The Democratization of Innovation has empowered “lead users” to develop breakthrough innovations. Users often discover needs for a new solution through personal involvement before any company may learn about the users’ pains. User driven solutions produce what market will want in the future. User innovators demonstrate an entrepreneurial mindset and have specific skills necessary for creating something new. This module is developed based on the pioneering work of professor Eric von Hippel at MIT, as part of a cross-listed science and engineering course on Technical Innovation and Entrepreneurship.

User Innovation

Technical Innovation and Entrepreneruship

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LOYOLA UNIVERSITY MARYLAND

PIPELINE

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User Innovation

Science and engineering students are often motivated to have a positive impact by leveraging their scientific knowledge and technical skills to solve problems with social impact. This provides an opportunity to engage students in innovation and entrepreneurial activities using issues that students have a passion for and personally care about. User Innovation provides the clarification that innovation does not belong to the domain of the producers only. In fact, we can refer to the efforts of individual scientists who have solved their "own" technical problems by creating new experimental systems that lead to the creation of scientific companies. Likewise, individual sports enthusiasts unsatisfied with the existing options are User Innovators who create new games such as basketball or develop new class of sports such as extreme sports. "User Innovation" done by individuals represents the demand-side innovation, while the supply-side innovation is often associated with industrial producers. In recent years, however, even some corporations have recognized the value of the user innovation, thus supporting and harvesting users' innovations as an effective approach to innovation, thus leading to the emergence and growth of a mixed user and producer innovation economy. This mixed model leverages the internal research and development of corporations linked with programs aiming at harvesting ideas and products developed through user innovation efforts.

User Innovation exercises and activities outlined here are designed to introduce students to technical innovation and entrepreneurship based on personal experiences, needs they have discovered, and pains they have experienced. Activities presented here are modeled after the pioneering work by professor Eric von Hippel at MIT, a leader and an authority in the field of "User Innovation". Interested individuals are now empowered to be engaged in the innovation and entrepreneurship process through open source innovation, access to makerspaces for prototyping, increased number of co-working spaces, growth of organizations supporting innovation and entrepreneurship, crowed sourcing possibilities, and expansion of collaborative creation that are essential elements for democratizing innovation.

The purpose of User Innovation exercises is to introduce students to an innovation process that starts with identifying "needs" and results in creating a working prototype by the end of the semester. The product developed may not be as advanced as a typical Minimum Viable Product (MVP), however, each team should produce a prototype that offers a realistic solution for a specific need or pain and provide an idea for a new opportunity.

The work presented here is shaped by two NSF supported initiatives: The "Pathways to Innovation" initiative, established in 2015 at Loyola University in collaboration with Epicenter at Stanford University and VentureWell, and a collaborative IUSE grant program involving American Physical Society, Loyola University Maryland, and several other universities called "the PIPELINE Project". The purpose of these two projects is to enhance the entrepreneurial mindset and innovative thinking of science and engineering students.

The topic presented under "User Innovation" module could be of interest to any discipline within science and engineering. It is the first module in a cross-listed science and engineering course on "Technical Innovation and Entrepreneurship" at Loyola. The "User Innovation" module is designed to be introduced early in the semester, thus allowing sufficient time for the development of ideas that leads to team projects that should be completed by the end of the semester. Exercises presented in the following pages should be completed sequentially. All resources for completing these exercises are provided including links to appropriate reading materials or videos.

What's the problem?

User innovation is guided by identifying needs, understanding pains, defining problems, and recognizing opportunities.

Top 10 pains

Assignment 1: Write down at least 10 problems that you've faced in your life, or problems that you personally care about.
READ Chapter 1 of: Democratizing Innovation

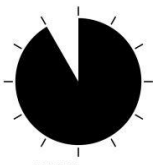
Play Meet Eric von Hippel (1.04 Minutes)
Professor Eric von Hippel (MIT) definition of "User Innovation" (3.37 Minutes)

Goal: Clearly identify and concisely communicate problems that are specific.

Instructions

The problems you write could be any issue impacting your life; work, school, family, financial, personal, health, technology, hobbies, activities, etc.

- **Are problems listed specific?** Stating problems that are specific gives you a better chance to solving them. For example, "I have a problem with time management" is less specific than, "I waste 2 hours a day chatting on the phone", or "I spend 3 hours a day on social media".
- **Do problems occur frequently? are they painful? Are there adequate solutions?** The problems could simply be something that annoys you, wastes time or money, prevents you from accomplishing a goal, or health related problems. Identify problems that, based on your best knowledge, currently don't have adequate solutions.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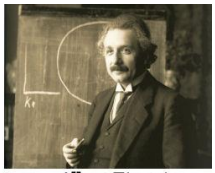

Albert Einstein

"I Would Spend 55 Minutes Defining the Problem and then Five Minutes Solving It" -- Albert Einstein

Self- Assessment of Top 10 Pains

Assignment 2: - *Provide a self-assessment of "top 10 pains" exercise*

- Consider the breadth and specificity of the answers provided.

Goal: Evaluate the quality of ideas and develop a habit for providing productive feedback.

Have you provided 10 or more problems, and if so with what level of specificity using the following criteria:

Your list; (a) states 10 or more problems & (b) the problems are defined with specificity. (Assign 3 points if this is the case).

The list; (a) states 10 or more problems, but (b) some of them are not specific. For example, it may describe a general feeling such as "I wish I was more active physicaly" rather than "I will prepare for the 10 Miles race in July starting tomorrow"
(Assign 2 points for this).

The list falls short of having 10 different problems, even if the problems listed may be both interesting and well-explained. Falling short of the primary goal of the exercise that is to have sufficient breadth is an indication for lack of sensitivity to and curious about problems that occur in your own life.
(Assign 1 point in this case).

Solve your problem: How was the Skateboard Invented? (3.06 Minutes)
Solve your problem: The Story of Emily & Fenway (4.59 Minutes)
Solve Your Problem: Wrap-up (45 seconds)

Top 3 pains

Assignment 3: *- Refine your list of top 10 problems to select 3 issues that you care about the most.*
- Don't lump the 10 problems into 3 general problem areas but choose 3 discrete problems from your pre-existing list of 10.

Goals: *Set Priorities by narrowing the choices of problems to solve*

Guidelines for completing exercise 2:

A. *Rank your top 10 problems according to their level of painfulness such as annoying, time-consuming, money-wasting, limiting in some important way, or the degree of painfulness physically or emotionally. Be Specific! For example, if the problem tends to cost you money, then state how much money, or if the problem happens to be time-consuming, then indicate how much time.*

B. *Beside the level of painfulness, consider whether you are more passionate about some of these problems than others? What's driving your passion? Do you happen to understand some of these problems better than others? Do you consider some of them to be more important than others?*

C. *Informed by your work in part A and B above, trim your original list to 3 problems and describe each of problem in greater detail by answering the following questions:*
   a. *What specifically is the problem?*
   b. *When did it first occur?*
   c. *In what context does it occur and how frequently?*
   d. *What consequences does it create? (e.g., does it waste your time or money?*
   e. *Does it stop you from doing something that you want or need to do?)*
   f. *How would your life change if that problem just disappeared?*

"Life is the sum of all your choices." - Albert Camus

Self-assessment of top 3 pains

Assignment 4: Conduct a self-assessment of assignment 3, with an emphasis on Depth, Method, and Specificity.

Goals: Practice evaluating the quality of ideas and develop a habit for providing productive feedback while focusing on the major problem(s).

How thorough was the selection of the 3 problems? Was selection randomly, or through careful consideration of factors such as level of painfulness? Are the problems described with a good level of specificity?

Assign 3 points for this exercise if:

- *Your assignment includes the list of 3 problems and shows an in-depth reflection according to guidelines (A, B, and C in assignment 3)*
- *It is clear why you chose the top 3 problems from your original list of 10;*
- *You've gone through the ranking exercise with a good level of specificity, generating an understanding of how painful your problems are, not just that they are painful;*
- *There is a thorough, introspective discussion of additional factors influencing your ranking, in addition to the level of painfulness;*
- *You explain each of the 3 problems in greater detail, including how each problem occurs in your life, its frequency, and what are the consequences of the problem for you and others*

Please mark 2 points if:

- *Your submission includes only a partial discussion of A, B, and C in assignment 3*
- *Your problem ranking lacks specificity. For example, you say that the problems on your list are painful, but you don't describe how painful they are;*
- *It is unclear what other factors, besides their level of painfulness, drive your selection of the top 3 problems; Or,*
- *Little is shared about the context of the problems; when do they occur, how frequently they occur, and what are the consequences.*

Please mark 1 point if:

- *Your submission does not include answers to A, B, and C.*

"Don't go through life, grow through life." – Eric Butterworth

Selecting a problem to solve that matches your skills

Assignment 5: Think over your skills and reflect how they enable you as a problem solver.
A good way to keep your innovation cost low is to utilize the skills that you already have!

Goal: Identify your relevant skills and use them to solve your problem.

Frame Your Problem to Match Your Skills Videos

Watch The Story of Krav Maga	(2.23 minutes)
Watch The Medical Innovation of Louis Plante (Pt 1/2)	(6.28 minutes)
Watch User Innovation Explained - What is co-forming?	(4.18 minutes)
Watch The Medical Innovation of Louis Plante (Pt 2/2)	(4.13 minutes)
Or Watch the compiled video Frame your Problem	(18.19 minutes)

A. **Conduct assessment of the skills that you have.** Based on the earlier videos, note that Louis Plante's music hobby played a crucial role in his solution to cystic fibrosis, the Frequencer. Also, Frank Nasworthy's innovation, urethane wheels for skateboards began as a hobby.

Skills you have: To list your skills think about what things you like to do, your hobbies, core competencies, professional skills, experiences, knowledge, or special insights you have developed based on your unique life experiences. Remember that skills are not just professional capabilities. Using 3D printers, ability to build using machine shop tools or software development are skills, but so is playing sports, making art works, solving puzzles, baking or cooking, or ability to develop connection with people. Your hobbies are not simply pleasant activities to keep you busy, but part of your skillset.

Skills to add: You may also add new skills by thinking about relevant skills that you currently don't have but can acquire at a low cost by not investing a lot of resources (e.g. money, time), based on skills that you already have. These are your adjacent, aspirational skills. For example, if you already know programing in MATLABC, it's probably easier for you to learn Java than it would be if you were starting programming from scratch. Remember that you won't always have all the skills you need, but continuous learning is an inseparable companion to innovation!

B. **Choose 1 problem from your pre-existing list of 3 that you feel is best suited for your skills.** For example, if you have a software problem on the list and you're a software engineer, you may have a good fit. Or if you have a sports equipment problem and you happen to play that sport and be a mechanical engineer, or you're just an all-around equipment tinkerer, that's great.

C. **Frame your problem**. Try and explore how you could solve your problem by utilizing the skills that you have. Frame your problem to fit the skills that you have. For example, if you're a software developer, can your problem be expressed as a software problem?

- Challenge yourself by first limiting yourself to the skills that you already have, because it'll be easier for you to innovate if you could get started right away.
- Conceptualize your solution by developing a concept of your solution with an understanding of how that solution will be enabled by your skills.
- Enjoy the introspection. You're likely to uncover skills that you haven't thought about before.
- If you find it difficult to choose 1 problem from the 3 that you have, don't overthink it. Just pick one that feels right and go with it. Who knows, it just might work, or you'll simply come back to other problems on your list later. Experimentation is a big, and enjoyable, part of innovation.

Self- Assessment

Develop a self-assessment rubric for this exercise (Similar to previous exercises) that could be used as a rubric. How would you assess your work in view of the desired breadth, focus, and framing needed for this assignment according to your own guideline? Please refer to questions asked and the instructions in part A, B, and C above to assess your work

How Do You Solve Your Own Problem?

The Story of Steve Schmidt & His Medical Innovation (Pt 1/2) (1:42 Minutes)

What is CoughSense? Steve Schmidt & Karen Travers (5:03 Minutes)

Challenge Opportunity

Who shares your pain?

Assignment 6: *Explore who else might have the same problem.*

Goal: *Identify whether your problem defines a broader need that is shared by others. Conduct interviews as a tool for market research for your ideas.*

Instructions

At this point it's a good idea for you to explore whether other people have the same problem that you have. Admittedly, this is not a necessary step – user innovation is about innovating, first and foremost, for your own use. When you're solving your own problem, you can make the solution just right for you. This is the power of user innovation and one of the reasons that it happens so often. However, understanding who else might have the same problem can be viewed as bridging the gap between innovation and entrepreneurship.

Moreover, talking with others may help see your own problem in a new light and aid you in developing a better solution to your problem. Also, it's an important step to take if you have entrepreneurial aspirations for your innovation. If you're looking to start a venture, the more people share your problem, the more benefit they gain from your solution and the less cost they incur from adopting your innovation, the greater are your odds of success.

In this exercise your goal is to talk to at least 5-10 individuals, who you believe have the problem that you experience, and see what you can learn. For a real case of a tech venture startup, you may need to interview hundreds if not thousands of people. Please follow the following steps:

A. **Brainstorm what groups of people might share your problem.** *Reflect on your problem and think why you're experiencing it. Are there any attributes of your personal or professional life that help create that problem? Can you use these attributes to construct profiles of different groups of people who may have this problem?*

   Try to identify at least 3 such groups (Segments) – this will be useful for helping you to think broadly and creatively about your problem. Jot down your observations for why you think they share your problem. If, for example, you're a surgeon and you have a problem with a piece of equipment for a procedure, maybe your counterparts in other surgical fields would share that problem too? Or if you're an American football player and have a problem with your protective gear, could rugby players, skiers, or athletes in other contact sports have your problem too?

B. **Choose 1 group of people from the few that you had brainstormed in Part A**. *Reach out to at least 5 individuals from that group and interview them. Share your problem with*

them and ask them to reflect on it. Do they have this problem too? If yes, ask them to describe in detail what causes this problem, how frequently it occurs, how painful it is, and what consequences it creates. How painful is it to these individuals, as opposed to how painful it is to you? Have any of these individuals tried solutions to this problem? If yes, what solutions have they tried, have they been satisfied with them, and what can you learn from these solutions? Jot down what you learn.

Be in inquiry mode, not advocacy mode, and don't offer a solution at this point. Remember, your goal is not to convince others that they have the same problem that you have and that they need your solution. We're still a little too early in the process for that. And your goal is not to determine with certainty that others share your problem, for that may not be the case. If you're focused on that, you may pursue a problem that doesn't really exist, which ultimately would endanger your entrepreneurial venture.

Your goal is only to explore whether your problem might be shared by others. If you don't find that the 3 individuals that you interviewed share your problem, you may want to reach out to people from the other groups that you had brainstormed. It's possible that your experience may be different this time.

C. ***Analyze the data****. Did your initial expectations of who else might have that problem get confirmed? If you did find that one or more of the people that you interviewed do share your problem, do they describe it in similar ways? Is it the same problem to them or is it somewhat different? This question is important, for it will ultimately influence the nature of your solution. If there are differences, what are they? Does the problem occur in a different context? Does it cause different consequences?*

You don't have to limit yourself to interviewing only 5 individuals. Feel free to interview more. In fact, frequently talking to people who have the problem that you're trying to solve should be an essential accompaniment to your entrepreneurial journey.

Expect to gain new ideas from this exercise. You're likely to begin seeing your problem in a new light. Knowledge that others share your problem, should give you new level of confidence that you're pursuing something promising.

But be prepared to find that others don't have your problem or don't experience it as strongly as you do. You could then either still pursue solving your problem or explore a new problem to solve – now you have a good list to go back to. This is all part and parcel of the entrepreneurial journey.

Importantly, this exercise will set the stage for the remainder of our User Innovator exercises, when you will be thinking about ways to diffuse your innovation, which is a term often used for sharing your solution with others, either for free or commercially. Whether, and the extent to which, others share your problem will help you think through how you may want to diffuse your innovation.

It's not fun to have problems. But if you want to be a user innovating entrepreneur, it helps when others have your problem too. Don't solve a problem just because it is interesting, solve a problem that is interesting and useful.

Interview Questionnaire

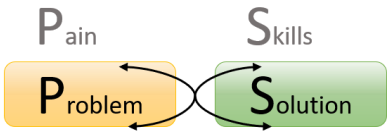
Submit a copy of the questions you have developed for your interviews and the answers to your interview questions. What have you learned from your interviews?

Note: You can use the following link to see the Interview Tips when planning for your interviews and developing your interview questions:

http://ww2.kqed.org/quest/wp-content/uploads/sites/39/downloads/2011/06/interview_tips.pdf

Self-Assessment

Develop a guideline for self-assessment of Exercise 4 (Similar to previous Exercises) that could be used as a rubric. How would you assess your work in view of the instructions in part A, B, and C above according to your own guideline?



Co-forming the problem

Assignment 7: Create a fuller description of the innovation idea / plan.

Goals: Implement a system for re-evaluating the innovation plan according to the new knowledge gained so far. Co-forming the problem and solution using your skills.

Watch videos about peer-to-peer innovation diffusion

The Story of Khan Academy	(2.27 Minutes)
The Story of Derya & Divers4Oceanography (Pt 1/2)	(3.42 Minutes)
Eric von Hippel on Peer-to-Peer Diffusion	(4.51 Minutes)
The Story of Derya & Divers4Oceanography (Pt 2/2)	(7.28 Minutes)
Peer-to-Peer Diffusion: Wrap-up	(1.01 Minutes)

Or watch the compiled video for Peer-To-Peer Diffusion (21.25 Minutes)]

In this exercise your goal is to offer a fuller description of the innovation you have in mind. You've already explored your solution concept to some extent earlier in this process, but you've done a lot of new thinking since then. You've also met and learned about other people who share your problem and may want a solution. Your perspective may have deepened and evolved. It's important to re-evaluate where you have landed so far. For this exercise follow the following steps:

A. **Write down again the problem that you had set out to solve**. State it just as you had in the beginning of this process.

Now restate the problem based on what you've learned so far. Ask yourself; How has your understanding of the problem changed? Is it still the same problem? Has it changed in subtle or even dramatic ways? What caused your change in perspective? What could happen going forward that would make your perception of the problem change yet again?

It's fine if your problem hasn't experienced redefinition. You may indeed have found the heart of your problem at the start. In this case, offer your thoughts on what you have learned that confirms your definition of the problem. Also, what factors, if present, would change your current definition of the problem?

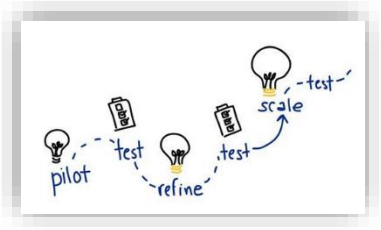
B. **Next, write down your solution concept as you had initially imagined it**. In a similar vein to Part A, restate your solution concept as you see it at the present time. What changes do you see? What works or doesn't about your initial solution concept? Has it expanded, shifted focus, or got completely redefined?

Give greater depth to the description of your solution. Highlight its main elements and discuss how these elements contribute to the solution of the problem. What existing materials, technologies, or processes are you planning to use? Would you need to invent a new material, technology, or process? What do you foresee to be the key to getting your solution to work just right?

Most likely, a good deal of trial-and-error is ahead of you. This is good – innovation rarely happens via single lucky strikes. Describe what you intend to try in developing your solution and what you're planning to learn from trying. How will you change the development of your solution based on what you learn? What do you hope to learn, and what do you plan to do if you learn something new?

C. **Finally, send your imagination in free flight**. Imagine that you have developed the solution. In what way do you want your solution to reach others? Do you imagine a startup company, a non-profit, a peer-to-peer community of some kind, some combination of these possibilities, etc.? What motivates you to pursue one of these paths? Why do you think this path is the right path to have your solution reach others?

Develop a guideline for self-assessment of this exercise (Similar to previous assignments) that could be used as a rubric. How would you assess your work in view of the instructions in part A, B, and C above according to your own guideline?



Diffusion of Innovation through Market

The Story of Video Game Mods	(5:20 Minutes)
The Story of Slava Menn & Fortified Bicycle (Part 1/2)	(3:33 Minutes)
The Story of Slava Menn & Fortified Bicycle (Part 2/2)	(5:26 Minutes)
Democratization of Innovation discussion	(3:47 Minutes)
Democratization of Innovation: Wrap-up	(1:06 Minutes)
or watch the compiled video for Diffusion through Market	(19:09 Minutes)

Team Formation & Idea Pitch

Assignment 8: Pitch your idea to your classmates

Goals: Present your idea succinctly & convince others to select your idea as a group project.

In 90 seconds pitch your idea to the class and describe the problem you want to solve. You will either convince 1 or 2 classmates to drop their ideas to join your project, or you should drop your idea to join another project idea. Consider the following factors in this process:

- Which idea are you most passionate about?
- Which idea matches your skills the best?
- Which team is the best team to join considering diversity of the team and the match between the skillset of the team members and the project?
- Which project is both interesting and doable within the semester time-frame?

Form a team to work on building a prototype based on either your idea or the idea proposed by another student:

- Make sure your skill set is a good match for developing the proposed prototype
- Define roles that matches each person's skill set and abilities and remove any role conflicts
- Make sure everyone is on the same page about the project objectives
- Establish a project completion timeline
- Establish a regular team meeting time
- Establish a clear communication plan among team members
- Ensure everyone is fully committed to complete a high-quality project / prototype
- Communicate what each expect of each other to complete the project.

Innovation Diffusion

Assignment 9: How to make choices among all options available.

Goals: Think about diffusion of your innovation
Engage in Peer-Assessments
Learn about value proposition analysis

Play

Distribution via the Market- The Steadicam	(3.16 Minutes)
The Story of AudioCommon (Part 1/2)	(5.24 Minutes)
The Story of AudioCommon (Part 2/2)	(4.44 Minutes)
How to Distribute Your Innovation Through the Market	(6.51 Minutes)
Diffusion via the Market: Wrap-up	(1.04 Minutes)
Or watch the compiled version for Diffusion via the Market	(21.27 Minutes)

Instructions

Making choices is at the heart of this specific exercise. Your goal here is to think about diffusion of your innovation, that is, the spread of your innovation in society. As Eric von Hippel describes it, you have a sequence of overarching choices when it comes to diffusion. Therefore, think about possible options and provide answers to the following questions:

1) Do you choose to diffuse your innovation or not? Why?

(For the purposes of this exercise, we ask you to assume that you are choosing to diffuse your innovation. Otherwise, the remainder of this exercise would be irrelevant for you.)

2) Do you plan to diffuse Peer-to-Peer, Via the Market, or both? What is your thinking for why you're making your choice?

3) If you plan to diffuse Peer-to-Peer, what is important for you to think about to increase the chances that your innovation is adopted?

4) Do you wish to license your innovation or to produce it yourself? How do you think about this choice?

5) Ultimately, whether your choice is to distribute Via the Market, or Peer-To-Peer, what kind of venture do you want to build and what is important for you to think about to make that dream a reality?

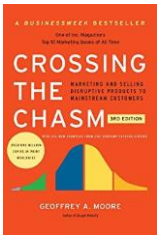
Peer Assessment

Important note, this exercise is based on Peer Assessment. In fact, it's the first of two Peer Assessments related to User Innovation part of this course. Unlike the previous exercises, your grade here will be awarded to you by a group of your peers in this course, based on a detailed rubric provided. You will be assessing your peers too.

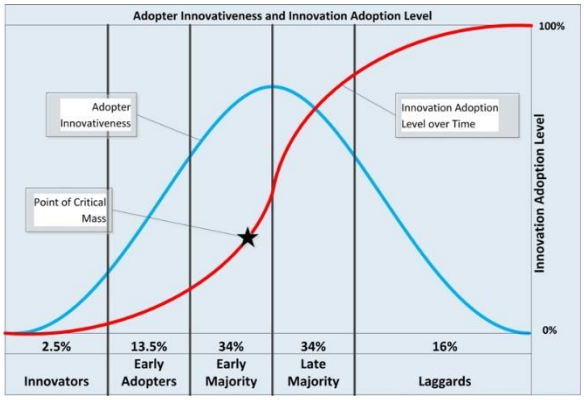
Use Peer Assessment is an opportunity to give and receive feedback. You stand to learn something new, and pay it forward by providing constructive, thoughtful, good-willing feedback to your peers on their submissions. To keep the process fair, please do your utmost to assess your peers based on the rubric provided. You will be able to see the rubric as soon as you submit your assignment.

I very much hope that you enjoy this process of introspection and analysis, and that it leads you closer to be the best user innovator that you can be.

More on Diffusion of Innovation:



1. For more reading about Diffusion of Innovation please see Crossing the Chasm by Geoffrey A. Moore
2. Watch the talk by Simon Sinek on the Law of Diffusion of Innovation
3. Watch the video by Den Adam on Diffusion of Innovation
4. Learn how Diffusion of Innovation can be connected to Diffusion of Social Network
5. If you like to understand the mathematics behind diffusion of Innovation, learn about Logistics Function and its connection to growth



Peer Assessment of Innovation Diffusion

Assignment 10: Provide a peer assessment feedback for a classmate

Goals: Analyze the proposed plan for diffusing innovation by a classmate.

Consider the questions asked leading to the proposed plan you are reviewing:

1) Do you choose to diffuse your innovation or not? Why?
(For the purposes of this exercise, we ask you to assume that you are choosing to diffuse your innovation. Otherwise, the remainder of this exercise would be irrelevant for you.)

2) Do you plan to diffuse Peer-to-Peer, Via the Market, or both? What is your thinking for why you're making your choice?

3) If you plan to diffuse Peer-to-Peer, what is important for you to think about to increase the chances that your innovation is adopted?

4) Do you wish to license your innovation or to produce it yourself? How do you think about this choice?

5) Ultimately, whether your choice is to distribute Via the Market, or Peer-To-Peer, what kind of venture do you want to build and what is important for you to think about to make that dream a reality?

Provide feedback in form of a peer assessment:

Please indicate whether the proposed plan answers most or all five questions posed in the exercise? Are the answers based on consideration of key factors presented in the course? Provide an assessment for the response(s) you reviewed using the rubric provided below.

Peer Assessment Feedback Rubric

Please award the full **3 points** when all the conditions below are met:

- *Your classmate innovator discusses whether or not to diffuse his or her innovation.* Examples of acceptable responses are:
  - He or she is not planning on diffusing the innovation.
    - This answer in general is acceptable because after all, user innovation is about use, first and foremost. In this vein, an answer such as, "Well, I solved my problem and that's all I care about," is just fine. You could also hear an answer such as, "Well, I solved my problem, but – even though I'd like to diffuse my innovation – *I just didn't find that others have this problem too*. So, it doesn't really make sense to diffuse." Such an answer is welcome too.
    - However, the innovator should assume, for the purposes of the exercise, that he or she would diffuse the innovation, to make the remainder of the process relevant and grounded.
  - The innovator would diffuse the innovation.
    - In this case, you want to hear from the innovator that he or she chose to diffuse partly because he or she "*heard from the market*". That is, *the innovator got to meet other people who experience the problem* that the innovator experiences, learning that that's a real need that should be addressed. In case of our course, the assignment involving interviews we did earlier should guide the discussion, based on what we learned through interviews whether others share the innovator's pains and the solution addresses their needs. Of course, it's fine for the innovator to state that he or she just wants to diffuse. There's nothing wrong with saying, "Hey, I want to be an entrepreneur," or, "I'd love to have impact on society through my innovations, so it goes without saying that I want to diffuse." Magic happens when this deeply personal desire for impact on society, and therefore for diffusion of one's innovation, goes in unison with the voice of the market.
- *The innovator discusses in-depth his or her choice to diffuse Peer-to-Peer, Via the Market, or both.*
  - It's perfectly acceptable, and even encouraged, to make personal considerations the front and center of this discussion. For example, an answer along the lines of, "I've always dreamed of being an entrepreneur, starting a company, and achieving financial independence" is completely legitimate. As is an answer such

as, "I'd love to offer my innovation as a free service to my community so that there are no financial barriers to its adoption, so Peer-to-Peer is the way to go for me." At the same time, personal considerations are not the entirety of the discussion. Market considerations do play a role too. For example, how does the user innovator plan to get compensated for his or her cost of innovation? Furthermore, what are the Communication and Design costs pertaining to the innovation? What does the measure of these costs say about the likelihood of the success of one diffusion path versus the other?

- *If the innovator plans to diffuse Peer-to-Peer, he or she discusses the plan to decrease costs and increase benefits both for the innovator and the adopter.*
  - Be wary of statements such as, "Surely my innovation will diffuse – after all, it's free", because to diffuse innovation, free isn't always free.
- *The innovator discusses plans to license the innovation or to produce it himself or herself.*
  - Here, a discussion of personal factors is a perfectly acceptable way to tackle the answer. For example, answers such as, "I just want to license in order to feel good from sharing my innovation, receive some royalties, and ultimately, have time to focus on other projects," are entirely valid.
- *If the innovator's choice is to produce the innovation himself / herself and diffuse it, whether Peer-to-Peer or Via the Market or both, the innovator describes the kind of venture he / she would like to build.*
  - The two choices discussed related to diffusion through market are a community-centered (small or medium) venture or a large enterprise. Keep in mind, similar logic applies to Peer-To-Peer ventures as well, as both options could be for-profit and non-profit. For example, consider Derya and Divers for Oceanography. If the innovator shares the interest to build a large enterprise, it's important for you to hear how the innovator seeks to adapt and evolve his or her product to encompass a likely more heterogeneous population of consumers. Remember, this applies to Peer-To-Peer as well. Think of Derya vs. Imi Lichtenfeld in thinking about this choice, the innovator would be well-served by thinking about user homogeneity, or heterogeneity, in his or her market and what that implies for the kind of product, and ultimately company, the innovator is poised to build.

<u>Award 2 points when answers show less than a perfect plan such as that below:</u>

You now have a good sense of what a "3 point" submission looks like. Work back from that to determine what qualifies for 2- or 1-point. Keep in mind the following considerations, which are most important.

- Diffusion is about a sequence of choices.
  - The first choice is whether to diffuse or not.
  - The second choice is whether to diffuse Peer-to-Peer, Via the Market, or both.
  - The third choice is whether to license your innovation or to produce it yourself.
  - The fourth choice is about the kind of company the innovator is looking to build.

A submission that falls short of the highest mark, would be a work that discusses most but not all choices in the sequence. We've learned that diffusion choices involve personal and market-driven considerations. Both are important and legitimate. They are, so to speak, the yin and yang of diffusion. A submission that falls short of the highest mark and earns only 2 points is a submission that discusses either only the personal or only the market-driven considerations.

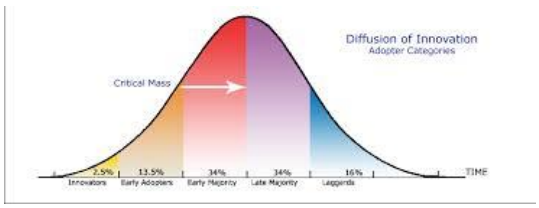
1 Point

Please award 1 point when answers show there is the need for more work to do:

The submission does not assume that the innovation would be diffused. It states that the innovator makes a choice not to diffuse and stops there, without discussing the bulk of the other questions posed in the assignment. While certainly legitimate in real life, this is against the spirit of the exercise. The submission does not cover most of the choices in the diffusion choice sequence – only one or two choices in the sequences are covered.

Comments: Things to consider for comments could involve:

- What thoughts do you have on the discussion of diffusion offered by this innovator?
- What's your favorite part about this submission?
- What suggestions for improvement could you offer?
- What advice and words of encouragement do you have?



User Innovation Reflections

Assignment 11: Provide a reflection about the User Innovation exercises and activities

Goals:
- explain the main factors leading to democratization of Innovation
- demonstrate understanding about user and producer innovation economy

Instruction: This exercise is a peer assessment. Just like with the former exercise, you will be graded by your peers. Your job will be to grade your peers too. Try not to approach the assessment process strictly. Look at it as an opportunity for you to get excited by the innovations of your peers, discover new perspectives, and offer constructive and encouraging feedback. Give it a nice last hurrah.

One of the main themes of our course is that innovation is becoming more accessible for everyone. We care about this not just because it gives us hope and inspiration, but also because there are some fundamental forces that drive our society and economy today. These forces are democratizing innovation. And it behooves you as a user innovator to understand these forces and, ultimately, learn to employ them for the benefit of your innovation and the world.

So, dedicate your reflections to answering these questions:

1) What are some of the forces that you've learned about in this module that are democratizing innovation?
2) Why and how, in your opinion, do they democratize innovation?
3) Which of these forces is most relevant for you?

Finally, write a few words of congratulations on completing this module (User Innovation section) for your peers.

Rubric for Peer Assessment of User Innovation Reflections

Award the full **3 points** when all the conditions below are met:

3 Points

- The reflection points out at least two fundamental forces driving the democratization of innovation.
- The document discusses the implications of the highlighted forces. For example, a possible implication of declining costs of communication is the increased ability to create innovation communities. For user innovators-entrepreneurs, declining costs of communication also offer the potential of reaching more customers and reaching them more quickly.
- The reflection addresses and even prioritizes, the relevance of the forces for the innovator. For example, the declining costs of product design ought to mean a great deal for innovators in hardware products.
- Your classmate offers a word of encouragement and advice to the peers.

Award **2 points** when answers are less than perfect in the document such as:

2 Points

- Only one force driving the democratization of innovation is discussed. OR
- It doesn't discuss why and how the described force democratizes innovation. OR
- It doesn't discuss the relevance of the highlighted force for him or her.

Award **1 point** when answers show significant need for improvement:

1 Point

- The submission doesn't hit upon the points presented in the rubric. As Confucius once said, "It's hard to find a black cat in a dark room, especially if the cat isn't there."

Comments: Don't forget some words of encouragement!

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- Hienertha, Christoph; von Hippel, Eric; Morten, Berg Jensen (2014), "User community vs. producer innovation development efficiency: A first empirical study", Research Policy 43, 190– 201

- Riggs, William and Eric von Hippel, 1994, "Incentives to innovate and the sources of innovation: the case of scientific instruments", Research Policy Volume 23, Issue 4, Pages 459-469

- Riggs, William and Eric von Hippel, 1992, "The Impact of Scientific and Commercial Values on the Sources of Scientific Instrument Innovation

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Additional Video Links:

- Innovator Mako Hill on Collaborative Communities (Part 1/4) (6:15 Minutes)
- Innovator Mako Hill on Collaborative Communities (Part 2/4) (5.51 Minutes)
- Innovator Mako Hill on Collaborative Communities (Part 3/4) (1:40 Minutes)