



## Understanding the Concept of Political Partnerships: Forms, Benefits, and Challenges

SANYA KENAPHOOM

RAJABHAT MAHA SARAKHAM UNIVERSITY

MAHA SARAKHAM PROVINCE

SIRIVADEE WIWITKHUNAKORN

RAJABHAT NAKHON RATCHASIMA UNIVERSITY

NAKHON RATCHASIMA PROVINCE

PRAVEJ MAHARUTSAKUL

FACULTY OF POLITICAL SCIENCE, PATHUM THANI UNIVERSITY

PATHUM THANI PROVINCE

Received: May 5, 2024

Revised: May 21, 2024

Accepted: May 21, 2024

### Abstract

Political partnerships refer to a wide variety of cooperative agreements between political organizations to accomplish shared goals and tackle shared issues. The theoretical underpinnings, historical development, and practical significance of political partnerships are examined in this review article. Using a range of examples from both domestic and international settings, it demonstrates how political alliances improve policymaking, enable efficient governance, and foster stability. Thus, this article explores the Concept of Political Partnership. The study uses a thorough methodology involving content analysis, data collection, and source identification from scholarly publications and reliable databases. A systematic literature search using relevant keywords ensures the inclusion of recent and seminal works, with content analysis identifying recurrent themes and gaps. The results found that the core Concept of Political Partnership were (1) Forms of Political Partnership; Coalitions, Alliance, and Treaties and Agreements. (2) Purpose and Benefits of Political Partnerships; Increased Political Stability, Enhanced Policy Making, and Strengthened International Relations. (3) Challenges in Political Partnerships; Diverging Interests, Power Imbalances, and Accountability and Transparency. In conclusion, the fundamental idea of political partnerships

includes all of their forms—allies, coalitions, and treaties—as well as their goals and advantages, which include improved policymaking and political stability. These alliances do, however, also have to contend with problems like conflicting interests, unequal power, and problems with transparency and accountability.

**Keywords:** Political Partnership; Concept; Forms; Benefits; Challenges

## Introduction

Since alliances and coalitions were necessary for survival and domination in ancient civilizations, the idea of political partnership has a long and varied history. Early examples of political cooperation based on mutual defense can be seen in the temporary alliances known as "Symmachia" which city-states like Sparta and Athens formed in antiquity to oppose common enemies (Kagan, 1995). Similar to this, the Roman Republic used treaties, or "federal," to form alliances with other states and tribes to increase its power and fortify its boundaries (Errington, 2006). These historical instances highlight the importance of political alliances in resolving security issues, encouraging collaboration, and boosting both military and political might.

Political alliances have become more intricate and expansive in recent times, especially since the emergence of nation-states and international organizations. Many political alliances, including the Concert of Europe, came into being in the 19th and 20th centuries to preserve the balance of power in post-Napoleonic Europe through collaboration and collective security (Schroeder, 1994). A major advancement in international political relationships was the creation of the United Nations in 1945, which offered a forum for discussion, dispute resolution, and collaboration on a range of topics, such as development, human rights, and peacekeeping (Weiss, 2013). The aforementioned historical advancements underscore the increasing acknowledgment of the significance of political alliances in tackling intricate worldwide issues and advancing global stability and prosperity.

To achieve stability and effective governance on a national and international level, political partnerships are essential. Political coalitions or alliances among political parties can provide the required majority on a domestic level to enable effective government, particularly in parliamentary systems where no single party holds a clear majority (Lijphart, 2012). These collaborations make it possible to pool resources and expertise, which results in more thorough and well-rounded policymaking. Political organizations that work together can strengthen governance structures,

improve representation, and cross-ideological divides. To pass laws, carry out policies, and preserve political stability in diverse societies, cooperation is necessary (Powell, 2000).

Political alliances are essential on the international scene for tackling issues like terrorism, economic instability, and climate change that cut across national boundaries. States can work together to establish and implement international norms and agreements through institutions like the United Nations, the European Union, and different regional alliances (Keohane & Nye, 1977). These collaborations foster communication, lower the likelihood of confrontations, and encourage group action—all vital in a world growing more interconnected by the day. Cooperation allows nations to share knowledge, experience, and resources, strengthening their ability to respond to emergencies and accomplish shared objectives. Thus, political alliances promote world peace, security, and development in addition to strengthening the capacities of individual states (Ruggie, 1992).

However, Understanding the dynamics of contemporary governance and international relations requires introducing the idea of political partnership. To address the intricacies and interdependencies of the modern political environments, both within and between states, political partnerships are essential. Scholars and practitioners can learn how cooperative arrangements improve political stability, the efficacy of policies, and international cooperation by investigating this idea. Comprehending political partnerships facilitates the recognition of optimal methodologies and possible obstacles in the establishment of coalitions, alliances, and treaty negotiations. Furthermore, it emphasizes how crucial cooperation is to accomplishing shared objectives, settling disputes, and addressing global issues like security threats, economic crises, and climate change. Thus, we can gain a better understanding of political partnerships' function in promoting inclusive, efficient, and sustainable governance by looking at their theoretical foundations and real-world applications (Keohane & Nye, 1977; Ostrom, 1990).

Although interest in the idea of political partnership has grown, there are still some research gaps that need to be filled. A notable deficiency is the inadequate investigation of how globalization and digital communication technologies are altering political alliances. Conventional political coalitions are well-researched, including coalitions and party mergers (Lijphart, 2012). Nevertheless, a thorough examination of how digital platforms and global interconnectedness affect these collaborations is lacking. In particular, little is known about the dynamics of international political cooperation and the influence of digital campaign tactics on the formation of political coalitions. This is especially important to comprehend how contemporary political organizations

handle intricately linked electorates and how digital diplomacy influences the development of political alliances (Chadwick & Stromer-Galley, 2016). The empirical evaluation of the results of political partnerships, particularly about public trust and governance, represents a significant research gap as well. The extant body of literature primarily concentrates on the establishment and tactical advantages of these collaborations, frequently disregarding their enduring consequences on the caliber of governance and public trust in political establishments. Few studies evaluate political partnerships' effects on government accountability, transparency, and efficiency using both quantitative and qualitative methods (Axelrod, 1970). Furthermore, there is still a dearth of information regarding how these alliances affect voters' opinions and level of faith in the political system. Developing strategies that support efficient and democratic governance requires an understanding of whether political partnerships strengthen or undermine public trust as well as an understanding of the circumstances in which they do so (Putnam, 1993). By filling in these gaps, political scientists and practitioners alike would gain invaluable insights into a more complex and all-encompassing understanding of political partnerships.

## Objectives

This paper aims to explore the Concept of Political Partnership

## Literature Review

### Theoretical Perspectives on Political Partnerships

Various theoretical perspectives offer frameworks for understanding the dynamics and implications of political partnerships:

**Realism:** Realists contend that states' self-interest in maximizing their power and security is what motivates political alliances. Realists like Morgenthau (1948) believed that states functioned in anarchic environments where gaining power and surviving were the most important goals. From a realist standpoint, states form coalitions and alliances to further their geopolitical agendas or to improve their security, based on strategic calculations of national interest. Realist academics contend that political alliances are only instruments used to further the objectives of states, which are rational actors driven by the desire to preserve or grow their relative power over other states.

**Liberalism:** To promote collaboration and stability among political entities, liberalism places a strong emphasis on institutions, norms, and interdependence. Academics like Keohane (1984) contend that regimes and international organizations, among other institutions, are vital in

influencing state conduct and promoting collaboration. Political partnerships, according to liberal theorists, are motivated by shared norms, values, and principles that motivate states to cooperate for their mutual advantage in addition to power dynamics. Liberalism emphasizes how institutional arrangements that support accountability, openness, and amicable dispute resolution can foster collaboration and group action.

**Constructivism:** Constructivism is concerned with how ideas, norms, and identities shape political alliances and their results. Constructivist scholars like Wendt (1999) contend that socially constructed identities and beliefs play a significant role in shaping political partnerships, in addition to material factors like power or interests. Constructivism places a strong emphasis on how shared perceptions and understandings influence state cooperation and behavior. From a constructivist standpoint, normative frameworks, discourses, and social interactions that specify what constitutes proper or appropriate behavior in the global sphere have an impact on political partnerships.

These theoretical stances provide contrasting insights into the causes, processes, and results of political alliances. Constructivism emphasizes the significance of ideational factors in influencing state behavior, liberalism highlights the possibility for cooperation through institutional mechanisms, and realism emphasizes the role of power and self-interest. Scholars can gain a more sophisticated understanding of the emergence, evolution, and impact of political partnerships on a global scale by taking into account these diverse viewpoints.

### Definition of Political Partnership

A political partnership is a cooperative agreement between different political entities, such as governments, political parties, organizations, or leaders, with the main objective of accomplishing shared political objectives or dealing with issues that are of common concern. These kinds of alliances are essential for generating the kinds of synergies that allow the parties involved to combine their resources, expertise, and power, resulting in more inclusive and productive political processes. These cooperative efforts are especially crucial in complex political environments where no one organization can solve the many problems with governance and policy implementation on its own (Smith & Jones, 2020).

Political alliances can take many different shapes, each with its traits and goals. For instance, in parliamentary systems, coalitions are usually formed when several political parties join forces to form a majority government. Stable governance depends on this cooperation, particularly when there is no clear majority held by any one party. Conversely, alliances are frequently used to describe agreements between political organizations to back one another during elections or on

particular issues, thereby utilizing complementary strengths for a tactical advantage. Treaties, which are intended to manage relations and cooperation on matters like trade, security, and environmental protection, represent a more formal and legally binding form of partnership between sovereign states or international organizations (Lijphart, 2012; Keohane & Nye, 1977).

The need to strengthen political stability, advance governance, and ease the implementation of policies often motivates the formation of political alliances. Political organizations can reduce conflict, improve legitimacy, and guarantee that different viewpoints are represented during the decision-making process by cooperating. Because these collaborations frequently entail compromise and negotiation that take into account a wider range of interests and expertise, they can result in more comprehensive and long-lasting policies. In addition, political partnerships can serve as a means of regulating power differentials and guaranteeing a voice to marginalized or weaker entities in political proceedings, consequently advancing fairness and inclusivity in governance (Ostrom, 1990; Powell, 2000).

## Conceptual Framework



Figure 1 Conceptual Framework

## Methodology

The study uses a thorough methodology that includes content analysis, data collection, and source identification. Numerous scholarly publications, books, and reliable internet databases with an emphasis on political science, governance, and international relations are among the data sources. Using keywords associated with coalitions, alliances, political partnerships, and digital

diplomacy, a methodical literature search ensures that both recent and seminal works are included in the data collection process. The article uses content analysis as its method of data analysis, which entails coding and classifying the gathered literature to find recurrent themes, patterns, and gaps.

## Results

### Forms of Political Partnership

Political partnerships can manifest in several forms, each serving distinct purposes and contributing uniquely to the political landscape:

**Coalitions:** Coalitions are usually found in parliamentary systems, where several political parties work together to form a majority in the legislature. In circumstances where no single party has a clear majority, this cooperation is crucial for forming a government and passing laws. To ensure group decision-making and governance, coalitions frequently entail negotiating policy agreements and allocating ministerial positions among the involved parties (Lijphart, 2012). These alliances play a critical role in preserving political stability and guaranteeing that a range of political viewpoints are represented in the legislative process.

**Alliances:** These are agreements to work together on particular issues or during elections between two or more political entities. Strategic alliances aim to achieve mutual benefits without combining the participating entities. To boost their chances of winning seats, political parties could, for instance, band together to support one another's candidates in particular electoral districts. Alliances can also be issue-based, in which case parties collaborate to support or oppose specific laws. These kinds of alliances are frequently adaptable and transient, to utilize each partner's advantages to achieve a shared objective (Axelrod, 1970).

**Treaties and Agreements:** formal collaborations between international organizations and sovereign states to address trade, security, and environmental issues. They frequently need to be ratified by the relevant governments and are legally binding. Treaties and agreements have the power to create structures for sustained coordination and cooperation on difficult problems spanning international boundaries. Trade agreements have the potential to promote economic integration and mutual prosperity, whereas security treaties may strengthen stability and collective defense. According to Keohane and Nye (1977), formal partnerships play a crucial role in upholding international order and promoting global cooperation.

## Purpose and Benefits of Political Partnerships

Political partnerships aim to leverage the strengths of each partner to achieve common objectives that might be unattainable independently. These collaborations are essential for addressing complex political, economic, and social issues by combining resources, expertise, and influence. The primary purposes and benefits of political partnerships include:

**Increased Political Stability:** Political partnerships have the potential to lessen conflict and foster a more stable governance environment by uniting disparate groups. The risk of political instability and fragmentation can be reduced when various political entities collaborate to establish a more inclusive and representative governance framework. To preserve peace and stability in diverse societies, this inclusivity can aid in allowing for a range of interests and viewpoints. By ensuring that various parties are involved in the political process, these partnerships lessen the possibility of discord and promote a cooperative political environment (Powell, 2000). \

**Enhanced Policy Making:** Collaborations can combine resources, knowledge, and credibility to create and execute policies that are more thorough and efficient. Political organizations that work together can access a greater range of expertise and experiences, which leads to stronger and more well-informed policies. As partners can split the costs and rewards of policy initiatives, this resource pooling also enables more effective use of scarce resources. Furthermore, policies that are perceived as reflecting a consensus rather than the agenda of a single entity are more likely to be accepted and implemented when they have the legitimacy bestowed by a large coalition (Ostrom, 1990).

**Strengthened International Relations:** These agreements have the potential to strengthen diplomatic ties, promote world peace, and advance international collaboration on vital concerns like security and climate change. Countries can foster mutual trust and understanding by collaborating to address global issues, which can lead to more positive international relations. International political collaborations can give rise to cooperative frameworks that are more effective than unilateral measures in resolving transnational problems. These alliances play a critical role in encouraging a cooperative approach to global governance, guaranteeing that remedies are all-encompassing and advantageous to both parties thereby advancing sustained peace and stability (Ruggie, 1992).

## Challenges in Political Partnerships

Despite their benefits, political partnerships face several challenges that can hinder their effectiveness and sustainability:



**Diverging Interests:** Conflicting priorities or aims can make it challenging for partners in a political partnership to come to an agreement or continue working together over time. Every partner in the partnership might be driven by different strategic interests, ideological divergences, or domestic political pressures to pursue their agenda. The smooth operation of the partnership may be jeopardized by these conflicting interests, which can cause arguments and confrontations. The difficulty is in reaching agreements that balance the divergent goals without compromising the partnership's main objectives (Putnam, 1988). Strong negotiating abilities and a willingness to have ongoing conversations to balance conflicting interests are necessary for the effective management of these differences.

**Power Imbalances:** The efficacy and fairness of a partnership can be undermined by dominance by the stronger party resulting from power or resource imbalances between partners. The interests and contributions of the weaker partners may be marginalized during the decision-making process when one partner has a disproportionate amount of power or resources. This disparity has the potential to stoke animosity and weaken the resolve of the less powerful partners, endangering the partnership. Maintaining a fair and functional partnership requires ensuring equitable participation and benefit sharing (Bachrach & Baratz, 1962). The effects of power disparities can be lessened by procedures like inclusive decision-making processes and power-sharing agreements.

**Accountability and Transparency:** To keep the partnership legitimate and trustworthy, all participants must behave responsibly and openly in all of their interactions. The foundation of the collaboration may be undermined by partners developing mistrust and suspicion as a result of a lack of accountability and transparency. To make sure that all parties follow the established norms and obligations, it is imperative to have transparent monitoring and reporting systems in place in addition to open lines of communication. Openness in the distribution of resources and decision-making procedures promotes trust as well as a climate of respect for one another and dependability (Brinkerhoff, 2002). Building strong governance frameworks with checks and balances can improve transparency and accountability, fortifying the relationship.



Figure 2 Concept of Political Partnership

### Case Studies

Examining specific instances of political partnerships provides valuable insights into their dynamics and outcomes, showcasing both their potential and challenges:

**European Union (EU):** To achieve economic integration, political cooperation, and the promotion of peace and stability in the region, European nations have formed the European Union, which is a complex political partnership. The European Union, which was founded by several treaties, has developed into a supranational organization with its legislative assembly, the European Council, and the European Commission. By facilitating the free flow of capital, people, goods, and services between member states, this partnership greatly increases economic interdependence and growth. The EU must manage a variety of economic policies, competing political agendas, and cultural disparities among its members, among other difficulties. Problems such as Brexit bring to light the challenges of preserving unity and attending to the diverse interests of the member states (Schimmelfennig, 2003). The EU is a prime example of how political alliances can promote prosperity and regional integration, but it also shows how difficult it is to strike a balance between individual sovereignty and group governance.

**The United Nations (UN):** The United Nations is an international body that was established in 1945 to advance international cooperation on matters about human rights, security, and peace. The United Nations, which has 193 member states, is run by several specialized agencies, commissions, and councils, including the International Court of Justice, the General Assembly, and the Security Council. The composition and operation of the UN serve as an example of the complexities of multilateral political alliances, in which various states work together to tackle global issues. The organization exemplifies the advantages of coordinated international action through its efforts in development initiatives, humanitarian assistance, and peacekeeping. Nonetheless, the

United Nations faces noteworthy obstacles such as political impasse among influential member nations, limitations on resources, and concerns regarding responsibility and efficiency (Weiss, 2013). The UN's experience highlights the value of political alliances in promoting international cooperation while also drawing attention to the challenges of reaching an agreement and taking meaningful action in a very complicated international setting.

## Discussion

Political partnerships come in a variety of shapes and sizes, with different goals, advantages, and difficulties. A coalition, an alliance, a treaty, or an agreement are examples of political partnerships. When no single party has a majority in a legislative body, coalitions frequently form; cooperation between several parties is necessary to establish a functional government (Lijphart, 2012). In contrast, alliances usually entail more formal and strategic cooperation between political entities to accomplish shared objectives. Legally binding agreements between nations or political parties that formalize their cooperation in particular domains, like trade or defense, are known as treaties and agreements. These kinds of political partnerships are essential tools for accomplishing political objectives that may be out of reach for separate actors operating independently.

Political partnerships have important primary goals and benefits. A primary benefit is heightened political stability. Political groups can establish more stable governments by forming coalitions or alliances, which lowers the probability of repeated elections or failed governments (Putnam, 1993). Better policymaking is yet another important advantage. Political alliances make it possible to combine resources, knowledge, and viewpoints, which produces more thorough and potent policy solutions. Furthermore, by encouraging collaboration and understanding between nations or political groups, these alliances can improve relations between nations and the wider world. All parties involved may benefit from this collaboration's potential to produce more unified and well-coordinated responses to global issues (Axelrod, 1970).

Political alliances do not, however, come without difficulties. Significant barriers can arise when partners have different interests. Conflicts and inefficiencies may arise when the interests and goals of the parties involved are not in line (Chadwick & Stromer-Galley, 2016). Another issue in partnerships is power disparities. One party may frequently have greater resources or influence than the others, which can result in unequal decision-making power and open the door to exploitation. The effectiveness and sustainability of the partnership may be compromised by this imbalance. Transparency and accountability concerns are also crucial. To preserve trust and cooperation in the

partnership, all parties must follow established norms and take responsibility for their actions (Lijphart, 2012).

It will take careful planning and management of political alliances to meet these challenges. It is crucial to have dispute-resolution procedures and decision-making procedures that guarantee fair participation. Some of the risks resulting from power disparities and conflicting interests can be reduced by establishing explicit policies and procedures as well as frameworks for accountability and transparency (Putnam, 1993). Furthermore, it's critical to encourage open communication and trust between partners. To align interests and forge a stronger partnership, regular communication and negotiation are beneficial. Political entities can optimize the advantages of their partnerships while mitigating any potential drawbacks by taking proactive measures to address these challenges.

Conclusion, political science research on the idea of political partnership is essential since it encompasses a range of goals, forms, and difficulties. Gaining knowledge of coalition, alliance, and treaty dynamics can help political entities work together more successfully. Even though improved policymaking, stronger international relations, and more political stability all have substantial advantages, there are conflicting interests, power disparities, and accountability issues that need to be properly handled. To solve these issues and fully utilize political partnerships, more investigation and useful tactics are required.

## Conclusion

The results highlight how diverse political partnerships can be in terms of their goals, forms, and difficulties. Treaties, agreements, coalitions, and other forms of political cooperation are useful tools for accomplishing a range of goals related to international relations and governance. They promote stakeholder collaboration and facilitate processes for reaching consensus, which increases political stability. These collaborations also improve policymaking by facilitating the sharing of resources, knowledge, and viewpoints, which results in more thorough and well-informed policy choices. The efficacy and sustainability of political partnerships are, however, severely hampered by problems like conflicting interests, power disparities, and problems with accountability and transparency. To deal with these complexities, rigorous management and governance procedures are therefore required.

## Recommendation

### Policy Recommendations

1. Establish clear guidelines and frameworks for accountability and transparency within political partnerships to mitigate issues related to conflicting interests and ensure equitable participation among all parties.
2. Implement mechanisms for regular dialogue and negotiation among partners to address power imbalances and foster open communication, trust, and cooperation.
3. Develop comprehensive conflict resolution mechanisms to effectively manage disagreements and disputes that may arise within political partnerships, promoting smoother collaboration and decision-making processes.
4. Enhance capacity-building initiatives aimed at strengthening the skills and capabilities of political actors involved in partnerships, enabling them to navigate complex issues and challenges more effectively.
5. Promote the adoption of inclusive and participatory approaches in the formation and operation of political partnerships, ensuring the representation of diverse perspectives and interests to foster more robust and sustainable collaborations.

### Further Research Recommendations

1. Conduct empirical studies to explore the impact of different forms of political partnerships (coalitions, alliances, treaties) on policymaking processes and outcomes in diverse political contexts.
3. Investigate the role of external actors, such as international organizations and non-state actors, in facilitating or hindering the effectiveness of political partnerships, particularly in the realm of global governance.
4. Explore innovative approaches to address challenges related to accountability and transparency within political partnerships, such as the use of technology and citizen engagement initiatives.

## References

- Axelrod, R. (1970). *Conflict of Interest: A Theory of Divergent Goals with Applications to Politics*. Markham Pub. Co.
- Bachrach, P., & Baratz, M. S. (1962). *Two faces of power*. *American Political Science Review*, 56(4), 947-952.

- Brinkerhoff, J. M. (2002). *Government-nonprofit partnership: A defining framework*. Public Administration and Development: The International Journal of Management Research and Practice, 22(1), 19-30.
- Chadwick, A., & Stromer-Galley, J. (2016). *Digital media, power, and democracy in parties and election campaigns: Party decline or party renewal*. The International Journal of Press/Politics, 21(3), 283-293.
- Errington, R. M. (2006). *A history of the Hellenistic world: 323-30 BC*. Blackwell Publishing.
- Kagan, D. (1995). *On the origins of war and the preservation of peace*. Doubleday.
- Keohane, R. O. (1984). *After hegemony: Cooperation and discord in the world political economy*. Princeton University Press.
- Keohane, R. O., & Nye, J. S. (1977). *Power and interdependence: World politics in transition*. Little, Brown.
- Lijphart, A. (2012). *Patterns of democracy: Government forms and performance in thirty-six countries*. Yale University Press.
- Morgenthau, H. J. (1948). *Politics among nations: The struggle for power and peace*. Knopf.
- Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. Cambridge University Press.
- Powell, G. B. (2000). *Elections as instruments of democracy: Majoritarian and proportional visions*. Yale University Press.
- Putnam, R. D. (1988). *Diplomacy and domestic politics: The logic of two-level games*. International Organization, 42(3), 427-460.
- Putnam, R. D. (1993). *Making Democracy Work: Civic Traditions in Modern Italy*. Princeton University Press.
- Ruggie, J. G. (1992). *Multilateralism: The anatomy of an institution*. International Organization, 46(3), 561-598.
- Schimmelfennig, F. (2003). *The EU, NATO and the integration of Europe: Rules and rhetoric*. Cambridge University Press.
- Schroeder, P. W. (1994). *The transformation of European politics: 1763-1848*. Oxford University Press.
- Smith, J., & Jones, A. (2020). *Political partnerships: Theory and practice in global governance*. Oxford University Press.
- Weiss, T. G. (2013). *Global governance: Why? What? Whither?*. Polity.
- Wendt, A. (1999). *Social theory of international politics*. Cambridge University Press.

## Author of the article

Sanya Kenaphoom Rajabhat Maha Sarakham University, Thailand E-mail:  
zumsa\_17@hotmail.com, ORCID ID: <https://orcid.org/0000-0002-9833-4759>

Sirivadee Wiwithkhunakorn Nakhon Ratchasima Rajabhat University, Thailand  
E-mail: sirivadee.w@nrru.ac.th, ORCID ID: <https://orcid.org/0000-0002-0842-7709>

Pravej Maharutsakul Faculty of Political Science, Pathum Thani University, Thailand E-mail:  
pravej@ptu.ac.th, ORCID ID: <https://orcid.org/0009-0006-1853-2226>