

National Science and Technology Museum

Administrative Plan for 2020

I. Introduction

The National Science and Technology Museum (NSTM) is a diverse science museum that collects pieces, conducts research, displays exhibits, provides education leisure, etc. The NSTM collects and conducts research scientific artifacts, and displays exhibits that are technology-related, influential on the development of technology and impactful on human life. The mission of NSTM is to "train everyone be a person with scientific literacy" to fully realize the spirit of lifelong learning, and to support the underprivileged group and provide social education services.

Considering the impact of environmental changes on human beings and the concept of sustainable development, NSTM is adhering to a developmental vision of becoming a "Green Museum" by promoting its core businesses such as collecting and managing pieces, themed exhibits, educational environments and public services to become a sustainable Green Museum for the environment, society, culture and economy.

In 2019, NSTM was awarded as follows,

1. NSTM's Taiwanese Journal for Studies of "Science, Technology & Medicine" and the "Technology Museum Review" have won the "Knowledge Impact Award" and "Knowledge Communication Award" in the 2019 Journals of National Central Library.
2. NSTM was awarded in "Excellence Management Quality" developed by the Chinese Society for Quality, and is the only social education organization that has won the award over the past 55 years.
3. Won the 2019 MOEA Energy Saving Leadership Silver Award. NSTM was the only national museum winner of this award.
4. 2019 Disease Prevention Excellence Official Group Award" of the MOHW.
5. Obtained certification for the "Evaluation of Environmental Education Facilities".
6. NSTM continue passed the ISO 27001:2013 International Accreditation and the BS 10012:2017 International Accreditation to ensure information security.

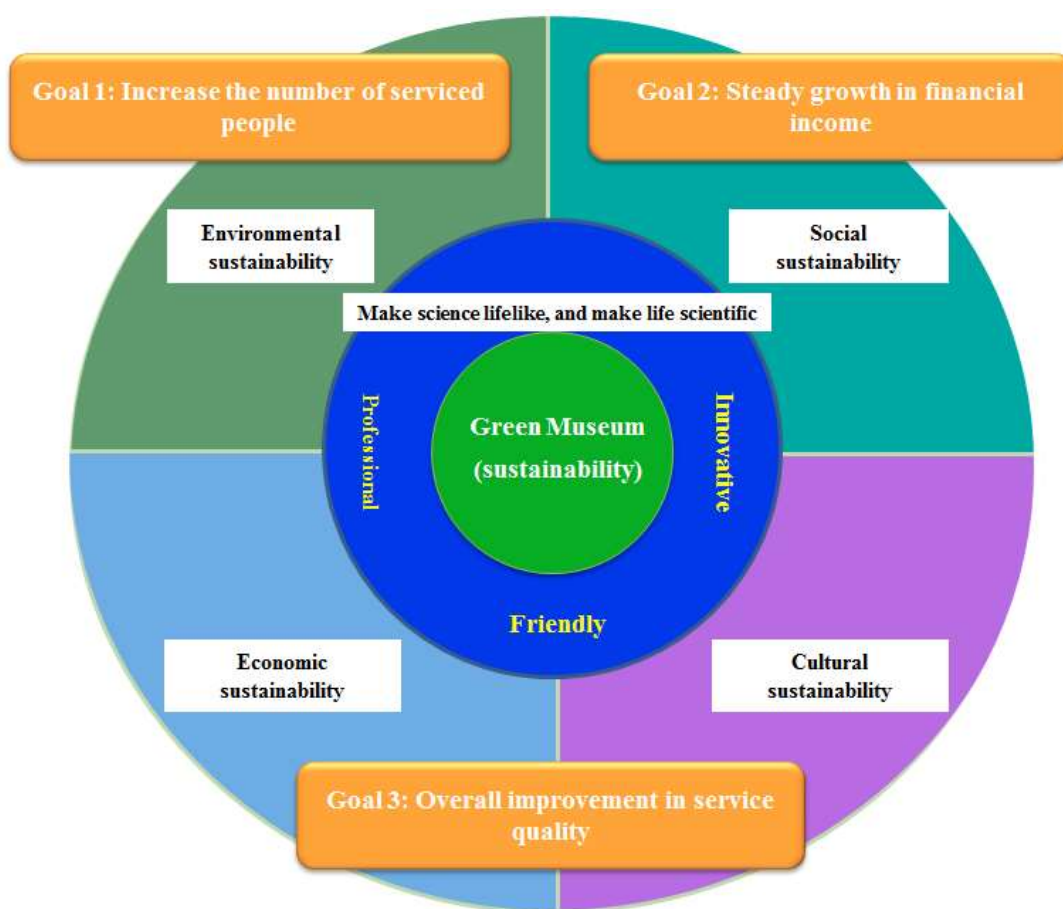
Please see the appendix for the specific achievements of 2019. Based on the abundant amount of achievements, we have proposed administration strategy and specific implementation measures for the plan of 2020.

II. Administration strategy and specific implementation measures for 2020

The NSTM uses "Get to the heart of the matter, and get to the bottom of it", "make logical improvement, step by step", and "strive for excellence to be the best" for sustainable management, and quality policy of "Being Friendly, Professional and Innovative" and

exhibiting the 5 qualities of “smiling, enthusiasm, being proactive, having patience, and take responsibility” . NSTM will implement 4 types of International Organization for Standardization from categories such as “Quality”, “Energy” and “Information Security” to improve service quality, and create a great culture by sharing touching stories to be “thinking ahead of the viewers, and being close to their hearts.” NSTM will also continue enrich its collection, high-quality exhibits and diverse educational activities for contextual learning and enhance the scientific knowledge, attitude and methods of the general public.

This year’s (2020) administrative direction has inherited the vision becoming a Green Museum, and will plan its operation based on the environment, society, culture and economy. The detailed implementation measures are described as follows:



The vision map for becoming a Green Museum

(I) Environmental Sustainability

1. Build a comfortable and friendly environment

- (1) Strengthen the regular maintenance of facilities and implement public safety mechanisms.
- (2) Implement ISO 27001 information security management system certifications and BS 10012 personal information management system verifications to improve information security.

- (3) Improve indoor air quality and safeguard the general public's health.
- (4) Beautify the environment with more green and build ecology, and construct a visiting environment that has a rich amount of environmental education connotations.

2. Practice conserving and reusing resources

- (1) Implement ISO50001 energy management mechanism to improve energy conservation.
- (2) Push for cross-domain partnerships, improve hardware, and increase energy efficiency.
- (3) Strengthen water and electricity facilities to prevent leakage, and gradually update old facilities.
- (4) Implement a management mechanism for the reuse of resources used to display exhibits, and increase the sustainable use of resources.

3. Creating a high quality service field

- (1) Implement ISO9001 Quality Management System Certification for enhanced service quality.
- (2) Conduct a service satisfaction survey to understand the needs of the public.
- (3) Expand smart inspections, promote NSTM APP, and improve efficiency.
- (4) Listen to both domestic and foreign customers, and establish an improvement tracking mechanism.

(II) Social Sustainability

1. Supporting the underprivileged, and implement equal education policies

- (1) Use social resources to help support the underprivileged in learning about science.
- (2) Provide places for underprivileged groups to attend classes free.
- (3) Refine tour services to improve the energy of the services to the underprivileged.

2. Develop diverse audiences, and promote community partnerships

- (1) Develop diverse marketing channels, operate social media, and expand potential audiences.
- (2) Host learning activities that invite the participation of family members, and expand family audiences.
- (3) Promote action-teaching aids, and root them into the science education of elementary and junior high schools.
- (4) Establish cross-regional industry partnerships.
- (5) Strengthen connection with communities.

3. Develop professional talent, and establish exchanges with international professional communities

- (1) Enhance employees' professional knowledge, and improve work quality and performance.
- (2) Enhance energy in R&D and innovation, establish professional brand.
- (3) Distribute professional journals and publications to establish professional brand image.
- (4) Host various types of educational training to improve professional competence.
- (5) Establish exchanges with museums' international specialist communities.

(III) Cultural Sustainability

1. Enrich collection, add cultural and creative products, and enhance promotion of popular science education

- (1) Collect scientific pieces systematically, deepen research of pieces.
- (2) Enhance the development ability of cultural and creative products, and revitalize collection.
- (3) Organize "Make science lifelike, and make life scientific" exhibition to enhance public participation.
- (4) Conduct inter-museum partnerships and exchanges, and carry out special off-site exhibitions of high-quality pieces to establish international image.
- (5) Launch diverse scientific education activities, and establish the scientific capabilities of the general public.
- (6) Host scientific reading events to enrich general public's competence in popular science.

2. Cooperate with global trends and important policies, and plan sensible public creation events

- (1) Cooperate with the 12-year Basic Education policy to launch a number of diversely themed courses for students of various ages.
- (2) Establish a popular science promotion center to develop talent for popular science.
- (3) Promote True Dream Land, and stimulate self-creation movement.
- (4) Carry out Intelligent Services for Happy Learning - National Social Education Agencies Science Innovation Service Plan, become a smart museum.
- (5) Cooperate with the New Southward policy to expand international exchange of popular science exhibitions and education.
- (6) Expanding fields for lifelong learning and implement multicultural education.
- (7) Set up "Culture and Creativity Group" to specifically handle culture and creativity affairs.

3. Promote green education and have green exhibitions

- (1) Develop environmental education courses, lesson plans and study forms.
- (2) Host large-scale national competitions and foundational environmental education activities.

- (3) Combine the resources of industries, government and academia to enrich the content in disaster prevention education.

(IV) Economic Sustainability

1. Adhere to the foundational operating spirit; realize management and improvement of manpower

- (1) Expand service capacity, and increase ratio of self-raised funding.
- (2) Promote optimization of asset utilization, and enhance usage benefits.
- (3) Make good use of society's human resources, and strengthen quality of service.

2. Establish and definitively carry out measures to increase revenue and reduce expenditures

- (1) Promote individual memberships, family memberships, corporate memberships and other systems to increase museum revenue.
- (2) Enhance the strategic alliances with similar and different industries, and actively strive to partners with other industries to add to revenue.
- (3) Compare prices with multiple sources, reduce procurement costs; conserve the use of consumables and items; conserve energy and use other conservation methods to reduce operating costs.
- (4) Develop cultural and creative products to highlight cultural tourism and added-value creativity.

III. Conclusion

As the overall social environment and trends change vastly, the NSTM aims to achieve a sustainable business philosophy, integrate innovative thinking and diverse high-quality services to operate the Museum. The NSTM aims to use "Deepened Service Quality," "Increased Service Capacity," and "Overall Growth in Income" as goals to diligently operate the NSTM, and have everyone enjoy coming to the NSTM, often and repeatedly visiting the Museum.

Appendix

The National Science and Technology Museum Annual Achievements for 2019

1. Exert the function of life learning and social education in conjunction with the national education policy

(1) Seek resources to organize diverse science education activities

NSTM has organized myriads of science education activities, where the experiential learning approach is adopted to let the public enjoy the hands-on experience and establish the concept of incorporating science into everyday life. The aim is to materialize the philosophy of "life with technology, technology for life". Science education activities were held in 2019 1,460 activities, 295,495 people served

(2) Advocacy of emerging technologies to enhance the influence of science education

Corresponding to the promotion of the new 2019 curriculum from the Ministry of Education(MOE), NSTM has actively conducted science and technology courses and relative activities to improve the youth's technology-related knowledge in STEAM (Science, Technology, Engineering, Art, and Mathematics).

(3) We uphold the spirit of fair share and social justice to help support the disadvantaged in scientific learning by use of external resources.

The NSTM Lanterns of Love Program has been the 7th successive year in 2019. This year (2019), the program received a subsidy of NT\$3,525,685 to support economically disadvantaged school children from Taiwan and offshore islands to visit NSTM for free. 2019 NSTM Lanterns of Love Program served 258 schools 5,441 teachers and students.

(4) Facilitate international exchanges in science education

Expand the global perspective of youths, and organize the "2019 Technology Exchanges and STEM Cooperation for Junior High School Students in Malaysia, Thailand and Taiwan", "Bangkok Youth Scientific Exploration Camp" and "Wa-Sci Science-Based Tour of STEAM in Singapore for the Teenagers" to provide overseas students with exchange opportunities and exert influence of the museum as an atypical educational institution.

2. Create diverse features on educational exhibition to foster disaster prevention and popular science in Taiwan

(1) Career aptitude test for the establishment of "My future - Technological and Vocational Paradise"

NSTM has co-organized "My future - Technological and Vocational Paradise" and "Agronomy Wonderland: Intelligent Agricultural Machinery" exhibitions with National

Kaohsiung University of Science and Technology and National Pingtung University to support the cultivation of talents that meet requirements of Taiwan's economic and industrial development. NSTM also guided students on their career aptitude test for preparation of future careers and to effectively achieve the function of social education.

(2) Renovation of the "Stories of Recovery and Reconstruction after MORAKOT"

In response to the 10th anniversary of the Morakot disaster, NSTM renovated the "Recovery and Reconstruction After Morakot " and renamed it as the "Stories of Recovery and Reconstruction after Morakot " to systematically demonstrate new disaster prevention concepts and achievements in various sectors and effectively improve public awareness on disaster prevention.

(3) Disaster prevention exhibition curated by NSTM

NSTM has dedicated efforts on cooperation opportunities and subsidies for the cultural relics exhibition "Rain and Rock Developments - Soil and Water Conservation Measures", educational exhibitions including "Awakening Technology and Preparedness for Disaster Reduction DNA" and "Soil and Water Conservation for Disaster Prevention", coupled with the National Disaster Prevention Day, which had led to outstanding achievements on conducting various advocacies for disaster prevention.

3. Expand the budget scale to generate more services and value

(1) Active Resource Widening and Implementation of Conservation Measures

With NSTM's business management strategies, coupled with increased revenue and reduced expenditures, raised income from venue rent and creative products development, we made additional revenue for NSTM funds. Self-raised income was NT\$209,866,000 in 2019, an increase of NT\$17,925,000(up by 8.98%) compared to 2018.

(2) Development of theme merchandise based on NSTM's collections to increase revenue

Cultural and creative products were developed based on NSTM's collections to highlight their features and significance. We also continue to cooperate with suppliers on introducing cultural and creative products and providing multiple selections for visitors in the aim of increasing NSTM's revenue. In 2019, NSTM increased revenue by NT\$109,960 compared to 2018.

4. In pursuit of perfection to better services and raise more annual revenue

(1) Enhance service quality to serve more people

By improving NSTM's overall environment, service processes, diverse exhibits, science education activities and service quality, we have served a total of 2,804,198 people in 2019. The total number of visitors in 2019 was 2,804,198.

(2)Management of social media and improvement of customer relationships

Adopted diverse marketing channels to cultivate target customers and attract potential visitors. The information on the platform includes social education such as exhibition, technology education, collections and research, as well as reports on environmental protection and new scientific knowledge. As of 2019, NSTM's Facebook fan page had 86,870 members.

(3)Utilize social manpower resources to improve services

NSTM strives to manage and utilize volunteers, student volunteers, and interns more effectively in facilitating the day to day operation of the museum and offer visitors more comprehensive services. In 2019, a total of 1,207volunteers were on duty for 205,467 man hours; 993 student volunteers accumulated 4,436 man hours of service; 77 interns accumulated a total of 21,608 man hours. The combined service time rendered by social human resources was 231,511 man hours, equivalent to that of 115 full-time staff at NSTM. Social human resources obtained were equivalent to 115 full-time staff.

Table 1 Income statement over the past 5 years

Unit: Thousand NT\$

Item	2015	2016	2017	2018	2019
Service Income	38,790	54,923	51,510	41,284	50,402
Cooperative Education Income	31,452	37,214	59,651	57,104	49,991
Educational Promotion Income	11,232	10,700	13,059	15,720	15,699
Other Subsidy Income	13,636	33,850	38,615	38,344	53,038
Interest Income	2,087	1,898	1,869	1,968	2,308
Asset-use and Royalties Income	28,437	35,207	28,169	31,720	30,771
Other Business Income	6,434	5,506	7,594	6,431	7,657
Social Education Institution Development Grant (A)	196,446	196,446	196,446	200,244	200,244
Total Income (B)	328,514	375,744	396,913	392,815	410,110
Self-Raised Income	132,068	179,298	200,467	192,571	209,866
Agency Current Self-Raised Ratio 1-(A)/(B)	40.2%	47.72%	50.51%	49.02%	51.17%

Table 2 Number of visitors served over the past 5 years**Unit: Person**

Person Item Item	2015	2016	2017	2018	2019
Exhibition Hall					
Permanent Exhibition	609,597	870,923	811,766	770,247	925,338
Paid Special Exhibition	36,286	132,264	62,654	43,160	39,213
3D Theater	86,300	119,579	127,373	96,771	116,659
2nd and 3rd Special Exhibition Halls	284,324	316,632	481,412	82,382	98,018
Experience Activity	170,175	157,466	145,767	179,263	205,779
LOHAS Energy Conservation House	5,578	5,287	3,122	21,278	24,682
Open Storage	16,755	18,214	14,786	10,886	12,746
Popular Science Library	60,479	77,964	78,239	84,615	85,237
Leased Area	127,501	106,205	114,700	109,921	113,428
Outdoor Plaza	574,584	475,734	494,611	530,507	437,891
Total in Museum	1,971,579	2,280,268	2,334,430	1,929,030	2,058,991
External services (Taiwan)	437,754	424,639	572,126	574,375	719,435
External services (Overseas)	195,079	454,598	59,960	557,737	25,772
Total (Taiwan)	2,409,333	2,704,907	2,906,556	2,053,405	2,778,426
Total (incl. Service Overseas and in Taiwan)	2,604,412	3,159,505	2,966,516	3,061,142	2,804,198