the concept of "Investing for Sustainability Impact" (IFSI), which involves investing in ways that promote positive environmental and societal change. This approach aligns with the broader goal of achieving sustainability in various aspects of life.

3.2. Open Forum (11:34am to 11:57am)

Q (CPAf-UPLB student to Daikin): Could you provide an explanation and further details regarding the meaning and significance of the stars in the performance indicators?
A (Daikin): Star ratings in the Philippines represent an initiative by Daikin aimed at establishing a universal standard to assist consumers in comprehending certain aspects. Specifically, these stars serve as an indicator of the efficiency level of equipment. When consumers purchase air-conditioning units, even those marketed as "inverter," the star ratings offer insights into the overall quality. The underlying principle is that a higher

number of stars signifies better quality and, consequently, a more favorable prospect for a long-term investment.

Q (CEAT-UPLB professor to Daikin): Regarding your training programs with TESDA, do you have any equivalent programs tailored for graduate students? Additionally, is there potential for collaboration of the training courses you offer, particularly in the field of mechanical engineering?
A (Daikin): We have been offering the NC2 program since the 1990s because TESDA did not have a comprehensive syllabus for proper installation training. Our aim is to provide Filipino skilled technicians with the knowledge they need to work efficiently and be well-versed in their field. We are open to collaborating with you in the educational efforts for students.

Q (UPLB student): Can students consider air conditioning installation as a part-time job?
A (Daikin): There are various partnership opportunities available, including those with TESDA for job-related training and with academic institutions for theoretical education. Our collaboration with TESDA aligns with our advocacy to enhance the quality of workers and technicians in the Philippines. Working in partnership with the government allows us to bridge the gap between knowledge and practical skills, ultimately providing a better education for technicians. While we are open to collaboration, we are still in the process of determining the specifics of how we can work together effectively.

Q (Dr. Alinsunurin): Most partnerships seem to be bilateral. Given the complexity often associated with such partnerships, what strategies could be employed to make them function effectively, especially when industry participation is introduced, it adds layers of interest and complexity?
A (Mr. Lim): We are currently conducting Training of Trainers (ToT) programs in collaboration with both the industry and TESDA. These programs are designed to provide education in NC3 qualifications, particularly for handling natural refrigerants.
A (Dr. W. Carada): Alignment of values among stakeholders is crucial, as well as effective resource management and accountability. This should apply to the initiation of activities, such as courses and collaborations

Q (CPAf-UPLB student): How do you go about promoting and supporting champion leaders?
A (Mr. Lim): TESDA primarily focuses on technician training, with an emphasis on NC2 certification. However, an issue arises when technicians pursue jobs abroad after achieving NC3 certification.
A (Daikin): We help student organizations in schools that encourage fellow students. Daikin supports consultants and students by providing sponsorship for training. Some

schools also have their own organizations that organize training sessions and invite us to participate.

Q (CEAT Professor): Are there exchange programs or post-graduate opportunities available for our participation at Doshisha University?
A (Dr. Alinsunurin): We are in the process of renewing our partnership/Memorandum of Understanding (MOU) with Doshisha University. Prof. Eiji will provide further details later.

Summary:
In response to inquiries from UPLB students and professors during the symposium, Daikin representatives provided insights into their initiatives and collaboration efforts. The discussion began with a query about the significance of star ratings in performance indicators. Daikin explained that these stars serve as a universal standard in the Philippines to help consumers gauge the efficiency of equipment, particularly air-conditioning units. More stars indicate higher quality and a better long-term investment.

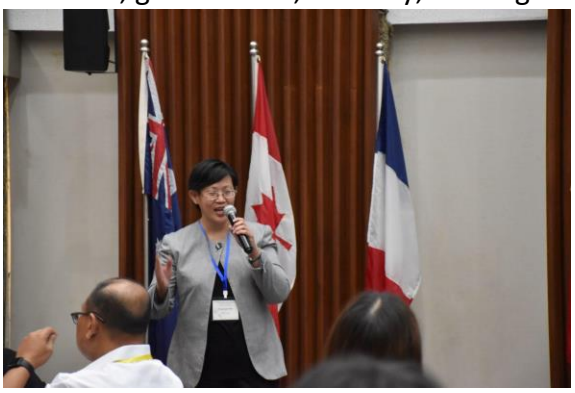
A professor from CEAT-UPLB inquired about Daikin's training programs with TESDA and their potential for collaboration in the field of mechanical engineering. Daikin clarified that they have been offering the NC2 program for technicians since the 1990s due to TESDA's lack of a comprehensive syllabus for installation training. They expressed openness to collaborating on educational initiatives.

Students showed interest in part-time opportunities related to air conditioning installation. Daikin explained that they have partnerships with TESDA for job-related training and academic institutions for theoretical education. These collaborations aim to bridge the gap between knowledge and practical skills in technician education.

Dr. Alinsunurin raised the topic of partnership complexity and strategies to enhance their effectiveness, especially when industry participation is involved. Daikin discussed their Training of Trainers (ToT) programs in collaboration with the industry and TESDA, focusing on NC3 qualifications.

The question of promoting and supporting champion leaders was addressed. Daikin mentioned their support for student organizations that encourage fellow students and provide sponsorship for training. Some schools also organize training sessions and invite Daikin to participate. Regarding exchange programs and post-graduate opportunities at Doshisha University, it was mentioned that a memorandum of understanding with Doshisha is being renewed, with further details to be provided later.

Overall, the symposium facilitated valuable discussions on environmental leadership, sustainable development, training programs, and collaborative efforts between the academe, government, industry, and organizations like Daikin.




4. CLOSING PROGRAM

4.1. Awarding of Certificates (11:57am-12:02pm)

Certificates of Appreciation, signed by Dean Rowena D.T. Baconguis and Prof. Eiji Oyamada, were presented to the speakers as a token of gratitude for their valuable contributions as resource persons. The recipients of these certificates included Dr. Marcelino U. Siladan, Dr. Miriam Caryl DL. Carada, Engr. Cesar Luis DL. Lim, Mr. JR Lacdang, Mr. Wesley Andre Chu, and Prof. Wilfredo Carada.





4.2. Closing Remarks (12:02pm-12:14pm)

Between 2000 and 2003, Prof. Oyamada was under the guidance of Prof. Willy Carada while also balancing a teaching role. At that time, he believed that teaching held greater significance than working with the UN. When he reflected on the Philippines, he has observed numerous changes, one notable distinction being the temperature. In the Philippines, conference rooms tend to be kept very cold. This prompted him to question Dr. Carada about why Filipino people have a preference for colder environments. Some suggested it was to prevent falling asleep, while others argued it was rooted in the culture of Filipinos' hospitality.

He mentioned that it was crucial for students who travel to various countries to prioritize respecting people and their cultures, without complaining about differences. This balance is essential, especially considering that most students in the graduate programs at Doshisha University come from diverse backgrounds.

During this 5-day trip, they visited several locations, including La Mesa Dam and treatment plant, received lectures from the University of the Philippines Diliman, and explored Daikin's operations. They also conducted visits to Los Baños and the Malvar Municipal Hall, as well as the Lima Industrial Center. He is confident that the students gained valuable insights and knowledge during this program. Lastly, he expressed his gratitude to UPLB for their hospitality and the opportunity for collaboration.



ADJOURNED (12:15pm)

Prepared by: Johnnelda P. Cosep | University Research Associate, UPLB CPAf

Global Resource Management Journal Vol.10
2024 年 3 月発行

編集・発行者　同志社大学高等研究教育院
〒602-8580　京都市上京区今出川通烏丸東入
電話：（075）251-3259
E-mail：ji-grmld@mail.doshisha.ac.jp
URL：https://grm.doshisha.ac.jp/

Journal for Information, Study and Discussion of
Global Resource Management, Doshisha University