

Core Facility Lifecycle: General principles and recommendations

By the EU-LIFE Core Facilities Working Group





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Introduction

Core facilities are an integral part of life science research institutions and provide centralised access to technological resources and expertise, such as equipment, databases, materials and collections, and other research resources. The centralised operational model enables organisations to maximise their financial, capital and human resources. Operated by professional teams with specific expertise, they serve research groups that do not have the capacity to establish and run these specialised resources individually. Core facilities contribute to the efficiency and quality of the output of research groups and provide continuity of technological expertise as well as institutional training.

In contrast to large Research Infrastructures (RIs) supported at the regional, national or international level, core facilities in life sciences are primarily supported by their host institution and are comprised of multiple specialised units. By providing technological services and expertise, and through their support of research and the training of scientists, core facilities and their staff have a strong impact on the scientific performance and output of their host organisation. This includes the delivery of publications, grant submissions, intellectual property, and academic progress. Their contribution to scientific research and innovation must thus be as flexible and timely as the scientific agendas and missions of the respective institutions. Central to the mission of providing state-of-the-art support is the development and / or adoption of technologies and to offer a range of scientific support services.

Research institutes should routinely review whether core facilities are relevant to their overall scientific mission, researcher needs and demands. When facility quality, output, return on investment or other KPIs are not sufficient, or new technologies supersede the status quo, institutes need to be prepared to adapt their core facility portfolio accordingly.

To support organisations through these change processes, we have described the phases and relevant considerations in key life cycle phases of core facilities; from the first idea, through planning, implementing, running, consolidating and even closing a facility. The life cycle of core facilities is a dynamic and complex process; this document sets out the general principles identified by the EU-LIFE Core Facility Working Group that should be considered throughout.

The lifecycle can be described in four phases, and we will consider each of these steps in detail and propose guidelines on how organisations can best address the different challenges.

Start-up



Motivation for starting-up a new core facility

- Availability of new science and/or technology; developed by industry or academic institutions
- Changes in institutional scientific direction
- New PI recruitments or PIs changing research focus
- Technology development within an individual research group expands to the level that it becomes necessary to manage as a community resource
- Collaborative activities between institute researchers and their external partners/networks
- Efficiency and/or quality gain by centralisation of previously dispersed resources

When deciding whether to establish a new facility, the following points should be considered

- Who are the relevant decision-making bodies within your institute?
 - They should be included in the consultation process, take responsibility for the concept and support the implementation of new facilities
- Who are the relevant stakeholders within or outside your institute?
 - Identify and consult with them; this should minimally include researchers and the other facilities within your institute.
 - User demand, surveys and discussions of the faculty will bring evidence to support the change initiative, whilst bringing expertise, energy, and perspective from a variety of areas.
- Which scientific considerations will influence the discussion?
 - New technologies and / or core facilities should be driven by research requirements
 - Undertake consultation to determine the scientific direction of users

- Can this technology be accessed from elsewhere locally?
 - Explore whether this a more feasible solution
 - Consider whether the technology can be established through transversal workflows across units before establishing a new platform
 - Is there an opportunity for collaboration / co-financing of staff, equipment or technology enhancements with other organisations?
- What are the risks associated with establishing a new facility?
 - Consider the alternative approaches.
 - Undertake strategic risk analyses, e.g. SWOT and PESTLE¹, to identify the internal and external factors which can influence the success
- How does this fit within the wider institutional context?
 - Do you need to close another facility to operate a new one, or will it sit alongside?
 - Consider extending or merging existing facilities to achieve the new goals set by research requirements.
- Is this a long-term requirement, or is it a short-term solution to address a specific question(s) or project(s)?
 - If short-term, is there an opportunity to partner with / outsource to local organisations who have similar infrastructures.
 - If the facility is established to support the objectives of specific, time-limited grants, will there be work for the facility once these grants have concluded?
- What are the financial constraints and will the new facility be financially sustainable?
 - Will it operate on a cost-recovery model, or be centrally financed? Is there subsidy to support its operation?
 - Can you apply for equipment grants (locally, internationally) to obtain the equipment? Or seek external third-party funding for the creation of an infrastructure.
 - The running costs of the instruments should be estimated to determine the overall financial impact.
 - Will the institute be able to finance the required personnel?

¹ SWOT: Strengths, Weakness, Opportunities, Threats and PESTLE: Political, Economic, Social, Technological, Legal and Environmental

- Are there any space or other operational constraints?
 - Confirm the space required and whether it has the necessary infrastructure, including power and gas supplies, climate control and floor loading capacity
 - Is the equipment anticipated to generate substantial volumes of data, beyond that which has been anticipated by your computing and/or data management plans? If so additional storage capability will need to be included.
 - Will the facility have any specific health & safety requirements, such as high containment facilities?
 - A clear project plan should be developed, including timelines, to establish when these, and other, constraints could be resolved and what the cost would be.
 - Is it feasible to get the right expertise in your institute to develop and run a new core facility?

Implementation



When planning to implement a new facility within an institute, the following considerations are relevant:

- How will it fit within your institutional context?
 - What is the number and make-up of potential users?
 - What are the user expectations for the facility?
- Will it be open to external customers?
 - Are there constraints to working with commercial partners?
 - How will access be managed?
 - How do the expected access rates compare to market prices, is it competitive?
- Would it be helpful to establish the new service at a small scale, for an initial test phase– and decide later if it becomes an institutional core facility?
- What does the ramping up phase look like, including a deadline for implementation?

- Develop a scenario and timeline that includes:
 - hiring/training personnel
 - preparing the infrastructure
 - purchasing the required equipment
 - implementation of administrative requirements, such as Finance, HR etc
- Will the institute be able to hire the required personnel, if needed?
 - Consider whether existing personnel can be re-trained to manage the facility
 - Consider the local market when advertising positions, to ensure the adverts are attractive and as competitively salaried as finances permit
- How long is the technology in the facility expected to last before upgrade of technology or instruments is required?
- Allocation of resources is required, including:
 - A qualified and experienced manager and support team
 - Equipment and associated infrastructure, including licenses and permits
 - Tools for access management, user and sample tracking
 - Research data management capabilities
 - All the above should be considered in the context of local recruitment, procurement and research management policies & procedures
- Stakeholder outreach, engagement and communication
 - Networking with stakeholder groups to raise awareness of the facility, such as presentations, trainings, web information and marketing material
 - Communication with potential users about the capabilities and standard operating procedures, including building a service portfolio
 - Clearly defined modes of access, ie whether it is fee-for-service vs. collaboration
- Establishment of governance structures and reporting mechanisms
 - Definition of costing and pricing model
 - Define the KPIs for the facility
 - Establish user and steering committees (in accordance with local structures)

- Implement proper reporting systems for evidence of usage (booking system)
- Do the new instruments and capabilities integrate into the existing technology workflows?

Operation



Once the facility is in operation considerations change from planning to monitoring performance and determining whether the facility is meeting its objectives. This involves:

- A clear line management structure for the new facility, which is well communicated to all stakeholders
- Developing a set of SMART² goals for the leadership and output of the facility
- Review/feedback by local oversight committees and by the appropriate local forum such as user groups, steering committees or other review mechanisms like surveys.
- Periodic external evaluation by international experts. Evaluation should include:
 - Monitoring KPI's
 - Identifying and monitoring measures of quality
 - Seeking regular feedback from users
 - Engaging with the facility staff
- Establishing personal and professional development plans for the workforce so they remain highly skilled and motivated experts
- Establishing safety nets and backup plans; these can include the provision to outsource services within local networks in the event of instrumentation or staff disruption
- Integrate with institutional asset management strategies, to ensure that instrumentation is maintained and replaced when necessary
- Participate in financial and business planning exercises, including cost recovery goals

² Specific, Measurable, Achievable, Relevant, Timebound

- Maintain an awareness of both market developments and research demand to ensure the facility remains state-of-the-art and fit for purpose. Resources for this include:
 - TechWatch seminars (via EU-LIFE and CTLS)
 - User surveys
 - Industry connections
 - Feedback from wider networks
- Actively raise the profile of core facilities using various channels, including social media and other communication tools

Structural changes or phasing out



Periodic reviews should be conducted to ensure the facility remains relevant for its users. If it meets requirements then it should continue to operate under an ethos of continual improvement, striving for excellence, efficiency and effectiveness.

However, there are occasions when decisions will need to be made regarding the future of the facility, including structural reorganisation or phasing-out. A comprehensive and transparent financial and operational review, including analysis of user base (current and future), should be conducted to inform these decisions, but final decisions should be taken on a scientific basis.

Contributing factors include financial considerations, such as when routine activities are more cost effective to undertake through a third party; the adoption of advanced capability or taking advantage of increased economies of scale through merging with another facility; the establishment of more comprehensive workflows, so facilities are merged rather than passing samples from one facility to another.

Under these circumstances, the following should be considered:

Structural changes

The structural changes of the facility may include: **merging** with another facility to consolidate resources or **outsourcing** some elements to a third party.

Merging: all aspects related to starting-up a new facility should be considered, with particular attention also paid to:

- Managing personnel issues:
 - Establishing robust communication methods between the two facilities, during development and implementation
 - Predicting, avoiding, and resolving conflicts between the two sets of staff
- (Re)allocating resources (equipment and finances) to the appropriate place
- Establishing a governance model when merging facilities from different institutions with
 - Defined shared or single management structures
 - Established contractual arrangements
 - Revised pricing/usage conditions
 - Defined minimum quotas for involved parties
 - Established user committees and mechanisms of evaluation.
- Retraining personnel and identifying expertise in the new facility
- Carefully monitoring and addressing any cultural aspects between the merging facilities

Outsourcing: particular attention should be paid to:

- Defining the scope of outsourced work
- Performing robust comparisons (internal vs external), including cost and delivery time, and the impact this has on facility economics if some elements of service are to be retained
- Defining a point of contact between internal users and external providers, who can act as a conduit of information between all parties
- The operational aspects such as shipping, billing, data / material transfer, sample tracking, VAT
- Drawing up standard operating procedures for managing the new arrangements
- Communicating the decision to users

Phasing out

As research strategies evolve and/or PI's turnover, it may be that a core facility is no longer viable and it is necessary to phase it out. The same decision may be taken for financial reasons, where it is more cost effective to outsource the services previously provided in-house. Identifying whether you need access to similar capability, and if so, where will it come from should be a pre-condition of making the decision to phase out a facility.



In circumstances where it has been determined that a facility is **phased out** then the following should be prepared:

- A clear articulation of the reason for closing, be it financial, strategic, changing research interests / needs, or external opportunity.
- As long a timeframe as possible to ease the transit, this includes developing a clear operational plan and timeline for concluding all work, which is shared with all relevant stakeholders
- Clear communication to all internal and external stakeholders
- Robust consideration of personnel issues



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