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OPEN ASIA
UNIFYING SCIENCE, EMPOWERING INNOVATION

OPEN-ASIA: Boosting engagement of HEIs in Open Science in India and Malaysia

OPEN SCIENCE INFRASTRUCTURE DEVELOPMENT PLAN P1-UM

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University of Malaya, Malaysia
(P1-UM)

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EXECUTIVE SUMMARY

The Open Science Infrastructure Development Plan at Universiti Malaya (UM) is designed to map out current Open Science landscape in Universiti Malaya, focusing on aspects such as Open Science infrastructure, institutional Open Science platform, Science Shop, Physical capital resources, governance and management mechanisms, integration into institutional processes and sustainability and operational measures.

This document aligns with the definition of Open Science in the UNESCO Recommendation of Open Science 2021, which aims to make research more transparent, accessible, and inclusive. By focusing on the four pillars of Open Science, UM Open Science aims to be a leading research university that champions Open Science in Malaysia, fostering a culture of transparency, collaboration, and equitable access to knowledge for societal and environmental progress aims to enhance research visibility and impact while ensuring compliance with FAIR principles (Findable, Accessible, Interoperable, and Reusable).

It is expected that this document provides a comprehensive situational and SWOT analysis of Open Science at University Malaysia and thus, providing a solid foundation for the University to chart its institutional strategies and action plans for Open Science from 2026 – 2030. Outputs, outcomes and impacts from Open Science will benefit multi-stakeholders including top management, researchers and lecturers, research officers, librarians, IT personnel, research students, partners and collaborators, communities and policy makers.

This document is endorsed by the UM Open Science Steering Committee during the first meeting, held on June 12th, 2026. The document describes existing infrastructure of Open Science in Universiti Malaya and it aligns with the UM Strategic Plan 2026 – 2030. However, this document is a plan, and does not have financial implication to the University.

The exercise is part of the OPEN-ASIA: Boosting Engagement of HEIs in Open Science in India and Malaysia. The OPEN-ASIA project has been co-funded by the Erasmus+ Programme for Capacity Building in Higher Education under the grant agreement No. 101128493. Further details can be found at: https://openasia-erasmus.org/

CHAPTER 1.

INTRODUCTION OF OPEN SCIENCE AT UNIVERSITI MALAYA

Open Science global movement is endorsed by UNESCO (2021) to make scientific knowledge openly available, accessible and reusable for all. It encourages transparency, collaboration, inclusivity and accountability across all stages of research, and promotes changes in the culture of science: (i) from Competition to Cooperation, (ii) from Science as Product to Science as Process and (iii) from For a Few to For All. The UNESCO Recommendation on Open Science 2021 highlighted four key pillars of Open Science: (1) Open Scientific Knowledge, (2) Open Science Infrastructure, (3) Open Engagement of Societal Actors and (4) Open Dialogue with Other Knowledge Systems.

The history of Open Science in Universiti Malaya started when the university researchers received requests from international funders, particularly from the EU and the RCUK to submit Data Management Plan (DMP) together with their research proposal and requests from journals to deposit their data in public repository. Universiti Malaya has also been actively involved in national projects and international engagements related to research data management. These have built momentum and led to significant Open Science progress and achievement for the University. Hence, to support the implementation of Open Science agenda, Universiti Malaya has established UM Open Science (UMOS) initiative in 2021. Adding to this, there are various Open Science initiatives and activities that are currently on-going in Universiti Malaya under these four pillars of Open Science, as illustrated in **Figure 1.**

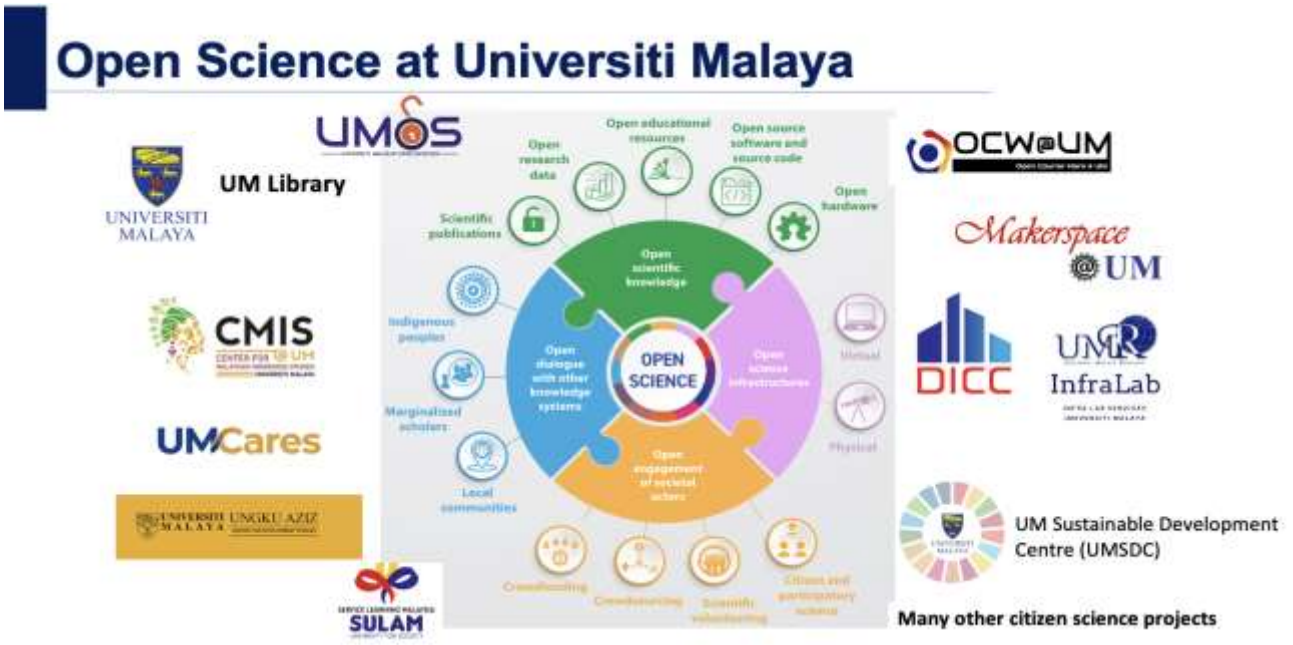


Figure 1. Examples of Open Science Activities and Initiatives at Universiti Malaya

CHAPTER 2.

OPEN SCIENCE INFRASTRUCTURE

2.1 Digital and research infrastructure

Universiti Malaya runs multiple institutional digital and research infrastructure, such as support for High-Performance Computing (HPC), managed by the Data Intensive Computing Centre (DICC) and centralised scientific instruments and research infrastructure (managed by INFRA Laboratory):

1. High Performance Computing (HPC)

   To facilitate the modern research of different research communities, the Universiti Malaya Data Intensive Computing Centre (DICC) provides support and access to High-Performance Computing (HPC). The HPC infrastructure consists of a 1536 cores HPC cluster and a GPU farm (with two NVidia DGX B200, two Nvidia DGX A100 and other GPUs), that are connected to our PetaByte storage systems (a high-performance parallel file system running on BeeGFS, and a hoem storage system on CEPH with 3 replica) via high-speed InfiniBand network. The total worth the infrastructure is about RM13 million, and most recent procurement processes are still ongoing.

   This facility supports the modern scientific experiments that require large-scale computational power, such as weather simulations, AI-aided digital health application, and natural sciences simulations (e.g. particle physics and computational chemistry). All of our UM researchers, as well as their collaborators, can access the UH HPC via a user-friendly workbench that is running on an Open OnDemand portal.

2. INFRA Laboratory

   This centralised infrastructure is designed to support diverse research activities across various disciplines by providing access to advanced instrumentation and specialised research services. The UM INFRA team oversees several key facilities, such as:

- INFRA Analysis: Equipped with advanced technology facilities with excellent technical support for students, researchers and customers inside and outside UM in various fields of research.
- Lab Animal Centre (LAC): Supports research involving animal models, production and breeding of conventional laboratory animals, while maintaining ethical standards.
- INFRA Microbiology: Offers instrumentation and services specific to food and water microbiology testing to the industry.

Each facility is equipped with state-of-the-art instruments and staffed by experienced personnel to assist researchers in their experimental endeavors.

2.2 Research Data Management

Universiti Malaya runs Research Data Management infrastructure support through the University Malaya Data Intensive Computing Centre (DICC) and provides supports for_knowledge-based resources and scholarly services, which is managed by the Universiti Malaya library:

1. Research Data Management infrastructure support.

Universiti Malaya, through Universiti Malaya Data Intensive Computing Centre (DICC), provides data management services that handle the entire research data life cycle. The data platform comprises 3 major components that cover three phases of research, i.e. a data management plan platform (https://dmp.dicc.um.edu.my/) for facilitating the creation of DMP before the project started, a data sharing platform (https://drive.dicc.um.edu.my) for enabling the sharing of data among internal and external researchers during the project, and a data achieve platform (https://researchdata.um.edu.my/) for the archiving and sharing of data after the project has been concluded.

2. Universiti Malaya Library

Universiti Malaya Library serves as the central hub for digital research support at Universiti Malaya, providing a comprehensive repository for scholarly outputs, robust research data management, and open access publishing support. It integrates key services such as standard material circulation and extensive research support to technology facilities, digital archiving, and specialised collections.

Researchers access Open Science services using their Universiti Malaya Single Sign-On (SSO) credentials. The Research Data Management workflow begins with the preparation of a Data Management Plan (DMP), followed by data generation and storage in UM Drive during active research and subsequent deposition into the UM Research Data Repository upon project completion. Deposited datasets are reviewed by assigned data stewards for metadata quality, ethical compliance and adherence to FAIR principles prior to publication. User support is provided through the Open Science Data Management Section, DICC and designated data stewards. Helpdesk support is available via email and scheduled consultations, while regular onboarding workshops and training sessions are conducted for researchers and postgraduate students.

2.3 Open Science Platform

Universiti Malaya Open Science Platform is managed by the Open Science Data Management Section, under the Department of Research Development, Deputy Vice Chancellor (Research &

Innovation) Office. The platform provides resources, knowledge and information regarding Open Science, especially on Research Data Management practices, and other Open Science activities across four pillars of Open Science, as outlined in the UNESCO Recommedation of Open Science 2021.

2.4 Open Science – Hubs (OC-Hubs) / Science Shop 2.0

A strong outreach and community engagement strategy is essential to drive the adoption of Open Science at Universiti Malaya. In Universiti Malaya, there are various community-based research activities, such as living labs organised under Universiti Malaya Sustainable Development Centre (UMSDC) for sustainable-related projects, community-based projects under UM Community Engagement Centre (UM Cares) and community-based projects focusing on solving poverty issues under UM Ungku Aziz Centre for Development Studies (UAC).

Additionally, Universiti Malaya runs the SULAM project, which stands for Service-Learning Malaysia – University for Society. SULAM is a transformative educational pedagogy launched by the Malaysian Ministry of Higher Education (KPT). It integrates academic coursework with meaningful, structured community service. Universiti Malaya is also proud of its open innovation initiative through Makerspace@UM which serves as a learning and collaborative hub that transform ideas to reality. UM also actively engages with local indigenous people for research, such as under the Centre for Malaysia Indigenous Studies Universiti Malaya.

2.5 Assessment of Equipment Purchased Within OPEN-ASIA Project.

Within the OPEN-ASIA project, Universiti Malaya plans to secure equipment to support the operation of Open Science practices at the University.

Table 1. Proposed IT equipment specification to be purchased within OPEN-ASIA project. The purchase status is on-going

Items	Purpose of purchase
1 unit of Laptop, 13-inch MacBook Air M5 1TB Storage	Supporting UM Open Science operation and implementation including for science shop
1 unit of Laptop, Lenovo 512 GB Storage	Supporting UM Open Science field-based activities and community engagement program, as well as for promotional events.
1 unit of Tablet Xiaomi Pad 8	Supporting UM Open Science field-based activities and community engagement program, as well as for promotional events.
1 unit of MAC Mini, M4 Pro; 24GB RAM; 1 TB SSD	Supporting UM Open Science operation and implementation including for science shop
1 unit of MAC Studio, M4 Max, 64GB RAM, 2 TB SDD).	Technical infrastructure of Open Science including data crunching, data processing, local AI LLM report writing and documentation and trial and development of pre-filled information
1 unit of SmartTV, Xiaomi TV S Mini LED 65" (2026), Brightness 1200 nits; Apple Airplay; Google Cast, 4k 60 Hz	Supporting UM Open Science operation and implementation including for science shop

CHAPTER 3.

INSTITUTIONAL OPEN SCIENCE PLATFORM

Open Science platform can be found at https://openscience.um.edu.my. The website provides resources for various Open Science initiatives, such as Research Data Management, Open Access publications and many others.

For Open Access publications, support mechanisms may include institutional repositories, publication advisory services, open access funding or article processing charge support, copyright and licensing guidance, and training on how to publish in reputable open access journals. These mechanisms help researchers increase the visibility, accessibility, and societal impact of their research outputs while ensuring that publication choices remain ethical and credible.

Table 2. Support mechanisms for Open Access

Support mechanisms	Description
Institutional repositories	Support for general institutional repository for research data is provided by the Department of Intensive Computing Centre (DICC)
Publication advisory services	Several supports provided by: 1. The Centre for Core Research Excellence (TERAS) under Department of Research Management (JPP). 2. UM Library
Open access funding or article processing charge support	Several supports are available: 1. Springer Nature Transformative Agreement APC 2. Article Processing Charge (APC) support for Open Access articles: Top 10% in Journal Q1 journals - up to RM12,000 Web of Science indexed jounals Q1 - up to RM6,000 Web of Science indexed jounals Q2 - up to RM2,000
Copyright and licensing guidance	Copyright and licensing guide follows UM Research Data Management Policy and UM IP and Commercialisation Policy
Training on how to publish in reputable open access journals	Regular training provided by The Centre for Core Research Excellence (TERAS) under Department of Research Management (JPP)

For FAIR data, support mechanisms include data management planning, institutional data repository, metadata standards, persistent identifiers such as DOI, data licensing guidance, and training on data curation and sharing. These mechanisms ensure that research data are Findable, Accessible, Interoperable, and Reusable, while also respecting ethical, legal, privacy, intellectual property, and cultural sensitivities

Table 3. Support mechanisms for FAIR data

Support mechanisms	Description
Data management planning	UM Data Management Plan (DMP) tool is accessible for UM researchers to create and update DMP. The platform is accessible at https://dmp.dicc.um.edu.my/
Institutional repository	UM researchers can deposit their research data at UM Research Data Repository. The platform is accessible at https://researchdata.um.edu.my/)
Metadata standards	The metadata standards for UM Research Data Repository follows Dublin Core.
Persistent identifiers	Digital Object Identifier (DOIs) are created for each deposited dataset on the UM Research Data Repository
Data licensing guide	Licensing guide follows UM Research Data Management Policy and UM IP and Commercialisation Policy
Training on data curation and sharing	UM provides regular hands-on training on data curation and sharing for UM researchers.

Currently, UM Institutional Data Repository is integrated with the Malaysia Open Science Platform (MOSP) Portal. It is anticipated that the UM Institutional Repository will be registered in other research data repository registeries, such as re3data.org. The UM Institutional Data Repository provides multiple access restrictions for research dataset. All UM researchers can deposit research data, and assign restrictions to the datasets, according to the sensitivity and confidentiality of the data. Data stewards are available to assist in managing the research management proccess.

CHAPTER 4.

SCIENCE SHOP 2.0

Universiti Malaya has on-going community based activities, as elaborated in **Chapter 2.4**. Moving forward, Universiti Malaya will introduce the concept of Science Shop as an OS-Hub activity, that enables local concerns to be translated into researchable questions, Living Lab activities, student projects, expert consultations, and concept briefs. Its operational model is grounded in a "listening before solving" approach, where community members are invited to submit lived problems through accessible channels such as QR questionnaires, community boards, social media, WhatsApp networks, mobile counters, and facilitated problem clinics. The model deliberately moves beyond academic extraction by recognising community experience as a valid form of knowledge and by creating structured pathways for matching community needs with UM expertise.

Under the Science Shop model, stakeholder engagement and Citizen Science functions are embedded through participation from residents, neighbourhood associations, NGOs, civil society organisations, schools, youth groups, faith-based groups, caregivers, and the UM campus community. These stakeholders contribute local observations, identify priority concerns, and support issue mapping. Internally, the submitted issues are collected, cleaned, grouped, filtered and matched with experts, and then, the university members then can write research questions based on the societal inputs. This ensures that the OS-Hub is not only an outreach mechanism, but also a structured Open Science platform for collaborative problem identification, academic translation, and community-responsive research. The model should be monitored through indicators such as engagement reach, quality of submissions, number of issues translated into projects, expert involvement, and feedback provided to participating communities.

The Science Shop will be coordinated under the Open Science Data Management Section office. Within this OPEN-ASIA project, the operation of Science Shop will involve multiple stakeholders as illustrated in **Figure 2.** To ensure the successful realisation of Science Shop, future plans to be implemented may include:

1. Establish an Open Science Ambassador Program to appoint faculty champions for Open Science advocacy.
2. Provide incentives for faculty members who integrate Science Shop model into their research and teaching.

3. Develop customised training modules for different faculties to address discipline-specific Open Science needs.
4. Review Science Shop model operation regularly to ensure the risks and benefits are managed and measured appropriately.

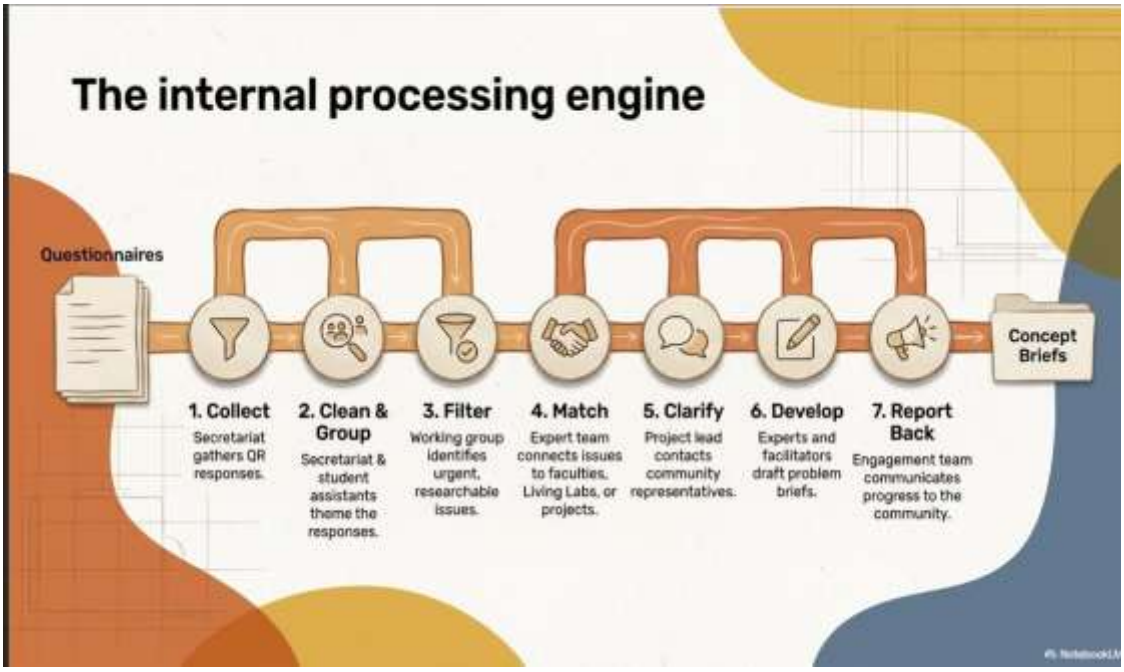


Figure 2. Proposed Operational Model for Science Shop

CHAPTER 5.

PHYSICAL CAPITAL RESOURCES

Chapter 2.2 elaborates existing physical capital resources that support Research Data Management (RDM)for Universiti Malaya. In terms of the RDM support services, Universiti Malaya has secured software and hardware (as listed in Table 4) to meet infrastructure needs.

Table 4. Repository hardware and software services for RDM

Software	Hardware
1. Repository platform: Dataverse (v. 6.0 build 1512-366fd41) 2. Storage system: CEPH (v 18.2.)	1. 3 x QuantaGrid D52BQ-2U (Intel Xeon Silver 4216 CPU @ 2. 10GHz, 137 GB, DDR4 3200 MHz, 96TB SATA SAS)

The repository is running on a High-Availability (HA) platform setting up on 3 Proxmox Server in UM Data Centre 2, operated by the Data Intensive Computing Centre (DICC). The data are stored in the CEPH filesystem with 3 replica across 3 dedicated nodes connected with 10Gbps network. Total usable storage space is 137TB. Service uptime since May 16th 2023 (i.e. Launching date of Malaysia Open Science Platform) is 98.93%.

Operation of the equipment supported various OS activities, training and research at Universiti Malaya. In terms of the deposition of data, a total of 50 research datasets are deposited at UM Research Data Repository, accounting for 463 files uploaded, 10 researchers and 18 departments. A cumulative of 22,255 downloads has been recorded so far, as of June 9th, 2026. These datasets belong to various subjects (some datasets may have overlapped subjects) as listed below:

1. Medicine, Health and Life Sciences (30 datasets),
2. Social Sciences (25 datasets),
3. Chemistry (11 datasets),
4. Earth and Environmental Sciences (9 datasets),
5. Engineering (11 datasets),
6. Computer and Information Sciences (7),
7. Agricultural Sciences (3),
8. Mathematical Sciences (2) and
9. Other (3).

Consolidated of infrastructure inventory is as follow:

Infrastructure	Capacity/Specification	Responsible Unit	Purpose
HPC Cluster	1,536 CPU cores and GPU farm	DICC	Advanced computing and AI applications
UM Drive	Institutional data sharing platform	DICC	Active research collaboration
UM Research Data Repository	Dataverse + CEPH	DICC	Long-term preservation and sharing
DMP Platform	Web-based platform	DICC	Data Management Planning
INFRA Laboratory	Centralised research facilities	INFRA Laboratory	Research services and instrumentation
Open Science Platform	Web portal	Open Science Data Management Section	Information, training and resources

In terms of Research Data Management workflow, researchers submit the research dataset for review by the data stewards, two data stewards are responsible for the review process and after reviewing, the data will be published or returned to researchers (if needed, for amendment). The metadata standard used is Dublin Core. The metadata then will be harvested from institutional repositiory to the Malaysia Open Science Platform portal . The key person who is authorised to review and approve metadata harvesting is the UM Open Science Coodinator. UM has recognised the important of the Open Science and has allocated internal operational funding to hire a full-time IT officer and a Research Assistant to operate and maintain the platform. Data stewards are full-time senior lectuers, research officers and librarians. These platforms are used for training and capacity building, such as the Research Data Management Workshop for Researchers, which are conducted regularly, at least four times a year.

CHAPTER 6.

UM OPEN SCIENCE GOVERNANCE AND MANAGEMENT MECHANISMS

In Universiti Malaya, the *Jawatankuasa Pengurusan Universiti* (JKPU) (University Management Committee) chaired by the Vice-Chancellor, is the highest committee that oversees all matters related to Univeristi Malaya. The JKPU committee reports to *Lembaga Pengarah Universiti* (LPU) (University Board of Directors). Open Science agenda cross-cut multiple portfolios of Universiti Malaya, such as Open Educational Resources and management of curriculum that falls under the Deputy Vice Chancellor (Academic), UM Library and Department of Digital Information under the Deputy Vice Chancellor (Development). However, for overall purposes, UM Open Science falls under the Deputy Vice Chancellor (Research & Innovation).

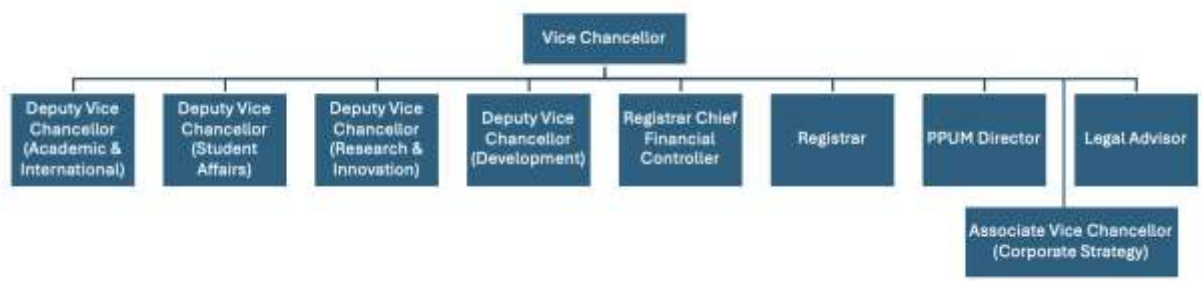


Figure 3. Organisational Chart of Universiti Malaya

Administratively, UM Open Science is managed by the Open Science Management Section, under the Department of Research Development (DRD), Deputy Vice Chancellor, (Research & Innovation). The Section reports activities regularly to the Department of Research Development (DRD) and to the Deputy Vice Chancellor, (Research & Innovation), monthly. The section also provides monthly reports to the Deputy Deans of Research of Faculty, Institutes and Centres at Universiti Malaya.

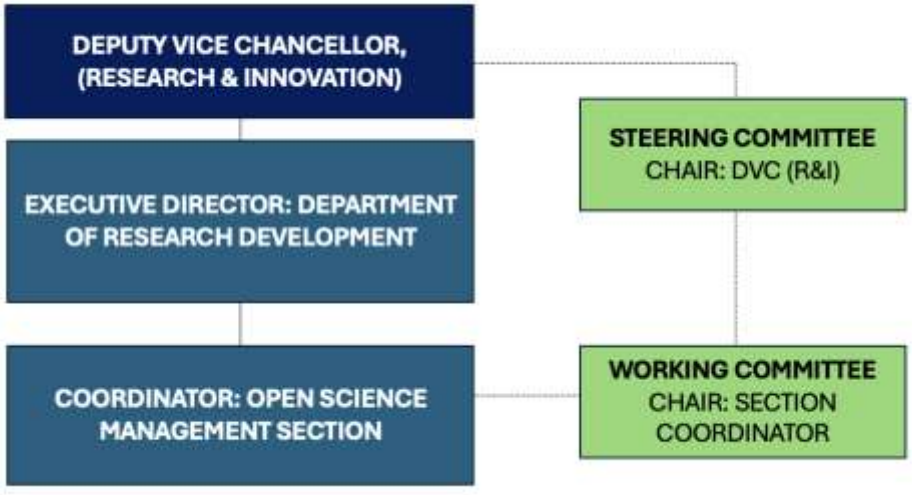


Figure 4. Organisational Chart of Universiti Malaya Open Science

Open Science agenda is also supported by two committee levels (steering and working committee) who serve different responsibilities, supporting Open Science (**Table 5**).

Table 5. Membership and functions of UMOS Steering and UMOS Working Committee

	UM Open Science Steering Committee	UM Open Science Working Committee
Chair	Deputy Vice Chancellor, (Research & Innovation)	Coordinator, Open Science Data Management Section
Members	1. Executive Director, Department of Research Development 2. Executive Director, Universiti Malaya Library 3. Director, Makerspace@UM 4. Executive Director, Academic Strategic Planning Division 5. Executive Director, UMCares 6. Exeuctive, Universiti Malaya Sustainable Development Centre 7. Director, Ungku Aziz Centre for Development Studies 8. Project Coordinator OPEN-ASIA 9. Head, Centre ofr Indigenous Study in Malaysia 10. Coordinator, Data Intensive Computing Centre	5 academic staffs, 4 research officers and 4 librarians

	11. Coordinator, Open Science Data Management	
Terms of Reference	Reviewing, and making decisions on aspects related to: • Directions for the Open Science initiative • Research Data Management Framework and implementation of the Open Science Principles as defined by UNESCO Policies, Guidelines and Policies • Infrastructure and Facilities • Collaboration Networks • Other matters related to research data management and the Open Science initiative	1. Report Open Science initiatives or activities to Steering Committee 2. Study, draft and prepare paperwork related to Open Science initiative, aligning with Strategic Plan UM 2026-2030 and UNESCO Open Science Recommendation 2021 3. Study, draft and prepare guidelines and action plans related to UM Open Science 4. Propose needs related to UMOS implementation, such as research data management, and involvement of communities, industry, etc.

As of June 5th 2026, the operation of UM Open Science (UMOS) is supported by 43 data stewards, comprising of librarians, research officers and lecturers. These data stewards are trained under the Training of Trainers (ToT) Data Stewardship on Open Science, organised by the Malaysia Open Science Platform (MOSP) under the Academy of Sciences Malaysia (https://mosp.gov.my/stewards) and recently, two data stewards enrolled in GO FAIR Fellowship Program. These data stewards are assigned to each Faculty, Institute & Centre. They are responsible to ensure data produced is of quality and follows the international best practices of Open Science. More information about data stewards can be found at https://openscience.um.edu.my/um-data-stewards-by-academic-ptj-and-research-centres.

The support operation and maintenance of infrastructure needs to support data lifecycle for research projects, namely: (1) Data Management Plan (DMP) Roadmap (Guideline and platform for Data Management Plan preparation), (2) UM Drive (Store research data and allow collaboration for active research project) and UM Research Data Repository (Enable archive and reuse of research output from completed research projects) are provided by the Data- Intensive Computing Centre (DICC). https://www.dicc.um.edu.my/our-services/. The security, maintenance, and data protection procedures aligns with the Universiti Malaya Security Policy and UM Research Data Management Policy.

CHAPTER 7.

INTEGRATION INTO INSTITUTIONAL PROCESSES

As a summary, UM integrates relevant Open Science policies, processes, resources including physical capital infrastructure, human capital, and funding support into its research framework by:

1. Encouraging open-access publishing through incentives like Page Charge Fund subsidies.
2. Implementing research data management policies and maintain infrastructure needs to ensure responsible data sharing.
3. Supporting transformative agreements to promote open-access publishing at no cost to researchers.
4. Conducting training programs, webinars and articles write-up to raise awareness and equip researchers with Open Science best practices.

By embracing Open Science, UM strengthens its research impact, global engagement, and innovation capacity, positioning itself as a leader in transparent and collaborative scientific advancement. Within this OPEN-ASIA project, UM is piloting several initiatives to further strengthen Open Science agenda at the University. The list includes (but not limited to):

1. Implementation of formal curriculum of Open Science for a master postgraduate course "Special Topics in Open Science".
2. Implementation of informal curriculum of Open Science for lifelong learning "Strategic Leadership for Open Science".
3. Implementation of Science Shop 2.0

In addition, UM Open Science also actively engages with the campus community through forums (e.g. Open Science Forum 2), workshops, webinars, meetings and stakeholder outreach to increase awareness about Open Science, seek inputs for Open Science planning, policy development and programs and training for Research Data Management. Current and future infrastructure support are ensured to align with institutional policy and strategies for Open Science at the Universiti Malaya.

CHAPTER 8.

DEVELOP SUSTAINABILITY AND OPERATIONALISATION MEASURES

Universiti Malaya is committed to building and sustaining a robust Open Science infrastructure through strategic budget allocation and external funding. Resources are distributed across personnel, technology, and training to ensure smooth implementation and long-term impact. For example, annual operational expenditure (OPEX) and Other Chargeable Annually Recurring Expenditure (OCAR) are allocated for purposes such as: (1) Personnel: Hiring administrative, technical, and training staff to manage Open Science operations, (2) Physical and Digital Capital Infrastructure: Maintenance of HPC clusters, Research Data Management support, research facilities and many others (3) OCAR allocation for training fees, logistics and implementation support for conferences, programs, exchange visits and promotions

In the future, possible funding mechanisms can be sought from securing government grants and international funding to support Open Science initiatives. Universiti may also seek to partner with publishers, industry leaders, and research institutions to support open-access publishing and data-sharing collaborations, establish a cost-sharing model where faculties contribute to Open Science infrastructure. In addition, Universiti Malaya may explore licensing guides for monetising research data and develop subscription models for external organisations accessing Universiti Malaya's research resources. By strategically managing resources and forming strong partnerships, UM aims to become a regional leader in Open Science, ensuring research is accessible, transparent, and impactful.

8.1 OPEN-ASIA Achievements and Future Development

As of June 2026, Universiti Malaya has established a mature Open Science ecosystem supported by 43 trained data stewards, multiple Open Science training and awareness activities which reached more than 300 UM community, implementation of formal and informal Open Science curricula, establishment of Science Shop 2.0 and continuous enhancement of institutional research data infrastructure. Future plans include expansion of repository capacity, strengthening FAIR data services, increasing researcher participation and further integration of Open Science into institutional policies and academic programmes.

CHAPTER 9.

DEFINE MONITORING AND IMPACT INDICATORS

Universiti Malaya ensures the effectiveness of its Open Science initiatives through structured evaluation and monitoring processes. Currently, UM Open Science monitors Open Science agenda through key metrics and indicators such as:

1. Open Access Publications – Percentage of research outputs published in Article Processing Charge (APC)- support Open Access journals
2. Data Sharing– Number of datasets deposited and downloaded in institutional repositories
3. Collaboration & Engagement – Involvement and Leadership in Open Science networks, committees and communities.
4. Training – Number of researchers trained and adopting Open Science practices; Number of data stewards trained.

Monitoring and assessment are reviewed regularly and reported at meetings at the UM Open Science Working Committee (four times a year) and Steering Committee levels (two times a year), as well as at administrative meetings under the Deputy Vice Chancellor, (Research and Innovation) portfolio on monthly basis.

At the national level, UM Open Science also reports to Malaysia Open Science Platform on quarterly basis during the Meetings of Malaysia Open Science Steering Committee and Malaysia Open Science Alliance.