Equipment Sharing Infrastructure Narrative (Case for Support)

Cambridge is well versed in establishing a collaborative environment to ensure it has the facilities to fulfil the multidisciplinary nature of state-of-the-art and novel research. Over 120 Small Research Facilities have been developed across the University that permit access to University staff and students as well as external clients who are interested in collaborating or who use the services provided as part of their R&D strategy. These facilities, along with 4600 individual items of equipment, appear on the University's equipment sharing database: https://www.equipment.admin.cam.ac.uk/

Agreeing to share details on the local platform permits access to equipment across the institution to all staff and students. Data is shared within a regional consortia (Science and Engineering South) consisting of Cambridge, Oxford, Imperial, King's College London, UCL, Queen Mary's and Southampton, and finally data is exported to the publicly accessible National Equipment Portal that is supported by almost 70 UK institutions. As such, this facilitates local, regional, national, and international awareness of shareable equipment.

To date 20,000 internal users have accessed the database and collectively viewed over 180,000 pages of information. An additional 9,500 members of the public have engaged with a publicly accessible project portal https://www.equipment-sharing.cam.ac.uk that provides funding support and news, and guides users to both the equipment database and the National Equipment Portal to facilitate wider awareness and engagement.

The National Portal https://equipment.data.ac.uk/ is supported by 68 institutions in the United Kingdom, containing details of over 20,000 items of equipment. Each record on the Cambridge Database contains the primary contact name, telephone and email address, below a description and photograph, including a direct link to the hosting department, and more than 70% of these records are exported to the National Equipment Portal.

Equipment sharing project outreach highlights upcoming equipment funding opportunities and the resources available to help with funding applications, and the project's X (Twitter) social media account provides daily updates on equipment and research related calls. By feeding into the grant application process details about how equipment will be made available for sharing, listing information locally, and exporting information to the National Equipment Portal, and assisting in the disposal of equipment, this initiative supports the complete equipment and research project lifecycle.

The database is accessible to all members of University staff and students, and therefore anyone is able to search for equipment which can be particularly useful for planning future research projects, for locating alternative equipment should current equipment fail or become inoperative, for conducting pre-purchase assessments, and for allowing researchers to move forward with research ideas even without an all-contained lab of their own.

When writing grant applications, applicants are advised to log into the database and enter the names and terms of equipment they wish to use or request, and the database will return records of the existing equipment. This enables applicants to identify who is managing that equipment and discuss using it or explore collaborative opportunities. This also helps applicants identify where there is a need for equipment the University doesn't currently possess or where existing equipment is at capacity.

The equipment sharing project team support the listing of any newly acquired equipment on the database, provide guidance and policy on giving access to equipment and facilities, details of costing templates and equipment and facility sharing agreements, and guidance on disposing of equipment.

Not only does sharing equipment benefit researchers by reducing the need to travel to reach specific tools that might, in fact, be available locally, a recent analysis of the 4000 or so items on the equipment database indicate that the average item was first in service (purchased, installed, and made operational) in 2013. This means that equipment is being used well beyond its 4-year depreciation point and is maximising its return on investment and is further evidence that the University is committed to prioritising reuse in the long term.

In terms of equipment end-of-life, guidance is also available on the disposal, rehoming, and recycling of equipment with links to the University's WARPit account and opportunities to donate usable equipment to Africa and further afield. https://www.equipment-sharing.cam.ac.uk/equipment-donations-disposal-and-recycling

Sharing equipment is also viewed as a further opportunity to grow existing networks and facilitate equipment cost recovery, and as an enabler to being at the forefront of science. This adds value to current research and raises impact at subject boundaries, allowing researchers to rapidly respond to emerging new areas. The exchange of ideas and expertise enhances the UK skills base and provides data and expertise in emergent and cross-disciplinary fields.

Condensed alternatives

The new equipment acquired by using the [**insert funding stream**] will upgrade and strategically strengthen resources for [**insert discipline type**] Researchers in Cambridge by contributing to the University's world class status for laboratory and research equipment. The bid is fundamental to the departmental and academic user base across the University, the local area, and beyond, and will ensure that the University remains at the forefront of world-leading research. Existing equipment sharing project outreach activities will provide additional awareness of the equipment across the University. These activities include the promotion in University publications, the circulation of a regular newsletter, email campaigns and bulletin posts that cascade from Head of Departments down, departmental, individual, and research group inductions and workshops, presentation at postdoc induction events, annual pathways to higher education practice (PHEP) sessions for newly appointed members of teaching and research staff, and via the project's dedicated X (Twitter) account that highlights equipment, current funding opportunities, local and national events, and the latest internal and external equipment sharing information.

The University will incorporate this equipment into its existing infrastructure that offers a unique emphasis on hands-on facilities comprising bespoke analytical capabilities supporting multiple research disciplines across all central Cambridge departments. This will add significant value to current research and raise impact at subject boundaries, allowing researchers to rapidly respond to emerging new areas. Exchange of ideas and expertise will enhance the UK skills base, providing data and expertise in emergent and cross-disciplinary fields. The University will maximise impacts through the support of well-staffed facilities offering state-of-the-art technology and dedicated expertise.

Cambridge is well versed in establishing a collaborative environment to ensure it has the facilities to fulfil the multidisciplinary nature of state-of-the-art and novel research. Over 120 Small Research Facilities have been developed across the University, permitting access to staff and students as well as external clients who are interested in collaborating with us or who use the services provided as part of their R&D strategy. These facilities, along with 4600 individual items of equipment, appear on the University's equipment sharing database that acts as a conduit to collaboration by providing up to date information on each item of equipment and the contact details of the laboratory and equipment manager responsible.

All of the equipment procured using this grant will be entered into the institutional Equipment Sharing Database http://www.equipment.admin.cam.ac.uk **to ensure it can be accessed by all researchers in Cambridge. As an additional function of inclusion in the local database, the equipment will appear on the National Equipment Portal that offers national and international accessibility to equipment for researchers and students worldwide** https://equipment.data.ac.uk**. This will create wider academic networks and support a comprehensive range of research and training. This infrastructure will facilitate the sharing of ideas, increase exposure to new research techniques, and enhance our researcher's employment and skills development. In terms of evidencing impact, Cambridge uses Symplectic and ResearchFish to monitor publications and other impacts arising from research, and combining the equipment's inclusion on the database with an appropriate booking system will permit the linking of outputs for REF and internal audit and assessment.**

UCAM is committed to sustaining and developing the user base of its shared equipment and facilities and maintains a database containing details of 4600 individual items of equipment and more than 120 Small Research Facilities (http://www.equipment.admin.cam.ac.uk). The database has been accessed by 20,000 users including many staff and students at UCAM who have collectively viewed 180,000 pages of information. Details of over 70% of the equipment and SRF's listed are exported to the National Equipment Portal which itself documents over 20,000 items of equipment and facilities across the country and is supported by almost 70 UK institutions. (https://equipment.data.ac.uk). The inclusion of the proposed equipment within these databases will create wider academic networks that will facilitate the sharing of new ideas, increase exposure to new pioneering research techniques and supplement a wide range of research and training activities within Cambridge's research community.

Sustainability (People and Equipment)

Funders are increasingly focusing on sustainability aspects of applications – not just the lifecycle of equipment and institution's annual environmental sustainability reports, but the sustainability of the **human resources required to maintain and operate research equipment, their skill set, retention and professional development.**

Increasing the awareness of, and sharing, equipment is viewed as an opportunity to grow existing networks and facilitate equipment cost recovery, as well as being an enabler to being at the forefront of science. This adds value to current research and raises impact at subject boundaries, allowing researchers to rapidly respond to emerging new areas. The exchange of ideas and expertise enhances the UK skills base, and provides data and expertise in emergent and cross-disciplinary fields. This will create wider academic networks and support a wide range of research and training. This infrastructure will facilitate the sharing of ideas, increase exposure to new research techniques, **and most importantly *enhance researcher's and technician's employment and skills development*.**

We will also consider the long-term benefits of this equipment in terms of research equipment life-cycle, and particularly end-of-life. Cambridge has established links to facilitate the local rehoming and recycling of equipment including links to the University's WARPit account and opportunities to donate usable research equipment for educational purposes to Africa and further afield https://www.equipment-sharing.cam.ac.uk/equipment-donations-disposal-and-recycling.

The institution has an excellent record of sustaining equipment with many items of equipment maintained beyond their expected lifetimes. This is supported by our excellent research technical staff and the healthy research eco-system across the Cambridge area.

A recent analysis of the 4600 or so items on the equipment sharing database indicate that the average item was first in service (purchased, installed, and made operational) in 2013. This means that the majority of equipment is being used well beyond its 4-year depreciation point and is maximising its return on investment and is further evidence that, as an institution, we are committed to prioritising reuse in the long term.

We offer a wide range of support tools to facilitate the ecological reuse, recycling and disposal of scientific equipment (https://www.equipment-sharing.cam.ac.uk/equipment-disposal-and-recycling). This includes guidance on the use of an institutional WARPit account for exchanging furniture, equipment, and other resources between university departments that has helped generate almost £418,000 in financial savings for the University, equivalent to 46.2 tonnes of waste diverted and a reduction of 227 tonnes of carbon.

Equipment can also be upcycled locally via Makespace; a community workshop in the heart of Cambridge with additional facilities on the Biomedical Campus that welcomes unused equipment and aims to refurbish and make it available to the local community. Guidance is also available on the philanthropic gifting or donating of unwanted but functional equipment or materials to bolster the amount of assets sent to African charities, many of which are focussed on medical aid, science and education.

Support is given to principal investigators and laboratory managers to guide them through these processes and testimonies of their experiences are available online https://www.equipment-sharing.cam.ac.uk/news

Important Links

UoC ES Public Portal:	https://www.equipment-sharing.cam.ac.uk
ES on Twitter/X:	https://x.com/cam_equip
ES Database:	http://www.equipment.admin.cam.ac.uk
National Equipment Portal:	https://equipment.data.ac.uk