

**Industrial Shodh Yatras (ISYs) and Final year projects**

for the Academic Year 2015-16

**Guidelines for Final Year B.E. students**

for finalizing the Problem Definitions of their Final Year Projects

**References:** 1. Regarding IDP/UDP activities and its time line, please refer to

[http://gtu.ac.in/circulars/15May/13052015\\_11.pdf](http://gtu.ac.in/circulars/15May/13052015_11.pdf)

2. Regarding FAQs related to IDP/UDP please refer

page 2 -5 of [http://www.gtu.ac.in/circulars/12July/19072012\\_01.pdf](http://www.gtu.ac.in/circulars/12July/19072012_01.pdf)

Or

page 2-4 of [http://www.gtu.ac.in/circulars/14Jul/07072014\\_01.pdf](http://www.gtu.ac.in/circulars/14Jul/07072014_01.pdf)

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Note: It is suggested that the GTU Innovation Club must be activated in every College/ Institution, if it is not already active. The Club membership includes one Faculty Member from every branch. This Faculty Member of the GTU Innovation Club may be called the Branch Coordinator of the particular college. The Branch Coordinator will keep track of the above process in coordination with students and Faculty Guides.

**The Concept Of IDP and UDP:** Every student of GTU is creative enough to solve real life challenges

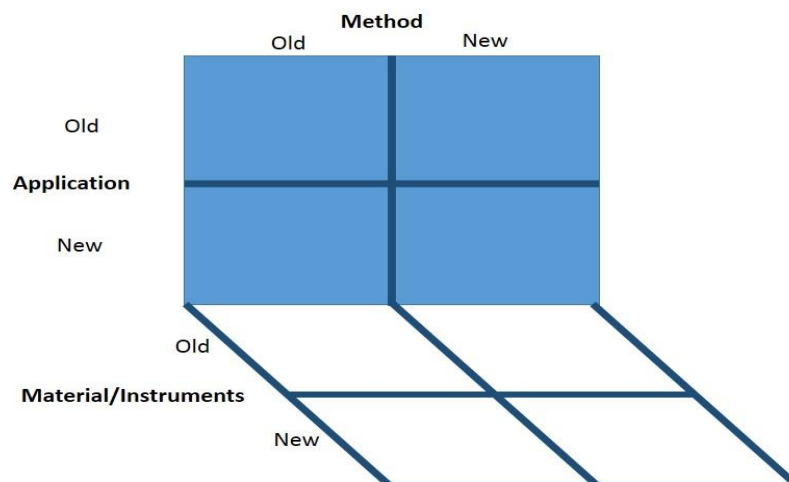
The students are required to form teams of 3-4 students (in general) for working on their final year project. With the guidance of a Faculty Member, they will start working to find a problem, the solution of which would constitute their final year project. The problem may be found by studying the products or processes of an industry through a Shodhyatra. A project based on such a problem is called an **Industry Defined Project (IDP)**.

Alternatively a project may be based upon the needs of NGOs, informal sectors, Govt. organizations and society at large. Students can take a research problem identified by the Faculty Members or it could be the idea of student, which is approved by the Faculty Guide. Such a project is called a **User Defined Project (UDP)**.

If some projects need more than 1 year to reach to a stage of final product (ready to be used), the teams and guides can carry on the same project, in subsequent years, exactly from where it had been left by the previous teams. GTU believes that in such iterations and cycles, many final year projects can become useful products for end users.

**WHAT IS AN INNOVATION?:** It has been suggested that, if one codified a particular challenge in a particular environment and tries to make new interventions, either in material, method or application, then it can lead to an innovation.

*“Conceptually, any innovation implies substantial improvement in the ways of doing things, producing goods or providing services. It may involve a new use of an existing resource or producing (or delivering) existing goods or services through new methods (or new instruments/materials)” (Gupta, 1992)*



To develop inclusive innovations, one needs to develop solutions pertaining to a specific challenge and look for how he/she/they can develop interventions which can cater to a different a) space b) sector c) social engagements d) skill sets and knowledge.

ACTION POINTS FOR COLLEGES/ INSTITUTES and for STUDENTS:

➤ **Phase I (Pre IDP/UDP Exposure program) – 21<sup>st</sup> May to 30<sup>th</sup> May 2015**

In this phase, the Institute/College needs to explain to their students the basic idea of IDP/UDP. Colleges/departments need to explain the entire innovation cycles, the IDP/UDP lifecycle, necessary steps needed and other guidelines. Such an exposure/literacy/sensitization program may be arranged in any 2-3 days after their 6th semester exam is over by the respective department/college. (*Leaders: Some of the colleges have taken the lead by organizing such training during the sixth semester, during the week-ends.*) The program may also contain briefing about interventions by the University. GTU's Student Start-up Policy and various aspects about innovation and its impact. The program should motivate and encourage students to innovate through their final year project.

Refer- [http://gtu.ac.in/circulars/15May/13052015\\_16.pdf](http://gtu.ac.in/circulars/15May/13052015_16.pdf)

➤ **Phase II (Industrial Shodh Yatra: ISY ) - 1<sup>st</sup> June to 31<sup>st</sup> July 2015**

The students are required to form teams of 3-4 students (in general) for working on their final year project. With the guidance of Faculty Members they will start working towards Industrial Shodh Yatra (ISY) to define a problem statement on which they will work for their final year project.

Students team need to identify the domain (area of work) in which they would be interested in working during their Final Year project in consultation with stakeholders like Faculty Members, industry persons, experts etc. Students need to interact with multiple set of users while sampling the inputs while defining the IDP/UDP.

Keeping in mind their domain of interest, the group shall identify local industries or workshops/users. One group should visit 3-4 such identified places to visit and adopt suitable measures based on design thinking to locate a challenge. After the first visit, the group shall return and discuss their experience and primary findings with the Faculty Guide and the rest of the groups and peers in the class and outside stakeholders for inputs.

The visit to industries for study of a product or process is called an Industrial Shodh Yatra (ISY).

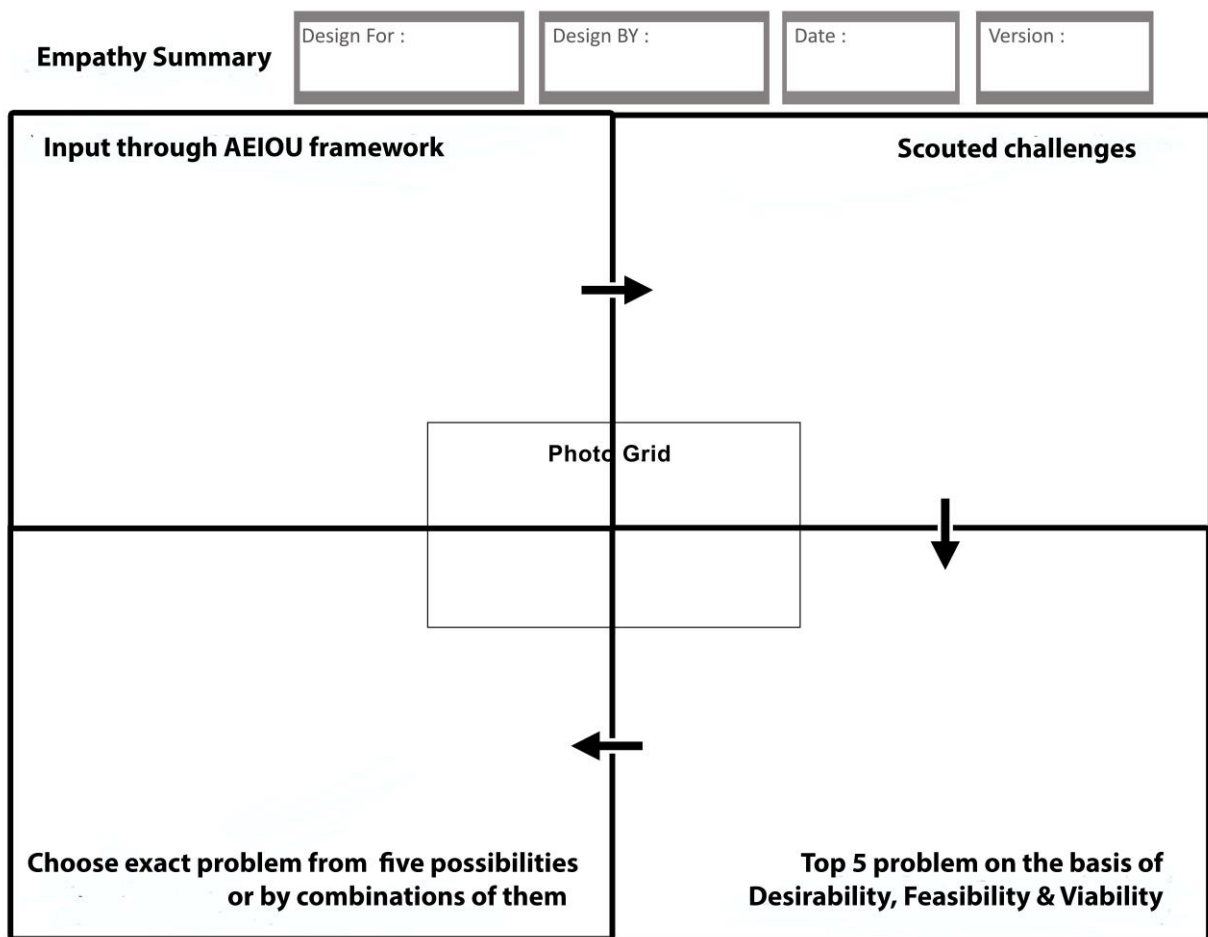
**Notes: 1. ISY is beneficial for all students whether they want to work upon an IDP or a UDP. After ISY students need to decide with the guidance of their Faculty Guide whether to select an IDP or a UDP.**

**2. When the academic session starts, the visits to industries should be done so that the academic schedule is also adhered to fully.**

➤ **Phase III Organization of workshops for different design canvases**

( Please read *Appendix 2 on AEIOU Framework for Observation Activity before reading the following page.*)

The Institute/College will arrange workshops for different design canvases like Empathy Summary, Ideation and similar design thinking practices. All the student-teams are required to participate in the workshops, involving the whole of the class and prepare the necessary documents. Students’ teams need to summarize AEIOU framework activity for *observation part* in Empathy Summary. Then they need to document scouted challenges of the Final Year problem, that they have selected. Out of those challenges the top 5 problems need to be selected on the basis of desirability, feasibility and viability. The teams may use some design tools like Diachronic & Synchronic analysis (Appendix 3). After discussion with Faculty Guide and other groups, the final problem statement may be defined. All teams need to validate their problem statements with the users.



Every student-team should fill up the data in the above empathy summarization matrix (in A1 sheet) by noting down all insights from inter-action with the user. Thereaftern, each team will present their matrix in a mini-exhibition format. During this mini-exhibition session, the corresponding users, may be invited. Each team of students is required to take photograph of each matrix/framework/poster and store its soft copy of documentation. **As per university circular, each team will upload their data online at the university server.**

-----For STUDENTS-----

#### **FOUR-STEP PROOCES FOR DOING A FINAL YEAR PROJECT**

**(2a)** Scouting for the problem - 1<sup>st</sup> June to 30<sup>th</sup> June 2015;

**(2b)** Secondary Research/ Prior Art Search -1<sup>st</sup> July -31<sup>st</sup> July 2015

**(2c)** Problem Definition – 1<sup>st</sup> July to 31<sup>st</sup> July 2015;

**(2d)** Registering into PMMS tool of GTU – Till 31<sup>st</sup> July 2015

THE FIRST STEP:

**(2a) Scouting for the Problem:** The problem may be found by studying the products or processes of an industry through an [Industrial Shodh Yatra \(ISY\)](#). (Please see Appendix 1.) A project based on such a problem is called an Industry Defined Project (IDP).

Student teams will be using [AEIOU framework](#) for the observation activity. (Please see Appendix 2).

AEIOU stands for Activity, Environment, Interactions, Objects and Users. Hence every team needs to observe for these basic elements in their selected domain. This framework will help to decide unarticulated needs of users. Students need to go through the process of Observation, Immersion (role playing) and engagement (interview) to get their requirements for the projects.

**(2b)Secondary Research/ Prior Art Search (PAS):** Students team need to search for patents and other related literature for their selected problem statement to check the already existing ways to solve similar problem and to find out about existing similar innovations. The team needs to upload Patent Search & Analysis Report (PSAR) on the Project Mentoring and Monitoring System (PMMS) in due course. Please see the detailed description in this document about steps for secondary research / PAS.

**(2c) Problem Definition: *Final scouting through Diachronic and Synchronic analysis:*** After primary observations, the team of students shall perform [Diachronic and Synchronic Analysis](#) of the product/system/process being examined. (Please see Appendix 3).

Every team of students needs to discuss their visit of Industries with the Faculty Guide and with other groups by using the Diachronic and Synchronic Analysis methodology and by preparing images/charts/diagrams for explaining flow of ideas clearly. The Problem statement, to be defined, shall be based on the User study and needs, Role Play, Observation, Empathy, primary Prior Art Search and understanding of the Macro System, etc.

By the process of observation, immersion and engagement (as given in Appendix 2), students would be able to understand the problem of industries/users whether the

problem/possible innovation is in form, feature or function and/or Material, Method or Application. After the observation, the perception of the team of students for the problems may change or even differ from the previous one. And from those inferences students need to define their final problem statement after iterative analysis again and again. Each team needs to frame a precise problem definition, after understanding all the necessary aspects of the problem.

**Group discussion/presentation with faculty guide and other teams and stakeholders:**

After the industry visit, prior art search, diachronic & synchronic analysis and other design thinking practices, each team needs to discuss their activities and about their scouted challenges from industry with the Faculty Guide and other groups in the class. On the basis of further discussion and inputs, the team needs to define the exact problem statement for which they will be working during Final Year Project/IDP/UDP. Problem identification by the group members is overlapped by the problem identification by the user/s and the problem identification by the various stakeholder/s other than them. On the basis of all these inputs the final and precise problem statement is generated.

**(2d) Registering into PMMS (Project Mentoring and Monitoring System) tool of GTU:**

By 30<sup>th</sup> July, every team must register themselves through online portal called PMMS by giving the title of the project, the names of the team members and name of the Faculty-Guide. For an IDP, the name of the industry and the Industry-Mentor for an IDP must also be specified. GTU has created this IT tool so that the mentors can work along with the Faculty Guides and students to help make the project better. This platform will also track progress and challenges in every 15 days and will keep the Faculty Guide, students, and the external Mentors connected.

-----NOTES ON SCOUTING FOR THE PROBLEM-----

**(2a.1) Scouting for the Problem: METHODOLOGY OF DESIGN DRIVEN INNOVATION (DDI)**

An engineer is a problem solver and as such he/ she has to inculcate the process of thinking as a designer to develop new products or processes. Every team of students should use the methodology of Design Driven Innovation for their project. This Design Driven Innovation process is based on Design Thinking Approach.

“Design Thinking is a **human-centered** approach to innovation *that draws from the designer's toolkit to integrate the **needs of people**, the **possibilities of technology**, and the **requirements for business success**.*”

—Tim Brown, President and CEO of IDEO

Design Thinking can be applied to solve all kind of problems from the simplest to complex problems. Design Thinking is a mindset that is possibility driven, Option focused and iterative. This can be divided into 6 interactive as well as iterative steps shown below. Each steps of Design Thinking involve rigorous and interactive efforts from defining a particular problem to deploy the solution in the market. Every step would involve iteration to check the idea/solution with the previous one to move forward.

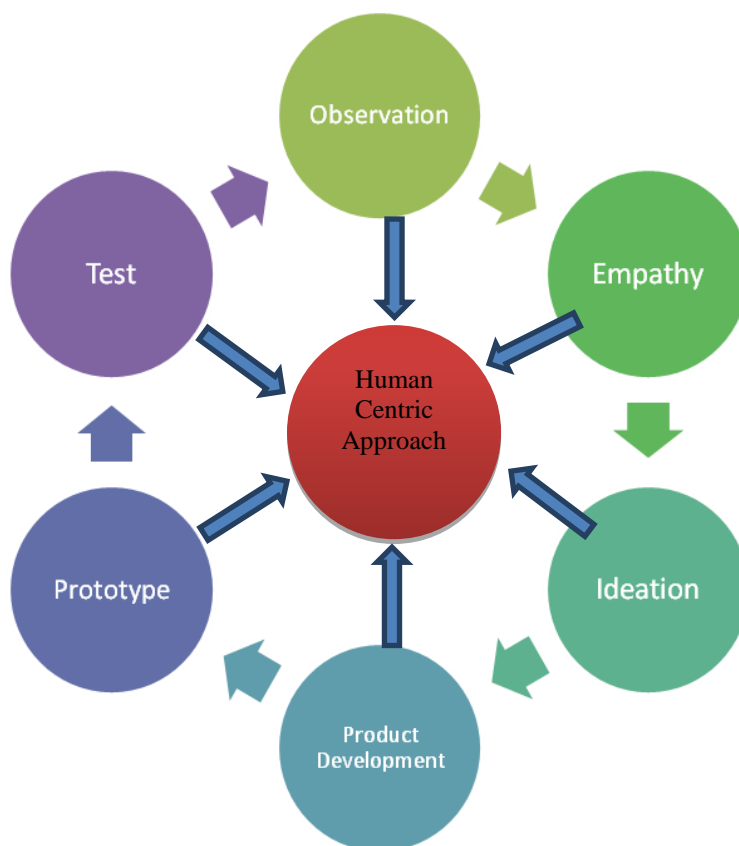


FIGURE: Design Thinking - Human Centric Approach

**(2a.2) Immerse: Role Playing**

In this activity a student need to become the user and actually live their experiences. During this process the innovator needs to envisage him/ her as the user of the desired product and identify, codify various needs from his/her perspective. During the immersion process, students and their Guide can get insights about the non-codified and undocumented needs of the contemporary user/industry.

**Being the user and primary problem identification:**

The group shall be divided into two: Few members will be 'role-playing the users' and identifying the problems by first-hand experience and the rest of the group members will be video-graphing the interviews (primary users, secondary users, stakeholders, etc.) The group members that would be role-playing are encouraged to perform the function of users in the industry they had visited. For example, for problem identification in a steering wheel of a car, the group must learn how to drive a car and understand how the steering wheel is being used and in how many different ways it can be used. The members that would be video-graphing are to record the videos at high FPS (frame per second) to enable them to view the videos in slow motion at a later stage for reference and better understanding.

The other group members will interview the entire bandwidth of stakeholders. For example, while identifying the problems pertaining to the steering wheel, the stake holders would include the car manufacturer, distributors, mechanic, driver, owner, various vendors (leather, nylon, adhesives, etc), various people on the shop floor or assembly line that assemble the part into the car, etc.

A visit to 3-5 places would help the group identify the problem process or area along with identifying the minor deviations that are there in each factory to suit their individual needs. This also helps the group to understand how any process can be customized to suit needs and increasing either comfort of operation or final output. This also introduces the group to frugal innovations and its practices, that India masters.

Another technique of understanding the needs and persona of the user and the stakeholder is noting the 'personal inventory' of them. It is a method of understanding the user and stakeholders by recording what other products/items they use. For example, if the user's inventory records are a pair of RayBan shades, a DSLR camera, a tripod, a pair of extra macro lens, a leather wallet, power bank, brass keychain, a deodorant, an aftershave lotion, etc.



The inference can be drawn that the user is a person that is extremely organized, uses branded products, is passionate about photography, likes to drive, etc. It also gives a hint of the purchasing power of the user and stakeholders and helps in product placement and bench marking of the products (Image: Personal Inventory of an Artist [http://36.media.tumblr.com/04f88f01e46d2b0e06f5c1eef85808bb/tumblr\\_mpbwrzhlvK1gz9v0to2\\_1280.jpg](http://36.media.tumblr.com/04f88f01e46d2b0e06f5c1eef85808bb/tumblr_mpbwrzhlvK1gz9v0to2_1280.jpg) ).

### **(2a.3) Engage user by Interview technique**

Interact and interview users through both scheduled and short “intercept” encounters. Prepare the set of questions to be asked to the same industry workers / executives / stake holders for thorough research. Some guidance is given in the link which describes different methods for interviewing and observation from Stanford University (<http://dschool.stanford.edu/wp-content/uploads/2013/10/METHODCARDS-v3-slim.pdf> ) on how to formulate questions to get the most relevant answers and how to verify / validate the same. Interviews are to be video-graphed, hence necessary equipment to be carried along with the study as and when required.

Getting out of the building and actually talking to your users is probably uncomfortable but potentially most effective way, if it is done in the right way. The thing here is not to directly go up and ask your user for the solution because most of the time they really don't know about the solution and even about the problem. Engage them in conversations that allow users to tell stories of their experiences and a likely solution.

**-----NOTES ON SECONDARY RESEARCH/PRIOR ART SEARCH -----**

**(2b) Secondary Research/Prior Art Search:**

(For increasing the innovation quotient of each of your IDP/UDP)

PAS: Prior Art Search activity: what it includes:

1. Web search/research publication
2. User feedback
3. Patent search<sup>2</sup>(PSAR)
4. Vendor/market search

<sup>2</sup> During this Patent Search and Analysis Report (PSAR) generation activity, every student within a team has to study at least 5 patents related either to his/her IDP/UDP or related to his/her area of interest. Analyzed data of each of these five patents is to be submitted online, once the university declares the web link along with the project progress details at a due date to be announced. The team needs to compile the findings of each member during PSAR and make a report on

1. What are the other solutions already existing and what are specific patent claims solving particular need or adding value related to your project?
2. How does the team wish to improve existing patent claims by their own project?
3. What would be new value addition/distinct feature the team will add to ensure their solution becomes unique and novel?
4. Which innovator /industry has already started working on improvements, the like of which you have taken up as your Final Year project? This will let the team understand the orientation of future research in academia. The academic R&D can be streamlined by tapping such data where industry aspires to build product/process which is going to come to market in future.

Prior Art/ Literature search is the step after gathering primary data from the domain/field and to begin any project. Many of the students have been developing novel solutions, but quite often they are not aware about the Intellectual Property Rights (IPR). Some of their solutions are quite unique and might fulfill the criteria of patentability. Student teams need to search related literature for selected problem product/process/system through patent database, literature review, market search/user interaction. Every team can search the relevant literature using various search databases (for web and patent search) by entering the key words with combinations of Boolean characters and/or wild characters. As patents are one of the most important aspects of Prior Art Search, some of the online free databases are listed below for reference:

Search Databases	Web link	Scope of search
Google's Patent Search	<a href="http://www.google.com/patents">http://www.google.com/patents</a>	US patents only
USPTO	<a href="http://patft.uspto.gov/">http://patft.uspto.gov/</a>	US Patents only
EPO	<a href="http://ep.espacenet.com/?locale=en_EP">http://ep.espacenet.com/?locale=en_EP</a>	- EP Patents - WIPO patents - Worldwide patents
Patent Scope (WIPO)	<a href="http://www.wipo.int/pctdb/en/">http://www.wipo.int/pctdb/en/</a>	WIPO Patents
Indian Patent Office	<a href="http://ipindia.nic.in/patent/patents.htm">http://ipindia.nic.in/patent/patents.htm</a>	Indian Patents (Granted as well as 18 month Published Patents)

PAS helps one to understand what has been done /attempted before. This enables innovators obtain ideas on which he/she should work further.

**Phase 2 - Industrial Shodh Yatra (ISY 2015) – in greater detail**

**Final year project:** Final Year projects are the capstone of engineering education. After going through technical subjects during their studies, the young brains have the necessary background and have learnt how to acquire technical knowledge for solving real life challenges. The work on the Final Year project helps a student integrate the knowledge, from various courses that he/she has studied, for solving a problem.

GTU wants the projects to be socially relevant and/or to be able to meet industry's requirements.

The users of an engineering product or process may be MSMEs, Large Scale Industries, Informal Sectors, Expert Individuals or Institutions, NGOs etc. GTU requires that each team of students should interact with the user of their choice and map the unarticulated needs of respective users. The need may be for improving a product or a process. Or it may be required to develop a new product for satisfying the need. The team of students will develop the improved or a new product/process as their Final Year project, with the approval of the Faculty-Guide.

**Industrial Shodh Yatra:** Industrial Shodh Yatra (ISY) is the course of action that leads a team of students towards a creative interaction with diverse users to discover a challenge/problem, the solution of which would lead to a better product or a more efficient process for a particular user or for a group of users or an industry. The suggested innovations may be incremental or disruptive.

In this process of ISY the team members are required to follow design thinking approach (given in the followed pages) and define a problem statement through the process of observation, immersion and engagement. During an ISY, a team of students, accompanied by their faculty guides, are required to interact with one (or more) industry/user and adopt a systematic approach to document the opportunity of improvement or of finding a new solution.

Generally an Industrial Shodh Yatra is organized by a College/ Institution or by a Head of Department (HOD) /by a Faculty Member. A team of students visit an industry and spend some time to study the products and processes of the particular industry and to have technical discussions with the personnel at the industry. The visit may conclude in discovery of an appropriate problem for the Final Year project for the team of students. The concepts of IDP/UDP and ISY were defined by GTU in 2010-2011.

**Objectives of Industrial Shodh Yatra (ISY):**

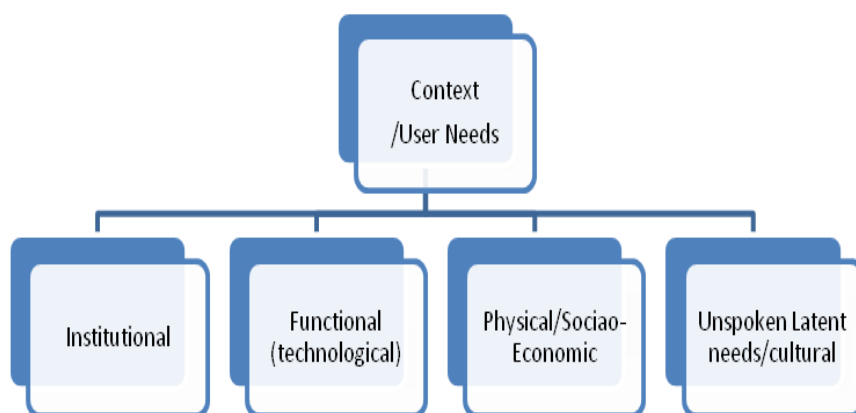
1. Forging linkages between Industry-Academia
2. Mapping real -life need of users/MSMEs/Industry/Others/Innovators
3. Codifying scouted challenges with the help of industry

4. Scouting innovations done by MSMEs and benchmark them w.r.t. global solutions
5. Mapping the Gap & converting it into final year projects as a part of Academic Research
6. MSMEs can leverage final year students as a skilled technical Human Resource for technology development, while students will get learning opportunity. This is particularly helpful to MSMEs since they may not be able to afford their own full-fledged R&D facility.
7. Using design thinking approach for developing incremental innovations for existing products or processes by doing innovations in form/feature/function and/or material/method/application of product. This process is called Design Driven Innovation (DDI).

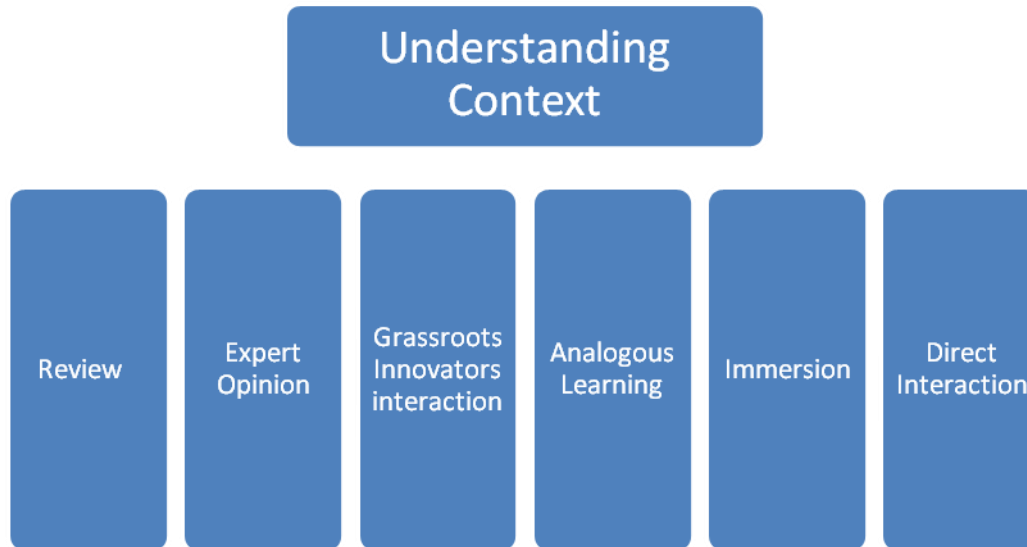
Whether a student chooses to take up an IDP or an UDP, the Final Year project should use the approach of Design Driven Innovation. This will make the work on the Final Year project interesting and educative, leading to the graduation of an engineer, who may be able to face the challenges of designing new products or processes successfully.

### Steps in Industrial Shodh Yatra (ISY):

ISY involves two of the six steps (given in the figure on design thinking): “OBSERVATION” and “EMPATHY” only. The team of student should go through the steps of “OBSERVATION” and “EMPATHY” by a systematic process, even though an external user like a specific industry may not be available in case of UDP. Student needs to define the exact parameters, context and the situation that will lead to the solutions pertaining to a particular problem. For this we need to define the user needs.



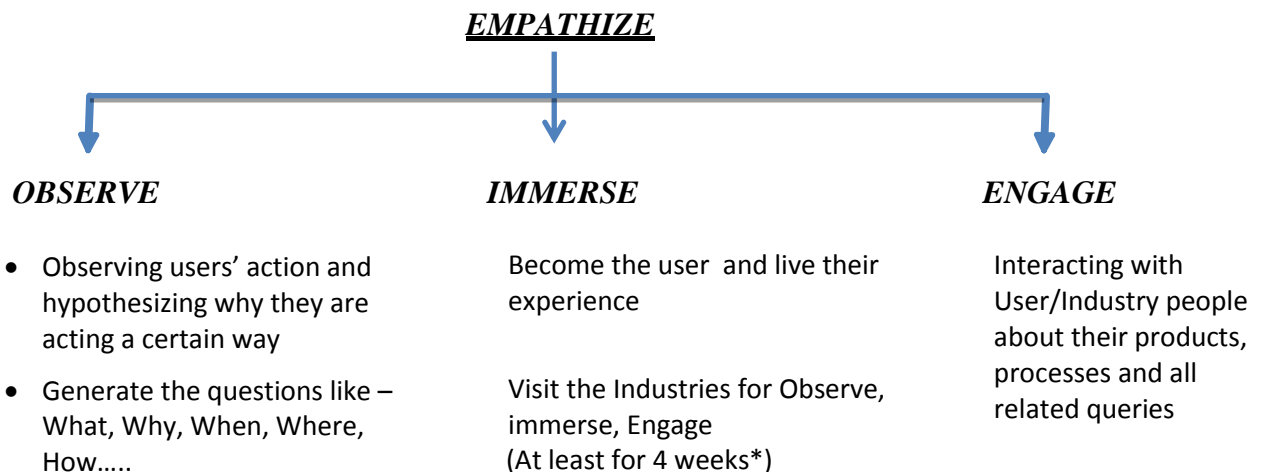
First students have to define all the parameters and then they need to take some specific cases to understand these. The latent needs can be better understood only when we interact with the user. This includes observation as well as detailed discussions with the community of users.



The user needs and context can be understood through the following parameters defined in terms of the needs and context: functional aspects, physical aspects, latent needs and institutional aspects.

**EMPATHIZE:**

To Empathize the User, one needs to observe again and again. For better Empathy of User, students need to follow the following steps of Observe, Immerse and Engage.



**AEIOU Framework for Observation activity**

**(2a.1) Observation: With the help of AEIOU framework**

Student teams will carry out the observation activity for their selected domain/industry with the help of AEIOU Framework. AEIOU is an investigative tool to help a designer to interpret observations gathered by ethnographic practices\* in the field. It is an Observation tool. *“Its two primary functions are to code/gather data, and to develop building blocks of models by analysis of data that will ultimately address the objectives and issues of a client/user.”*<sup>1</sup> The groups of students are requested to divide the work amongst each other for AEIOU framework.

Regarding AEIOU theory, please refer to:

[http://gtu.ac.in/circulars/15Apr/04042015\\_AEIOU.pdf](http://gtu.ac.in/circulars/15Apr/04042015_AEIOU.pdf)

AEIOU summary canvas exercise to define problem definition/project /IDP/UDP:

AEIOU Summary:		Group ID:	Date:	Version:
		Domain name:		
<p><b>Environment:</b></p> <ul style="list-style-type: none"> <li>- General impressions / observations (Style, material &amp; atmosphere)</li> <li>- Floor plan</li> <li>- Elements, features and special notes</li> <li>- Scenes</li> </ul>	<p><b>Interactions:</b></p> <ul style="list-style-type: none"> <li>- General impressions / observations (Who is interacting with whom, what?)</li> <li>- Scene of interaction (How it is being done)</li> <li>- Elements, features and special notes</li> </ul>	<p><b>Objects:</b></p> <ul style="list-style-type: none"> <li>- General impressions / observations (What components are involved? How?)</li> <li>- Inventory of key objects</li> <li>- Elements, features and special notes</li> </ul>		
<p><b>Activities:</b></p> <ul style="list-style-type: none"> <li>- General impressions / observations</li> <li>- Sketch/photo- Summary of activity</li> <li>- Elements, features and special notes</li> </ul>		<p><b>Users:</b></p> <ul style="list-style-type: none"> <li>- General impressions / observations (Who is present? role and responsibilities?)</li> <li>- Scene of user in context</li> <li>- Elements, features and special notes</li> </ul>		

<sup>1</sup> Refer Ethnohub: <http://help.ethnohub.com/guide/aeiou-framework> , accessed on 16 May 2015.

\* <http://en.wikipedia.org/wiki/Ethnography>

**Observation Technique:**

1. *What is user/person (or users/persons) doing?*

-What is the user/person you're observing doing in a particular situation? Note the obvious as well as the surprising and random activities. Just report the objective facts.

2. *How are they doing it? (Body Language, posture, style etc.)*

-How is he doing it? Does it require effort? Does he appear rushed? Pained? Happy? Sad? Is the activity impacting the user in either a positive or a negative way?

3. *Why are they doing it in this way?*

-Why is he doing what he's doing, in the way he's doing it? This step usually requires that you make informed guesses regarding motivation and emotions. This step will reveal assumptions that you should ask users about, and it will often uncover unexpected realizations.

**General Information:**

- Information/Data "are gathered via ethnographic methods: notes, photos, videos, interviews, field observation, etc.
- During field observation, use the AEIOU framework as a lens to observe the surrounding environment.
- Record observations under the appropriate headings.
- Supplement direct observations with photos or video tape when appropriate.
- Review and cluster observations to disseminate higher-level themes and patterns."<sup>2</sup>
- A,E,I,O,U individual analysis can be done in A3 paper but the whole AEIOU summary canvas to be A1 size canvas.

References:

*The AEIOU framework was originated in 1991 at Doblin by Rick Robinson, Ilya Prokopoff, John Cain, and Julie Pokorny. Its aim was to help analyze Ethnomethodology data and Conversation analysis with MECE categories. You may refer it from the following websites:*

[http://www.drawingideasbook.com/images/AEIOU\\_worksheets.pdf](http://www.drawingideasbook.com/images/AEIOU_worksheets.pdf)

<http://www.doctordisruption.com/design/design-methods-8-aeiou/>

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<sup>2</sup> Refer Ethnohub: <http://help.ethnohub.com/guide/aeiou-framework>, accessed on 16 May 2015.



**Diachronic & Synchronic Analysis**

**(2c.1) Diachronic and Synchronic Analysis:**

**Diachronic analysis** means the analysis of how a particular activity has been performed since thousands/hundreds of years ago. This is better studied by plotting it along a timeline. For example: How forging was done in renaissance era to how it changed during the industrial revolution, how it is done in modern times and how it is being done with the help of robotic arms. Identify the changes in process and tools and why those changes were adopted. Refer the images of Diachronic Analysis for Mobile phone/Communication Device in the given link:

<http://iq.computersciencedegreehub.com/evolution.jpg>

<http://www.designinfographics.com/infographics-images/evolution-of-the-cell-phone-the-worlds-gone-crazy.png>

**Synchronic analysis** means the analysis of how a particular activity is being performed in various other parallel industries. Activities similar in action like forging. Refer the images of Synchronic Analysis for Mobile phone/Communication Device in the given link:  
<https://drive.google.com/open?id=0B4o8FlssBX7BNTFGUDBWVmdzQ00&authuser=0>

In general, diachronic analysis relates to the way something changes (or doesn't) over time and why. Synchronic relates to the way something is used at a certain point in time but in different contexts (Students must observe the constants and the variables). The groups stay in the college/institute and generate their prior art search data and primary diachronic and synchronic analysis.

**Note: Separate Guidelines for specific work during semester 7 and 8 will be issued by the University. For academic year 2014-15, such guidelines are available on the web-site.**

**GTU believes that by thoroughly crafted policies, processes, incentives and real-time mentoring and quality benchmarks, at least 1000 student projects can become useful products every year. Some of these innovations can possibly become successful technology start-ups or get transferred to MSMEs who in turn can use them for improving their productivity and create value.**