

National Science and Technology Museum

Administrative Plan for 2019

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 2018, NSTM was awarded as follows.

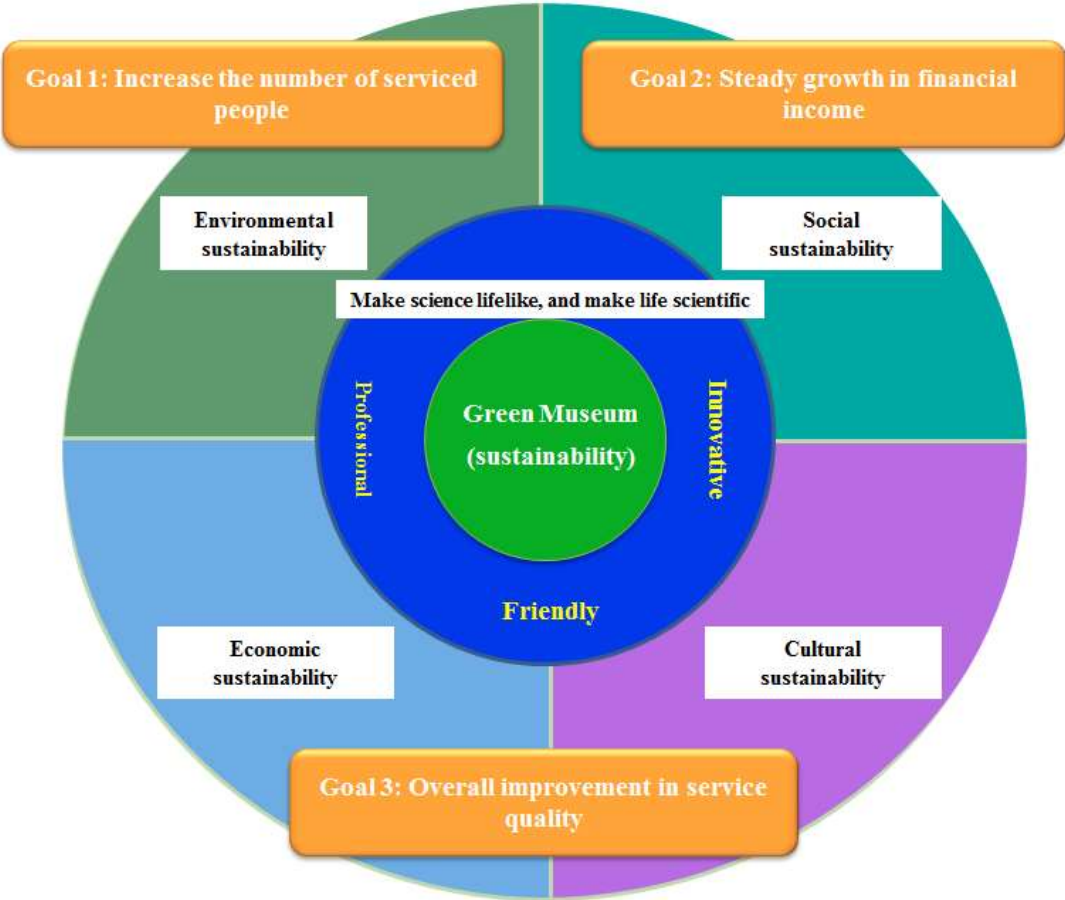
1. ISO 9001 Plus Award for Quality Management System (QMS) Transformation and Innovation Management Benchmark. NSTM is the only museum in Taiwan to receive this award.
 2. Outstanding Award from Ministry of Economic (MOE) Affairs Water Resources Agency for water conservation.
 3. Dengue Fever Prevention Mobile Learning Kit - Exterminator Squad received 2018 Asia Pacific Network of Science and Technology Centres Award for Creative Science Communication.
 4. Outstanding National Senior Citizen Volunteer Team Award at the 10th Elite Senior Citizen Award, which was organized by the Old Five Old Foundation.
 5. Completed ISO 50001:2011 energy management system international accreditation. NSTM was also registered with the Taiwan Accreditation Foundation and received a certificate.
 6. Updated Personal Information Management System and obtained the BS 10012:2017 International Personal Information Management Certificate.
 7. Environmental Protection Administration, Executive Yuan's Outstanding Public Toilet Certification Won second place for 2017 Kaohsiung City Institution with Excellent Indoor Air Quality.
 8. Outstanding organization for MOE's Open Government Data Operations Evaluation.
- Please see the appendix for the specific achievements of 2018. Based on the abundant

amount of achievements, we have proposed administration strategy and specific implementation measures for the plan of 2019.

II. Administration strategy and specific implementation measures for 2019

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 introduce 5 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 (2019) 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) Introduce 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) Introduce 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) Introduce Qualicert (Service Quality Certification), and 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.

Appendis

The National Science and Technology Museum Annual Achievements for 2018

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

(1) Seek resources to organize diverse science education activities

In order to achieve the goal of Science Experience and Experience Science, 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 integrating science into daily lives, and integrating daily lives with science.

(2) Building a smart technology exhibition and educational platform to enhance people's scientific knowledge

NSTM has forged museum-industry collaborations by working with the domestic smart vehicle, industrial robot and related component manufacturers to create the Smart Manufacturing – Smart Car and Industrial Robot exhibition areas. Exhibits collected include robotic arms, heavy motorcycles, EVs, and RV gear reducers etc. Visitors are able to engage in the diverse visiting experience via dynamic/stationary exhibits with corresponding APP as digital media.

(3) Developing innovative technology education activities and building a smart manufacturing education platform

The Robot Classroom and Programming Classroom were created, while robotic interactive learning and teaching aids, as well as innovative experiential course materials, were developed. In addition, Smart Technology Exploration and Smart Robot Promotion and Educational Courses were held in conjunction with the Creative Robot Competition in an effort to elevate the technology-related knowledge of the public and students in south Taiwan.

2. Facilitate international exchanges in popular science education in support of the New Southbound Policy

(1) Promote people-oriented, bilateral, and resource-sharing New Southbound Policy

In supporting the government's New Southbound Policy, NSTM relocated the Invention Exhibition to the Tech Dome Penang in Malaysia in 2017, making it the first collaboration between NSTM and New Southbound Policy countries. Lively, creative approaches were applied to attract visitors, in turn inspiring creativity and enabling them to appreciate inventions in Taiwan. The exhibition was subsequently relocated to the

National Science Museum Thailand in Bangkok and received wide acclaim from the local public.

(2) Signing a cooperation agreement to promote Dengue fever prevention education

Using exhibits from the Dengue Fever Area of NSTM's permanent exhibition hall Diseases Prevention Combat Camp in conjunction with mobile learning kits, the exhibition was relocated to the Tech Dome Penang in Malaysia. Moreover, popular science and environmental health education-related experiences were exchanged with local schools. NSTM signed a cooperation agreement with Tech Dome Penang and the National Science Museum Thailand to promote Dengue Fever Prevention Mobile Learning Kit - Exterminator Squad to Thailand and Malaysia. The purpose is to jointly promote Dengue fever prevention education.

(3) ASPAC members join forces to organize the exhibition

NSTM, National Science Museum Thailand and Singapore Science Centre are all members of the Asia Pacific Networks of Science Centres (ASPAC). In 2018, we co-organized the Rice is Life Exhibition, where diversified and exhibition techniques were applied, drawing inspiration from daily life to showcase cultural diversity and industry achievements in the Asia Pacific region, so that the visitors will be able to experience and appreciate the diverse appearances of rice in the region. This is the first joint exhibition by ASPAC members, and the first stop was held at NSTM on November 29, 2018. The exhibition will be relocated to the National Science Museum Thailand on March 3, 2019.

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

(1) NSTM Lanterns of Love Program's promotion and science education for economic disadvantaged school children

The NSTM Lanterns of Love Program was launched in 2013 and entered its 6th successive year in 2018. This year (2018), the program received a subsidy of NT\$3,091,440 (including NT\$300,000 subsidy from MOE) to provide economic disadvantaged school children from Taiwan and offshore islands to receive support and visit NSTM for free.

(2) Proactive measures to raise revenue and cut expenditure

In 2018, NSTM raised revenue by NT\$206,306,631 and cut expenditures by NT\$52,717,054, totaling NT\$259,023,685.

(3) Pool social resources to improve exhibition service performance

In 2018, 71 joint exhibitions were held by pooling the resources of at least 84 social enterprises, an increase of 1.4% compared to 2017.

(4) Envelopment of theme merchandise based on NSTM's collections to increase revenue

Cultural & creative products were developed based on NSTM's collections to highlight their features and significance, as well as increase the revenue of the museum.

4. Utilize social manpower resources to improve overall performance

In order to offer visitors more comprehensive services, NSTM strives to manage and utilize volunteers, student volunteers, and interns more effectively in facilitating the day to day operation of the museum. In 2018, a total of 1,159 volunteers were on duty for 199,863 man hours; 900 student volunteers accumulated 4,434 man hours of service; 77 interns accumulated a total of 21,623 man hours. The combined service time rendered by social human resources was 225,920 man hours, equivalent to that of 113 full-time staff at NSTM.

5. In Pursuit of perfection to serve more people and raise more annual revenue

By improving NSTM's overall environment, service process designs and service quality, combined with diverse exhibits, films, and popular science education activities, we have won the public's hearts and totally served 3,061,142 people in 2018.

In 2018, 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\$192,571,155.

Table 1 Number of visitors served over the past 5 years

Unit: Person

Person Item Item	2014	2015	2016	2017	2018
Exhibition Hall					
Permanent Exhibition	698,550	609,597	870,923	811,766	770,247
Paid Special Exhibition	-	36,286	132,264	62,654	43,160
3D Theater	113,575	86,300	119,579	127,373	96,771
2nd and 3rd Special Exhibition Halls	157,223	284,324	316,632	481,412	82,382
Experience Activity	135,585	170,175	157,466	145,767	179,263
LOHAS Energy Conservation House	5,923	5,578	5,287	3,122	21,278
Open Storage	13,993	16,755	18,214	14,786	10,886
Popular Science Library	103,614	60,479	77,964	78,239	84,615
Leased Area	118,570	127,501	106,205	114,700	109,921
Outdoor Plaza	575,581	574,584	475,734	494,611	530,507
Total in Museum	1,922,614	1,971,579	2,280,268	2,334,430	1,929,030
External services (Taiwan)	334,720	437,754	424,639	572,126	574,375
External services (Overseas)	0	195,079	454,598	59,960	557,737
Total (Taiwan)	2,257,334	2,409,333	2,704,907	2,906,556	2,053,405
Total (incl. Service Overseas and in Taiwan)	2,257,334	2,604,412	3,159,505	2,966,516	3,061,142

Table 2 Income statement over the past 5 years**Unit: Thousand NT\$**

Item	2014	2015	2016	2017	2018
Service Income	34,043	38,790	54,923	51,510	41,284
Cooperative Education Income	24,915	31,452	37,214	59,651	57,104
Educational Promotion Income	11,456	11,232	10,700	13,059	15,720
Other Subsidy Income	13,416	13,636	33,850	38,615	38,344
Interest Income	2,110	2,087	1,898	1,869	1,968
Asset-use and Royalties Income	26,574	28,437	35,207	28,169	31,720
Other Business Income	3,944	6,434	5,506	7,594	6,431
Social Education Institution Development Grant (A)	196,446	196,446	196,446	196,446	200,244
Total Income (B)	312,904	328,514	375,744	396,913	392,815
Self-Raised Income	116,458	132,068	179,298	200,467	192,571
Agency Current Self-Raised Ratio 1-(A)/(B)	37.22%	40.2%	47.72%	50.51%	49.02%