



# Design & Innovation Centre Services

WP2 – Development

Brunel University



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## Abbreviations and Acronyms

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Brunel	Brunel University, London
CRETHIDEV	Creative Thinking Development
EC	European Commission
EU	European Union
HEI	Higher Education Institution
IIITD	Intraprastha Institute of Information Technology- Delhi
POLIMI	Politecnico Di Milano
RIMT	RIMT University
UAEGEAN	University of the Aegean
WP	Work Package
WUD	World University of Design



# 1 Introduction

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## 1.1 Innovation Centres

The innovation centres established by the DESINNO project will provide access to state-of-the-art design and prototyping equipment. With their trained-expert staff, the centres will offer new services to both students and companies as well as to relevant stakeholders in India. These new services will include internship positions, industry sponsor projects, short courses, workshops, training seminars, informative events, funding opportunities, and opportunities to participate in various R&D national or international projects. The established state-of-the-art equipment and design software will also be utilized for educational purposes (e.g., design projects within courses) and for the benefit of graduates, design professionals, companies and the stakeholders involved in the Design market.

These centres will also provide links with industrial partners for the setup of joint interventions, will facilitate the setup of sponsor projects, will foster collaboration between industrial partners and universities for new product development, and other activities related to education and research. Each centre will have a design lab with certain equipment and software for new product development and prototyping. The activities of WP1 have laid the foundations for the new centres; these include a cross-country research report, which analyses the importance of the design sector for the economy of India, the training needs of experts, and the favoured pedagogical approach for training and development of improved design courses. Across WP2, with the capacity building sessions and improved design courses, further groundwork has been laid to aid the success of the centres and the methodologies, equipment (hardware and software) and the improved design courses material will form the backbone of the centres' success.

The centres will achieve nationwide academic awareness and will contribute to:

- the establishment of cross-sectoral projects for collaboration and co-learning;
- the establishment of Inter-industry projects;
- the development of extreme affordability principles while taking care accessibility and sustainability aspects;
- the development of community-based programs;
- the modernization and internationalization of Indian HEIs.

A key aspect of safeguarding the sustainability of the project's outcomes is to ensure that the centres:

- Play an integral role in learning and teaching in their institution;
- Engage with industry and stakeholders in the community;
- Are flexible enough to meet the different needs of each institution, whilst also being concrete enough to ensure that they have a clear operational model;
- Have a clear model for generating and sustaining funding of equipment and activities going forward.

This document is designed to be read alongside the sustainable business model for the services operation of the three Design & Innovation Centres and will provide the ways to reach the target groups and after the lifespan of the project. Existing worldwide paradigms, like the fab-lab or the tech-lab models, are analysed to help optimize the effect and sustainability of the Design & Innovation Centres.



## 1.2 Collaboration Platform

Alongside the new centres is the collaborative website platform, hosted on Slack, which is being managed by IIIT and will continue its operation after the end of the project. The virtual space will foster collaboration between:

- The three DESINNO centres;
- The centres and companies in both India and Europe;
- The universities and companies that wish to establish a collaboration in the form of a sponsored project or an internship position;
- The centres and other relevant stakeholders, such as policy-makers and Indian research centres;
- The centres and initiative groups who would like to establish new design centres and/or new design curricula.

The Slack channel will provide a collaborative workspace and will foster new projects and joint activities. It will include video and other content, with provide a community space for individuals to connect, it will host project demonstrations, and will serve to promote the centres' services.

## 1.3 Sustainable Business Model

The business model is designed to ensure the sustainability of the new innovations centres as well as the collaboration platform that will be used as a shared workspace and the ground of new projects and joint activities between academia and industry.

The sustainable outcomes for DESINNO project are:

- Three Design & Innovation Centres, equipped and operational;
- Innovative and permanent methods for Research and Design;
- Extreme affordability principles;
- Infrastructure (labs) and methodology for the development of community-based programs;
- Infrastructure (labs) and methodology for the development of cross-sectoral projects;
- The modernization and internationalization of Indian HEIs.

The sustainable business model for the operation of the three Design & Innovation Centres will provide the ways to reach the target groups and after the lifespan of the project. Existing worldwide paradigms, like the fab-lab or the tech-lab models, will be studied to optimize the effect and sustainability of the Design & Innovation Centres. This Sustainable Business Model establishes the basis for both the sustainability of these centres after the lifetime of the project and the creation of new ones in India.

## 1.4 Funding Opportunities

The fact that these centres will be established in HEIs permits their funding through research project funding initiatives or university's financial resources. Further to that, the centres will be funded through the services that they will offer to the design sector (concept development, prototyping, seminars, consultancy, joint projects, etc).

Funding opportunities may also arise from the following national organisations:

- Make in India: <https://www.makeinindia.com/article/-/v/make-in-india-reason-vision-for-the-initiative>
- Start Up in India: <https://www.startupindia.gov.in/>
- National Skills Development Mission of India: <https://skillindia.nsdcindia.org/>



With the development of the design & innovation centres and the establishment of a design community in India, the possibilities of Governmental funding for the development of the design sector will increase. The roundtable “The Design in India; how new Design & Innovation Centres can provide sustainable economic growth” will be the starting point for a debate about the importance of design & innovation centres for economic development.

## 1.5 Engaging Stakeholders

The project has already established a connection with NITI Aayog via the webinar hosted by RIMT University in January 2021.<sup>i</sup> This existing connection lays the foundation for further collaborations with the Government of India initiative for encouraging and establishing Entrepreneurship and Innovation Centers in educational institutes as ATAL incubation labs.

The project will enhance the recent national "Make in India" initiative. The early involvement of policy-makers and/or government agencies in the roundtable, is expected to continue after the project on a direct ad-hoc basis or through other structured project opportunities. The collaborative platform, will bring together all stakeholders involved and provide the means of structured cooperation for Policy making.

## 1.6 Pilot

Six product-design pilot projects will be implemented in the target universities in order to lay the foundation of close collaboration with local industry. These pilot projects will be developed based on the new methodologies and expertise that have been developed by the earlier activities in WP2 and will make use of the new equipment in the newly established centres.

In the pilots, selected groups of students will be involved in industrial driven product design projects. The briefs of these projects will be set up with the support of European HEIs and with the potential involvement of companies. At the end of the three product-design pilot projects, each target university partner will gather feedback from faculty members, experts and students. The feedback gathered will be summarised into pilot-project reports, which will be analysed by the project partners who will suggest improvements to be implemented in the final 6 months, with regard to the utilization of the equipment and services of the new centres, and the material of the associated design courses.

## 1.7 Methodology

This document is designed to be read alongside the sustainable business model created on Canvas. It offers an overview of existing practices at similar organisations, as well as detailing the proposed equipment, services, users, and activities of the new Centres. The sustainable model is focused around two core activities: teaching in the respective HEIs and services offered to the community.

In order to sustain the use of the Design and Innovation Centres within their respective institutions, they will become an integral part of project-based modules. All Indian HEI partners already have these kinds of modules in place. Thus, the centres can continue to serve students and staff in the teaching of courses at the institution.

It is also proposed that the centres will act as a ‘one stop shop’ for design and innovation support for start-up companies, SMEs, young entrepreneurs, social activists, not-for-profit organisations, etc. In this way, these centres can be a link between the industries and Indian HEI. They can gather requirements from the industries and turn them into design projects for design students to work on in project-based modules. The requirements gathered through these centres could also lead to academic research projects for staff and research students.



## 2 Existing Worldwide Paradigms

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### 2.1 Design Factory Global Network (DFGN)

<https://dfgn.org>

The Design Factory Global Network (DFGN) is a network of innovation hubs based in higher education institutions and research organisations across the world. DFGN has 31 design factories in 24 countries, including Singapore, Japan, China, Turkey, Israel, the UK, USA, Australia, and Brazil. At present the DFGN does not have any factories in India. The shared values of DFGN hubs enables collaboration across institutions, despite differences in governance and setup of the various institutions at which it is based. The hubs offer an opportunity for industry partners to collaborate on new concepts with scholars, students, and other companies. They also facilitate interdisciplinary research, which can be conducted with industry partners where relevant.

As a network of innovation platforms, it would be worth considering linking the centres with DFGN as a way of contributing to their international reach and collaborative opportunities. The objectives to drive change, work with local companies, and foster education, research and practical design opportunities speak well to the ethos of the DESINNO Innovation Centres, while the international approach would contribute to the reputation of the centres.

### 2.2 Institute of Making

<https://www.instituteofmaking.org.uk/>

The Institute of Making is described as “a multidisciplinary research club for those interested in the made world: from makers of molecules to makers of buildings, synthetic skin to spacecraft, soup to diamonds, socks to cities.”<sup>ii</sup> It is based at University College London (UCL) in the UK and membership is open to all staff and students at the college, regardless of discipline or role. Membership is free. The Institute of Making defines its mission as: “to provide all makers with a creative home in which to innovate, contemplate and understand all aspects of materials and an inspiring place to explore their relationship to making.”

The Institute of Making is based around a Materials Library, which offers members the opportunity to interact with a range of remarkable materials designed to spark imaginative and conceptual innovation. The Institute of Making also has a Makespace workshop, in which makers can design and build using traditional and modern tools, materials and techniques. Tools include 3D printers and scanners, ceramics, CNC machining, heat tools, laser cutters, power tools, sewing machines, and electronics.

An important aspect of their work is public engagement, and to that end they host more than 60 events annually, covering a range of themes and addressing a range of audiences. Events include evening talks, public open days, and research events, and are designed to introduce members to new areas, develop members’ skills, connect research collaborators, and build the Institute’s international profile. As part of its international agenda, the Institute of Making has hosted visits from international research organisations, universities and companies. They also have been invited to present on work undertaken at the Institute, at institutions across the world. Another aspect of the Institute’s work is its role in steering policy and attracting industrial collaborators.

As part of its work in fostering innovations in research, the Institute offers paid summer studentships for undergraduates. The scheme enables participants to undertake materials/making research for a maximum of ten weeks during the summer. A focus is on multidisciplinary projects, that engage with different departments and areas of expertise. The Institute also offers small research grants to fund, which supports projects led by both staff and students. The scheme also facilitates multidisciplinary research and teaching workshops led by other materials and making groups at UCL. In addition to offering its own funding, the Institute also hosts a number of major research projects funded by a variety of funding bodies including the Department for International Development, the Engineering and Physical Sciences Research Council (EPSRC) and the Wellcome Trust.





The Institute of Making is open four days each week, from 10:00-17:30 on Tuesdays, Thursdays and Fridays, and with later opening, from 13:00-19.30, on Wednesdays. Membership is open to all UCL staff and students, regardless of discipline or role.

## 2.3 Central Research Laboratory

<https://centralresearchlaboratory.com/>

The Central Research Laboratory (CRL) is a co-working space and the UK's first product accelerator. It is open to designers and entrepreneurs who want to turn their product and technology ideas into a new business. Originally CRL was funded by Brunel University, U+I, HEFCE, and the European Union Regional Development Fund, but it has recently partnered with the University of Brighton and Mouser Electronics to secure additional funding and expand its operations. CRL provides entrepreneurs with access to equipment, space, and support to develop prototypes with a view to manufacturing. It has supported 75 companies and has forged a community of entrepreneurs at its site in West London.

CRL offers a range of membership types: start-ups with teams of 3-20 people can rent a private office starting at £600 per month, while an individual can rent a dedicated desk for £200 per month or a hotdesk for £100. Virtual membership is also an option and for £50 per month this provides members with a professional address and postal collection, as well as two day passes each month and access to CRL's online spaces and Slack group. Non-members can buy a day pass for £25+VAT, which grants access to the workspace, machinery, and prototyping facilities. It is also possible to book ad hoc meeting and event spaces at CRL.

The events run by CRL have been limited in recent months due to Covid-19 restrictions, but have included a virtual demo day.<sup>iii</sup> CRL also runs an annual Accelerator Programme, which supports the process of bringing excellent product-based ideas to market. Running over six months, the programme includes practical workshops on business start-up, market and product development, design for manufacture, and investment readiness. The programme helps participants to understand customer needs and product value, assists with manufacturing at the right cost and establishing supply chains, gain hardware-specific funding from grants, to crowdfunding and angel investors. Participants receive a grant of £5,000, mentoring, and access to CRL workshops and workspace. A second phase of the project includes further support with product development, commercial and fundraising strategy, it also involves a visit to manufacturing plants in China. Companies that are selected to take part in this second phase register an option agreement for 3% equity in their business. This 3% option is not connected with the European Regional Development Fund.

CRL also runs a flexible support programme for start-ups and scaleups, called Boost. This short-term programme runs over a number of days and offers participants mentorship and workshops. Workshop places are free of charge, funded by the European Regional Development Fund, and would-be participants must apply for a competitive place. An example of this is a three-day course exploring how to secure early stage investment.

CRL markets itself to new clients around three core areas:

- Space: including 24/7 access, free parking, meeting rooms, prototyping workshops, photo studio, and event space.
- Community: monthly socials, community Slack group, events and workshops, kitchen, onsite café, complimentary coffee and refreshments.
- Support: high-speed internet, in-house electrical engineer, product development team, flexible options for business growth, all-inclusive pricing, expert drop-ins.

This offers a useful framework for thinking about the marketing of the new centres and their offer to members.



## 2.4 Fablab Network

<https://www.fablabs.io/>

A digital fabrication laboratory (Fablab) is a workshop space that provides users with access to equipment, materials, technology, and skills, to enable them to use “technology and digital fabrication to allow anyone to make (almost) anything.” The Fablab network has labs in more than one hundred countries across the world, with over 2,000 Fablabs globally. There are currently twenty-five Fablabs in India.<sup>iv</sup> It is relatively straightforward to establish a Fablab, if you have the relevant expertise, and they provide a recommended list of capabilities.<sup>v</sup> Fablabs are designed to be a community resource, providing open access for individuals, as well as scheduled access for education programmes. In addition to equipment and space, Fablabs offer a varied education programme and professional digital fabrication services for a range of different organisations.

As a network of innovation labs, the Fablab format represents a valuable networking opportunity for the new centres. Given their focus on equipment, space, and skills, the Fablab model speaks well to the approach of the DESINNO Innovation centres. Furthermore, being part of a global network would help to sustain the international outlook of the new centres.



## 3 Existing MakerSpaces in India

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### 3.1 MakerSpace

Ahmed et al. (2017) suggest that MakerSpaces in India are relatively young and only exist in a small part of the country. The following section offers an overview of five Indian MakerSpaces detailing resources, activities and prices in order to identify best-practice in facilities, engagement, and price points.

#### 3.1.1 Makers Asylum

[www.makersasylum.com](http://www.makersasylum.com)

Maker's Asylum is a community MakerSpace based in Mumbai and Delhi. It has a range of equipment, including 3D printers, laser cutters, CNC machines, electronics lab and prototyping tools for the purpose of woodworking, robotics, bicycle building and repair, rapid prototyping, open source computer-aided design. As well as providing the space and equipment for makers, it also offers training where members can develop their skills using particular tools – hand tools, power tools – methods – including laser cutting, soldering – and approaches – design thinking & portfolio building, CAD modelling & 3D design. Training is available at three different subscriptions – “Explorer”, “Tinkerer” and “Maker” level members – and start at INR 22,275 for a 25 credit course.

#### 3.1.2 Workbench Projects

[www.workbenchprojects.com](http://www.workbenchprojects.com)

The Workbench Project in Bengaluru describes itself as “an innovative and integrated maker space, co-working, startup incubation and Fab Lab.” It has a 5000 sq ft. space which is equipped with digital fabrication, 3D printing and a woodworking lab. Workbench Projects has three basic membership plans – Maker Pro (INR 4,000/month), Co-Working Pro (INR 5,000/month), Weekend Maker (INR 2,000/month) – as well day passes starting at INR500 per day. Special power tools (such as table saw, spray paint etc.) are available for members to hire for an extra fee.

Workbench Projects run a Fab Academy, which is a 6-month diploma programme where participants learn how to envision, prototype and document their ideas. The programme is based in practical experimentation and is based on MIT's rapid-prototyping course “How To Make (Almost) Anything”. Fees for the course are \$5,000. Workbench also offers the Skill-ED Certification programme, which is also 6-months long and is particularly focussed on practical building, rather than theory and study. The course costs Rs 1,50,000 (excluding taxes).

#### 3.1.3 J Moon

<http://jmoonmaker.space>

JMoon Makerspace is based in Delhi. Equipment includes 3D printers, FlashForge Creator Pro, and a range of tools. Day membership costs INR499, while monthly membership costs INR2599. JMoon Labs is the R&D arm of the company. They offer a range of services for a fixed fee, including hardware prototyping (INR 10,000), web development (INR 8,000), and 3D design (INR 250 per hour).

J Moon runs a startup incubation initiative, which offers participants access to the space, support from interns and makers, contact with manufacturing partners, and support with business plans and funding. In return, participants give a 5-8% share in their company's equity, or share their skills and knowledge with the space's community through delivering workshops and classes. J Moon invites all its members to deliver classes or sessions, to help with skill-sharing and community-building.

#### 3.1.4 Vigyan Ashram

<http://vigyanashram.com/InnerPages/FabLab.aspx>



Vigyan Ashram is India's oldest fab lab and the first to be established outside of MIT in 2002. It is equipped with materials such as laser cutters, a welding station, milling machine, 3D printer and scanner, and vinyl cutting machine, as well as an electronic table, hand and power tools. It is possible to use Vigyan Ashram fab lab in three ways: as a member of a "Fab Camp", as a user, and as a visitor. Vigyan Ashram hosts a range of workshops and small camps for those starting out – both adults and school children – and these include Arduino based projects, training in digital fabrication tools, and "FabEd" which is training in all fab tools. Those with existing knowledge of the tools are eligible to use the Fab Lab. Visitors to the Fab Lab are also welcome with prior booking, and will be offered a tour of the facilities and an overview of the projects. Another aspect of training offered by Vigyan Ashram is the Fab Academy, which is a full time course lasting six months and provides training on digital fabrication. Those who successfully complete the training will earn a diploma. In addition to the main Fab Lab, Vigyan Ashram has a D-I-Y Lab, which includes an IT workplace, fabrication tools, agricultural setup, biogas, solar systems, electronics and 3D printing. Vigyan Ashram also offers an entrepreneurship accelerator, with a focus on rural startups.

### 3.1.5 CEPT-Fablab

<http://fablab.cept.ac.in>

FabLab CEPT is based within the Architecture and Design campus of CEPT University in Ahmedabad and is co-run by the university and the Motwani Jadeja Family Foundation. As well as offering access to tools and equipment, FabLab CEPT also provides users with mentorship and training opportunities. Their equipment includes a vinyl cutter, 3D scanner, 3D printer, laser cutter, and milling machine. A continuing student with valid ID card can join for 10,000 INR per month, while the individual or professional membership fee is 25,000 INR per month. They also offer institutional member for a fee of Rs 8,000 per month, with access to wood and metal workshops an additional Rs8,000. As part of their high school programme they have run a range of 6-day courses on topics including robotics (INR 1740) and 3D printing (INR950). For members they run free "Fab Friday" events which have covered topics such as Japanese Binding, Elastic to Fantastic, and Talking Electronics.



## 4 DESINNO Innovation Centres

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### 4.1 Overview

The new DESINNO Innovation Centres are developed on a permanent basis and will offer services to the staff and students at each institution, as well as to external stakeholders. The Centres will operate on a not-for-profit model, with each institution providing the space for the Centre and covering the operating expenses. In some cases, a small fee may be charged to external users to cover the cost of operating expenses, such as staffing and consumables. Any profit from fees will be invested back into the Centre, so that it is a self-sustaining enterprise.

### 4.2 Equipment

Equipment and software for the design & innovation centres will be purchased, installed, tested and adjusted by the three target universities. The equipment and software to be purchased for each centre will facilitate the production of product prototypes. Each Design & Innovation Centre will be equipped with:

- 1x3D printer
- 1xLaser cutter/engraver
- 1xDesktop milling machine
- 1x3D scanner
- 10xWorkstation PCs
- 1xReverse engineering software (academic license)
- 1xParametric product design software (academic license)

To ensure the sustainability of these items, the necessary software will run under academic licenses which will be perpetual or valid for at least two years. Existing academic agreements with major developers like Autodesk and PTC will be realized to obtain most important design software at the lowest possible price. Open-source software will also be utilized for complementing the design & innovation centres.

This equipment will be used by the centres for providing services both to the student community but also to the industrial sector and Indian professional designers.

### 4.3 Services

It is proposed that the Innovation Centres fulfil the following functions:

- Providing co-working space for start-up companies, SMEs, young entrepreneurs, social activists, not-for-profit organisations, etc. who want to engage with young designers. Subscription/membership charges will be used to fund the activities in a long term.
- Offering design and manufacturing services for start-up companies, SMEs, young entrepreneurs, social activists, not-for-profit organisations, etc. who need help in terms of design and small-batch production. Different payment rates could be charged for different services, e.g. design projects and manufacturing consultation.
- Providing training courses for start-up companies, SMEs, young entrepreneurs, social activists, not-for-profit organisations, etc. who want to want to learn about design and digital fabrication. A number of courses could be offered according to expertise of the Indian HE, e.g. product design and communication design.



## 4.4 Users

Chen, Lam and Choi (2019) highlight the importance of having a clear audience in order for a business model to be sustainable, focussing on *who* and *how* they intend to empower. The three new Design and Innovation Centres will target a number of groups, including:

- Students and faculty members of the Institutions that will have free access to the new methodologies, equipment and software installed on the centres for research and development of new and innovative products.
- Newborn and small companies that will have access to the new methodologies, state-of-the-art product development equipment and design software.
- Professional designers and design studios that will have access to the new methodologies, state-of-the-art product development equipment and design software.
- Industrial partners for building collaborations and networking that, in turn, will provide internship positions and sponsor projects to the target HEIs.
- National and international universities that will have a reference point for setting up new collaborations and future projects that will also facilitate students' and faculty mobility in international institutions.

## 4.5 Health & Safety

Full health and safety policies for each aspect of the centres' operations should be drawn up, covering access to workshops, first aid, collaborative working, display screen equipment, electricity, and fire safety. Also, where applicable, guidance should cover fume cupboards, lone working, manual handling, and work placements.

Training and induction needs for centre users should be identified before the centres open. All centre users should be given a full induction by staff trained in health and safety. Each centre will undertake a full risk assessment process to identify and manage any risks associated with centre activities, for both employees and users. Examining potential causes of harm and outlining specific steps to prevent that harm occurring, a risk assessment should be signed, dated, and regularly reviewed. The risk assessment findings should be communicated with staff in the following way:

- Copy of risk assessment circulated to staff
- Controls covered in team procedure issued to staff
- Induction
- Team Meeting, Toolbox Talk
- Email circulation
- Any other relevant methods

The risk assessment will assist with the identification of training needs in relation to specialist equipment, manual handling, and any other associated activities, as well as the contents of an induction for centre users.

While Covid-19 remains a public health issue, it is important that Centres are particularly attuned to health and safety measures designed to combat the spread of the virus. Labs should adhere to local and national legislation and guidance, and may want to issue guidance to users on issues such as social distancing, ventilation (both mechanical and natural), and face coverings (such as masks and visors). Using testing where possible and ensuring that those with symptoms do not visit the lab are also important safety considerations. Where contact tracing is used, labs may need to store the details of users to notify them in the event of any case of Covid-19 in the lab.





## 4.6 Training, Events & Public Engagement

An important aspect of the organisations surveyed above is their training, events, and public engagement activities, which both work to promote the organisations whilst also often generating revenue and ensuring the sustainability of the business. Another important aspect of the success of the models above is the role they play in community-building; Moilanen (2012) identified social aspects as the second primary purpose for those visiting makerspaces, after building objects, thus offering a space for community is an important aspect of such spaces.

Xinchejian offers a useful model for an inexpensive, community building event in its “Open Nights”, which are held at 19.00 every Wednesday evening. These events provide a space for entrepreneurs, hobbyists, scholars and makers to mix, sharing ideas, projects, and achievements. The event is free, open to all, and attracts approximately 30-40 attendees. By being free and informal, these events focus on community-building, as well as serving to welcome a wider audience to Xinchejian.

In terms of more formal courses FabLab CEPT offers an interesting model in their high school programme, which offers 6-day courses on a variety of topics including robotics (INR 1740) and 3D printing (INR950). By engaging with young people, FabLab CEPT also does important work in nurturing the next generation of designers. The Maker’s Asylum offers a series of short courses for makers wishing to develop particular skills. For example their Woodworking 101 workshop (INR 4,500) runs over two days and introduces participants to the art of working with wood. It is open to anyone over the age of 13 and at the end of the session, participants take home an item they have crafted themselves. They also run a 3-hour Drone Workshop (INR 1,500) and a two-day workshop on Digital Fabrication (INR 2,500). Courses focussing on a particular skill such as these are popular across makerspace contexts and offer a valuable revenue stream for organisations. Another popular workshop is an introduction to the tools and equipment in the space/lab, which could also be run as inductions, as they are at Blackhorse Workshop in the UK.<sup>vi</sup> J Moon invites all its makers to run free classes for community members, thereby providing an inexpensive way of developing members’ skills and offering activities. Certificated classes, such as those run by Workbench Projects, also offer a valuable revenue-stream and could be offered as short courses by the Indian HEIs.

FabLab Cept hosts an annual conference and this approach could be adopted by the new centres, building on the DESINNO conference, held at the end of the project. The Institute of Making in the UK also offers a valuable model for offering research-focussed events, many of which draw on the expertise hosted in the organisation via its research projects.<sup>vii</sup> This organisation also offer valuable models of online engagement events – such as online technician consultations<sup>viii</sup> and online introduction to darning<sup>ix</sup> – which could provide a useful model for approaching engagement and dissemination which Covid-19 restrictions are in place.

## 4.7 Planned Publicising & Dissemination Activities

A brochure for each centre will be created to help market the new innovation centres. A total of 200 brochures will be available both in an electronic format and in paper version during the implementation of the project. The brochures will present the new-established design & innovation centres along with their new services. They will focus on specific audiences and respond to local need. Electronic versions will be disseminated using the project’s mailing list, social media channels, and project website.

### 4.7.1 Background Paper

A background paper for the roundtables will be offered in electronic and printed version and will be disseminated to the roundtable. The background paper will be the starting point for a debate about the importance of the Design & Innovation Centres for economic development.



#### 4.7.2 Roundtable

The roundtable event – “The Design in India; how new Design & Innovation Centres can provide sustainable economic growth” – will take place towards the end of the project. The background paper will be presented serving as starting point for discussion. The main outcomes of the roundtable will be included in the recommendations.

#### 4.7.3 Recommendations & Follow-up

Recommendations will be drafted into a document titled “How Design & Innovation Centres are useful for the economic development of India”. It will be available both in an electronic and paper format and will contain general, as well as specific, recommendations addressed to particular target groups. Recommendations will be disseminated among relevant stakeholders both through mails, regular meeting and will be presented at the final conference and printed.

The implementation of the recommendations “How Design & Innovation Centres are useful for the economic development of India” will be ensured before the end of the project, with actions recorded in the follow-up report.

#### 4.7.4 Final Conference

The final conference will take place during the last month of the project. The conference will allow the meeting between project members and stakeholders and will aim at promoting the transferability of the project recommendations. It will provide a valuable opportunity to disseminate outcomes of the improved design courses at the three target universities. The project recommendations will be printed and disseminated during the event. The conference will be held in-person, but online activities will be considered to run alongside the event.

#### 4.5.5 Beyond the Lifetime of the Project

The DESINNO project already has two journal articles in progress and it is proposed that the Innovation Centres, their implementation, pilot projects and evaluation, form the basis of papers in subsequent publications. Journals such as the International Journal of Technology and Design Education,<sup>x</sup> the International Journal of Art and Design Education,<sup>xi</sup> the International Journal of Design,<sup>xii</sup> Design Studies,<sup>xiii</sup> and Design Principles and Practices.<sup>xiv</sup> Possible conferences include HEAd<sup>xv</sup> and KES International.<sup>xvi</sup>





## 5 Appendix

### 5.1 Example Lab Operating Regulation

The text below is a template for the operating regulation of the Design & Innovation Centres and it can be adapted by the Indian HEIs according to their circumstances.

#### Rules of Operation of the Design & Innovation Centre in ..... University

##### Article 1: Establishment-Name

The Laboratory entitled “XXXXXXX”, is established at the Department of XXXXXXXX at XXXXXXXX University. The Laboratory serves the educational and research needs in the following subjects:

1. Product Design – Conceptual, Detail Design
2. Prototyping – 3D printing, engraving, laser cutting, milling
3. 3D Modelling – CAD, parametric design
4. Reverse Engineering

##### Article 2: Internal rule

The operation of the laboratory is governed by these rules of procedure, as discussed in the following articles.

##### Article 3: Mission-Purpose (and areas of activity)

The mission of the Design & Innovation Centre is:

- To support the educational and research needs of the Department of XXXX at the University of XXXXX, in matters that fall within the technical-scientific subjects, as defined in article 1 hereof.
- To foster and promote the collaboration between the University and Industrial partners, including companies, design associations, design professionals, etc.
- To implement and promote product design policies by the Government or Governmental Bodies.

The fields in which the Design & Innovation Centre operates are the following:

- 1) Education in the field of Product Design & Innovation
- 2) Research in the field of Product Design & Innovation
- 3) Collaboration with the Industry and stakeholders
- 4) Provision of services to external parties, like professional designers and companies

##### Article 4: Staff

The Design & Innovation Centre is staffed by Academic and Technical Staff of the XXXXXXXX Department at XXXXXXXX University, whose work falls within the teaching, research and technical support and by other Personnel of the XXXXXXXX Department at XXXXXXXX University, responsible for XXXX.

##### Article 5: Administration-Responsibilities

1. The Director of the Design & Innovation Centre is a member of the Faculty of the XXXXXXXX Department at XXXXX University, to which the laboratory belongs. [The term of office of the Director is XX years. It is possible to elect the same person as Director for more than one term. The Director is replaced, in case of absence or disability, by members of the Faculty of a corresponding



field, of the same Laboratory and in particular by the oldest member of the Faculty, starting from the first tier.]

2. The Director of the Laboratory exercises his responsibilities in accordance with the existing provisions, such as: the coordination of the didactic (undergraduate - postgraduate) and research work of the Centre, the preparation and submission of the annual operating program of the Centre, the care for the equipment, the financial management and the allocation space in the Centre, the suggestion to the Department for the appointment responsible personnel for the consumables and the mobile equipment, the submission to the Department of the annual report of activities, as well as the signing of any document related to the Centre and generally the responsibility for its smooth operation.

### Article 6: Installation-Logistical Infrastructure

The Centre is installed on the premises of XXXXXX University and in areas allocated to it, for the smooth operation and safe installation of the equipment .

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- i <http://niti.gov.in>
  - ii <https://www.instituteofmaking.org.uk/about>
  - iii <https://centralresearchlaboratory.com/demoday-07/>
  - iv [https://www.fablabs.io/labs?q%5Bcountry\\_code%5D=IN](https://www.fablabs.io/labs?q%5Bcountry_code%5D=IN)
  - v <https://docs.google.com/a/fabfoundation.org/spreadsheets/d/1U-jcBWOJEjBT5A0N84IUubtcHKMEMtndQPLCkZCkVsU/pub?single=true&gid=0&output=html>
  - vi <https://www.blackhorseworkshop.co.uk/courses/>
  - vii <https://www.instituteofmaking.org.uk/research>
  - viii <https://www.instituteofmaking.org.uk/events/detail/technician-online-consultations2>
  - ix <https://www.instituteofmaking.org.uk/events/detail/public-workshop-introduction-to-darning>
  - x <https://www.springer.com/journal/10798>
  - xi <https://onlinelibrary.wiley.com/journal/14768070>
  - xii <http://www.ijdesign.org/index.php/IJDesign>
  - xiii <https://www.journals.elsevier.com/design-studies>
  - xiv <https://designprinciplesandpractices.com/journals>
  - xv <http://headconf.org>
  - xvi <http://seel-21.kesinternational.org/dates.php>

