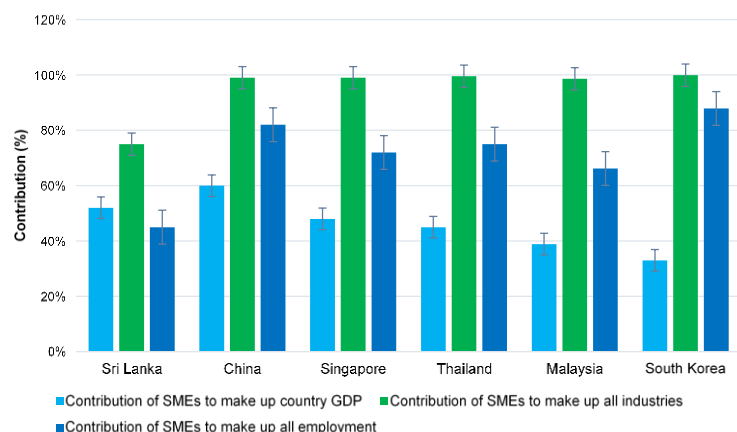


ARE WE IN A RESILIENT WAY TO DEVELOP SMALL AND MEDIUM ENTERPRISES (SMEs) FOR ECONOMIC REVIVAL?

SRI LANKAN SMEs TODAY

In most economies, especially in developing countries, small and medium enterprises (SMEs) play a significant role. The statement is applicable and true for us as far as being one of the developing countries. If we consider the areas under the purview of SMEs, they make up broad areas that lead to economic activity like agriculture, manufacturing, mining, production, construction, and service sector industries, etc. In general, it could generate a vast amount of employment while expanding the Gross Domestic Product (GDP) by inspiring different economic activities that are needed for the economic development of a developing country. Recent publications show that SMEs participate in the economy by fulfilling over 75% of the total enterprises and over 45% of total employment and making a 52% contribution to the GDP in Sri Lanka approximately. However, we don't see the real picture since it is impossible to precisely estimate the whole contribution of SMEs to the economic system due to the scarcity of data. Having understood the reality, since independence, subsequent governments in Sri Lanka have taken varied steps, from time to time, to improve this important sector. However, a few studies have examined their current development, challenges, and have proposed some prospects. When analyzing these studies, it is clear that Sri Lanka has not gained the desired level that needs the modern world through SMEs when compared with different developed and developing countries within the region (Ex: China, Singapore, Thailand, Malaysia, and Singapore).



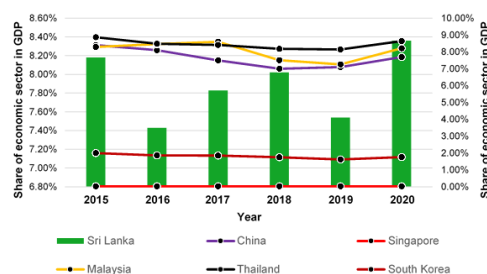
Contribution of SMEs to make up the country economy, overall industries, and overall employment in Sri Lanka, China, Singapore, Thailand, Malaysia, and South Korea

NATIONAL SCIENCE AND TECHNOLOGY POLICY (NSTP)

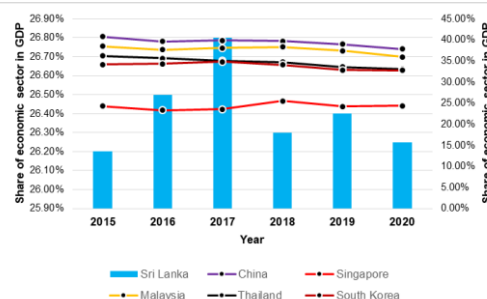
In 1994, the Science and Technology Development Act was passed by Parliament, resulting in the National Science and Technology Commission (NASTEC) being established in 1998 with policy advisory functions vested in it. NASTEC is continuing its efforts to create a comprehensive National Science and Technology Policy (NSTP). This Commission created the NSTP, which was adopted by the government in 2009 and is still in operation today. However, promoting SMEs was not a major concern in the current NSTP in Sri Lanka. But it is with the legitimacy provisions to manipulate and implement the strategies that can be incorporated into the SME sector as the major stakeholder. Thereupon, the R & D outcome may be commercialized through the SME, with the expectation of a viable impact on the national economy. With the directions, NSTP has been focused on S&T for social and economic development based on a few directions denoted as cultural innovation, national development, human resource, research & development, technology transfer, natural resources & the environment, indigenous knowledge, innovations, and intellectual property rights, quality improvement of S&T institutions, and human security. Under these directions; NSTP tries to provide equal and adequate opportunities to aware of basic education related to S&T to foster make new methodologies and productivities in day-to-day life to raise the efficiency of economic activities, and promote an appreciation of S&T among the public, leading to a culture of innovation and entrepreneurship, as an essential aspect of a progressive society in Sri Lanka.

SHARE OF ECONOMIC SECTOR IN GDP

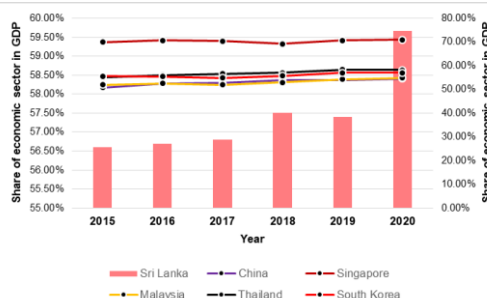
The statistics show the share of economic sectors in the GDP in Sri Lanka, China, Singapore, Thailand, Malaysia, and South Korea from 2015 to 2020. In 2020, the share of agriculture in Sri Lanka's GDP was 8.36%, the industry contributed approximately 26.25%, and the services sector contributed about 59.67%. According to the data of the last six years, Thailand is the best country for the agricultural sector from among the selected countries. China is the best for the industrial sector contribution, and Singapore shows the best values for the services sector.



Share of agriculture sector in the gross domestic product (GDP) from 2015 to 2020 in Sri Lanka, China, Singapore, Thailand, and South Korea



Share of industry sector in the gross domestic product (GDP) from 2015 to 2020 in Sri Lanka, China, Singapore, Thailand, and South Korea



Share of service sector in the gross domestic product (GDP) from 2015 to 2020 in Sri Lanka, China, Singapore, Thailand, and South Korea

SHORTCOMING OF NSTP IN SRI LANKA

Developing countries have a greater number of literates in the modern world. However, the absence of broad-based scientific knowledge with an integrated approach to S&T has constricted the growth of an innovation culture. There is a problem when dealing with normal people that are associated with scientific and technology-based work/projects. Therefore, the implementation of NSTP is very important to give basic S&T knowledge to young people, especially schoolchildren and all entrepreneurs that acquire basic scientific knowledge. But the practical mission requires high capital costs and higher levels of expert knowledge with proper planning. Because of their poor economies, developing countries will be unable to meet this target. Therefore, NSTPs cannot implement this process continuously.

Sri Lanka is a country blessed with a rich repository of indigenous knowledge developed and practiced over a long period that spans over two and a half millennia. Therefore, NSTP can implement research on finding better locally available initiatives that can be useful to produce new materials that are needed for the local SMEs and introduce them into the industrial sector through research. Those resources, however, will not last long unless they are conserved and used in a sustainable manner. But people tend to gather raw materials that can be needed for their industrial processes at an appropriate scale for their commercial purposes without considering conservation (Ex: *Munronia pinnata* (Binkohomba), *Gyrinops walla* (Agarwood), *Santalum album* (Sandalwood) have become rare due to overexploitation from the wild). This results in the overexploitation of the resources, which ultimately become endangered or extinct. As a result, resources are overexploited to the point that they become endangered or extinct. As a result, the policy becomes weak when it comes to controlling people or common suppliers, and it also fails to prevent biopiracy.

Many medicinal plants are available in the country with a very high potential for health and economic benefits, and village people have basic ideas about most of the medicinal plants and their utilization. But most of the medicinal plants have not been well studied scientifically. Therefore, the capability of NSTP to transfer knowledge to the industrial sector is very low. Furthermore, people come up with a lack of knowledge related to legislation associated with sustainable natural resources management and sustainable industry maintenance (i.e. some legal barriers to growing, expanding, and transporting indigenous plants for commercial purposes are very strict). Therefore, during policy implementation, it becomes a big issue.

According to highly labor-intensive manufacturing and limited capital investment, labor-intensive industries or processes require large quantities of physical effort to complete necessary tasks. In labor-intensive industries, the costs associated with securing the necessary personnel outweigh the capital costs in regards to importance and volume; while many labor-intensive jobs require low levels of skill or education, this is not true of all labor-intensive positions. When making a capital investment for SMEs, people have to use their cash reserves or seek a loan from a bank. If it is not interconnected with a public company, it might not issue a bond to finance capital investment, and banks provide loans up to desired levels only under complex rules and regulations.

Developing countries hesitate due to severe industrial limitations when trying to develop a modern society economically. These countries must import or leverage much technology while often lacking the expertise to make wise choices because of their lack of development. Sri Lanka has shared many of the problems of other developing countries, including inadequate access of the population to industrial services, maldistribution and informal use of technology, a relatively weak national industry for the production of drugs and medical devices. Sri Lanka, in attempting to improve their industrial systems, must import high-end technology, and they often lack the expertise to make wise choices due to professionals leaving the motherland because of political, socio-economic, scientific, educational, and perhaps very intricate personal or financial considerations. Narrow educational policies, resulting in fewer opportunities for furthering knowledge and expertise, also contribute to the migration of professionals to other technologically advanced countries.

On-site, the technologies are frequently applied inexpertly to complex industrial management strategies, and they become a drain on national resources, along with expensive materials (i.e. pharmaceuticals) and pieces of equipment whose cost is high and also available equipment is not accessible to all scientists in the relevant fields. Thus, NSTP has to examine the cases in Sri Lanka, which has shared many of the problems of other developing countries, including inadequate access of the population to industrial and health services, due in large part to a maldistribution of resources and wealth in general, and heavy private-sector control of health services. Other problems include maldistribution and excessive use of technology; a relatively weak national industry for the production of drugs and medical devices; a weak policy structure for dealing with medical technology; and little tradition of using research or policy analysis as a guide to action. Some lapses in controlling private-sector abuses (specifically, unnecessary establishments and mining, etc.), coordinating and regionalizing services, regulating equipment and its use, and controlling charges, attempting to introduce prospective payment where possible. Therefore, possible policy and strategic interventions must be enriched with some steps to stimulate local pharmaceutical and medical equipment industries with efficient benefit-sharing processes to encourage local medicinal practitioners, etc. Furthermore, if the NSTP could focus on complications correlated with imposing import controls and conservation of intellectual properties within Sri Lanka by providing short-, medium-, and long-term solutions, it would be great value addition.



Agarwood for agarwood perfume



Sandalwood for cosmetics

M. pinnata (Binkohomba) for pharmaceutical

R & D is the driving force behind industrial innovations that accelerate economic development. Low R & D expenditures and outputs, misaligned public R & D systems with industry needs, low numbers of researchers and brain drain, and low tech-transfer capacities are all significant flaws in current R & D policies and strategies. And also, universities and public research institutions (PRIs) seeking to partner with industry or other organizations need a policy for effective intellectual property (IP) management and knowledge transfer. An IP policy provides structure, predictability, and a beneficial environment in which enterprises and researchers can access and share knowledge, technology, and IP. If not a poor or lack of IP policy for research commercialization leads to a waste of IP, as recognized by the World Intellectual Property Organization (WIPO). Therefore, NSTP has to add a new objective into its framework to develop a better IP policy. Slow regulatory reform, lack of institutional capacity to implement, continued brain drain, un-sustained political and financial commitment to the agenda, a risk-averse entrepreneurial culture, trade liberalization, and foreign direct investment (FDI), nascent coordination among policy-makers, weak design implementation capacity for income and expense (I & E) agenda, weak SME sector innovation, and entrepreneurship ecosystem depressed the SME policy in Sri Lanka by adding lapses to the SME policy framework during SME development.

POSSIBLE POLICY INTERVENTION

Most lapses associated with SMEs in Sri Lanka diminish the fast growth of the social economy. Therefore, it should be a proper mechanism of making authorities provide better direction to overcome those lapses to ensure the development of the economic system of the country through enough S&T innovation. Hence, strategic interventions from the NSTP will be the best solution in this case. The Sri Lankan NSTP has already acknowledged several lapses. Overcoming those lapses by developing R & D associated with modern S & T will create a proliferation ground for SMEs in Sri Lanka. To address the concerns of maximum possible value addition to local mineral resources and to develop appropriate strategies for sustainable utilization of the limited resources of the country, there is an urgent requirement. Approval by the Cabinet of Ministers to formulate a National Policy on Mineral Resources under the Ministry of Technology, in consultation with relevant stakeholders in Sri Lanka is necessitating. The policy should reiterate the commitment of the government, in partnership with the people, to the sustainable utilization of the country's mineral resources for the benefit of present and future generations. This is to be sure that aligning with the National Policy Framework "Vistas of the Prosperity and Splendor" has been empowered by H.E. the President, Gotabaya Rajapaksa, in his victory at the presidential election in 2020. His strategy strives to guarantee that the country's resources are utilised to their full potential, with appropriate value addition, while also ensuring competent environmental management within Sri Lanka's sustainable development framework.

Sri Lanka is a country with rich biodiversity and natural resources, and most of the SMEs are associated with rural areas. As a result, while manpower availability is not a major issue, their lack of S&T knowledge, as well as poor pieces of knowledge of managing and carrying out industrial activities, creates challenges when entering the process. Hence, NSTP can direct its efforts towards reducing the issues that come up when dealing with normal people. Therefore, the very important thing is to try to provide basic S&T knowledge to young people, especially those in secondary school and all entrepreneurs that acquire basic scientific knowledge. In this case, providing equal and adequate opportunities for all to acquire a basic science education may be initiated by ensuring that all secondary schools, particularly the rural ones, have trained teachers and facilities for science teaching to popularize science education among students through target activities such as collaborating with relevant educational authorities in curriculum development, networking, etc., which may be very important. Besides, if our government has actively attracted several leading universities to operate branch campuses, making a bridge between universities and industries for technological collaboration, it will improve the student's skills related to persistence, networking, self-confidence, and enabling skills such as business planning, financial literacy, and managerial skills combined with professional skills. This method has already been used in Thailand. This advance encourages the development of more highly trained students to support industrial innovation and stimulating the secondment of undergraduate and graduate students to innovation-oriented companies, in particular SMEs, giving systematic support for public-private innovation partnerships, programs operating to support public-private research and innovation collaboration, and adopting longer timeframes in programs to advance commercialization and ensure commensurate levels of funding for commercialization activities, will be the advantages in this case too, as practiced in South Korea.

As an example, Sri Lankan universities have students with a well-grounded knowledge of the subjects, but they pass their very young ages with that knowledge without their own income sources, and their contribution to the economy of the country is trifling. It means that Sri Lankan educational centers do not pay much attention to how to engage in a proper way to commercialize the S&T-based knowledge that students bring with them. They conduct a large amount of S&T-based research to find commercial products, but the findings and the finding-based knowledge do not reach the industrial level due to a lack of industrial-based or associated activities for the students. Therefore, most of the patent licenses have been lost from Sri Lanka, and it has already led to biopiracy. Besides, entrepreneurs continue their industries with their knowledge-based only coming with their experience. They have no idea about the updates, and sometimes they hesitate to work with updates because they consider the updates to be risks. This will lead to low productivity and low production quality that affect economic growth. Then this is one of the major situations in which NSTP should be involved in the economic development of the country.

Some people in rural areas who like to be entrepreneurs have to get their skills to a professional level. They may have to enter private universities or related institutes, but there will probably be a high cost. Considering the Sri Lankan situation, most people have no financial background to be involved in this. Then, as in China, Thailand, Singapore, Malaysia, and South Korea, this will provide a better chance to use science-based technology coming from most developed countries through private sectors and government/public sectors can provide partnerships or chances coming from abroad while the government would be playing a coordinating function among them. Therefore, there should be a program to minimize the negative effect on the overall state development projects by improving the performance of the government sector, like in Thailand. And young people get benefits from that partnership, especially in rural areas that can develop SMEs, and it will also help to enhance the quality of products and services. Other strategies were found to might affect on the business success of SMEs in Sri Lanka today, such as customer and markets, the way of doing business and cooperation, resources and finance strategy, and external environment, etc.



To supplement native labor and provide skilled labor, the government can systematically implement a liberal immigration policy to attract overseas talent. This is a very complex method, and to get success, most of the authorities should have to work together. The policy can play a vital role by preparing linkages among authorities. Besides, women in most of the rural areas of Sri Lanka are jobless. Furthermore, they are experiencing the majority of the difficulties when attempting to merge with industries. The Spark program in China, Sri Lanka can also create a program directed by NSTP that can be packaged by S & T to benefit the lives of the rural poor. It should be an amendment with specific consideration of the needs of rural women, or indeed, whether it has led to greater benefits for men than for women. It will have the potential to improve the status of rural women by increasing their incomes and their participation in rural enterprises. The proliferation of rural enterprises will have become a greater generator of rural prosperity than agriculture itself.



Besides, the initiation of research programs on ecosystems and aquatic and terrestrial fauna and flora with special reference to endemic species with a view to conservation and sustainable use within the framework of national development activities, As a result, encouraging research into the propagation, conservation, and long-term utilization of unexploited and underexploited plants and other commercially valuable organisms is important. In addition, promoting research aimed at value addition to plant-based natural resources through the production of high quality and standardized end products such as medicines and derivatives of essential oils, and retrieving, adding, and packaging the relevant research outputs into policy briefs for effective communication between researchers and policy formulators Thus, maintaining well-classified databases according to the updated data coming from minerals and marine resources and developing capabilities to assess and maintain databases on minerals and marine resources, etc. might be good initiation programs under NASTEC.

The Tourism Development Authority in Sri Lanka is the government authority combined with planning, development, regulation, and policy implementation of tourism and related industries. Tourism is a very attractive industry in a country like Sri Lanka, so to develop the industry with high additional values, the most preferable way is to combine it with modern technology. It can be nourished to encourage the industry to make the most business-friendly regulatory environment for local entrepreneurs while conserving the natural beauty of the country. In this case, the most considerable one is to protect the environment while maintaining economic and social development at all decision-making levels in Sri Lanka. Improving public awareness and education, strengthening the environmental monitoring and enforcement capability, and establishing a comprehensive environmental-management system to concerns the issues that can be reported are the initiatives that can be preceded by the policies.



We should concentrate our efforts on major research areas such as the discovery of new energy sources. For example, sunlight, the origin of all energy, was also taken for granted. If our S&T development had kept pace as in the past, we could be utilizing sunlight, of which we have an abundance, as our main source of energy instead of using petroleum, coal, etc. Billions of dollars used to import this fossil fuel could have been saved and utilized for other necessities, like finding new raw materials that may be useful in industries, improving modern agricultural technologies, and promoting cleaner production technologies to ensure environmental sustainability by providing appropriate S&T support for industries to replace fossil fuel-based energy with renewable or cleaner energy sources, providing appropriate S&T support and incentives for industries to adopt cleaner production technologies that generate less waste and improve productivity, etc., will be the main considerations.

Besides, introduce funds to support collaborative R & D projects that are undertaken in collaboration with universities or public research entities, review current tax incentives for R & D and innovation, particularly their impact on SMEs, before proposing more generous tax incentives, and provide incentives for collaboration between industry and research centers and universities. Fostering awareness about IP to strengthen the scientific capability for effective implementation of laws and regulations to protect natural resources and the environment and the potential for commercializing research, making a clear IP policy for publicly funded research, and supporting research processes that promote collaboration with industry and social partners will be the major objectives of NSTP in Sri Lanka to give competition to Malaysia, Thailand, and South Korea.

If it could lead to a better legal environment and IP protection for industries and provide a better financial environment, it would be a boon for the business-friendly regulatory environment for local entrepreneurs in Sri Lanka. This will be encouraged the development of more highly trained students to support industrial innovation and stimulate the secondment of undergraduate and graduate students to innovation-oriented companies, in particular SMEs, giving systematic support for public-private innovation partnerships, to support public-private research and innovation collaboration, and adopting longer timeframes in programs to advance commercialization and ensure commensurate levels of funding for commercialization activities will be main outcomes. The Korean work-frame can be taken as an example in this case.

The establishment of new science-based technologies helps protect the environment, build safer homes, schools, and factories, and develop energy-saving transport systems. Advances in medicine also save lives and improve health standards throughout the country. In this scenario, it is important to work on advancing knowledge in areas that are particularly important to us and where we have a solid base of knowledge with comparative, competitive advantages. Then, continuing progress in biotechnology, nanotechnology, and ICT promises further improvements in living standards and economic performance. Moreover, the establishment of world-class research centers to carry out cutting-edge research in areas important for national development is a key strategy in this scenario. Strengthening existing research and development institutions to establish centers of excellence in appropriate fields such as electronics at ACCIMT, mechatronics at NERD Center, and biotechnology at universities and ITI, as well as establishing world-class new research centers with advanced facilities in emerging technologies of national importance, such as nanotechnology and radioactivity usage, will be good targets. NSTP has the potential to become a world-class research facility provider for emerging S&Ts of national significance.

Besides, NSTP has to take some steps to stimulate the local pharmaceutical and medical equipment industries, including medicine with efficient benefit-sharing processes to encourage local medicinal practitioners, etc. Developing mechanisms such as updating databases to retrieve, collate, and document information on indigenous knowledge and practices such as national surveys, establishing and improving access to new databases on traditional knowledge and practices while ensuring Intellectual Property Rights, creating and establishing a meta-database by a designated state institution for ready access by networked institutions, In fact, researchers, and the public are researching the chemical, biological, and medicinal properties of specific practices in the traditional systems of medicine, developing institutional policies and mechanisms that will direct research and development institutions and universities to establish research programs for the further development of traditional practices and techniques into viable technologies, especially in medicine. Also, make sure the national platforms for researchers and institutions to gain recognition for further development of indigenous technologies and formulate and implement a regulatory or legal framework for the protection, conservation, and sustainable use of traditional knowledge and practices, etc. should be the main focuses of NSTPs in Sri Lanka. This will reduce the heavy-private sector control of health services and the high cost of medical remediation. Although, enough attention to the natural resources will reduce biopiracy as well, and it will create a bridge between Sri Lanka's (resources) and other developed countries (technology) to conduct the world's important research together that can be a long-term income-making pathway. And also, a well-developed traditional medicine system will be a good opportunity to improve the tourist attraction of the country, and sometimes it will bring the best investments to the country.



Importantly, the policies in S&T in Sri Lanka should have to focus on mainly how SMEs are affected by the current COVID-19 pandemic. In the face of this uncertainty, many SMEs are already struggling to maintain their financial stability. Then, financial aid should quickly be made available to companies like Singapore to help them resuscitate their businesses and support employees who are affected by the ongoing crisis. Besides, if the country has the ability to introduce a digital program to help SMEs build digital capabilities. The sector-specific Industry digital plans can provide SMEs with a step-by-step guide on digital solutions to adopt and relevant training for their employees at different stages of their growth S&T policies should have been implemented to manipulate the technical process that is essential between industries and other government units. Furthermore, during this situation, the government has a responsibility to improve the close coordination between the private sector and the government. Introducing e-procurement programs could be encouraged to further level the playing field for SMEs to compete for tenders with larger companies, direct investors, and domestic suppliers. Then policies and other government agencies should modify speedily to prevent the breakdown of the supply chain and client relationship associated with small and medium industries and the Malaysian framework can take as an example in this case.

Collectively, National economic development and science and technology innovation to identify the major challenges on the development of Sri Lankan SMEs and various contributions to the national economic challenges being faced and the initiatives and incentives offered by the related authorities were discussed. Among the challenges; lower level of Science-based technological innovation and limited skilled humans, the absence of broad-based scientific knowledge, weak implementation of policies due to the poor economy of the country, weak commercialization of research & indigenous knowledge, poor sustainability of natural resources, lack of expert knowledge, high-cost technology import and leverage much technology, maldistribution and informal use of technology, the reluctance of rural people to integrate with new technology and hesitance to pay for the technology, lower levels of research & development facilities, a high level of international competition, a high level of private-sector interference without government manipulation, and weakness of national fund gathering and distribution are prominent. These lapses suggested that the existing policies are either insufficient or not delivered effectively enough to overcome these problems. Despite this fact, finally, NSTP has to play a key role among the possible interventions proposed for effective implementation and strategic transformation to a positive step toward formulating a workable framework to upgrade SMEs in Sri Lanka.

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Disclaimer

This article was prepared on behalf of the Young Scientists Forum (YSF) of National Science and Technology Commission (NASTEC). NASTEC-YSF gives the younger scientists in Sri Lanka a platform to independently voice their opinion on science and technology that could enrich the decision-making processes at NASTEC.

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