Integrated Proposal for Design Education

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Draft 1.3

NATIONAL INNOVATION COUNCIL

GOVERNMENT OF INDIA

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Executive Summary:

The National Innovation Council is working with the Ministry of Human Resource Development on a proposal for the creation of 20 Design Innovation Centres, an Open Design School and a National Design Innovation Network that will connect these new design schools together, along with a wide range of stakeholders.

The goal is to increase the reach of design education and promote wide-ranging design innovation.

1. Design Innovation Centres (DICs)

- DICs are not regular design schools, and must instead be considered to be **specialized design research institutions**, that in some cases are also involved in design education, depending on their individual mandate.
- **DICs will be co-located in existing educational and research institutions** that do not currently have a design program, thereby infusing the principles of design thinking[1] into academic institutions. They will not be 'design departments' of the host institution, and will retain autonomy in their functioning.
- The **underlying mandate of each DIC** would be to scout continuously for innovation opportunities in both economic and social domains, and to determine priorities for action in a structured but open process involving all stakeholders.
- **DICs may chose to have a regional focus** (local crafts/local industry/ environmental needs/skill development needs, etc.), **and/or could focus on the host institution's core function**.
- DICs will be free to network and partner with other institutions, and will not be limited in any way by their being co-located with the host institution.
- In addition to sharing faculty with host institutions, their own permanent staff, DICs will have **rotating faculty** comprising of working professionals from varied educational and professional backgrounds, as well as international faculty through extensive ties with leading design institutions across the world.
- DICs will **promote collaborative learning** between students of the DIC and of the host institution.
- DICs will **share physical and intellectual resources** with the host institution and other design schools, to facilitate cross-disciplinary learning and research.
- DICs will have **autonomy in designing course content and delivery methods,** in order to respond rapidly to change, and to continuously improve methods.
- DICs will work closely with NDIN to take innovative student projects from successful prototypes to a committed business venture.

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[1] http://en.wikipedia.org/wiki/Design_thinking

[2] Massachusetts Institute of Technology (MIT) has been sharing its learning material through the

2. Open Design School (ODS)

- ODS is a multi-disciplinary design school with a flexible curriculum, responsive pedagogic strategy, and rotating faculty from the best design institutions across the world. ODS will **share its design curriculum and other design learning resources freely online**, through an Open Course Ware (OCW) model[2],**bringing access to design education to the entire country.**
- Apart from the online delivery model of design and skills-related courseware, **ODS courseware would be made available to design and skill coaching centres** that would **fill the gap/fulfill the requirement in some cases for 'face time' interactions, to take theoretical learning into a practical mode**. These units would complement the OCW material by providing hands-on learning through infrastructure support (like machines, tools, looms, etc.), a classroom environment, and guidance from a trained instructor.[3]
- To overcome traditional boundaries of design education, **curriculum at ODS** would be **designed for flexibility, adaptability and periodic re-evaluation and reinvention**.
    - Students will not be limited to choosing only one course of study, and would instead be **free to choose major and minor fields of study**. For example, a student could choose to major in product design, while studying animation film making, graphic design and ceramic design as minor subjects.
    - Students will also be able **to cross-register for courses and electives, and work collaboratively on projects with other academic institutions**.
    - This would result in a **'T'-shaped education** - with a broad understanding of a wide range of disciplines, and deep knowledge in one.
- ODS would also **support the development of live projects in each region** that would teach students how to apply these formal learnings in local contexts with local stakeholders.
- **ODS will promote collaborative learning** with other academic and research institutions, and with local companies and social organizations; this remit would give its students broad exposure not only to other academic disciplines, but also to the business and social stakeholders that will necessarily be involved in any solutions.
- **ODS will have rotating faculty** – comprised of fewer permanent staff and more visiting faculty from industry, from leading design institutions across the world, and from varied educational and professional backgrounds. This will help create

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[2] Massachusetts Institute of Technology (MIT) has been sharing its learning material through the OCW model since 2002. The National Programme on Technology Enhanced Learning (NPTEL) is an initiative funded by the Ministry of HRD, Government of India, and is doing similar work. http://nptel.iitm.ac.in/

[3] Instructor training will be coordinated by ODS

an international culture at the school, giving students broad exposure to international practices.

- **ODS will promote the sharing of physical and intellectual resources** with other design schools and academic and research institutions, to facilitate cross-disciplinary learning and research.
- Anybody can enroll for courses shared through OCW, and **a special acknowledgement model will be created** (by adopting the Mozilla Open Badges[4] model) for specific skills learned outside the classroom. The Open Badges initiative recognizes that learning happens everywhere, and that traditional degrees and transcripts often leave out the informal learning that happens outside of the classroom. "Using Mozilla's Open Badge Infrastructure, any organization or community can issue badges backed by their own seal of approval. Learners and badge earners can then collect badges from different sources and display them across the web—on their resume, web site, social networking profiles, job sites or just about anywhere." – from their website.

3. National Design Innovation Network (NDIN)

- NDIN is a network that **connects design schools and professionals to a wide range of stakeholders**, including academic institutions, government, industry, social organisations and the public, **to work collaboratively to provide design solutions for India**.
- NDIN will have a central facilitating body (yet to be named, provisionally called the NDIN-Nerve Centre or NDIN-NC) tasked with coordinating the various functions of the network.
- **Primary functions of NDIN-NC** will be to:
    - Reach out to various stakeholders for registering with the network
    - **Generate projects addressing various challenges facing society, industry and the environment -** to do this, it would involve the public, industry and government for identifying specific needs.
    - **Form collaborative, multi-disciplinary teams from its various member stakeholders to address these challenges**.
- **Secondary function of NDIN-NC** is that of a **Nation-wide design incubator** for innovative ideas. NDIN-NC will also explore the potential for the development and scaling up of emerging but early stage solutions – for example, by providing access to relevant support functions like venture funding, technical development support, business plan development, etc.
    - **NDIN-NC will accept, evaluate and support innovative ideas for design incubation from any member in the network, and also from the general public**.

[4] http://www.openbadges.org/en-US/

    - It will create a repository of best practices and innovations in all fields from across the world, for ready reference. This will also serve an 'address book' function to help connect with relevant stakeholders.
    - In its Design Incubator function, **NDIN will strive towards supporting the creation of a sustainable business model/implementation strategy in all its projects**, to ensure that innovative ideas are not brought to market only to eventually fail because of a less-than-thorough business plan.
    - NDIN-NC will link up with other similar initiatives to form a unified window on design innovation and incubation for the public.
- **NDIN will be anchored by a leading design school (like NID or IITB's IDC).** Although anchored at a Design school, NDIN must be driven by design professionals and industry, and to this effect, will have a board of directors, with representation from the design industry, manufacturing sector and Ministry of HRD.
- **NDIN will promote the sharing of physical and intellectual resources** between its member institutions – particularly design schools and academic institutions. **The aim is to spread the core principles of design thinking** to all disciplines through collaborative learning and practice.
- NDIN will effectively act as **a platform for massive crowd sourced innovation**, by virtue of being an inclusive network of stakeholders, and its mandate to promote innovative problem solving through collaborative teamwork.

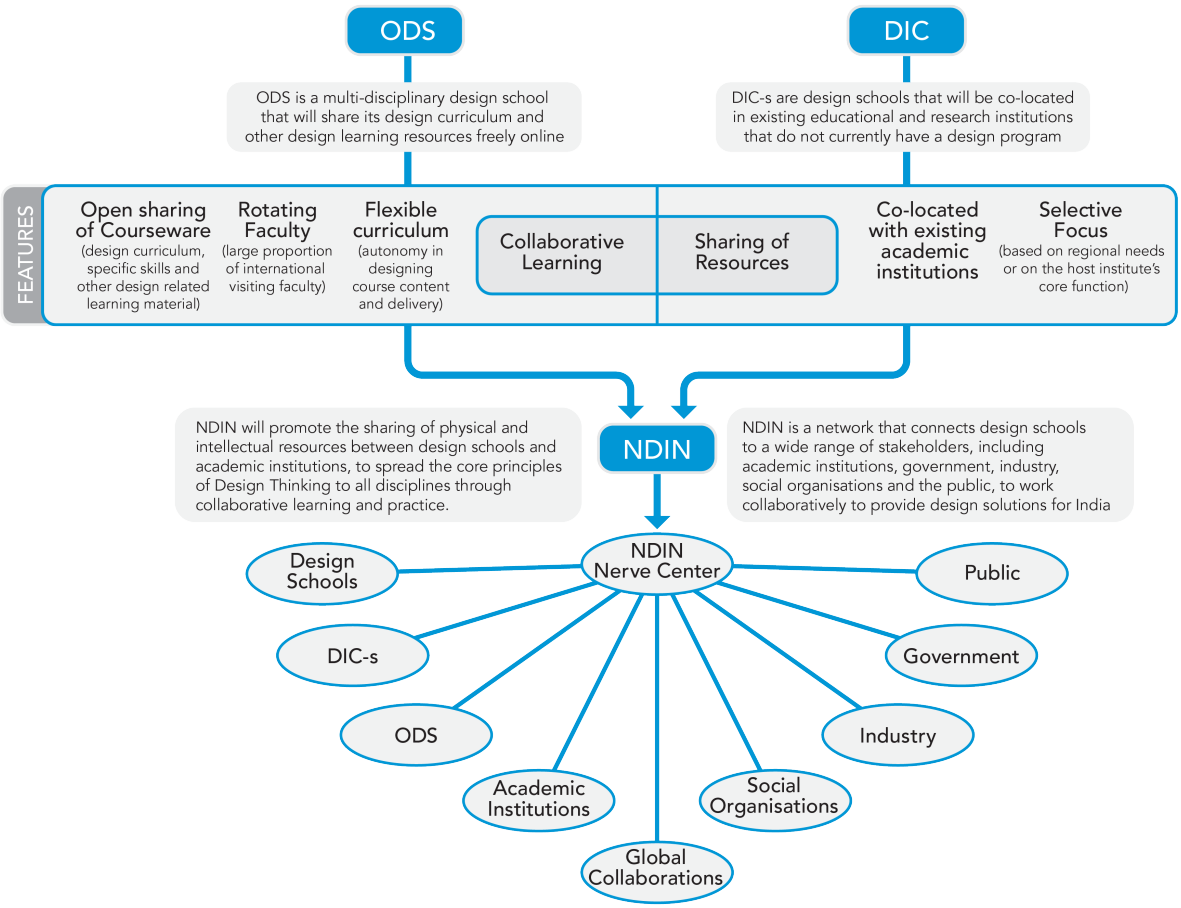

Fig. 1 ODS, DIC and NDIN: An integrated proposal

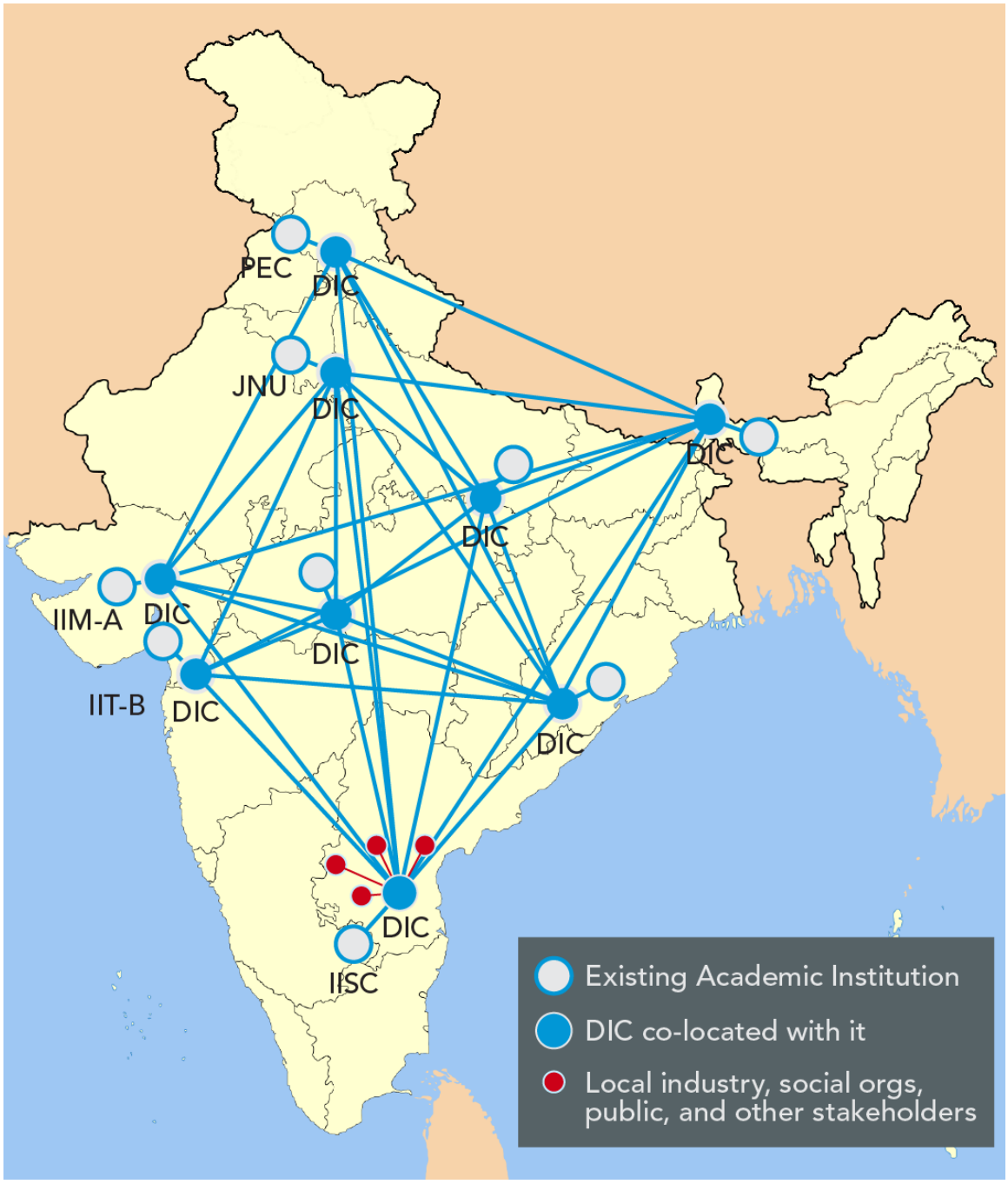

Fig. 2 Illustration showing a potential network of DICs connected through NDIN (a sample DIC network with local industry and other stakeholders is shown in the south).

Please see the Annexure for details on each of the above proposed initiatives.

Annexure

Introduction

Summary

Annexure

Integrated Proposal for Design Education in India – Draft 1.3

Introduction

"Design-centered innovation is a force multiplier that can help the country move up the value chain, making Indian industry globally competitive. In this context, a National Initiative for Design Innovation would be launched in the Twelfth Plan. Under this initiative, 20 new Design Innovation Centres (DIC), one Open Design School (ODS) and a National Design Innovation Network (NDIN), linking together all these schools, would be set up. ODS would ensure maximum reach of design education and practice in the country through various collaborative education programmes (linking a broad spectrum of educational institutions), and free sharing of its courseware through the internet. NDIN would be a network of design schools that work closely with other leading institutions of industry and academia, NGOs and government to further the reach and access of design education, to promote design innovation in all sectors, and to develop wide-ranging collaborative projects between institutions. ODS and NDIN would also raise the standards of design education and innovation in the country through various initiatives including the creation of fabrication labs and digital media zones across educational institutions on a large scale."[5]

Summary

The National Innovation Council is working on a proposal for the creation of **21 new centres of design learning and innovation** (20 Design Innovation Centres and 1 Open Design School), and the establishment of a National Design Innovation Network that will connect these new design schools together, along with a wide range of stakeholders, through a new model of open and collaborative learning and sharing of physical and intellectual resources between institutions. **The goal is to raise the standard of design education and promote wide-ranging design innovation**.

1. Design Innovation Centres (DICs)

- DIC is a new model of design education and research schools **that will be co-located in existing educational and research institutions**.
- The institutional arrangement between DICs and host institutions **will allow students at both institutions the opportunity to cross-register for courses**, thus allowing students to broaden their knowledge and understanding of other disciplines.
- **By virtue of being co-located** within existing educational or research institutions, DICs will benefit from their infrastructure and faculty, and can therefore **be realized within a short timeframe and with minimum investment**.

[5] From the draft 12th Plan Document.

- **The mandate of each DIC would be carefully defined**, taking into account factors such as the existing institution's core function, socio-economic and environmental challenges, opportunities and realities in the local geographic region, and industry requirements.
- **Each DIC would have a mentor from the industry**, chosen where possible, from a field related to the specific focus of the DIC (where applicable).

1.1 Objectives

The DIC model aims to create an environment of rich transdisciplinary interaction and learning between design and unrelated academic disciplines. The added benefit of a research focus will ensure that these formal, and often informal, engagements happen in an environment that encourages exploration and experimentation. This will help create the conditions within which innovative thought can flourish.

The purpose of setting up Design Innovation Centers is:

- To create a culture of innovation and creative problem solving, in a collaborative, transdisciplinary framework
- To enable knowledge sharing and collaboration amongst industry, academia, Government Institutions, research laboratories, etc.
- To engage industry to sponsor design research.
- To serve as a fountainhead for imparting design education and engaging in design research through student, faculty, and multidisciplinary collaborative projects.
- To facilitate interdisciplinary design-focused education, research and entrepreneurial activities in order to create commercial opportunities and build partnerships between academics and industry.
- To promote, nurture and advance the culture of design and innovation in the country leading to significant contributions and breakthroughs impacting quality of human life.
- To create an ecosystem facilitating students and faculty to take their innovative ideas from classrooms/labs to market/people.
- To facilitate evolution of new models of academia - industry interactions as well as academia - social interactions and develop institutional networks for innovations in various thematic areas.
- To promote innovations which are both inclusive and disruptive – to challenge the status quo.
- To build a flagship programme in the area of design and innovation which can be replicated in other institutes/universities in our country
- To promote all forms of innovations in the complete value chain from process to product.

- To promote increased interactions/collaborations with institutes/organizations and individuals worldwide, working in related areas.

It may be mentioned clearly that all the proposed Design Innovation Centers would not be engaged in pursuit of all the above objectives, rather the Design Innovation Centers would be encouraged to select a few of the objectives for themselves and pursue them for visible outcomes. For example, one of the Centers could engage in promotion of design education, curriculum design and pedagogy; some others may engage in the rural sector particularly to meet the challenges of agriculture, rural health and sanitation; some would of course engage in industrial design, process design and manufacturing. In short, the **Design Innovation Centers would not be clones of one another but would also have innovative structures relating to the objectives which they wish to pursue.**

1.2 Pedagogy, curriculum and faculty

- DICs are not regular design schools, and must instead be considered to be specialized design education and/or design research institutions that work in a multidisciplinary and collaborative manner, with other academic institutions and various relevant stakeholders.
- Course content and delivery methods at DICs will be innovative and will be open to constant improvement, experimentation and evolution.
- Course at DICs will not be defined by conventional silos of fields like 'product design' or graphic design', instead learning will be based on skillsets and projects that students can select as per individual preference and ability.
- The courses offered at DICs will not have a specific science or engineering specialization focus but they will be allowed to have specific application focus such as bio-design, inclusive innovation, assistive technologies, sustainable energy technologies, etc. These courses would be available to students from very early stages of their programmes.
- Presently many knowledge creating activities do not go beyond institute corridors, therefore, the DICs will also provide a necessary eco-system and resources to students/faculty to take their ideas beyond a first successful prototype to a pre-production prototype. The Design Innovation Centers will also play a crucial role in promoting industry sponsored and community driven projects.
- The DICs shall be free to network and partner with other institutes depending upon their area of work. They would adopt a **Hub and Spoke** model with the host institution acting as the mentor while the DIC acting as the hub, would reach out to other institutes (spokes), in creating a network.

- Special attention must be given by the host institution to integrate the DIC into the curriculum of its academic programmes, in order to maximize the benefit to both institutions.
- Student intake at a DIC must be in the approximate range of 30 students in undergraduate courses and 25 in post-graduate programmes. This is only a guideline and the imperative lies with each DIC.
- Faculty at DICs will be a mix of shared staff from the host institution, permanent staff drawn from various design disciplines, and a large proportion of visiting faculty, from leading design institutions across the world. Faculty will also include professionals and educators from unrelated disciplines, to bring the broadest possible exposure to students.
- Faculty training for DICs could be facilitated by National Institute of Design, by introducing a specialized programme for faculty training and development. To become teachers at DICs, these trainees must not only learn a broad range of skillsets taught amongst the various disciplines of design, but must also be put on live projects for experience. A special abridged syllabus may be worked out for the proposed faculty by NID where the training should be carried out. Period of training could be based on input from NID and would depend on the depth to which the faculty at DICs needs to be trained. The abridged course could be held once every two/three years – depending on the number of DICs being added on every year.

1.3 Organisational structure (Governance and Funding)

- The first 5 Design Innovation Centers would be established in centrally funded institutions so as to avoid the difficulty of fund flow from the Ministry. The funding support would be offered to the lead institution based on their project report. It is expected that the lead institution will also partner with industry as also with other funding agencies for the Center. It is also expected that the Centers would become self-sustaining over a period of time.
- The Design Innovation Centers to be set up in the current financial year 2012-13 would be co-located in established institutions, drawing faculty, infrastructure etc. already available with the institutes. Some of the DICs may be located in institutions which are in the process of being established, i.e. the new IITs.
- Host institutions would allow a good degree of autonomy the DIC, which would retain operational autonomy in conducting their academic programme. The DIC would provide the host institution with an enhanced design capability, and would promote cross-disciplinary learning between design students and students from other academic programmes.

- Internal evaluations would ensure efficient handling of resources and DICs could be reviewed periodically by a competent authority[6]. Enough leeway must be given as DICs are in an experimentation phase, and must be allowed to continue to evolve their approach to design education in a dynamic manner, sometimes taking radical risks or departures from convention. This must be encouraged, rather than held against the DIC, as it is the central feature of the DIC approach as opposed to traditional methods of design education.
- Private funding may be project-based. The infrastructure thus created will initially be used for the sponsored project, and subsequently would be retained by the DIC and made accessible to all students. It is important that the core research mandate of the DIC be decoupled from private or government funding and that the DIC retain complete autonomy in handling allocation of funds, deciding its research direction, and in any other internal matter.
- The primary functions of DICs will be research, innovative transdisciplinary design learning, and to support the creation of an innovation-friendly environment.
- Each DIC will have a board of directors, chosen from the humanities, arts, sciences, and could be educators and/or practicing professionals from the industry.

2. Open Design School

2.1 Context (Why we need an open approach to design education)

- **Access to quality design education in many parts of India is a problem area,** given the limited number of schools and educators. An open approach to design education at ODS would bring access to design learning resources to the general public, by using the internet for sharing design education modules.
- In today's digitally networked world of instant information availability and unprecedented possibilities of collaboration and knowledge sharing, it is easily possible to access information on other disciplines and broaden a student's knowledge base. **ODS students would collaborate and network extensively with other academic institutions** and broaden their knowledge base through exposure to other academic disciplines.

[6] An expert committee could be set up by the government to evaluate the functioning of DICs. This committee should have representation from the design community – practicing professionals and educators. The role of this committee must be a positive one, offering guidance and direction, rather than a negative one.

- A **multi-disciplinary design education**, while retaining the option of specializing in one discipline, **would allow design students to choose a curriculum of study as per their individual interests and aptitude.** *For example*, a product designer would be able to also study furniture design or ceramic design as a second course of study, while opting for classes in graphic design alongside, thereby learning comprehensive skills that would be demanded of him/her in the real world, as opposed to a traditional system that would focus on courses oriented towards product design. Infrastructure limitations may be at least partly overcome through resource sharing with other design schools across the country.
- **Today's workplace increasingly requires teamwork between a wide range of professional disciplines**, which in turn requires professionals to develop a multi-disciplinary awareness and the ability to work collaboratively. ODS will focus on helping graduates straddle both worlds.
- The lacuna of the modern education model is the compartmentalization of knowledge, which produces highly specialized professionals who know little or nothing outside of their area of expertise. Through an open and collaborative educational model we propose to **create an educational system that encourages lateral learning through broad exposure to a multitude of related and unrelated disciplines, rounded off with specialist knowledge and training in specific discipline(s).**

2.2 Open Design School - pedagogic model

- **Passive learning would give way to problem-based, action-based analytical learning**. With instant access to educational material from various academic disciplines on the NDIN, students need no longer focus on memorizing courseware and could instead focus on learning how to use and process this information in an 'Active Learning Classroom'.
- **Promoting teamwork and collaborative problem-solving**: Learning modules will be designed to promote interdisciplinary and collaborative learning through joint courses with other academic institutions in the NDIN.
- **Multiple teachers for a class**: Courseware would be taught in a multi-dimensional manner through partnerships with related, relevant disciplines. *For example,* a course on design history could be taught by a historian and an industrial designer together, each complementing the other's perspective and adding additional dimensions to the students' understanding of the subject. Similarly, an urban planner and a sociologist could teach a course on town planning together.

- **Joint classes across academic institutions**: Certain courses could benefit from being turned into joint exercises between design students and students of other academic disciplines. *For example*, product designers and medical students could sit together in a class on product ergonomics.
- **Leverage technology to control and improve the quality of content delivered.** Students will benefit more from watching instructional videos by a teacher who understands his/her subject thoroughly and can explain the concepts in an articulate manner. This is particularly important in the Indian context where there is a shortage of qualified teachers. The **National Knowledge Network** can be leveraged here to provide access to digital educational material.
- **Access to digital learning material** will also enable students to revisit lectures as required, or look laterally at related content to gain a more comprehensive understanding of their lesson.
- **Social networks** will be leveraged to empower students in various ways – by working remotely on collaborative projects or by getting real-time feedback from peers and faculty across institutions, to name just a few.
- **Free and open access to courseware is only the first level** of open participation and knowledge sharing. Several other programmes will be implemented that encourage the local community to interact with students and even work together on live projects.
- ODS would improve upon the traditional model of design education and would **increase awareness about design thinking among the general public** through its community programmes, craft documentation and intervention initiatives and through workshops for specific sectors like artisans, skilled and semi-skilled workers etc.
- Students of the ODS would be the thought leaders of the industry, equipped with strong technical skills born of a solid core programme, and capable of independent creative thought as a result of extensive interaction with other academic and research institutions, industry, NGOs and the government, as well as their local communities.
- ODS would **provide free access to design learning material for all** (which would include video lectures and transcripts, sample student projects, recommended reference material, etc.). This would empower individuals and communities in powerful ways; for example, a village of traditional carpenters could upgrade their skills and keep abreast with the latest developments in wood fabrication tools and techniques, or teach themselves design management practices for small businesses – through free access to OCW material[7].
- ODS would support **trans-disciplinary and collaborative learning**—enabling design students at ODS to collaborate with students of other disciplines on their

[7] Government of India is already implementing a plan to connect 250,000 panchayats through a rural broadband network.

classroom projects. Students could also turn classroom projects into live projects in the field—by creating collaborative teams of students and faculty from other design schools, other academic institutions, social or governmental bodies, industry or a relevant person from the public. **Such an approach has the potential for tremendous social impact, as classroom projects are transformed into actual implementable solutions, through the guidance of qualified professionals and organisations in the project team, and through collaborative problem solving.**

- Students at ODS would be able **to choose a curriculum of study as per their individual interests and aptitude.** *For example*, a product designer would be able to also study furniture design or ceramic design as a second course of study, while opting for classes in graphic design alongside.
- ODS would use the National Design Innovation Network (NDIN) to **share its physical and intellectual resources** with other member institutions. A combined pool of resources would empower all member institutions.

ODS would also **interact with the public** through various initiatives, some of which include:

- **Open interaction days** with school children, local or specific communities and casual visitors
- **Community-collaborative design projects** that actively involve local community members in design projects
- **Requirement posting by various sections of society**, which can be taken up as live projects. *For example*, a local government hospital could indicate a requirement for physiotherapy aids that could then be taken up as a collaborative real-world project by students of design and medicine besides interested community members, and social or philanthropic organisations.

2.3 Curriculum and faculty

2.3.1 Curriculum:

- Apart from the online delivery model of design and skills-related courseware, ODS courseware would be made available to design and skill coaching centres that would fill the gap/fulfill the requirement in some cases for ‘face time’ interactions, to take theoretical learning into a practical mode. These units would complement the OCW material by providing hands-on learning through infrastructure support (like machines, tools, looms, etc.), a classroom environment, and guidance from a trained instructor.

- To overcome traditional boundaries of design education, curriculum at ODS would be designed for flexibility, adaptability and periodic re-evaluation and reinvention.
    - Students will not be limited to choosing only one course of study, and would instead be free to choose major and minor fields of study. For example, a student could choose to major in product design, while studying animation film making, graphic design and ceramic design as minor subjects.
    - Students will also be able to cross-register for courses and electives, and work collaboratively on projects with other academic institutions.
    - •This would result in a 'T'-shaped education - with a broad understanding of a wide range of disciplines, and deep knowledge in one.
- Innovative, inclusive and evolving curriculum: The course structure at ODS will be a mix of guided instruction and individual exploration mentored by visiting professionals alongside resident faculty. The structure of the curriculum will encourage cross-disciplinary learning and interaction for students between different academic institutions. For example, a joint course could be arranged between students of industrial design, architecture and public policy, for them to better understand the interdependencies of each other's work while working on a project related to public health and sanitation.
- A solid core programme will be supplemented by interdisciplinary open electives, balancing traditional instruction and individual exploration.
- Course content will be based on inputs of working professionals who are in sync with industry requirements and standards and can anticipate future trends.
- Supplemental/supporting investigative courses from the humanities will foster deep thought and dialogue in students, and train them to become macro level thinkers with the technical skills for micro-level implementation.
- Feedback from students and faculty will be incorporated into the course structure to make it responsive and adaptable to changes in technology and context.
- Local TEDX-style presentations scheduled periodically into the calendar will challenge students to produce high-quality, meaningful projects and research to present to their peers for constructive feedback and review and will be available online for the general public.
- The Library will be imagined as a knowledge-cum-resource centre that will host multiple types of media—from traditional types like books and DVDs to material samples, fixtures and joineries etc. Reimagined as a 'playground of resources', the library will transform into a dynamic environment of exploration and discovery. Physically, in addition to traditional and digital media, there will be an open repository of materials, joineries, fixtures and other odds and ends in a workshop-like space that encourages curiosity and hands-on learning.

- Apart from the traditional diploma/degree – based recognition of learning, ODS could adopt the Mozilla Open Badges platform to acknowledge learning and skills acquired outside of the classroom, and through its Open Course Ware program. “By displaying skills and achievements that traditional degrees and transcripts often leave out, badges can lead to jobs, community recognition, and new learning opportunities.” – From their website .

2.3.2 Faculty:

- Staff at the ODS must have an inclusive and open approach to pedagogy, and must not think in terms of silos of design disciplines. They must encourage cross-discipline experimentation and learning, and must themselves, to the extent possible, be multi-disciplinary designers.
- ODS will have a large proportion of visiting faculty - from leading design institutions across the world, and also working professionals.

2.3.3 Evaluation:

- Jury-based evaluation where a panel of faculty and working design professionals evaluate a student’s work at the end of each semester.
- No grading or marking system to be employed. Students will be evaluated against their own previous performance. This will create a non-competitive environment where students feel free to help each other and work collaboratively in teams.

2.4 Physicality

2.4.1 Location

It is proposed that a space be created for a multi-disciplinary Open Design School in the National Capital Region, which would benefit from proximity to leading academic institutions like IGNOU, IIT, JNU, NIFT and SPA to name a few, and would be centrally positioned to bring the positive impact of design education and practice to challenges across the country.

2.4.2 Architectural considerations

A residential campus will encourage students to focus on the intensive curriculum, and the proximity to peers will encourage collaborative process. Student workspaces are envisioned as large, open-format warehouses with workbenches to prototype on. Attached machine shops, printing units and other state-of-the-art fabrication facilities will inspire a hands-on approach to design. Further details may be discussed later.

3. National Design Innovation Network (NDIN)

NDIN is a network that connects design schools and professionals to a wide range of stakeholders, including academic institutions, government, industry, social organisations and the public, to work collaboratively to provide design solutions for India.

NDIN would also function as a nation-wide Design Incubator, and will facilitate the development of innovative ideas into finished, realisable solutions.

To facilitate interaction and coordinate its functioning, NDIN will have a central facilitating body (provisionally called the NDIN-Nerve Centre or NDIN-NC) tasked with coordinating the various functions of the network.

Why is NDIN needed? / OBJECTIVES

The increasingly complex challenges of industry and society can best be met by teams with varied educational backgrounds that enable them to address a complex range of issues, and sometimes by the public themselves coming forward with innovative solutions to their problems. NDIN will facilitate the creation of multidisciplinary teams from varied educational backgrounds, bringing their combined expertise to bear on the challenges of society, environment and economy.

NDIN is essentially envisaged as a network for design schools to work closely with other leading institutions of industry, academia, NGOs and government, to further the reach and access to design education and practice, and to be open for interaction with the general public. Students would be able to use this Network to access other academic disciplines, industry and policy making bodies to broaden the scope of their university education and go beyond the limitations of their prescribed curricula. For example, a student of textile design with interest in animation could sign up for open electives in a partner animation film school to learn the fundamentals of animation; or an exhibition design student could actively pursue his/her passion for history by jointly engaging with the National Museum and students of history from Jawaharlal Nehru University in co-creating an exhibition space on Indian folk music traditions.

3.1 Goals of NDIN:

1. **Create a culture of collaborative problem solving** by creating multi-disciplinary teams of design students with students from other institutes of academia, that work together on projects to address challenges facing society, industry and the environment.

2. **Support innovative ideas** from any individual or organization, and even the public, by guiding it through the product development process into an implementable solution.
3. **Create a common pool of resources – both physical and intellectual** – shared by member institutions. This would empower an institution by having access to resources beyond the limitations of its own infrastructure.

3.2 NDIN-Nerve Centre

- **Primary functions of NDIN-NC** will be to:
    - Reach out to various stakeholders for registering with the network
    - **Generate projects addressing various challenges facing society, industry and the environment -** to do this, it would involve the public, industry and government for identifying specific needs.
    - **Form collaborative, multi-disciplinary teams from its various member stakeholders to address these challenges**.
- **Secondary function of NDIN-NC** is that of a **Nation-wide design incubator** for innovative ideas. NDIN will also explore the potential for the development and scaling up of emerging but early stage solutions – for example, by providing access to relevant support functions like venture funding, technical development support, business plan development, etc.
    - **NDIN-NC will accept, evaluate and support innovative ideas for design incubation from any member in the network, and also from the general public**.
    - It will create a repository of best practices and innovations in all fields from across the world, for ready reference. This will also serve an 'address book' function to help connect with relevant stakeholders.
    - In its Design Incubator function, **NDIN will strive towards supporting the creation of a sustainable business model/implementation strategy in all its projects**, to ensure that innovative ideas are not brought to market only to eventually fail because of a less-than-thorough business plan.
    - NDIN-NC will link up with other similar initiatives to form a unified window on design innovation and incubation for the public.
    - NDIN-NC will also empanel a variety of ancillary support services for the creation and sustenance of innovative new enterprises (like lawyers, manufacturers, distributors, exporters, and venture capitalists, to name a few).
    - NDIN-NC will adopt a transparent and open approach towards its functioning, which will give confidence to innovators in working with it.

3.3 Design Innovation Support Cells:

Each institution in this network will create its own Design Innovation Support Cell (DISC), a small 2-5 person unit charged with ensuring that innovative ideas are given the right guidance and opportunity to mature through relevant investigation, collaborative action and industry participation and funding. DISCs will also act as an interface to NDIN for each institution. DISCs can be thought of as design incubation units that also actively create collaborations and partnerships between dissimilar academic disciplines and institutions towards a common goal – to address challenges in multidisciplinary teams, thereby increasing the potential for innovative problem solving.

- An important function of DISCs is to recognize that **innovative ideas can come** not only from enrolled students or faculty, but also **from anybody outside the academic system**, or from local communities. *For example,* a classroom exercise in public hygiene management conducted in a health services class in a medical school could throw up innovative ideas on town planning and systems design that could be brought to the table as a social intervention project with a school of architecture and town planning, and a design school, for all involved to work on collaboratively.
- NDIN-NC will coordinate the activities of the various DISCs and liaise with NDIN members, external agencies, and the public for potential projects.

3.4 Organisational structure

- **NDIN will be anchored by a leading design school (like NID or IITB's IDC).** Although anchored at a Design school, NDIN must be driven by design professionals and industry, and to this effect, will have a board of directors, with representation from the design industry, manufacturing sector and Ministry of HRD.

3.5 Envisioned benefits of NDIN

- **NDIN will promote the sharing of physical and intellectual resources** between its member institutions – particularly design schools and academic institutions. **The aim is to spread the core principles of design thinking** to all disciplines through collaborative learning and practice.
- NDIN will effectively act as **a platform for massive crowd sourced innovation**, by virtue of being an inclusive network of stakeholders, and its mandate to promote innovative problem solving through collaborative teamwork.

Benefit to students

- **Students would be able to use this Network to access other academic disciplines, industry and policy making bodies to broaden the scope of their university education and go beyond the limitations of their prescribed curricula**. For example, a student of textile design with interest in animation could sign up for open electives in a partner animation film school to learn the fundamentals of animation; or an exhibition design student could actively pursue his/her passion for history by jointly engaging with students of history from Jawaharlal Nehru University in co-creating an exhibition space on Indian folk music traditions.
- **Design students would use NDIN to work in collaborative, multi-disciplinary teams along with other academic institutions**, to bring multiple perspectives and skills to bear on a problem, thereby creating the conditions for innovative design solutions. **As this process is adopted in more institutions across the country, we hope that the incremental multiplier effect will result in massive social impact, by encouraging broad-based design innovation in areas addressing the many challenges facing India today**.
- **Faculty exchange between institutions** would expand students' exposure to other disciplines of learning, and get multiple perspectives on their own courses of study as well.

Benefit to industry

- Industry will benefit immensely from **having access to** these new partnerships that will bring about **new forms of collaborative innovation on a regular basis**, grounded in reality and powered by all the necessary speciality skillsets that each specific project demands.
- By making industry a part of the collaborative learning process early on, **design - driven solutions will address manufacturing realities as well as consider environmental impact** – leading to better designs that minimise wastage, make effective use of material properties and are more likely to make the transition into actual implementable products and solutions.

Benefit to society

- As more and more institutions begin applying themselves to challenges faced by society, the number of collaborative, **design-led interventions will aggregate into massive social change** across the country.
- Local, area-specific challenges can be posted as design requirements by the public to NDIN, which can then be taken up by interested member institutions as collaborative field projects. Thus, **NDIN has the potential to address challenges**

from the macro to the micro level. **Secondary initiatives** that leverage the NDIN will have important, widely distributed and rapid impact, particularly in projects **like craft and culture mapping.**

- Partnerships with industry and leading academic institutes, live labs and projects with NGOs will give students the opportunity to work on highly compelling and socially relevant projects. **Design students will develop a broad understanding of social, cultural and economic issues through extensive cross-disciplinary exchange of ideas and learning**.

4. Implementation strategy

4.1 Pilot projects and Competitions

To encourage member institutions of NDIN to work collaboratively, a series of curated pilot projects and design challenges will be prepared beforehand. A few examples are:

1. **Design for the entire life-cycle** (Challenge): This will challenge institutions to do research on those products whose end-of-life cycle is most injurious to the environment, the local water table, or to the workers handling the discarded products in landfills and recycling plants, and to redesign them to be more friendly to the environment and easier to handle and recycle/upcycle/repurpose, etc.

2. **Innovative design of tools for craft communities**: Various craft communities (like leather workers, for example) have a very real need for improvements in the design of their tools. Principles of ergonomics and attention to locally available material and production processes would be an important requirement.

4.2 National Knowledge Network (NKN): **"**The NKN is a state-of-the-art multi-gigabit pan-India network for providing a unified high-speed network backbone for all knowledge related institutions in the country. The key to successful research today demands live consultations, data sharing and resource sharing. Therefore in order to optimally utilise the potential of institutions engaged in generation and dissemination of knowledge in various areas, it is important to connect them through a high speed broadband network." – www.nkn.in

The DICs, ODS and NDIN will also leverage the NKN to connect various design, academic, research and governmental organisations and individuals to build a virtual community of design experts, resources and new business models for the future.

4.3 Design innovation and practice: Through their Design Innovation and Support Cells, design schools that are members of NDIN will offer design services to industry and will work on furthering design research through internal student projects, faculty initiatives, PhD programmes and live industry projects. Faculty, students and graduates from NDIN member schools would have the option of working at these DISCs, which will provide the very best in design services to all levels of industry – national and local, the crafts sector, social development organisations and the government. DISCs will become powerhouses of design that will foster design innovation starting from the local community to the national level.

4.4 OPEN – Open Participatory Education Network: OPEN is the underlying organisational model upon which the ODS and the NDIN operate. It has been conceived of as a model of participatory and collaborative education that could be applied to any academic discipline. Its core values/objectives are interdisciplinary and collaborative learning, open knowledge sharing, and creating an innovation friendly environment. Its salient objectives are listed below:

- Tie together disparate organisations to a common cause, e.g. social innovation
- Create an inclusive environment that facilitates innovation not just by students but also by the general public, organisations, communities etc.
- Create a supportive ecosystem that provides the necessary tools and resources to foster and support innovation. This system must recognize, evaluate, guide and enable innovative ideas to successfully make the journey through the development cycle and reach maturity as realized products.
- By pooling together resources, institutions in the OPEN network ensure that students get access to many more facilities rather than be limited to one organisation.
- Create networks of association through cross-disciplinary interaction in educational courses and live projects, sharing of resources and promote a new dynamic of collaborative thought and action.
- Include the general public and the local community in institute activities in a structured manner, thereby allowing both students and community members to benefit from the interaction.
- Importantly, the OPEN model can be applied across domain verticals to new academic institutions and can also be integrated into existing organisational structures.

5. Summary and conclusion

5.1 Why we need open sharing of learning resources

- Existing educational institutions have physical limitations like infrastructure, location, and faculty strength, and can hence serve only a limited number of students.
- Digital technologies today have reached a level of maturity and robustness whereby it is possible to bring access to learning material to anybody through the internet (NKN can be leveraged in this context).
- Free and open sharing of courseware is anticipated to create a spin-off industry of design tutors who use this content. This is to be encouraged, and these tutors can be specifically trained and certified to teach specific skills or courses. Specific tutor-training programmes could be conducted by NID, ODS, or by a specialized DIC.

5.2 A cohesive vision for Design Education in India:

- Design Innovation Centres (DICs) are to be set up in institutions that don't have a design department, **to enhance the innovation capacity of the host institutions and to make design an integral part of their pedagogical processes**. DICs will also serve the function of connecting these institutions (and themselves) to NDIN, thereby facilitating trans-disciplinary learning across academic institutions and other member institutions.
- An Open Design School (ODS) is to be set up, which will bring a new, flexible model of pedagogy to design education by allowing students to customize their curriculum by choosing to learn skills from across disciplines. ODS will also bring the benefit of design education to millions by freely sharing learning material online.
- Existing institutions that already have a design programme will not have DICs – they will instead have **Design Innovation Support Cells (DISCs)** which will link them to NDIN. DISCs will connect these design institutions with other member institutions in NDIN. Through their DISCs, member design schools of NDIN will offer design services to industry and will work on furthering design research through internal student projects, faculty initiatives, PhD programmes and live projects. Faculty, students and graduates from NDIN member schools would have the option of working at these DISCs, which will provide the very best in design services to all levels of industry – national and local, the crafts sector, social development organisations and the government. DISCs will become powerhouses of design that will foster design innovation starting from the local community to the national level.

- NDIN, DICs and ODS will together create an ecosystem for design innovation in India, by connecting design education with research, academia, social organisations, government, the public, and industry and creating a unified network that facilitates, oversees and promotes collaborative problem solving by creating multi-disciplinary teams from various member institutions that work together on challenges of industry and society.