EXPERIENCE IN DEVELOPING THE SCIENCE, TECHNOLOGY AND INNOVATION DEVELOPMENT STRATEGY TOWARDS 2030, AND IMPLICATIONS FOR DEVELOPING A MID-TERM PLAN FOR IMPLEMENTING THE STRATEGY DURING THE 2026-2030 PERIOD

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Summary:

Experience from countries around the world shows that strategy development in general, and science, technology and innovation (STI) strategy development in particular, the strategy development process and method are considered decisive factors for the quality and feasibility of strategy development documents. There is no common or one-size-fits-all process and method for developing the STI strategy development to apply to all countries, but it depends on the conditions, context, and strategy development tradition of each country. The article focuses on analyzing the practical process and methods of developing the Science, technology and innovation Development Strategy for 2030 in Vietnam, drawing lessons from experience, and suggesting implications for developing the Science, technology and innovation Development Plan for the period 2026 - 2030.

Keywords: *Science and technology; Innovation; Strategy; Plan; Strategy process and method; Period 2026 - 2030.*

Code: *21112101*

1. Concepts and relationships between strategy development and strategy implementation mid-term planning in terms of the strategy development process and method

At the national level, strategy is understood as a comprehensive and long-term plan to orient the development of the country, its sectors, and fields, ensuring sustainable development and adaptability to the international context that always has complex fluctuations (*OECD, 2021; World Bank, 2022*). In the practice of strategy development in many countries around the world, creating a strategic document that ensures quality and feasibility depends on many factors, in which the process and method of strategy development are decisive.

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1.1. Concepts about the process and methods of strategy development

a) Strategy development process

According to Bryson (2018), the strategy development process is a set of systematic steps, carried out to ensure the determination of goals, development orientation, and measures to implement the strategy in accordance with practical conditions.

The strategy development process usually has the following basic steps: (i) Determining the mission, vision, and core values, which are the foundation for strategic orientation, determining the role and overall goals; (ii) Assessing the context and analyzing the environment, including internal analysis (capacity, resources) and external analysis (trends, opportunities, challenges); (iii) Developing goals and setting priorities, which is determining the milestones to be achieved in each development stage of the strategy, setting the priorities to focus resources on; (iv) Identifying strategic options, which is the process of identifying and evaluating feasible options, combining resources and proposing specific solutions; (v) Implementing and monitoring, which is establishing mechanisms for measurement and the strategy adjustments align with reality. Implementing the above steps of the strategy development process will contribute to ensuring transparency and accountability in the strategy development; enhancing the scientific nature of strategic decision-making; mobilizing the participation of stakeholders, creating consensus in strategy development and implementation; establishing specific monitoring and evaluation indicators, minimizing risks when implementing strategies *(Mintzberg, 1994; Bryson, 2018).*

b) Strategy development methods

Strategy development methods refer to a set of scientific approaches, tools, and techniques used to support the strategy development process. According to OECD (2021), strategy development methods are analytical frameworks and practical tools to support goal setting, context assessment, scenario development, and implementation roadmap development to achieve the overall strategy objectives. Strategy development methods are of particular importance to the quality and feasibility of strategies.

Strategy development methods provide a scientific foundation for comprehensive analysis of internal and external factors, ensuring that decision-making is based on reliable data and information; contributing to optimizing resources and orienting appropriate solutions; allowing for the prediction of future fluctuations and the development of contingency plans; ensuring the participation of many stakeholders, helping to create consensus and commitment in the strategy implementation process.

Some most commonly used methods by countries in strategy development are SWOT analysis (Strengths, Weaknesses, Opportunities, Threats), which

is a basic tool to assess the internal and external environment of a country or sector; PESTLE analysis (Political, Economic, Social, Technological, Legal, Environmental), which helps to comprehensively assess the macro factors affecting strategy; Scenario Analysis, which forecasts different future situations and proposes response measures; Delphi method, which helps to collect expert opinions to reach consensus on complex and uncertain issues;...

1.2. The relationship between the strategy development process and method and the process and method of developing the strategy implementation mid-term plan

If the strategy is the general orientation, vision, mission, and core goals to be achieved in the long term (usually from 5 to 10 years or longer), the mid-term plans (3-5 years) aim to break down long-term goals into short-term and measurable goals. The mid-term plan concretizes the strategy through the implementation of tasks, projects, etc. that need to be carried out in each stage. The mid-term plan transforms the long-term strategy into feasible actions, suitable for the specific context at each time. Therefore, the process and method of developing a long-term strategy are closely related to the process and method of developing mid-term plans. Developing a mid-term plan requires applying a strategy-developing process and method to ensure consistency from the strategic vision level to specific actions while creating conditions for flexible measurement and adjustment of strategic goals.

Based on the above concepts and the relationship between the strategy-developing process and method and the strategy implementation mid-term plan-developing process and method, the following sections will analyze the process and method used in the practical development of the Strategy for Science, technology and innovation Development to 2030 in Vietnam, draw lessons learned, and thereby draw the implications for developing the Science, technology and innovation Development Plan for the period 2026 - 2030.

2. Process of developing the Strategy for Science, technology and innovation Development to 2030

The Strategy for Science, technology and innovation Development to 2030 (the Strategy) was issued by the Prime Minister in Decision No. 569/QD-TTg dated May 11, 2022. Although there have been no studies or assessments, it can be acknowledged that the Strategy development process has followed the basic steps, and utilized diverse scientific tools and techniques to support the Strategy development process.

2.1. Strategy development preparation stage

a) Proposing and approving the Strategy development plan

Previous periods of developing the Science and Technology development strategy had not paid due attention to proposing and approving the strategy development plan, so there had been passivity in coordinating activities and using resources, causing waste (*Hoang Xuan Long et al., 2019*). Lessons learned show that the strategy development plan is very important, in determining the success of the strategy.

In mid-2020, the Ministry of Science and Technology was assigned by the Prime Minister to develop the Strategy for Science, Technology and Innovation Development for the period 2021 - 2030[2] (later adjusted to the Strategy for Science, Technology and Innovation Development to 2030), but since the end of 2019, the Ministry of Science and Technology has proactively prepared and approved the Strategy Development Plan, which specifically identifies the tasks, implementation progress, and resource allocation to develop the Strategy, ensuring that the Strategy development is going on schedule and meets the quality requirements. The Strategy Development Plan was approved by the Ministry of Science and Technology leaders, laying a foundation to ensure that the Plan is implemented in practice.

b) Establishing organizations to develop the Strategy

Science, technology and innovation is an interdisciplinary field and in fact, it spans all stages of the production process in all sectors, fields, organizations, enterprises, etc. The Strategy for Science, technology and innovation Development to 2030 is determined to be built to serve and be implemented across all sectors and levels. For that reason, the process of developing the Strategy has focused on attracting the participation of representatives of sectors, levels, and the business community in many different forms, especially their participation in the Strategy development organizations.

The Ministry of Science and Technology has established: (i) the Strategy Drafting Committee, consisting of members representing leaders of ministries, sectors, localities, and the business community to give direction and organize the assessment of the implementation results of the Science and Technology Development Strategy for the 2011-2020 period and the development of the Science, Technology and Innovation Development Strategy to 2030[3]; (ii) the Strategy Editorial Team, consisting of members representing leaders at the Department level of ministries, sectors, and

[2] Decision No. 696/QD-TTg dated May 25, 2020 of the Prime Minister on promulgating the Plan to implement Conclusion No. 50-KL/TW dated May 30, 2019 of the Secretariat on continuing to implement the Resolution of the 6th Central Conference Congress XI on developing science and technology to serve the cause of industrialization and modernization in the conditions of a socialist-oriented market economy and international integration.

[3] Decision No. 3476/QD-BKHCN dated December 14, 2020 of the Ministry of Science and Technology establishing the Drafting Committee for the Strategy for Science, Technology, and Innovation Development for the 2021-2030 period.

localities, headed by a Deputy Minister of Science and Technology; (iii) the Editorial Team Standing Committee, consisting of members representing leaders of units under the Ministry of Science and Technology and a number of experts. The Editorial Team and the Editorial Team Standing Committee are responsible for editing the contents of the Strategy[4].

Thus, the organizational structure for developing the Strategy has been carefully formed from the beginning, clearly demonstrating the awareness of the role of the organizational structure in developing the Strategy. Furthermore, compared to the S&T development strategies of previous periods, this stage has emphasized more on the participation of the business community (through representatives such as the Vietnam Association of Small and Medium Enterprises, the Vietnam Federation of Commerce and Industry) and ministries and branches ensuring the Strategy is oriented toward S&T and Innovation, originating from the needs of socio-economic development, and serving socio-economic development. The organizational apparatus has had positive effects for developing the Strategy, typically The drafting Committee and the Editorial Team have held meetings to discuss and reach a consensus on the approach, process, and method of developing the Strategy, and importantly, the fundamental and core contents of the Strategy.

It can be affirmed that the proactive preparation of the planning and the organization of the construction apparatus have contributed to the certain success in developing the Strategy for S&T and Innovation Development to 2030.

2.2. Strategy development phase

The main activities of this phase are to carry out tasks to define the mission, vision, and core values of the Strategy; assess the context and analyze the environment; develop goals and identify priorities; and identify strategic options. This phase includes the following main tasks:

a) Proposing S&T and Innovation contents into the 10-year Socio-Economic Development Strategy 2021 - 2030

In previous periods of developing S&T development strategies, the Ministry of Science and Technology has paid attention to proposing S&T content in the Socio-Economic Development Strategy. However, due to both objective and subjective reasons, S&T contents were not clearly and consistently expressed in the Socio-Economic Development Strategy, leading to difficulties in implementing S&T activities and in developing and implementing the S&T development strategy. Therefore, during the time of participating in the drafting of the 13th National Party Congress Documents,

[4] Decision No. 3477/QD-BKHCN dated December 14, 2020 of the Ministry of Science and Technology establishing the Editorial Team and Standing Editorial Team of the Strategy for Science, Technology, and Innovation Development for the period 2021-2030.

the Ministry of Science and Technology has actively proposed specific, coherent and consistent content of science, technology and innovation into the 10-year Socio-Economic Development Strategy 2021 - 2030.

This activity demonstrates both the awareness of the role of science, technology and innovation in socio-economy development; as well as establishes a political and legal basis for the development and implementation of the Science, technology and innovation Development Strategy to 2030 through the organic connection and interconnection between the contents of the 10-year Socio-Economic Development Strategy 2021 - 2030 with the Science, technology and innovation Development Strategy to 2030.

b) Evaluation of the implementation results of the Science and Technology Development Strategy for the period 2011-2020

The Ministry of Science and Technology has integrated the evaluation of the implementation results of the Science and Technology Development Strategy for the period 2011-2020 with the development of the Science, technology and innovation Development Strategy to 2030, clarifying the results achieved, identifying limitations, and analyzing both subjective and objective causes of the limitations to having measures to overcome in the period 2021 - 2030, serving as a basis for determining the viewpoints, goals, orientations, tasks, and solutions main measures for developing science, technology and innovation in the next 10 years. The Science, technology and innovation Development Strategy to 2030 inherits the results, achievements, and lessons learned from the Science and Technology Development Strategy for the 2011-2020 period while identifying new content to take advantage of opportunities and overcome challenges in the new context.

c) Developing the Strategy Outline

The Strategy Outline provides a framework that defines the main pillars, main content sections, key objectives, and scope of the Strategy. The Strategy Outline will ensure that all detailed contents developed afterward are consistent with the overall vision and objectives that have been set out. Recognizing that role, before developing the Strategy document, the Ministry of Science and Technology focused on developing the Strategy Outline, consulting with experts and units under the Ministry, and being reviewed and approved by the Ministry's leaders. This is the basis for ensuring that the development of the Strategy closely follows the identified content orientation, enhancing stakeholder participation and consensus in the development of the Strategy.

d) Conducting research activities

The Strategy for Science, technology and innovation Development is a policy document, but unlike an ordinary policy document, it requires a

comprehensive approach, long-term forecasts, and directional and general overview content. Therefore, in the process of developing the Strategy for Science, technology and innovation Development to 2030, research activities have received great attention and focus.

The Ministry of Science and Technology has approved the Ministry-level Science and Technology Program "Research on strategic orientations for the Development of Science, technology and innovation in Vietnam for the period 2021 - 2030" with the aim of providing theoretical and practical bases for evaluating the results of implementing the national science and technology development orientation for the period 2011-2020 and developing strategic orientations for the science, technology and innovation development for the period 2021 - 2030. Before that, the Ministry of Science and Technology also approved the implementation of several research tasks on the methodology for developing the Strategy and forecasting research, selecting priority technology fields to serve the development of the Strategy.

In addition, the Ministry of Science and Technology has also requested ministries, branches, and localities to prepare reports on analyzing and evaluating the status of science, technology and innovation development for the period 2011-2020; Proposing viewpoints, goals, orientations, tasks, and measures for the development of science, technology and innovation in the period of 2021 - 2030 of ministries, branches, and localities. At the same time, the Ministry of Science and Technology has conducted research and reviewed the experience in developing science and technology development strategies in previous periods, the 10-year socio-economic development strategy for 2021 - 2030, development strategies for a number of sectors and fields, and science, technology and innovation development strategies of a number of countries in the world; organizing the collection, synthesis, and construction of a system of documents and data to serve the analysis and calculation of the main goals, orientations and tasks and measures of the Strategy.

e) Carrying out international cooperation activities

The Ministry of Science and Technology has coordinated with international organizations to exchange and cooperate in research, and jointly organize seminars and conferences to supplement foreign experiences and scientific and practical arguments for the development of the Strategy. Typically, in collaboration with the World Bank, the "Vietnam Science, Technology and Innovation Report" is developed to provide supporting analysis for the development of the Strategy, synthesizing policy assessments and recommendations, and providing a roadmap on science, technology and innovation to guide priority actions to promote innovation in enterprises in Vietnam (*Ministry of Science and Technology and World Bank, 2021*); in coordination with the Aus4 Innovation Program (Australia) to develop a "Report on international experience in identifying and selecting strategic goals, targets and recommendations for Vietnam in developing the Strategy

for Science, Technology and Innovation Development to 2030" and "Report on international experience in identifying priority orientations in the fields of Science and Technology, priority technology orientations and recommendations for Vietnam in developing the Strategy for Science, Technology and Innovation Development in Vietnam to 2030";…

f) Developing a draft of the Strategy

Based on the results obtained from the above activities, the Strategy Editorial Team has developed a draft Strategy including the following documents and materials: *(i*) Draft Submission to the Prime Minister for promulgating the Strategy for Science, Technology and Innovation Development to 2030, which analyzes and clarifies the necessity and basis for developing the Strategy, viewpoints and principles for developing the Strategy, the process of developing the Strategy, key issues and main contents of the Strategy; (*ii*) Draft Decision of the Prime Minister promulgating the Strategy for Science, Technology and Innovation Development to 2030, including viewpoints, goals, orientations, tasks and key measures for developing Science, Technology and Innovation; *(iii)* Report explaining the development of the Strategy for Science, Technology and Innovation Development to 2030, in which the report explains and clarifies the necessity, viewpoints, principles and methods of developing the Strategy, the basis for determining the content of the Strategy, the international and domestic context affecting the development of Science, Technology and Innovation in Vietnam to 2030, the structure and main contents of the Strategy.

2.3. The stage of completing and submitting the Strategy for promulgation

The main activity of this stage is to organize the solicitation of comments on the overall draft Strategy, supplement, complete, and request the approval of the Drafting Committee before submitting it to the Prime Minister. Right from the beginning of the Strategy development, the leaders of the Ministry of Science and Technology and the Drafting Committee have directed not only to engage organizations and individuals from within and beyond the science and technology sector to participate in the development of the Strategy but also to attach importance to the stage of soliciting broad contributions from all relevant parties, from policymakers, state managers in ministries, sectors, localities, research institutes, universities, enterprises; the understanding, sharing and commitment to implementing the Strategy of communities inside and outside the science and technology sector is an indispensable condition to determine the level of implementation, role, and influence of the Strategy on socio-economic fields. Therefore, the draft Strategy has been widely consulted with many organizations and individuals (through workshops and written requests for comments) such as units under the Ministry of Science and Technology, leaders and former leaders of the Ministry of Science and Technology, the National Council for Science and Technology Policy, research institutes, universities, enterprises, business

associations, scientists, technology experts from the 3 regions of the North, Central, and South; 28 ministries, branches, and 63 localities; agencies of the National Assembly and Party agencies at the Central level;...

Overall, the stages and steps of the Strategy development process presented above were carried out both sequentially and in parallel. In addition to the policy community, the science and technology community, and the management community, the participation of representatives of the business community in developing the Strategy has been widely mobilized. Therefore, the process of developing a Strategy is essentially a process of considering, exchanging, discussing, selecting, and proposing consensus options on viewpoints, goals, orientations, tasks, and measures for developing science, technology and innovation among sectors, levels, and the business community.

3. Methods for Developing the Strategy for Science, technology and innovation Development to 2030

As presented above, the process of developing the Strategy includes many different activities, including forecasting, determining viewpoints, priority orientations, tasks and solutions for science, technology and innovation development, etc. To carry out these activities, it is necessary to use many different methods, typically some of the following methods:

3.1. Political, Economic, Social, Technological, Legal and Environmental (PESTLE) Analysis Method

The purpose of using the PESTLE method is to identify opportunities and challenges for the development of science, technology and innovation in Vietnam until 2030. PESTLE analysis is an analytical tool to identify international contexts that affect a specific field of the country in 6 aspects: politics, economics, society, technology, law, and environment. The six factors in the PESTLE analysis are all external, objective factors that bring opportunities but also point out the challenges to be faced. Through a comprehensive analysis of the above factors, it is possible to make objective and accurate decisions in determining the contents of the Strategy. From the results of the PESTLE analysis, the Strategy Editorial Team has compiled the major trends (megatrends) affecting the development of science, technology and innovation in Vietnam until 2030. Each major trend is analyzed to identify opportunities and challenges for the development of science, technology and innovation in Vietnam until 2030, which serves as the basis for determining the measures of the Strategy.

3.2. Balanced Scorecard (BSC) analysis method

The purpose of using the balanced scorecard (BSC) analysis method is to identify the strengths and weaknesses of Vietnam's science, technology and

innovation. This method is widely used in developing strategies for businesses and is also used on a national scale for a specific field. In the field of science, technology and innovation, 4 factors are included in the balanced scorecard analysis: Service/beneficiaries objects - Policy and Law - Development capacity - Finance to identify the strengths and weaknesses of Vietnam's science, technology and innovation. To specify the above points, the analysis of the current status of Vietnam's science, technology and innovation is built on the following factors: (i) contributions of science, technology and innovation to people, businesses, and the state sector; (ii) the promulgation of policies and legal documents on science, technology and innovation; (iii) on the national potential of science, technology and innovation; (iv) on finance of science, technology and innovation. The Strategy Editorial Team has organized workshops, consulted experts on the current status of science, technology and innovation in Vietnam, and identified strengths and weaknesses. The information received will be used for SWOT analysis to serve the selection of the measures for the Strategy. On the other hand, the analysis of strengths and weaknesses also serves as the basis for determining the Strategy's objectives.

3.3. Analysis of strengths, weaknesses, opportunities, and challenges (SWOT) and establishment of TOWS matrix

The purpose of using SWOT analysis and establishment of the TOWS matrix is to propose key measures for developing Vietnam's science, technology and innovation by 2030. After identifying opportunities and challenges from PESTLE analysis, and analyzing strengths and limitations from BSC balanced scorecard analysis, the SWOT analysis method will be applied to each specific objective of the Strategy to find measures to achieve the set strategic objectives. The strategic measures are built based on referring to measures in documents issued by the Party and State and supplementing some measures from international experience, at the same time arranging and analyzing according to the TOWS matrix- which are scenarios that occur to promote strengths (S), overcome weaknesses (W), take advantage of opportunities (O), and minimize challenges (T). From there, propose measures: Attack (use strengths to optimize opportunities - SO); Adjust (minimize weaknesses by taking advantage of opportunities - WO); Defense (use strengths to minimize challenges - ST); and Hold (minimize weaknesses and avoid risks - WT).

3.4. "Technology Foresight" Method

The "Technology Foresight" method is used to describe the readiness to respond to long-term issues in general and long-term issues in the future of the S&T system. This is one of the quite effective methods to be able to rightly choose several S&T and innovation orientations that should be

prioritized for development. Based on this method, experts in many different fields can exchange and discuss to reach consensus on priority technology directions and cooperate to make them a reality.

To apply the above method in determining priority technology directions and priority science and technology fields, the Ministry of Science and Technology has actively implemented it in various forms, such as: organizing many rounds of consultation with experts from ministries, branches, research institutes, universities, scientists, technology experts, and managers on science, technology and innovation development directions for the period up to 2030; using research results on priority technology directions according to the Delphi method through consulting with experts in many rounds to assess the importance/positive impact of technology fields as well as selected technology directions on the development of industries and fields; researching technology trends in the world, strategies, and plans of selected countries to propose priority technology fields for the period up to 2030.

3.5. Expert method

The expert method plays an important role in providing the scientific basis, practical experience, and long-term forecasting when developing the Strategy. Throughout the entire process of developing the Strategy, the Ministry of Science and Technology has attracted and mobilized the participation of experts in all steps, from developing the Strategy outline, developing the contents of the draft Strategy, and providing comments to complete the draft Strategy before submitting it to the Prime Minister. The expert method has helped ensure that the suggestions and measures proposed in the Strategy have a scientific basis; experts provide forecast changes in the economic, social, technological, and environmental context, ensuring that the Strategy adapts to the future and increases flexibility; experts help create consensus among stakeholders through discussions based on science and practice, thereby enhancing the acceptance and commitment to the Strategy.

Thus, compared to previous periods of developing a science and technology development strategy, in this stage, the role of forecasting methods and information has been emphasized and brought into play in the process of developing the Strategy.

4. Comments and evaluations

In general, the process and method of developing the Science, technology and innovation Development Strategy for 2030 are based on international experience in developing strategies for Science, technology and innovation Development, experience in developing strategies in other fields of Vietnam, with adjustments drawn from lessons learned of the Science and Technology Development strategy developing activities in previous stages. It can be

affirmed that the process and method of developing the Strategy for Science, technology and innovation Development to 2030 have been effective, contributing significantly to the successful development of the Strategy. However, besides the advantages, the process and method of developing the Strategy also have some limitations and shortcomings.

4.1. Strategy development process

During the process of developing the Strategy, the participation of representatives of ministries, branches, localities, and the business community was mobilized to contribute ideas, needs, resources, goals, orientations, tasks, and solutions for developing science, technology and innovation in many different forms. However, the above participation and contributions have not been effective. The Strategy Drafting Committee and the Editorial Team have organized several meetings, but because of that, the members are leaders of ministries, branches, and leaders of units, so they are busy with many tasks and have not spent adequate time to participate in the activities of the Drafting Committee and the Strategy Editorial Team. During the time of developing the Strategy, the leaders of the Ministry of Science and Technology, who are also the Head of the Editorial Team, mostly worked directly with several members of the Standing Editorial Team to give guidance to develop the Strategy's content.

Ministries, sectors, and localities have been ordered to conduct thematic reports on the current situation, upcoming context, goals, orientations, and solutions for science, technology and innovation development within the scope of ministries, sectors, and localities, but these reports have not really met the expectations and goals because the proposals in their reports do not have a comprehensive, and clear basis and feasibility in implementation; and furthermore, they have not been placed in the overall relationship with the socio-economic development as well as with the science, technology and innovation development of the country. Some ministries, sectors, and localities have contributed opinions to the draft Strategy in a formal and not substantive manner.

There are several reasons leading to the above limitations, typically the participants in the development of the Strategy do not represent relevant parties and stakeholders, so the opinions given do not reflect the common aspirations and will of related ministries, sectors, localities, and the business community, and in some case, those opinions are even lack of consistency of the contributing opinions due to frequent changes of representatives who are taking part in the discussions on the Strategy contents. Besides, due to the diverse composition of participants and cultural differences in each industry and field, it is difficult to reach a consensus while exchanging ideas, information, and dialogue.

4.2. Strategy development method

The method of developing the Science, technology and innovation Development Strategy for 2030 has focused on overcoming the limitations of previous strategy development stages. In the stage of developing the Science and Technology Development Strategy to 2010, almost no forecasting methods (foresight) were applied in the strategy development process other than SWOT analysis. The stage of developing the Science and Technology Development Strategy 2011-2020 had some data analysis activities, however, like the previous stage, this stage still mainly focused on "document development", with almost no calculation, processing of relationships, and selection of options regarding goals, tasks, and strategic solutions (*Hoang Van Tuyen et al., 2018*).

In the process of developing the Strategy for Science, technology and innovation Development to 2030, many methods have been combined and used such as the analysis method of politics, economics, society, technology, law, and environment (PESTLE); the balanced scorecard (BSC) analysis method; the analysis method of strengths, weaknesses, opportunities, and challenges (SWOT) and the TOWS matrix; "technology foresight" method;... Through the implementation of the research task "Forecasting and selecting priority technology fields to serve the development of Vietnam's Science, technology and innovation Development Strategy for the period 2021 - 2030", the Delphi survey technique was applied to forecast technology fields and priority technology directions in the period up to 2030.

Though, the above methods for developing the Science, technology and innovation Development Strategy for 2030 still have some shortcomings and limitations such as The method for developing the Strategy is primarily rely on qualitative methods, compared to the experience of many countries in the world, we still lack some quantitative methods such as the method of analyzing key technologies; the method of developing a technology roadmap (technology road-mapping); bibliometrics, including some techniques such as measuring and analyzing data on scientific publications, measuring and analyzing data on patents, etc.

However, the quality of the Strategy document is still basically guaranteed. The above limitations stem from many different causes, including the main causes such as limited resources for developing the Strategy; the Strategy developing team lacks proper training in strategic thinking and modern strategic planning methods; there is no specific and unified legal framework for developing the Strategy;...

4.3. Some lessons learned

From the practice of the process and methods of developing the Strategy for Science, technology and innovation Development to 2030, the following lessons can be drawn:

First, developing a strategy requires implementing all steps of the process and applying the right methods to ensure that the strategy has a clear and unified development orientation, ensuring feasibility, optimizing resources, minimizing risks, and adapting flexibly. This is a decisive factor in achieving success in implementing the strategy.

Second, it is necessary to allocate sufficient resources (finance) to ensure the synchronous, and full implementation of the steps in the strategy development process, as well as applying a variety of strategy development methods.

Third, attract and mobilize the participation of many representatives' composition of ministries, branches, localities, and especially representatives of the business community in developing the strategy, most importantly, there needs to be a rational form of organization to ensure the participation of many stakeholders while ensuring that such participation is substantial and effective.

Fourth, specific guidelines are needed on the process and methods of developing the strategy (different from regulations on developing and promulgating legal documents) so that the strategy-developing activities are unified, substantial, and effective.

5. Suggestions for developing the Science, technology and innovation Development Plan for the period 2026 - 2030

5.1. Practices in developing the Science, technology and innovation Development Plan to 2025

On May 11, 2022, the Prime Minister issued the Science, technology and innovation Development Strategy for 2030. The Strategy will be implemented through medium-term plans (3-5 years), short-term plans (annually), programs, projects, etc., of which the most important are medium-term plans because this is the type of plan built to serve the implementation of the goals in each stage of the Strategy. Immediately after the Strategy was issued, the Ministry of Science and Technology organized the development and approval of the implementation of the Science, technology and innovation Development Plan for 2025[5]. The Plan for

[5] Decision No. 2667/QD-BKHCN dated December 28, 2022 of the Ministry of Science and Technology on approving the directions, goals, and tasks of science, technology, and innovation to 2025.

Science, technology and innovation Development to 2025 has concretized the main viewpoints, goals, orientations, tasks, and solutions of the Strategy, while adding new content to suit the world and domestic context in the period up to 2025. However, the process and method of developing the Plan for Science, technology and innovation Development to 2025 also have certain limitations.

In the process of developing the Plan, attention has not been paid to some important stages and steps, especially the lack of a preparation stage for developing the Plan (there is no development plan, no organization to develop the Plan such as the Editorial Team or the Plan Drafting Team); there has been no activity to summarize the 5-year plan of the previous period to clarify the results achieved, the limitations, the subjective and objective causes of the limitations in order to have remedial measures in the period up to 2025; There are no activities to forecast science, technology and innovation;... In addition, the process of developing the Plan has not attracted the widespread participation of sectors, levels, and the business community.

The methods for developing the Plan have not been clearly defined and used in practice, especially the use of forecasting methods and information in the process of developing the Plan. Some targets by 2025 set out in the Plan such as investment in science and technology/GDP, human resources for scientific research and technology development/10,000 people, science and technology organizations ranked in the world region... have been determined from the Strategy. Meanwhile, some other targets such as the contribution of total factor productivity (TFP) to economic growth; the number of enterprises meeting the criteria of science and technology enterprises and the number of innovative startups; the global innovation index; the rate of enterprises with innovation activities... lack convincing explanations. According to our discussion with the Planning team, these shortcomings are due to objective reasons such as difficulties with limited resources, pressure on the progress of the Planning process, etc.

5.2. Some suggestions for developing the Science, technology and innovation Development Plan for the 2026 - 2030 period

In the 2026 - 2030 period, Science, technology and innovation continue to be identified as having a particularly important role and mission: "…taking science, technology and innovation as the main driving force for development"; "Science, technology and innovation are the breakthroughs to bring the country into a new era, the era of the nation's rise[6]"; "The core content of the country's industrialization and modernization in the 2021 - 2030 period is to promote the strong application of science and technology,

[6] Speech by General Secretary To Lam at the opening and closing sessions of the 10th Conference of the Party Central Committee XIIIth Congress.

innovation, especially applying the achievements of the Fourth Industrial Revolution, creating breakthroughs in productivity, quality, efficiency, and competitiveness of industries, fields, and the entire economy" [7]... Therefore, the development of the Science, technology and innovation Development Plan for the 2026 - 2030 period that is both breakthrough and feasible is very important. The content of the Plan is not only to continue to specify and implement the Science, technology and innovation Development Strategy to 2030 but also to add new content to suit the situation and requirements of national development in the new context.

Based on the relationship between the process and method of developing a strategy with the process and method of developing a medium-term plan to implement the strategy; Practical process and method of developing the Science, technology and innovation Development Strategy to 2030; overcoming limitations in developing the Science, technology and innovation Development Plan to 2025, this part draws some suggestions in developing the Science, Technology and Innovation Development Plan for the period 2026 - 2030.

- *It is necessary to prioritize the proposal and approval of the agenda to develop the Science, technology and innovation Development Plan 2026 - 2030.* From the experience of developing the Strategy, it shows that this is an important task, deciding the success of the Plan. The agenda for developing the Science, technology and innovation Development Plan 2026 - 2030 will be a tool for the Ministry's leaders to closely and effectively direct the process of developing the Plan, creating initiative in the process and methods of developing the Plan.

More importantly, when the agenda is approved by the Ministry's leaders, there will be commitments and guarantees on the assignment of implementation, ensuring resources such as human resources, material resources, financial resources, and information to develop the Plan on schedule and meet quality requirements.

- *The process of developing the Science, technology and innovation Development Plan for the 2026 - 2030 period needs to be closely linked with the process of developing the Socio-Economic Development Plan for the 2026 - 2030 period.* Currently, the Central Committee is developing the draft Documents of the 14th National Congress, including the Socio-Economic Development Plan for the 2026 - 2030 period. From now on, the Ministry of Science and Technology needs to proactively and actively participate in the process of developing the Socio-Economic Development Plan, proposing the contents of Science, technology and innovation into the Socio-Economic

[7] Resolution No. 29-NQ/TW dated November 17, 2022, the 6th Conference of the Party Central Committee XIIIth Congress on continuing to promote industrialization and modernization of the country to 2030, with a vision to 2045.

Development Plan to ensure the organic connection and connectivity between the contents of the Socio-Economic Development Plan and the Science, technology and innovation Development Plan.

Only then will science, technology and innovation originate from the practical needs of socio-economic development, be oriented to serve socio-economic development, facilitate the implementation of science, technology and innovation activities, as well as in the development and implementation of the Science, technology and innovation Development Plan for the period 2026 - 2030.

- *Developing the Science, technology and innovation Development Plan for the period 2026 - 2030 is not the sole task of the science and technology community, only for science and technology, but must be organically linked to the activities of all sectors and fields in the entire economy.* In other words, the science, technology and innovation development plan is not only a plan of the science and technology sector alone. To do so, the process of developing the Plan needs to maximize the participation of ministries, branches, localities, business communities, and international experts in the process of developing the Plan to enhance the exchange of ideas and information, strengthen dialogue channels, and create the highest consensus in deciding on the selection of Plan options.

The key to the problem is to resolve the contradiction that the case of developing the Strategy encountered, which is that it is necessary to gather many stakeholders to participate in developing the Plan, but the more participants, the more formal the activities become; on the contrary, narrowing the number of participants will create conditions for substantive activities, but will not attract widespread participation in developing the Plan. Therefore, the issue of concern is to have a reasonable form of organization so that the participation of relevant parties is substantial in each stage of developing the Plan, closely linked to the activities of developing the Plan, especially contributing intelligence and expertise to the content of each argument, direction, goal, task, and measure stated in the Plan.

- *Pay attention to evaluating the results of implementing the Science, technology and innovation Development Plan for 2025*. In the process of developing the Science, Technology and Innovation Development Plan for the 2026 - 2030 period, it is necessary to integrate the evaluation of the results of implementing the Science, technology and innovation Development Plan to 2025, clarify the achieved results, limitations, and causes (subjective and objective) of the limitations to having remedial measures in the 2026 - 2030 period, as well as serve a basis for determining the directions, goals, tasks, and solutions of the Science, Technology and Innovation Development Plan for the 2026 - 2030 period.

The Science, technology and innovation Development Plan for the 2026 - 2030 period will, on the one hand, inherit the results and lessons learned from the Science, technology and innovation Development Plan to 2025, and on the other hand, identify new contents to take advantage of opportunities and overcome challenges in the new context.

- *Pay attention to implementing research activities to have a theoretical and practical basis and input information for developing the Plan*. It is necessary to focus on studying the socio-economic needs for Science, technology and innovation; studying and assessing the status of Science, technology and innovation; studying and analyzing development trends in the world; studying and determining the directions, goals, tasks, and measures of the Plan; studying and determining the programs and projects of Science, technology and innovation to implement the Plan;...

- *Clearly identify and use in practice the methods of developing the Plan.* Plan development methods play a particularly important role in the process of developing the Plan because they are tools to help analyze the status of science, technology and innovation, forecast future trends, and identify priorities in science, technology and innovation development. Plan development methods directly create the basis for identifying clear goals and feasible measures to implement the Plan.

From experience in the method of developing the Strategy and limitations in developing the Science, technology and innovation Development Plan to 2025, the process of developing the Science, technology and innovation Development Plan for the period 2026 - 2030 needs to clearly identify and practically use the methods of developing the Plan.

Depending on specific conditions of resources and time, it is necessary to flexibly combine qualitative and quantitative methods, most importantly through plan development methods with sufficient data for analysis and calculation, thereby, choosing options for goals, tasks, and solutions of the Plan will be more convincing and feasible.

- *Finally, it is necessary to complete the legal framework for the development of science, technology and innovation plans.* The Ministry of Science and Technology can study and develop a circular guiding/instructing the development of science, technology and innovation plans, which provides specific guidance on the process, methods of plan development, as well as the structure and content of the science, technology and innovation development plan.

Only when there is a legal framework can the development of science, technology and innovation plans be ensured to be “disciplined” and consistent throughout the science and technology sector.

In short, while facing the strong development trend of science, technology and innovation and the increasing role of science, technology and innovation in socio-economic development, the Ministry of Science and Technology has paid great attention to the development of the Science, technology and innovation Development Strategy to 2030, ensuring quality and feasibility through a systematic and scientific process and method of developing the Strategy.

Based on the relationship between the process and method of developing a strategy and the process and method of developing a medium-term plan to implement the strategy; lessons learned from the practice of the process and method of developing the Strategy for Science, technology and innovation Development to 2030; and the shortcomings and limitations in developing the Plan for Science, Technology and Innovation Development to 2025, the article has proposed some suggestions for developing the Plan for Science, Technology and Innovation Development for the period 2026 - 2030.

Only when applying a systematic and scientific process and method of development can the Plan for Science, technology and innovation Development for the period 2026 - 2030 ensure quality and feasibility, both continuing to implement the Strategy and realizing the goals and priority orientations for Science, technology and innovation development, and promoting the contribution of Science, technology and innovation to socio-economic development in the new context./.

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