

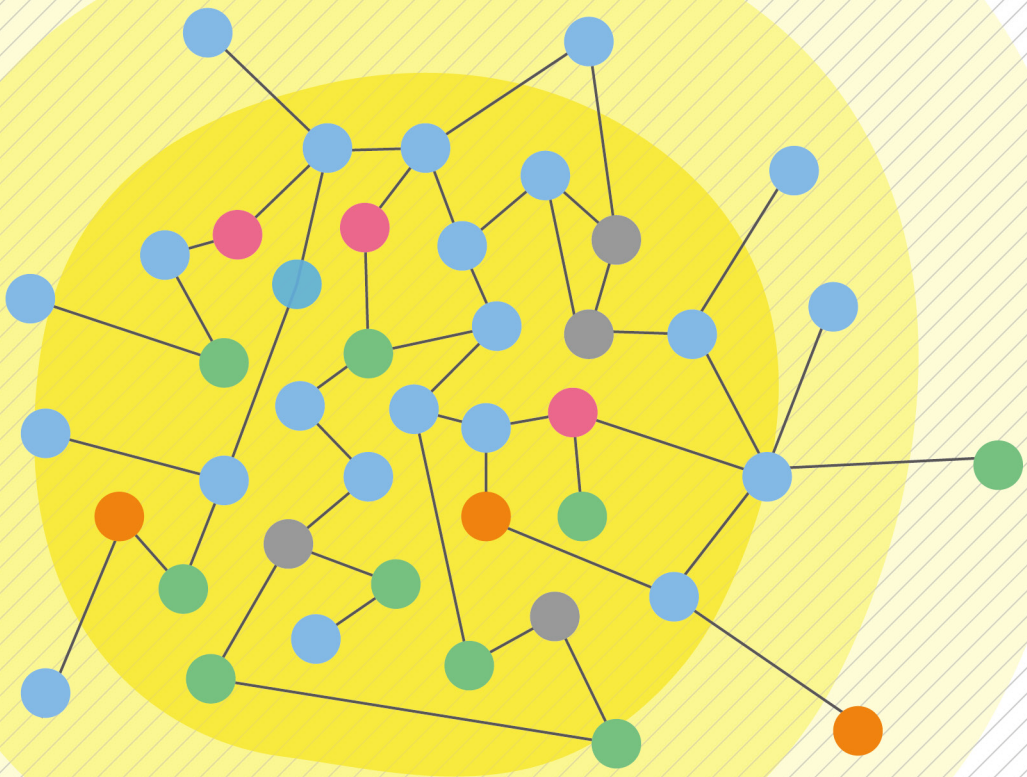
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# ***Open innovation community for cross-disciplinary research collaboration***

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*Scenarios for the Biomimetic Design Lab  
(BiDL) at Tongji University*

**Yue Zhu**





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at Tongji University

**Yue Zhu**



Master of Art thesis by Yue Zhu  
International Design Business Management (IDBM),  
Department of Design  
Aalto University, School of Arts, Design and Architecture



*“ What is wise in this  
world exists equally  
inside of us and outside  
of us, and it is through  
**collaboration** that  
wisdom, stories, songs are  
made manifest. ”*

----- Joanne Arnott



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# ABSTRACT



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**Author** Yue Zhu

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## Abstract

After the third industry revolution, technology has been developed extremely fast - web technology has leaded the world into era of Web 2.0. Now the world is becoming more connected and networked than ever before. Under this circumstance, it seems reasonably clear that how to innovate and how to use resources in a more efficient and effective way becomes one of the most important topic of discussion in this era. Now a number of open movements have been merged into the current innovation activities, including open innovation, open source, crowd sourcing. People have realized the power of collaboration in a wider range, through bridging the internal and external resources; it was further noted in some certain cases innovation could be faster and more sustainable. In addition, the trend of open innovation has been developed towards the form of "community". In the mega-trend of open innovation, research institution should seek its unique pattern and way to make innovation development as well. Now, cross-disciplinary collaboration has been one of the common research ways for research institution.

"How to build an open innovation community for cross-disciplinary collaboration research" is the main research objective of this thesis. And the aim of this thesis was to create guidelines for cross-disciplinary collaboration research institutions to build open innovation communities. Question of "how to initiate and sustain community" has been investigated in this thesis. The extensive literature review has identified attributes of open innovation community summarizing process of building open innovation community and key points along its process. By studying the cases of P&G's "connect and develop" program, OpenIDEO, and SFC (Sino-Finnish Center), key points of building open innovation community together with practical complements have been discussed in depth. Based on these insights, the guidelines of building open innovation community were therefore possible to be outlined and summarized.

BiDL research lab of Tongji University was the design case, which had been carefully studied in this thesis, and the guidelines of building open innovation community have been applied to BiDL research lab. A major effort was imported by the author to systematically discuss the key points of building open innovation community in the view of the background and current situation of BiDL lab, as well as the way how to design the communication platforms of BiDL community. Based on the prototype of BiDL community, this thesis proposed a new direction of development for cross-disciplinary collaboration research, and would be a reference for those who wish to build open innovation communities.

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**Keywords** Open innovation, community, process, management, communication channels, knowledge creating and sharing, community engagement, online platform.

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# INTRODUCTION

01

# 1. Introduction

## 1.1. Background

Nowadays, open innovation has already become a megatrend for a variety of firms or organizations. The way of how human society innovates is currently undergoing a significant shift. Companies have built their own open innovation platforms to collaborate with external entities and look for future-oriented solutions for their problems, which dramatically improves their efficiency and lowers their costs. Others have constructed online open innovation platforms that leverage crowdsourcing for social good. After more than a decade of development, open innovation is not just a way of internal and external resources management, it also becomes a way of running communities, and more and more are driven by internet and social media, the concept of “open innovation” become deeply related with “open source”, “crowdsourcing”, “co-creation”, etc. The role of communities has been recognized in the area of creating and disseminating knowledge and innovation.

The benefit that open innovation has brought to firms inspires academic institutions as well. In China, the traditional research way of academic institutions is kind of closed innovation. Most of the time, researchers work in the labs does not have much external resource input or internal resource output. And we should be aware that not all the best talented people would work in one lab, and there may already has a relevant solution outside for the problem, so working in an open innovation way could better leverage the external source and make better use of the internal source to improve efficiency and stimulate innovation for academic institutions as well. Especially nowadays, the MOOC(Massive Online Open Courses) become very popular and well accepted, the traditional education way is being debated and about to be changing.

A sustainability lab (BiDL) is currently trying to be built by Professor Leuba Leuba with his team at Design and Innovation College (D&I) of Tongji University, biomimicry and biomimetic design would be one of the main research areas in the lab. Biomimicry as a fast-emerging, cross-disciplinary science and engineering practice demands both internal source in design school and external source from other disciplines, interdisciplinary collaboration would be one of the key activities of BiDL. For now BiDL is working with many other external international biomimicry researchers and trying to construct the networking with other institutions. The Leaders of BiDL also have then intention to develop BiDL towards an open innovation

way in the near future: the research achievements would be open source for students, employees, teachers of D&I.

## 1.2. Objective

The main research objective of this thesis is to investigate how to implement open innovation into cross-disciplinary research collaboration, and BiDL, the biomimetic design lab at Tongji University would be a design case in this thesis. To design the open innovation scenarios for BiDL, how to construct and sustain the open innovation community would be the main focus and to be discussed in this thesis, the practical influence factors of building community would be probed, and guidelines of building an open innovation online platform would be generated and applied to BiDL case.

## 1.3. Research questions

- How to initiate and compel community?
- How to sustain community through various means?
- What are the differing incentives?
- What would be the appropriate way to organize or combine different tools of open innovation for cross-disciplinary research collaboration?

## 1.4. Scope

The scope of this thesis will focus on cross-disciplinary research collaboration, and its context related to open innovation ecosystem would also be discussed. To understand the context of cross-disciplinary research collaboration, author will look into a series of open innovation cases, including profit-driven firm, design platforms that pursuit social value, and non-profit education platform, etc. Further more, practical factors would be analyzed in this thesis, including the tools of implementing or promoting open innovation.

## 1.5. Thesis Structure

The main structure of this thesis is as follows:

- Literature review:

In this part, literatures about open innovation development and open innovation community would be reviewed to acquire insights, including trend of open innovation development, related terms of open innovation, definitions and attributes of open innovation community, and

key points of building open innovation community.

- Case study:

Based on the achievements from literature review, three cases of open innovation community would be studied, which could contribute to gaining deeper understanding of how to form and sustain the community, and accumulate more practical knowledge.

- Guidelines generation:

According to the outcome of literature review and case study, guidelines of building open innovation community would be generated through community building process.

- Case design:

Apply open innovation community guidelines to BiDL case, discuss how to build BiDL's open innovation community, especially considered key points of different community building stages, and create proposals for BiDL to create and sustain its open community comprehensively.







# WHAT IS OPEN INNOVATION COMMUNITY

# 02

## 2. What is open innovation community

### 2.1. The brief of open innovation

“Open Innovation” is a term developed by Henry Chesbrough, which conclude “Open Innovation” as a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, it means that valuable ideas can generate from inside or outside the firm and can enter the market from inside or outside the company as well<sup>1</sup>. Stefan Lindegaard suggested that we should view open innovation as a philosophy or a mindset, and the more practical definition he gave is that open innovation is about bridging internal and external resources and acting on those opportunities to make innovation happen<sup>2</sup>.

The concept of open innovation is originated from the theory of commercial company management, while since we are in a networking era, everything is strongly connected with others, the theory of “Open Innovation” brings inspirations to almost all sectors of society.

#### **“Closed Innovation” vs. “Open Innovation”**

In the words of the historian of science Thomas Kuhn, Henry Chesbrough said that there is a “paradigm shift” in how companies commercialize industrial knowledge. The old paradigm of how companies innovate could be called as “Closed innovation”, in which the organization would control over the whole innovation process and all the ideas would be kept inside the organization, the managers would avoid sharing resourced with outside. While, the new way of innovation is named as “Open Innovation”, in contrast with the closed innovation, open innovation organizations works with external resources. The principles that differing closed innovation and open innovation includes that it is impossible that all the talented people work in the same organization, and the organization that could make the best use of internal and external ideas would win. These principles also could apply to non-profit organizations. Although now not all the industries operate in an open innovation pattern, it is clearly a megatrend that running in an open innovation way could make innovation better, faster and greener. Stefan Lindegaard pointed that open innovation is the future and the term “open innovation” would vanish in five to seven years, it would be

1 Henry Chesbrough, “Open Innovation: The New Imperative for creating and Profiting from Technology”, 2003.

2 Stefan Lindegaard, “Making Open Innovation Work”, 2011.

viewed as “innovation”, because most of the organization would already chose to operate innovation activities in an open way, and everyone would eventually use open innovation models. Besides, Lindegaard also suggests that it is essential to build open innovation capabilities in as parts of the organization’s innovation DNA, since the mindsets of the staffs is the fundament of innovation movements.

### **“Open Innovation” VS “Open Source”**

It is quite common for people to sense confusion of the two concepts “open innovation” and “open source”, while as Chesbrough (2011) defined that “Open innovation is sometimes confated with open source methodologies for software development. There are some concepts that are shared between the two, such as the idea of greater external sources of information to create value. However, open innovation explicitly incorporates the business model as the source of both value creation and value capture. This latter role of the business model enables the organization to sustain its position in the industry value chain over time. While open source shares the focus on value creation throughout an industry value chain, its proponents usually deny or downplay the importance of value capture.<sup>3</sup>” Thus it makes a clear poin that the main difference between “open innovation” and “open source” is that the former has a prime goal of capture value.

Just as Chris and Stefan Lindegaard pointed out in the conversations host by opensource.com<sup>4</sup>, another critical difference between open innovation and open source is that collaboration in the open innovation world is much more transactional, and most of the efforts are taken by a company which has the desire to increase revenues and profits, besides, most of the achievements would belongs to the company which running the project. While in an open source innovation project, usually the problem or opportunity would be put in the central position instead of the company or organization itself. And they also suggested that open innovation and open source are both great tools that suitable for different works, for instance, open innovation fits better for companies that want to innovate faster and focus on their own problems, while open source works more efficiently for communities that shares common problems and opportunities. For now, the open source innovation works great in the software industry, and not rise people’s expectation for creating business value. Comparatively, open innovation model is more effective and realistic in short-term circumstance. But since open source usually has better performance in building and managing community,

3 Source: Chesbrough, H. (2011). Open Services Innovation: Rethinking Your Business to Grow and Compete in a New Era (1st ed.).

4 <http://opensource.com/business/10/10/open-innovation-and-open-source-innovation-what-do-they-share-and-where-do-they-diffe>, January, 2014.

so the open source model, in which people and organizations are all connected to each other, has great value in being a reference for construct community by an open approach.

“Open innovation” and “open source” are not mutually exclusive, since they are both open approaches for innovation activities. Francois Letellier’s, an open source specialist, supported the point that open source is a very effective form of open innovation.

### ***The process of Open Innovation***

From the Open Innovation Paradigm that created by Henry Chesbrough, we could view open innovation from a process view, during the process from research to development, and then to the market, the boundary of the firm is permeant, thus there are inflows and outflows of resources exchanged along the process. As we also could learn from this open innovation paradigm, open innovation is an approach that could work and better to be used at any stage along the innovation process, not just at one single specific stage, even though most commonly firms would be more likely to accept external input in the front end of the innovation instead of along the whole process. Author thinks that the reasons of why many companies fall into the trap of applying open innovation only in the front end includes that they may not understand the real impact of the tools of open innovation and do not know how to use them as a combo during the whole innovation process, Lindegaard also point another reason that people would look forward more creativity and openness at the front end, and after the front end, things would become more complex to be openness, so usually companies would get into execution mode.

### ***“Ecosystem” vs. “Community” in Open Innovation***

The principle of Open Innovation requires the organizations would bridging the internal and external resources, and also build an open innovation culture and mindset, which means that every members or department inside of organization and every stakeholders of the organization is be aware of the fact that they need to be or already is connected with each other, thus an open innovation ecosystem would be conceived. From a company’s perspective to view the ecosystem, the stakeholders would include trade partners, venture capitals, SMEs (small and medium entrepreneurs), joint development partners, suppliers, academic institutions, government labs, and consumers, etc. The diverse stakeholders has different expertise areas and strengths, for example, the supplier has its unique information channels, and knows better about certain products; while the consumers could be involve to provide their insights about the service experience, to launch co-creation activities and improve the product to better enter the market, and so force. So, if we view the open innovation activities from ecosystem perspective, then it

will be easily to understand that open innovation has the base for cross-disciplinary collaboration.

While, Kevin McFarthing discussed the different of organizing open innovation by ecosystem and community perspectives<sup>5</sup>, and he suggests that in the open innovation ecosystem, there are various connections between stakeholders, but not all of them to the core, McFarthing suggests that ecosystem only provide the environment for open innovation activities, but it could not drive for collaboration or create innovation. He also suggests that open innovation community should also be strived for, since in the community, the members could address each other as comrade. The community is a deeper representation of certain intent and goals, which also strive for core value creating. Stefan Lindegaard also suggests that the open innovation movements are developing towards community now.

## 2.2. Definitions of community

The traditional definition of “community” is a group of people that shares common values, while Lauren Perkins, the CEO of Perks Consulting, gives a new definition of “community” in the tech world in her course of “Community-driven user acquisition” on General Assembly website<sup>6</sup>, which is “a network of individuals who interact through digital mediums in pursuit of mutual interests or goals”. Besides, Joel West and Karim R. Lakhani developed the definition of Gläser (2001) and proposed that a community to be a voluntary association with members that assembled by a shared goal. Community also meant, “support from people who share common joys and trials” (Dede, C.J. 1996). In the case of open innovation, the voluntary members united in communities by creating, adapting, adopting or disseminate innovations. And community-building referred to creating a sense of belonging, of connected to others and to ideas and values (Sergiovanni, T.J. 1995).

As author presented before in the “open innovation” versus “open source” section, open innovation model usually works in firm-centric form, according to the phenomenon and definitions of “community”,

<sup>5</sup> Organizing Open Innovation – Ecosystems or Communities? Kevin McFarthing, April 10, 2012

<http://www.innovationexcellence.com/blog/2012/04/10/organizing-open-innovation-ecosystems-or-communities/#sthash.BfjbgJnL.dpuf>

<sup>6</sup> <https://generalassemb.ly/online/videos/introduction-to-user-acquisition/>, March 1st, 2014.

members in the community do not necessarily work for same organization, thus author supports the opinion that communities have the capability to outstretch the firm-centric feature of open innovation. (Chesbrough, 2003)

## 2.3. Attributes of Open Innovation community



Figure 2.3  
Five attributes of Open  
Innovation Community  
Source: author

### **Openness:**

There are many different types of communities, the open innovation communities has feature of creating innovation outside the boundaries of the organization. Thus an open innovation community generates innovation through an open approach.

Talking about the openness, West and O'Mahony (2008) suggested a framework, which suggest that the openness include two aspects: Transparency and Accessibility, the transparency denotes to the aulity and quantity of information should be freely unveil to community members, while the accessibility refers to the possibility for community



members to dynamically participant in the community activities. Move over, Kerstin Balka, Christina Raasch, and Cornelius Herstatt (2010) added the third aspect of openness, which is Replicability, it denotes the possibility for community members to obtain or copy the open source in the community.

### **Diversity:**

As von Hippel (2005) suggests, “Innovation communities can have users and / or manufactures as members and contributors”, author thinks that open innovation community has the feature of diversity, the community could encompass different stakeholders, including main users and sponsors, etc.

### **Networking:**

There are overlaps in the definition between networks and community. In the Web 2.0 era, massive connections have been built between communities, thus it also makes the process of networking. Vanhaverbeke (2006) advocates that network plays a core role in organizing the open innovation activities. Author emphasizes that each open innovation community is not separated, on the contrary, according to the openness and diversity of open innovation community, the community members could be in several communities at the same time, which also bring possibilities to connect communities, and networks are forming along with these connections.

### **Knowledge creating and sharing:**

Open innovation communities can act as a source for learning and generating external ideas or solutions for organizations (Chesbrough, 2006). For innovative communities, knowledge sharing is a vital aspect of activities and a requisite condition for the community to acquire innovation ability at the initial stage (Lars Bo Jeppesen, Keld Laursen, 2007).

### **Value capturing:**

As author analyzed before, the main difference between Open Innovation and Open Source is that the former one has a prime goal of capture value. As an open innovation community, besides the capability of generating innovation and creating value, it is rather important to realize of value, at least take “how to capture value” into main consideration.

## 2.4. Chapter conclusion

In this chapter, author synthesize literatures of general knowledge related to Open Innovation and open innovation community, explained the definitions of both concepts, compared the differences between Closed Innovation and Open Innovation, discussed the characters of open innovation community. Moreover, it is found out that “community” has

became one of the fundamental forms of open innovation activities, and the trend of open movements develops towards “community”. Thus, it is critical to study “community” form for open innovation activities.

While, only having the overview of open innovation community is not enough for gaining a comprehensive understanding of how to form and retain the open innovation community, so in the next chapter, author will investigate the keys of how to initiate open innovation communities.





# COMMUNITY BUILDING STRATEGY

# 03

## 3. Community Building Strategy

As in the last chapter, author mainly reviewed what is open innovation community on the theoretical level, and in this chapter more practical factors would be discussed. Now almost all the open innovation communities would tend to choose Internet platform as their intermediary, so when we talked about open innovation community, it is hardly to discuss this issue without involving online platform, while the organizational management behind the online platform is another important aspect, and according to the management strategies, suitable tools could be chose and organized to launch and sustain open innovation communities.

Open innovation community could be viewed and developed from different perspectives including the users' motivations, communication channels or management tools. Author considers it is critical to for an open innovation community to not only participate into the open innovation ecosystem to connect with different stakeholders, but also need to acquire potential community members to join its own innovation process, and then sustain community members to form an active open innovation community. Therefore, "how to form community" becomes one of the key issues in this thesis.

### 3.1. Community Building process

Open innovation could be viewed and developed from different perspectives including the innovation process, networking or ecosystem. Author considers it is critical to for an open innovation organization to not only participate into the open innovation ecosystem to connect with different stakeholders, but also need to acquire participants to join its own innovation process, and then sustain participants to form an open innovation community. Therefore, "how to form community" becomes one of the key issues in this thesis.

The traditional definition of "community" is a group of people that shares common values, while Lauren Perkins, the CEO of Perks Consulting, gives a new definition of "community" in the tech world in her course on General Assembly website, which is "a network of individuals who interact through digital mediums in pursuit of mutual interests or goals".

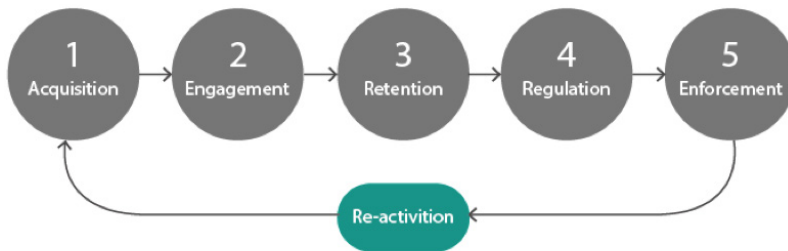


Figure 3.1.1  
User acquisition  
lifecycle,  
Source: Lauren Perkins,  
2013

Lauren Perkins introduced a user acquisition lifecycle for running the community (see Figure 3.1.1). It shows that it is not enough for just acquire users at the beginning. Actually there are five main steps to construct a completed community:

1. The first step is acquisition: at the every beginning, potential users would get the information and come to visit.
2. The second step is engagement: as soon as the visitors are acquired, they should be engaged into the activities, and the actual relationship has been build from this phase, the visitors would be transformed into community members.
3. The third step is retention: After building the relationship with community members, the community manager needs to manage and retain the community members.
4. The fourth step is regulation: once the vibrant community has been acquired, there are some regulation issues need to be noticed, the community members should be aware of what is the regulation of the community. This step is about putting rules up.
5. The fifth step is enforcement: this step is about making sure that the rules have been setting up would be enforced.

More over, after a period, some of the community members' interests may get decreased, and in this situation they should be treat as new users and need to be reacquired again.

Regard to the community development process, Feverbee.com, which is a community management online course platform, introduces an alternative approach of building a community<sup>1</sup>. The detailed processes are as follows (see Figure 3.1.2):

1. Set realistic objective; 2. Prepare resources and expectations;
3. Audience and sector analysis; 4. Conceptualization; 5. Platform Development; 6. Small-scale prototype and test; 7. Establishment; 8. Maturity; 9. Mitosis. These processes advocate a step-by-step method of building online community, which indicates that thoughtful preparation is needed before building a community. Besides, In the course document, it is also pointed out that the communities' life span differs by the

1 <http://course.feverbee.com/communitydevelopment.pdf>

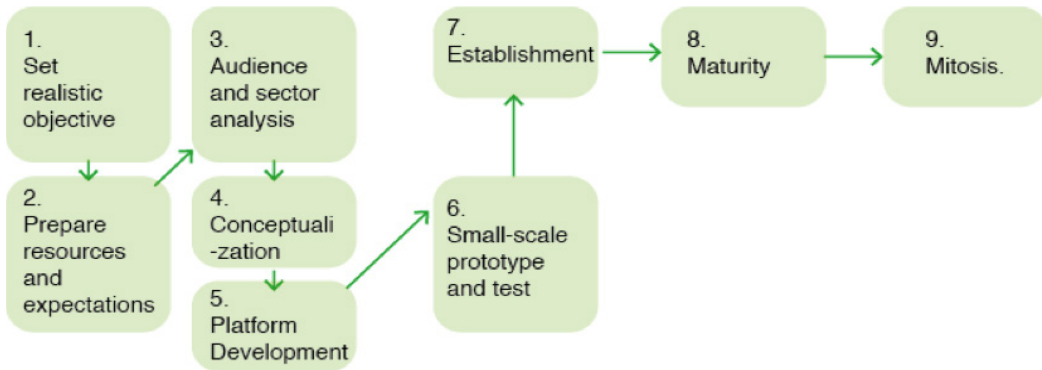


Figure 3.1.2  
Community development process,  
Source: <http://course.feverbee.com/communitydevelopment.pdf>, Feb, 2014

members' interests and the management skills.

Former literatures have discussed the process of community-building in distance learning classes as well. Dr. Ruth E Brown (2001) suggested that there are three levels of community. The first level is making-online acquaintances, the next level is about participants become community members and being part of the community, the third level is camaraderie emerged in the community. (see Figure 3.1.3).



Figure 3.1.3  
Community building in distance learning class,  
Source: Dr. Ruth E Brown, 2001

Author compared these three different theories about community building process by mapping these steps along the process. Then it is clear to see that these three different theories could be categorized into three main phases (see Figure 3.1.4 and Figure 3.1.5):

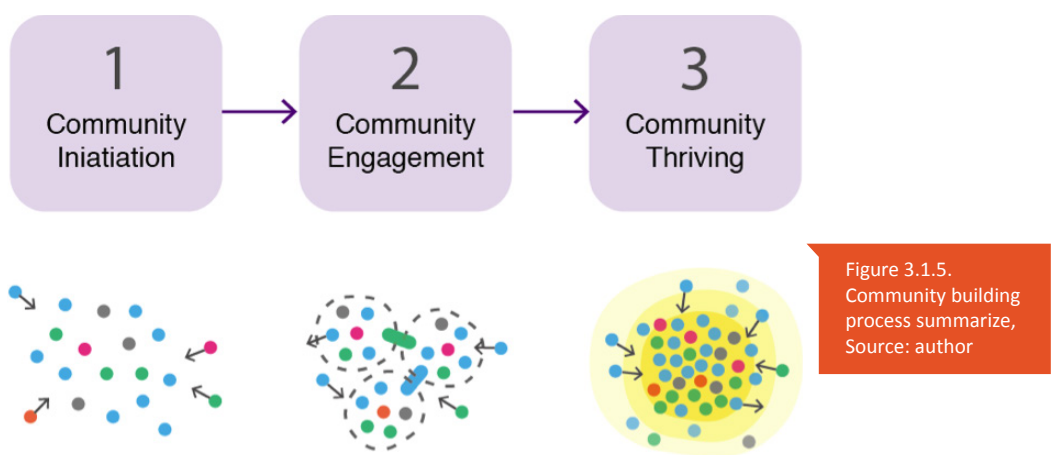
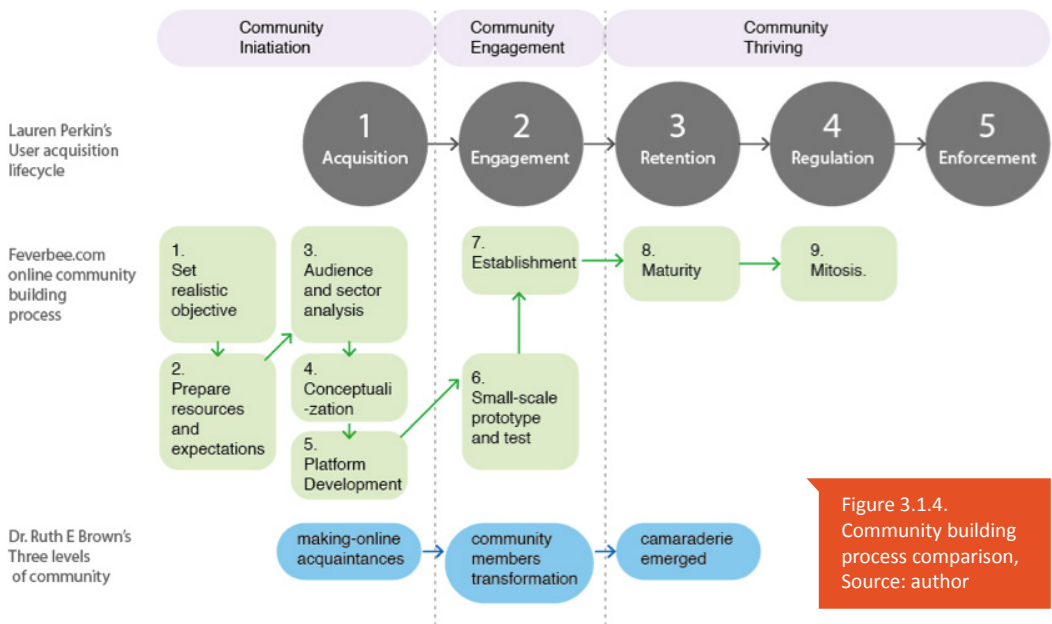
**1. Community initiation:**

This phase is mainly about acquiring potential community members, and they are still visitors for the community. The community organizer should consider how to acquire more potential users at this phase.

**2. Community engagement:**

After acquiring visitors, community managers should engage them into the community through events or activities, it is a process about transform visitors into community members, and the relationship among the community members are start to form.





### 3. Community thriving:

After the community engagement phase, community members have been connected, and the main challenges in this phase is how to sustain and thrive the community.

Thus the core process of community building could be simplified into these three phases.

## 3.2. Key points of Open Innovation community building

### 3.2.1. Consider determining questions

Lauren also suggested there are several determining questions of community should be considerate thoughtfully when plan to build a community. The community manager needs to understand a series of situations about the potential users, especially the user behaviors:

- What is the purpose for your open innovation community?
  - What are the main challenges?
  - Where is your audience now: where do they spend most of their time?
- What the users behavior already is?
- Where will you reach out to them?

How to build the communication flow between you and the users?

- Which channels are going to be important for you and your audience?

The diverse channels always linked to different contents that attract different users/ what your ideal customers looks like?

- What is the use case for each channel?

What tools that people are using most usually?

### 3.2.2. Establish communication channels

#### ***The management styles for Open Innovation online platform***

Lauren Perkins introduced two different community management styles in her course, one is about user-generated style, and another is filtered style.

The filtered style is a more traditional way of managing platform, in this style, the community manager does the majority work, they have the duty to filter and organize the information generated on the platform. On the contrary, in the user-generated style, users are the main contributors of the content on the platform; the platform is self-organized to some extend, tools like crowdsourcing probably would be used, while the community manager only does little manage work, which low down the cost of human resources.

The user-generated content has been characterized as a two-way conversational media, it is one of the key features of Web 2.0 which

advocate everyone to create one's own content, comment on or edit others content. Variety of types of user-generated content includes forums, blogs, wikis, social networking sites (e.g. Facebook, renren.com, etc.), customer review sites, crowdfunding sits and so forth. The key for encourage user-generated style is to understand that it is more about creating a "fun space" for participants rather than generating material for them to consume, and the social incentives always motivate people signally and sustainably, which author would discussed further in the next section.

### **Social media**

Social media is defined as that which offers the way people share ideas, content, thoughts and relationship online (Scott 2010, 38). It also has been defined as that which allows anybody to communicate (Sterne, 2010, xvii).

Stefan Lindegaard (2012) poined out that innovation is increasingly tend to happen in communities, and that would be driven by social media and social media tools and service<sup>2</sup>. He also suggest that social media supports open innovation in five aspects:

1. Better interactions with others that goes beyond the organizational boundaries;
2. Promote the idea generation and feedback loops;
3. Better understand the ecosystem by business intelligence;
4. Find the right new people for assisting your innovation efforts;
5. Improve the innovation outcome by branding, promotion and marketing.

Social media is one of the perfect tools for co-creation and collaborative innovation. Billions of Internet users joined thousands of online communities to stay connected others and share user-created content such as images, video and articles. Social media sites like Facebook, Twitter and LinkedIn have created a whole new communication landscape. And they offer massive opportunities for organizations to interact with their audiences more frequently and easily.

### **Wiki**

Wiki is a web application that enables individuals or organizations to modify or edit content in collaboration with others. The most famous and successful product of Wiki is Wikipedia. Now wiki has been used into different fields, universities also have been taking endeavor to construct teaching platform by applying Wiki technology.

The benefit of Wiki has been acknowledged widely, in a guidebook that

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<sup>2</sup> Stefan Lindegaard, "The impact of social media on open innovation", August 20, 2012.

developed by wiki and licensed under Creative Commons, wiki’s tangible and intangible benefits has been categorized as follows<sup>3</sup>:

Table 3.2.2 Tangible and Intangible benefits of Wiki (James Matheson, Mar 14, 2009)

Tangible benefits	Intangible benefits:
<ul style="list-style-type: none"><li>• Reduce project delivery time</li><li>• Improve communications and collaboration.</li><li>• Reduce emails by 30% or more</li><li>• Eliminate the costly practice of emailing, editing and merging documents.</li><li>• Openness and transparency</li><li>• Increase in work product re-use</li></ul>	<ul style="list-style-type: none"><li>• Connect people across organizations</li><li>• Used as a project management tool</li><li>• Multiple ways of using the platform</li><li>• Easy editing</li><li>• Easy to keep updated</li><li>• Interactive conversation</li></ul>

Wikis do provide a powerful, creative platform for collaboration. In the core of a wiki project is collaborative knowledge building by participants, mediated by user-generated design. Nowadays, it is quite common that many education institutions and universities are using wiki as a tool for teaching. Wikis help engage students in their learning while providing social interaction and learning communities with their peers in the learning process. Many instructors have found that wikis meet the needs of the changing educational environment by allowing students to take ownership of their learning as they collaborate on projects<sup>4</sup>.

Author also noticed that wiki is a prefect tool for managing massive resource and building an open database. If combine wiki with crowdsourcing, such as Wikipedia, it is possible to build a self-correct database platform.

More over, there are several challenges for using Wiki as an education platform:  
Students enjoy the shared space and ease of use of wikis and frequently add and delete information; they are reluctant to edit each other’s work<sup>5</sup>. Ioanou and Artino <sup>6</sup> also pointed out that students had uncomfortable

3 <http://docs.servicerocket.com/display/www/Benefits+of+using+a+wiki>, December 30, 2013  
4 Robert E. Cummings and Matt Barton, Wiki Writing: Collaborative Learning in the College Classroom (Ann Arbor, MI: Digital Culture Books, an imprint of the University of Michigan Press and the University of Michigan Library, 2008).  
5 Brian Foley and Tae Chang, “Wiki as a Professional Development Tool,” in Proceedings of Society for Information Technology and Teacher Education International Conference (SITE) 2008,Karen McFerrin, Roberta Weber, Roger Carlsen, and Dee Anna Willis, eds. (Chesapeake, VA: AACE, 2008), pp. 2959–2966  
6 Andri Ioannou and Anthony R. Artino Jr., “Wiki and Threaded Discussion

feelings when editing another's work and regarded this requirement as an additional pressure. In addition, a course has requirement with collaborative learning might be a mismatch for a student who would be more willing of learning alone. A study of solitary learners reflects that while these learners valued the multiple perspectives provided by online discussions with peers, they preferred individual accomplishment of course-specific tasks and did not readily participate in collaborative instruction<sup>7</sup>. Other students might not be comfortable in learning environments where they are expected to take ownership of their own learning, where changes in pedagogy might not fit their expectations and thus not be valued by them<sup>8</sup>.

### 3.2.3. Generate various motivations

It is obvious that not all the people will created contents or participant the events on in the community, to puzzle out what drives people to join the on-line activities and what attract them to join the communities, by which means, would be very critical for constructing an open innovation community.

The “1-9-90 principle” is already well-known in Internet culture, it means that only 1% of the participants are really actively create new content, 9% of the participant would edit the exist content, and 90% of the participant choose to be lurkers, usually they only view the content without contributing<sup>9</sup>. But the lurkers in this site may not still be a lurker at another site; for instance, one may only view the Wikipedia pages to gain the basic knowledge, while he could post vast information about himself on Facebook or Twitter. Then the issue of motivations of different active rate performance shall be very valuable to be discussed at here.

The incentives that many user-generated sites used to motivate users' contribution have been categorized as implicit and explicit motivations by Frank Smadja<sup>10</sup>. The implicit motivations include social connection,

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for Online Collaborative Activities: Students' Perceptions and Use,” *Journal of Emerging Technologies in Web Intelligence*, vol. 1, no. 1 (August 2009), pp. 97–106.

7 Fengfeng Ke and Alison Carr-Chellman, “Solitary Learner in Online Collaborative Learning: A Disappointing Experience?” *Quarterly Review of Distance Education*, vol. 7, no. 3 (Fall 2006), pp. 249–265.

8 Laura Zurita, “Learning in Multicultural Environments: Learners as Co-designers,” paper presented at Networked Learning 2006, April 10–12, 2006, Lancaster, UK.

9 Charles Arthur, “What is the 1% rule? ”, *The Guardian*, Thursday 20 July 2006

10 Frank Smadja, Toluna: “Mixing Financial, Social and Fun Incentives for Social Voting”. Retrieved 3 March 2010.

badges, or levels on the site. While the explicit motivations are about the tangible rewards, mostly it means monetary rewards. It should be noticed that the tangible rewards would reduce the impact of the other form of social motivations, and since the tangible rewards has higher requirement of financial cost, it makes the content host have to spend heavy cost to retain long-term contributors.

According to other literatures related to participant motivations, it is distinguishes as two main types of motivations: intrinsic and extrinsic motivations. The intrinsic motivation includes fun, self-determination, competence, curiosity, interest, task involvement, while the extrinsic motivation includes evaluation, recognition, monetary incentives, etc (Amabile, 1993; Ryan and Deci, 2000). And it turns out that intrinsic motive such as fun, recognition and reputation is drive people more sustainable than monetary rewards. Both Hertel et al. (2003) and Wolf (2005) suggest intrinsic motives is the most underlying reasons for people to participate constantly, for instance, the enjoy-based intrinsic motivation is the strongest and most ubiquitous drivers than others. (Lakhani and Wolf, 2001; Lakhani and Wolf, 2005). Further more, it has

Table 3.2.3 Four types of motivation (Hutch Carpenter, 2011)

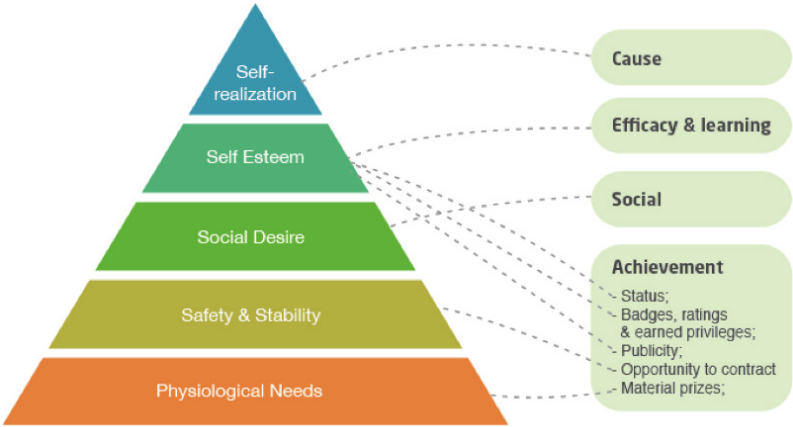
Type	Brief	When it applies	Examples	Watchouts
Cause	Cause is the motivation of an individual to see or make improvements in something of personal interests.	Cause is the best form of forming community, it is because of that cause is about to “tapping people’s innate desire to see something improved, something that is important to them”, and cause extends to people’s expects as well.	My Starbucks Idea: customers submit and vote ideas for the taste they like;	1) watchout for a failure to engage the community;  2) To let everyone aware participants’ contribution.
Achievement	Achievement as a powerful form of motivation, competing against others to accomplish a goal of personal interest. Several ways of this motivation: 1. Cash prizes; 2. Non-cash-prizes; 3. Status; 4. Badges, ratings and earned privileges; 5. Publicity; 6. Opportunity to contract	Achievements motivation is suitable in almost all circumstances of crowd-sourcing / community forming, especially be applied to an initiative.	Cisco I-Prize applied several ways of implementing achievements motivation: A high prize was set for the top ideas; participants could sell ideas and earn reputation based on their contribution.	It is critical to make it clear about how to select the winning ideas.
Social	The social motivation consists of two parts: 1) Interacting with others with similar interests 2) The crowd sourcing effort’s fit with a person’s social identity. Definition: Desire to find and interact with others sharing an interest, and the fit of the community and its goals with one’s identity.	Circumstance that could apply social motivation: 1) Long-term OI communities: participants connected by interactions and later return for the formed relationships; 2) Short-term, contest oriented initiatives 3) Organizations with strong brands	SAP Community Network (SCN) is a community, where SAP’s various stakeholders engaged with one another, which covers a spectrum of activities.	1) Try hard to avoid “flame war”  2) Not everyone will be social – the 1-9-90 rule.  * A vote-oriented community relatively has higher participation rate.
Efficiency and learning	Definition: Opportunity to exercise one’s existing skills towards a goal, learns new ones, and receives feedback for improvements. * The focus is more on the process instead of the outcome.	This type of motivation is suitable to build on people’s creative or problem solving.	Netflix Prize CrowdSPRING runs a site where business solicit submissions for various digital and physical designs	1) The management of Intellectual Property  2) Participants creative work may be seen as “spec work”

been point out that some future indirect rewards also could motive people to participate, these future indirect rewards encompass peer recognition, personal skills and capabilities improvement, knowledge base, career advancement, etc. (Holmström, 1999; Hars and Ou, 2002). Esteve Almirall and Jonathan Wareham conclude individual’s motivation could be viewed as two aspects: behavioral aspect and social network effects, we could learn that usually the intrinsic rewards and networking affect the people’s incentives better than monetary rewards.

Hutch Carpenter suggested that motivations that promote innovation energy of a target community could be categories into four main types: cause, achievement, social, efficacy and learning.

While, Abraham Maslow (2012) proposed a theory of human’s needs hierarchy, the model suggests that human needs will only be fulfilled one level at a time. It also shows the motivation of self-actualization has major effect in creativity and problem solving. While author compares Carpenter’s four types of motivation and suggests that these motivations all have corresponding position in the needs hierarchy model (See Figure 3.2.3). Even though similar to the human needs only could be fulfilled one level at a time, a certain type of motivation would be most attractive to people who are in a certain level of needs. For instance, for the individuals who just fulfill the safety and stability needs, the social motivation would motivate him best. When offering the motivations to your community members, it is essential to consider what are the needs

Figure 3.2.3  
Human needs hierarchy  
model and motivation  
relationship,  
Source: Abraham  
Maslow



of them.

### 3.2.4. Leverage the power of crowd



As the Internet technology developing rapidly, now when we talk about open innovation community, it is hardly to discuss this topic without involve Internet and social networks. People tend to spend more time on the Internet and form communities based on the Internet nowadays. “Crowdsourcing” is one of the most important terms related to Open Innovation and it is also generated based on the development of Internet; since it has been applied to a greatly wide range, author thinks it need to be discussed explicitly in this thesis.

Jeff Howe, a contributing editor for Wired magazine, coined the word “crowdsourcing” in 2006. Howe offered the following definition of crowdsourcing: Simply defined, crowdsourcing represents the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call. . . . The crucial prerequisite is the use of the open call format and the large network of potential laborers. And according to Wikipedia, “crowdsourcing” is the practice of obtaining need services, ideas, or content by soliciting contributions from a large group of people, and especially from an online community, rather than from traditional employees or suppliers. Crowdsourcing has become one of the most common ways to apply open innovation, and the power of massive collaboration has been profoundly recognized and valued now. Using crowdsourcing, organizations, or even individuals, could collect ideas or let the crowd involve in the whole innovation process. Some people may confused “crowdsourcing” with “outsourcing”, one of the most obvious differences is that “outsourcing” regard lowering down the cost as the main purpose, while “crowdsourcing” does not, decreasing the cost is only one of the benefits that “crowdsourcing” could bring, further more, using “crowdsourcing” cloud also getting inspirations, collecting ideas, improving products, communicating with users, creating more opportunities, or create social value, etc.

Crowdsourcing is a model for problem solving, not merely a model for doing business (Brabham, 2008a; Brito, 2008; Fritz et al., 2009; Haklay and Weber, 2008). The crowdsourcing model is also well suited to organizations’ marketing and public relations goals, as the process of managing an online community allows organizations to forge close relationships with publics and allows consumers to participate in the making of brands (Phillips and Brabham, 2011).

As Paul Sloane pointed that crowdsourcing has many different fields, organizations could choose the field that fit their purpose better. There are open innovation platforms that people could only get simple suggestions, like Naming Force, this type of platform is suitable for organizations that just want a new of a new brand of a product. Using

Topcpd.com could solve tougher programming problems, it connects massive freelance programmers all around the world. While, complex technical challenges would be easier to be settled by seeking solutions from Innocetive or Nine Sigma.

For the taxonomy of crowdsourcing, there are several ways of classification. According to the behaviors that people acting in crowdsourcing, Brabham proposed that crowdsourcing have four different types<sup>11</sup>:

- The knowledge discovery and management approach
- The broadcast search approach
- The peer-vetted creative production approach
- Distributed human intelligence tasking.

These different types of crowdsourcing could be used by organization for tasking crowd with finding and collecting information, solving empirical problems, creating and selecting creative ideas, or analyzing large amounts of information. While Jeff Howe also defined four main categories for crowdsourcing, according to the content of crowdsourcing<sup>12</sup>:

- Collective intelligence, or crowd wisdom.
- Crowd creation
- Crowd voting
- Crowdfunding

Author thinks the taxonomy of crowdsourcing changes constantly with the society and technology development, there will have more types of crowdsourcing or open innovation emerges in the coming future, while for the fact that we already have acquired, author considers Jeff's taxonomy is more clear, which each category has distinct characters to not be easily confused with others.

### **Collective intelligence / Crowd wisdom**

Collective intelligence is one of the most common types of crowdsourcing, in which the crowd is gathered and shared their knowledge. The collective intelligence has been applied widely in the world now, companies including IBM, Dell collect ideas widely from their customers, and Starbucks built a platform called "My Starbucks Idea" (<http://mystarbucksidea.force.com/>) to accumulate customers ideas about the beverages and food. One of the most famous case is Wikipedia, and in some websites like Quora or ZhiHu, people could ask various question in their lives or works, and then others could answer the questions which they feel they know the answers, massive questions have been replied with smart answers with very effective speed, and

11 Crowdsourcing: A Model for Leveraging Online Communities, Daren C. Brabham, Ph.D. 2011

12 Paul Sloane, A Guide to Open Innovation and Crowdsourcing, 2011

the answers would be amended and improved soon after that. Some research organizations are also embrace crowd wisdom as an important tool in their research, since the crowd could be everywhere in the world, so the one of the advantages of crowd is that they have various location, which could bring diverse information with their context, for instance, Arizona State University launched a platform named Ventus, which encourages the crowd to contributing information about power plant that people noticed near them. Crowd intelligence is mustered and leveraged to solve problems from crowd, which bring mass information effectively exchange.

### **Crowd creation**

Crowd creation is another common type of crowdsourcing, and it is easy to be confused with crowd wisdom, the difference between crowd creation and crowd creation is that crowd creation really turn the crowd to actually create a product or service, for example, the creation of Linux. Author thinks crowd creation and crowd wisdom are not entirely two different terms, actually these two concept could reveal the depth of the crowd engagement, and these two concepts could be viewed as two tools that used at different phases along the open innovation process, the crowd wisdom probably are most commonly used at the inspiration and brain storming phase, and the crowd creation would be used till the implementation phase.

### **Crowd voting**

Crowd voting usually is considered to be the conjunction with crowd wisdom and crowd creation. Crowd voting uses crowd's evaluation to sort or organize enormous amount of information. Crowd voting could be used when then market performance need to be predicted. LEGO CUUSOO is an open platform built to invites LEGO fans to submit their ideas to be considered as future LEGO products, this process of collecting ideas could be viewed as crowd wisdom, and then LEGO CUUSOO lets everyone to vote on and discuss ideas to help the LEGO Group decide what to release next, which is crowd voting. According to the results of crowd voting, LEGO group would know which idea would be a popular future product, and then the fans and LEGO group would enter the implementation and production phase, which is crowd creation.

### **Crowdfunding**

Crowdfunding is the collective effort of individuals who network and pool their money, usually via the Internet, to support efforts initiated by other people or organizations<sup>13</sup>. Crowdfunding is considered as a

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13 Ordanini, A.; Miceli, L.; Pizzetti, M.; Parasuraman, A. (2011). "Crowd-funding: Transforming customers into investors through innovative service platforms". Journal of Service Management 22 (4): 443.

concept that derived from crowdsourcing<sup>14</sup>. Organizations could use crowdfunding when they need to raise the money for their activities, while crowdfunding also could make the people who feel interested to be involved in the innovation process. A group of researchers felt they needed to start a project on global warming really quickly in order to have an impact. They are now on their way to do the first-ever Greenland expedition relying solely on crowdfunding, they using blog to update their recent activities to keep investors aware of the progress and attract more crowdfunding<sup>15</sup>.

Now crowdfunding has been widely accepted for a while, it offers a new way of planning business models, and the following are the benefits of crowdfunding:

- By using crowdfunding, the organizations need to be more financial transparent, which is good for the organizational sustainable development.
- Crowdfunding is not only a way to get money from the crowd, it is a way to get the organizer to directly engage with the public as well.

The most famous and mature crowdfunding platform is Kickstarter, from US, but now Kickstarter is only available for users in UK and US. Besides Kickstarter, Indiegogo is another international crowdfunding platform. Crowdfunding has been accepted and developed later in Asia compare to US and Europe, but now the Campfire in Japan and Demohour in China already emerged and become more and more popular. Julian B. Gewirtz published an article discussed the crowdfunding impact in China in Jan of 2014, it is mentioned in the articles that In China, where most people have never participated in a free election, crowdfunding reflects the democratic process: It allows a large group of individuals to express preferences, then view data collecting all individual responses, which eventually determines whether a proposed project comes to success<sup>16</sup>.

Author thinks that crowdfunding gives open innovation organizations a chance to organize open innovation activities shift from top-bottom way to bottom-up way, which brings more freedom of action and more possibilities to the innovation process. For academic institutions, if they could rise funding from the crowd, they could skip the fussy and complex funding application process, and more and more projects could have the chance to be launches despite of the limit national research funding, and

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14 Canada Media Fund, "Crowdfunding in a Canadian Context – exploring the potential of crowdfunding in the creative content industries". accessed February 7, 2013.

15 <http://darksnowproject.org/category/project-updates/#give-now>, Dec, 2013.

16 <http://www.chinafile.com/carpe-coin-crowdfunding-could-change-chinese-politics>, Dec, 2013.

the research process would be share with the crowd to gain wider range of impact.

### 3.2.5. Utilize retention tools

#### **Interactions**

The key prerequisite to organizational learning is the knowledge transfer between community members. (Joel West & Karim R. Lakhani, 2008) Interaction within a community indicates that innovation promotes extension by other user innovators (Von Hippel, 2001). Communities vary from how they interact.

#### **Regulation**

According to Lauren's strategy, community organizers should set rules in the community once the community member has engaged in the community, there are some regulation issues need to be noticed, the community members should be aware of how the community runs, what is encouraged to do and what is not.

#### **Gamification**

According to Wikipedia, Gamification is the use of game thinking and game mechanics in non-game contexts to engage users in solving problems. Sauermann and Franzoni (2013) did a research about sustainability of Interest-based motivation, in this research they found out that participant's interest would appear declining after a period of time, and they recommended getting people "hooked" through gamification<sup>17</sup>. As author analyzed before, usually the intrinsic motivation (such as fun, enjoyment, etc.) would have stronger attractiveness for the participants than the extrinsic motivation (such as money reward), and gamification provides the fun experience to the participants, which creates intrinsic motivation that could "hook" more and more people stay on the platform.

Gamification is a tool that could be combined with crowdsourcing, there is a website developed by a team from Syracuse University named as "Citizen Sort"<sup>18</sup>, it contains tools and games to classify various species of insects, animals, and plants. Through this website, the public are invited to do real science by playing games. Biologists and naturalists get help classifying plants, animals and insects, and information scientists, human-computer interaction researchers, and computer scientists receive an opportunity understand citizen science. It turns out that

<sup>17</sup> Henry Sauermann, Chiara Franzoni, Participation Dynamics in Crowd-Based Knowledge Production: The Scope and Sustainability of Interest-Based Motivation, 2013.

<sup>18</sup> <http://www.citizensort.org/>, Dec, 2013.

games have great potential as a motivator for participation and as a tool for producing high quality data.

### 3.2.6. Select IPR management tools

As Henry Chesbrough said, now in a world of speedily disseminates knowledge, the mindset of how to manage Intellectual Property has been changed to a great extent. “Metabolic rate” is a lively implication of open innovation organizations gain, digest and make use of knowledge. For an open innovation organization, it is essential to choose a suitable way to manage their Intellectual Property. For many organizations, the ideas or products that are “on the shelf” would be a fortune to themselves if these ideas or technologies could get out of the organization, using licensing greatly to create and enlarge impact or market. They could open part of the resources to external experts or even the public to get more inspirations or improvements.

There are several tools for managing Intellectual Property, in this thesis author will discuss three tools that be used commonly among open innovation organizations, which are open data, open access, and common creative.

#### **Open data**

The term “Open data” is defined as the idea that certain data should be freely available to everyone to use and republish as they wish, without restrictions from copyright, patents or other mechanisms of control<sup>19</sup>.

“Open data” has similarities and connections with other “open” terms, for instance, “open source”, “open access”, etc. Along with the development of the Internet, “open data” has been gaining popularity recently, and it represents an open mindset towards IP sharing. John Wilbanks, the vice president of science of Creative Commons said that, “Numerous scientists have pointed out the irony that right at the historical moment when we have the technologies to permit worldwide availability and distributed process of scientific data, broadening collaboration and accelerating the pace and depth of discovery... we are busy locking up that data and preventing the use of correspondingly advanced technologies on knowledge”

The open data movement could open the data source that was difficult to access in the past and it lays down the base for massive information exchange and collaboration. Several open-data government initiatives have been launched, such as Data.gov and Data.gov.uk. Once the

19 Auer, S. R.; Bizer, C.; Kobilarov, G.; Lehmann, J.; Cyganiak, R.; Ives, Z. (2007). “DBpedia: A Nucleus for a Web of Open Data”. The Semantic Web. Lecture Notes in Computer Science 4825. p. 722.

government set some source as open data, then the transparency is created for public, and researchers also could gain access to authorized source. While research institutions could open their research data for public education, and companies could use open data to build public trust.

### **Open access**

With the trend of digitization and price increase stimulated the movement of open access, the traditional way of publish academic research outcome is being challenged. Open access means unrestricted access via the Internet to peer-reviewed scholarly research. “Open access” is a very similar term related to “open data”, the difference between these two terms is that the primary content for which open access is intended is scholarly journal articles. The main characters of open access include “free of charge”, “online source”, “immediate”, “availability”, “research articles”, “re-use rights”. There are two parts of open access, one is free to read, and the other is free to re-used. It makes no sense that the achievement that scholars gained by spending vast time and funding would end up with locking in some database. The openness would accelerate new discoveries and researches worldwide. In the future, open innovation and open access might change the way researchers get credit for their work. Universities like Harvard are now encouraging their staffs to use open access instead of publishing on journals.

### **Creative Commons**

A Creative Commons license is one of several public copyright licenses that enable the free distribution. A Creative Commons license could be used when an author wants to give others the right to share, or use, or build upon a work that they have created. The Creative Commons license provides a kind of flexibility for author to choose which way they would like their creation to be distribute, and it also protects the people who use or redistribute an author’s work, so they don’t have to worry about copyright infringement, as long as they abide by the conditions that are specified in the license by which the author distributes the work. Now the Creative Commons license are widely used, creators could choose the certain types of license depends on which way they want to disseminate their work, there are four different types of licenses, including Attribution (BY), Share-alike (SA), Non-commercial (NC), No Derivative Works (ND), these four types of license could be combined according to the specific situation, and about sixteen possible combination could be generated. The authors need to decide whether or not they want credit for their works, or if their works could be used for any commercial purpose, or to which extend others could change or build on.

## **3.3. Chapter conclusion**

In this chapter, process of building open innovation community had been discussed, as well as six key points along the building process. In conclusion, there are three main phases of building community: (1) community initiation, (2) community engagement, and (3) community thriving.

Each phases has its corresponding key points that need to be considered. In the Community Initiation phase, organizers needs to consider determining questions, generate various motivations, and establish communication channels. In the Community Engagement phase, organizers still need to consider offers various motivations, besides, to become an open innovation community, the power of crowd should be emphasized. In the Community Thriving phase, retention tools need to be used to keep the existing members stay in the community and extend the community by involving new members. In this phase, suitable IPR management tool also need to be selected. (See Figure 3.3)



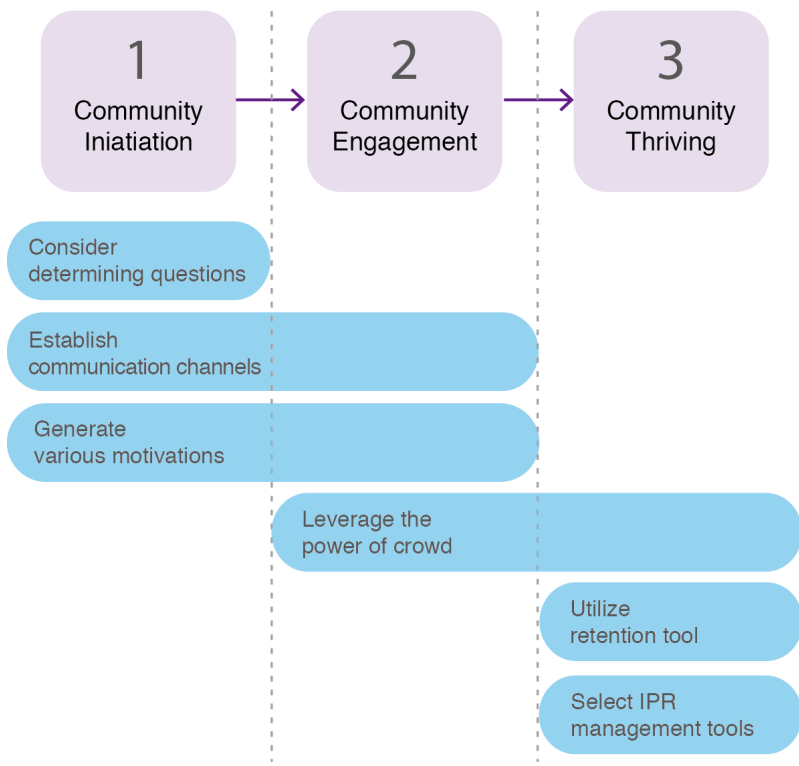


Figure 3.3  
Key points along the  
community building  
process,  
Source: author



# CASE STUDIES

# 04

## 4. Case studies

Constructing Open Innovation community is a practice of looking beyond the four walls of companies – towards users, governments, universities and other firms, the concept and movement of open innovation community already affect different sectors of the society, including design firms, NGOs, academic institutions. In this chapter, author will analysis several different cases of Open Innovation community, which will discuss how to construct and retain open innovation communities in practical ways. This chapter of case study would lay down the base for further case design of BiDL lab.

### 4.1. Reasons for the chosen cases

In order to have a comprehensive understanding about how to build and sustain the open innovation community, author prefers to investigate several related cases from different perspectives. Because there are multiple roles in the open innovation ecosystem and the members in an open innovation community also have different backgrounds, author select cases that could be reference for different needs of BiDL. Since BiDL is an academic design institution, when it starts to construct its own open innovation community, it needs to consider how to assemble its internal resources and how to connect with external resources. In another word, BiDL needs to know how to acquire community members, build its communication channels to outside, and seeking collaboration with external partners. Thus, author has selected three different cases:

#### **1. Connect + Develop Program of P&G:**

The reason of select P&G as one of the case is that P&G represent a classic example of how to construct open innovation network from the perspective of profit-driven firms. Besides the reference regards to P&G's effort in building community, author also could investigate how small academic institution could find channels to cooperate with big companies, and how to through such collaboration to implement innovative ideas to market.

#### **2. OpenIDEO launched by IDEO:**

The second case, OpenIDEO, is a non-profit community-based online platform, and more importantly, it is designed and managed from design perspective, it would thereby reflects how to form an online design open innovation community and running projects on the online platform;

#### **3. Sino-Finnish Center (SFC)**

The third case is Sino-Finnish Center (SFC), unlike the former two cases, SFC forms its community mostly on physical platform, it presents how to create and sustain inspiring community in campus environment. SFC is a great case of how to assemble university resources and how to collaborate with companies and governments. Moreover, the environmental similarities between BiDL and SFC make the cases study has more practical meanings.

## 4.2. The C&D program of P&G – mature profit-driven open innovation case with extensive channels

### 4.2.1. The introduction of P&G's Open Innovation Network

Procter & Gamble Co. (known as P&G) is one of the most successful consumer goods company in the world, its products include food, cleaning agents, personal care products, etc. P&G has nearly 100,000 employees and a significant R&D (Research and Develop) department with over 6,500 scientists, with the enormous human source, P&G created substantial intellectual property, which include over 29,000 patents<sup>1</sup>. With the fast developing technology, the rate of inventions from the internal R&D of P&G had decreased, as Chesbrough (2003) argues that the decline in the strategic advantage of internal R&D is related to greater range of creators of knowledge and the raised mobility of knowledge workers. Time has changed, the former business model that only rely on the internal R&D to develop new products could not satisfy the new demands, and now the world is more connected, P&G decided to collaborate with external scientists, engineers and other organizations, thus P&G embraced open innovation and launched a new approach called “Connect & Develop”.

As Bruce Brown, Chief Technology Officer of P&G, has said, “Connect + Develop has helped deliver some of P&G’s leading innovations, and is critical in helping us deliver on our renewed growth strategy moving forward. Connect + Develop has proven to be a winning strategy, with still more room for growth.” Connect + Develop is a strategy that collaborate with external resource to boost innovation, and this open innovation strategy has been applied across P&G globally. To launch and maintain C&D, P&G has its dedicated team called Global Business

1 Mark Dodgson, David Gann, Ammon Salter, “the role of technology in the shift towards open innovation: the case of Procter & Gamble”, 2006.

Development. For the C+D strategy, crowdsourcing is used mostly at the phase of ideas collection, and ideas that are more mature or would be more appreciated.

#### 4.2.2. Community initiation

##### **Determining questions**

The Purpose of C+D program is to boost the efficiency of innovation process, lower cost, and pursuit for profit.

The main community members include individuals who has great ideas, entrepreneurs, academic labs, research institutions, universities, companies, SMEs, suppliers, governments, etc.

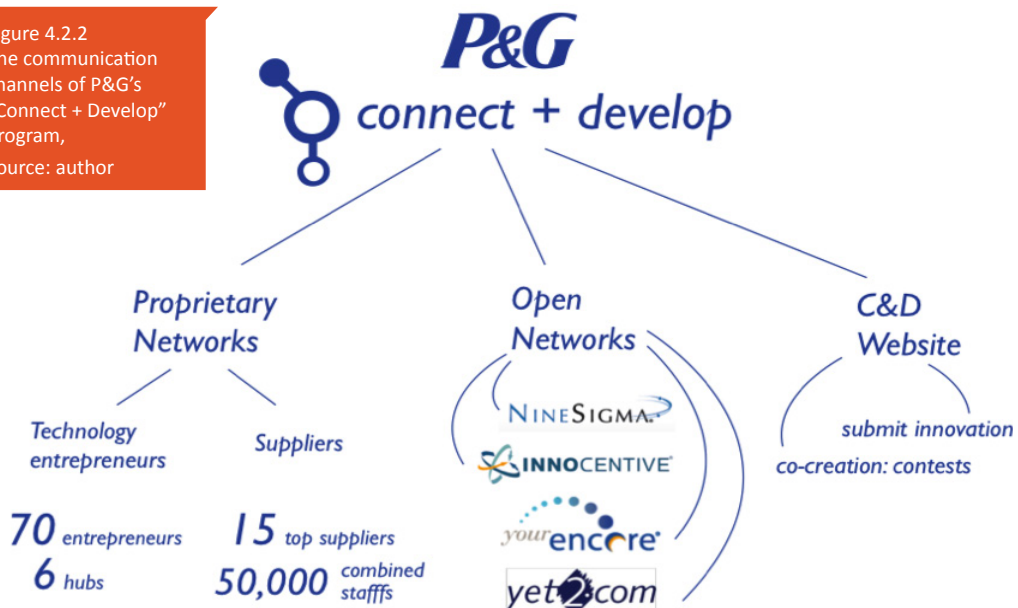
The main challenges for P&G are as follows:

Building channels for making use of external resource, for instance, seeking ideas that could be implemented into the market or technologies that already exist and could be applied in P&G's products;  
Building channels for open internal resource to the outside, or instance, licensing technologies invented inside of the company to the outside market.

##### **Communication channels**

P&G developed several core networks of Connect + Develop for seeking out new ideas, two of the largest networks are (1) Proprietary networks and (2) open networks. Besides these two networks, P&G also built open

Figure 4.2.2  
The communication  
channels of P&G's  
"Connect + Develop"  
program,  
Source: author



innovation channel through (3) its office website. Figure 4.2.2 shows how the three networks work during the whole innovation process.

#### Proprietary Networks:

P&G relies on several proprietary networks to launch connect-and-develop activities, these proprietary networks including technology entrepreneurs and suppliers. Regarding the technology entrepreneurs, P&G has about 70 of them work out of six connect-and-develop hubs (China, India, Japan, Western Europe, Latin America, and the United States), they would seek ideas or technologies with the defined boundary by the ways of literature mining, patent database, market survey, or technology fairs. P&G's technology entrepreneurs had identifying over 10,000 ideas by 2006.

Since the suppliers have different but related knowledge landscape, so more insights could be gained from suppliers. P&G also has innovation collaboration with its suppliers; for instance, there are approximately 50,000 combined R&D staffs with P&G's top 15 suppliers. Top-to-top meetings have also been hold between P&G and its suppliers frequently; the benefits of these meetings include improving relationship, promoting the flow of ideas, and strengthen mutual understanding.

#### Open networks:

In addition to the proprietary networks, P&G also connects with several open networks to extend their idea searching channels, following four networks are the major connect-and-develop resources for P&G: NineSigma, Innocentive, YourEncore, and Yet2.com. Through these open networks, P&G is connected with companies, universities, government labs, private labs, scientists, engineers and consultants, etc. Moreover, these open networks are platforms for ideas and technology collaboration, are market place for intellectual property and human resource exchange. For instance, P&G had problems solved by diverse professions of individuals around the world on NineSigma, and through Yet2.com P&G licensed its technologies to other companies.

P&G did not spend massive time and resources to running open innovation virtual market by themselves, while P&G do realize the advantages of open innovation intermediaries. By participating in several intermediate platforms, such as InnoCentive, P&G collaborated with diverse problem solvers who from external open innovation communities.

#### Connect-and-Develop website:

P&G has built connect-and-develop website to receive submissions of innovation and seek partnership with others. Everyone could submit their ideas or patents through the connect-and-develop website, and even participant P&G's regular competition. Since P&G receives a high volume of submissions under the C+D strategy, it is much more efficiency

to use an online submission system to manage the collection, evaluation, and responding process. Through this online platform, P&G also post all aspects of its needs, which make it easier for participants to submit their ideas. It is well noticed that on the website, P&G builds an online co-creation channel (<https://www.cocreate-pg.com>)

The P&G Co-Creation Channel is a new crowd-sourcing community platform running multiple open innovation contests to co-create with exceptionally talented creative thinkers and creators around the world. Everyone could register on the site as a community member, but only users from US or Canada could join the contest and win prize.

**Social Media:**

P&G connect the Connect + Develop program with outsider by take advantages of social media, through its site, there are links to LinkedIn and twitter, now there are already 1,006 members have joined in the C+D group on LinkedIn.

### **Generate Motivations**

The motivations that P&G offered differ from different networks.

- In the proprietary networks, the main motivation for community members is profit rewards.
  - In the P&G's Open Networks, problem solvers could get monetary rewards, and have the possibility to contract with P&G.
  - Then through P&G's website, besides the monetary rewards from submission ideas, participants who the contests have the opportunity to win the prize and have publicity on P&G's website and other medias.
- In summary, P&G mainly use Achievement motivation to acquire community members.

### **4.2.3. Community Engagement**

In the last section, author investigated about the acquisition work of P&G's open innovation community, the three different networks consisted a comprehensive communication channels to the outside, and P&G also formed its open innovation community from different levels. The three networks lead to further engagement of P&G's open innovation community. (See Figure 4.2.3)

#### **Initiative seeking external resource**

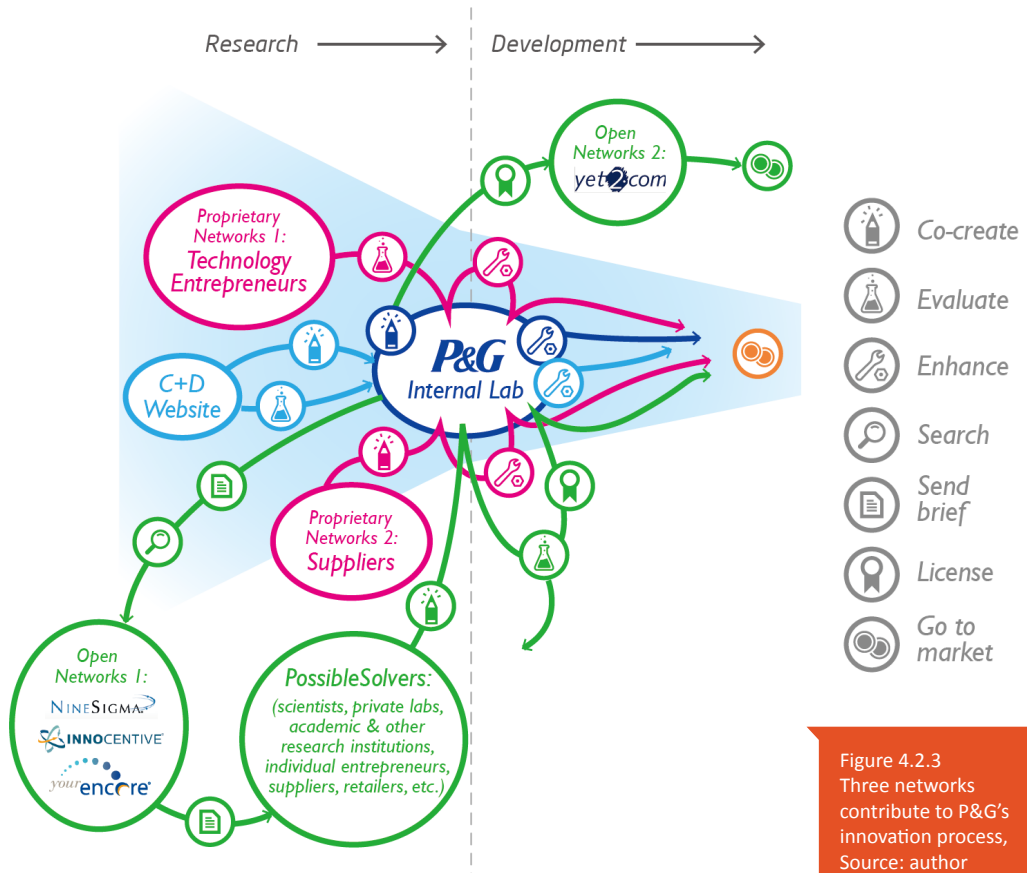
The proprietary networks require P&G to seeking external resources more on its own initiative; the community members have the closest collaborative relationship with P&G.

#### **Take advantages of its own community**

The C+D site is a channel for everyone to participant in the co-creation activities of P&G. It is also a platform that forms P&G's own open innovation community. While author finds that the co-creation channel



is not very active now, the motivation that P&G offers to community members is mostly the prize of contest, which would results in most participants could not get any rewards in the end, even though the most active and valuable community participant would be e rewarded as well, the members still would easily leave after the contest. The contests usually require the participants to create something new to fit the topic, it has higher effort cost compare to just sending an existing innovative ideas. Thus the C+D site is still a good platform for people who looking for opportunities of implementing their ideas to market, especially



when they only have great ideas or technologies but lack of funding and experience.

#### 4.2.4. Community thriving

##### **Trough the C+D Co-creation Channel**

Community members could give comments to the ideas, and participate the evaluation of winner ideas. The activeness of the community depends on if there is a contest running on the platform to a great extent. For now the Co-creation Channel has accumulated 197 ideas,

1044 comments, and has acquired 755 members. But as the last contest had been over for about seven months, the community is not active, only very few members visit the site.

### **Regulation**

On the P&G's open networks, P&G follows the rule of other open innovation intermediaries. While on the P&G's site, P&G create the regulation by itself, in the FAQ section (Frequently Asked Questions), the rules of submission, partnering have been explained to the outsiders.

### **Interaction**

P&G sites has already developed seven different languages, including English, Chinese, Japanese, France, Germany, and so forth. Besides the Q&A page for people to have interaction with P&G, the Co-creation channel also has interaction function that people could give comments on the ideas. But in general, since P&G's open innovation program is P&G-centric, so the interactions are mostly between users and P&G, interactions among the community is still not very active.

### **IPR management**

Through the online submission system, P&G only consider non-confidential information for its initial review of submission, the submissions that lack intellectual property protection would be declined. The submissions would be reviewed and evaluated across P&G, and these data would not be open to outside. The submissions that fit P&G's needs would be taken the form of a licensing or supply agreement, or other type of collaborative venture.

## **4.2.5. Conclusion of P&G case study**

As author explained above, P&G has built the extensive open innovation network and plays as the host and the leader of the network. The ultimate goal of C+D network is to make more profit through efficient innovation process, so it is relatively obvious that P&G seeks ideas more initiatively and actively.

For small academic institutions, there are several approaches to collaborate with big companies:

- Looking for opportunities through online open innovation intermediaries, diverse organizations and companies post their needs on these intermediates.
- Submit existing concepts or technologies that fits the companies' needs to their open innovation platform

For any organization that wants to form its own open innovation community, at the initial phase, it is wise to be more active to seeking external resources, and it is also vital to open channels to receive and exchange resource with outside. P&G intended to manage its Co-Creation Channel in a crowdsourcing way, and it also has built an online framework that could involve members into idea submission phase

Table 4.2.5 Key points conclusion of P&amp;G's community building

P&G	Offline	Online
1. Community Initiation	Determining questions: - Purpose: improve efficiency, lower cost, and pursuit for profit - Audience: individuals who has great ideas, entrepreneurs, academic labs, research institutions, universities, companies, SMEs, suppliers, governments, etc.	Establish Communication Channels: - Open innovation intermediaries: Innocentive, Ninesigma, YourEncore, Yet2.com, etc. - P&G site: Online submission system, Co-creation Channel - Social network: Twitter, LinkedIn.
	Establish Communication Channels: - Proprietary networks	Various motivations: - Achievement: monetary rewards, opportunity to contract
2. Community Engagement	- Co-creation with suppliers - Seek ideas or technologies - Further cooperation with the scientist found in the open networks	Leverage the power of crowd: Online design process - Contest (crowd intelligence, crowd voting) - Ideas submission (crowd intelligence)
3. Community Thriving	Implementation: Selected reviewed ideas or technologies would be implemented into market	Utilize retention tools: - Regulation: rules of submission - Interaction: on the site / email
		IPR management: - Licensing - Supply agreement - Other type of collaborative venture

and evaluation phase, but since the motivation of contest is sole and unsustainable, the community is not as active as expected. In summary, the C+D program of P&G has great performance of looking for certain expertise and solutions of specific problems.

## 4.3. OpenIDEO – open innovation platform for design projects

### 4.3.1. the introduction of OpenIDEO

OpenIDEO is an online platform launched and developed by the famous design and innovation firm IDEO in August of 2010, it is a nonprofit online community platform designed for creative thinkers to solve problems that would bring social value. The OpenIDEO team created a collaborative, inclusive platform based on the IDEO's experience of leveraging collaboration amongst professionals from different disciplines.

The site was launched in 2010 with a challenge from celebrity chef and healthy-eating advocate Jamie Oliver. Since then they have collaborated

with quite a few organizations ranging from The Grameen Creative Lab to Oxfam. The challenges have covered improving sanitation in low-income urban communities; increasing the number of registered bone marrow donors; and connecting food production and consumption.

The OpenIDEO team consists mainly by an IDEO design team including Nathan Waterhouse, Tom Hulme, Haiyan Zhang and largeeBlue. According to the information showed on their webpage, the ultimate purpose of OpenIDEO is to help solve some of the world's grand social challenges. The main participants of OpenIDEO include the veteran designer, the new guy who just signed on, the critic and the MBA, the active participant and the curious lurker.

### 4.3.2. Community initiation

#### **Determining Questions:**

The Purpose of OpenIDEO is to solve challenges for social good.

The main community members include creative thinkers, veteran designer, the new guy who just signed on, the critic and the MBA, the active participant and the curious lurker.

The challenges for OpenIDEO are as follows:

Building a platform for diverse participants to join the design process online, which including:

- Manage the design process online for individual participants or group work;
- Have good projects;
- Rise funding for the projects: attract sponsors for projects;
- Build channels that could reach potential participants and attract them to join the project;
- Sustain the OpenIDEO community: promoting conversation among the online community; managing the information flow

#### **Communication Channel**

OpenIDEO recognize and enable everyone from different disciplines to contribute to their creative process and feel as if they are a part of the process. Most of the users of OpenIDEO are creative thinkers who would like to solve social problems. And OpenIDEO wants to form an online community that could keep involving more and more creative thinkers, and then they started to think about how OpenIDEO reach out to the audience?

1. OpenIDEO used it brand impact. The host, IDEO is a famous design consultancy company, and it has high reputation in the creative field with strong appeal, massive designers were attracted by the fame of IDEO

firstly.

2. Due to the technology development, people become more and more associated with online community and spend more time having interaction through social media. Therefore, OpenIDEO, as an online community based platform, unavoidably to be effect by the social network and chose to initiatively choose to connect with several leading social network, for instance, Facebook, Twitter, LinkedIn and Google plus. The connection with social network even could be regarded as a way of broadcasting, through the existing participant, more and more potential participants and sponsors might be attracted.

3. Through the online platform, the OpenIDEO team could have conversation with participants. OpenIDEO values the core strengths of the community and they manage the platform in a community-centered way. "OpenIDEO is meant to foster a strong, vibrant, lively community that thrives on inspiration." Encourage people to have teamwork at each step of the design process fosters the collaborative spirit and promotes the community to a large extend.

### **Motivations**

In the case of OpenIDEO, as it is mainly a non-profit platform that works for social good, the motivations of participant mainly belongs to their intrinsic motivation, including peer recognition, personal interest, meeting new people, etc. And OpenIDEO also use some techniques to create a feeling of ownership for participants to keep them sustainably create content one the platform and form online communities.

At the beginning, the main users are attracted through the online platform, from the OpenIDEO site, they would know that what is the main activities of this platform, then people who are interested in the challenges who be acquired, the "cause motivation" works for people who want to do something for social good, contribute to solving social issues, seeing things being improved. Since OpenIDEO is an open innovation platform, so everyone could join the design process or give comments, which is also an interaction process, thus people who want to communication with others who share the similar goals would be motivated to join the platform.

The OpenIDEO platform implemented IDEO's design process and many other tools, community members could learn design skills by participating in the challenges, and during in the problem solving process, participants also would learn the specific challenge-related knowledge. Therefore, the Efficacy and Learning motivation also works.

What people could achieve by join OpenIDEO?

By participating the activities in OpenIDEO, people could acquire reputations in design community. Community members could gain

a Design Quotient, which shows their strengths according to their performance on OpenIDEO, it could be inserted into CV, and ideas or thoughts also could be published on the websites and have the possibilities to be implemented in the reality.

### 4.3.3. Community Engagement

#### **Crowdsourcing**

OpenIDEO is incubated in the trend of online collaboration and consumer activism, the team wanted to explore a mean to harness the mass human resource, in another words, the crowdsourcing, to do social good. Since IDEO has experience and researches about social innovation projects, the team knew that the community could promote the ideation and evaluation phase of a project, especially when designers are trying to solve big problems with small budgets. Thus with the tools of open innovation, the team built an online platform that could leverage the knowledge and power of crowd to solve social problem with much less cost. And at openideo.com all ideas are reusable, shareable and remixable. No one owns the idea. Each person can build from another's ideas. OpenIDEO uses crowd wisdom at the inspiration and concepting phase, crowd voting also used during concepting phase, more over, crowd creation happens at the refinement phase. Thus through the step-by-step crowdsourcing application, the community based on OpenIDEO platform was built.

#### **Engagement of design process**

OpenIDEO has launched a comprehensive website, which allows all community members to join the design process online. The complete OpenIDEO online design process has six main stages: inspiration, concepting, refinement evaluation, winning concepts, and realization. (See Figure 4.3.3)

Before the first step of inspiration, each challenge would be post with a big question by IDEO or the sponsors, the question normally would be open-end type, along with the big question, there would be a brief which introduce sponsor, related issues and goals for the challenge, to make the challenge solvers understand the topic well.

##### 1. Inspiration:

In the inspiration stage, the main task is to gathering related knowledge and understanding opportunities, the community gathers and share existing examples, material, such as articles, blog posts, pictures, prototypes, and project descriptions, on- and offline that relate to the issue, etc. This stage helps to familiarize everyone involved with what has been tried before and what existing concepts might be applicable to the challenge at hand.

##### 2. Concepting:

After gathering inspirations, the challenge could enter the concepting

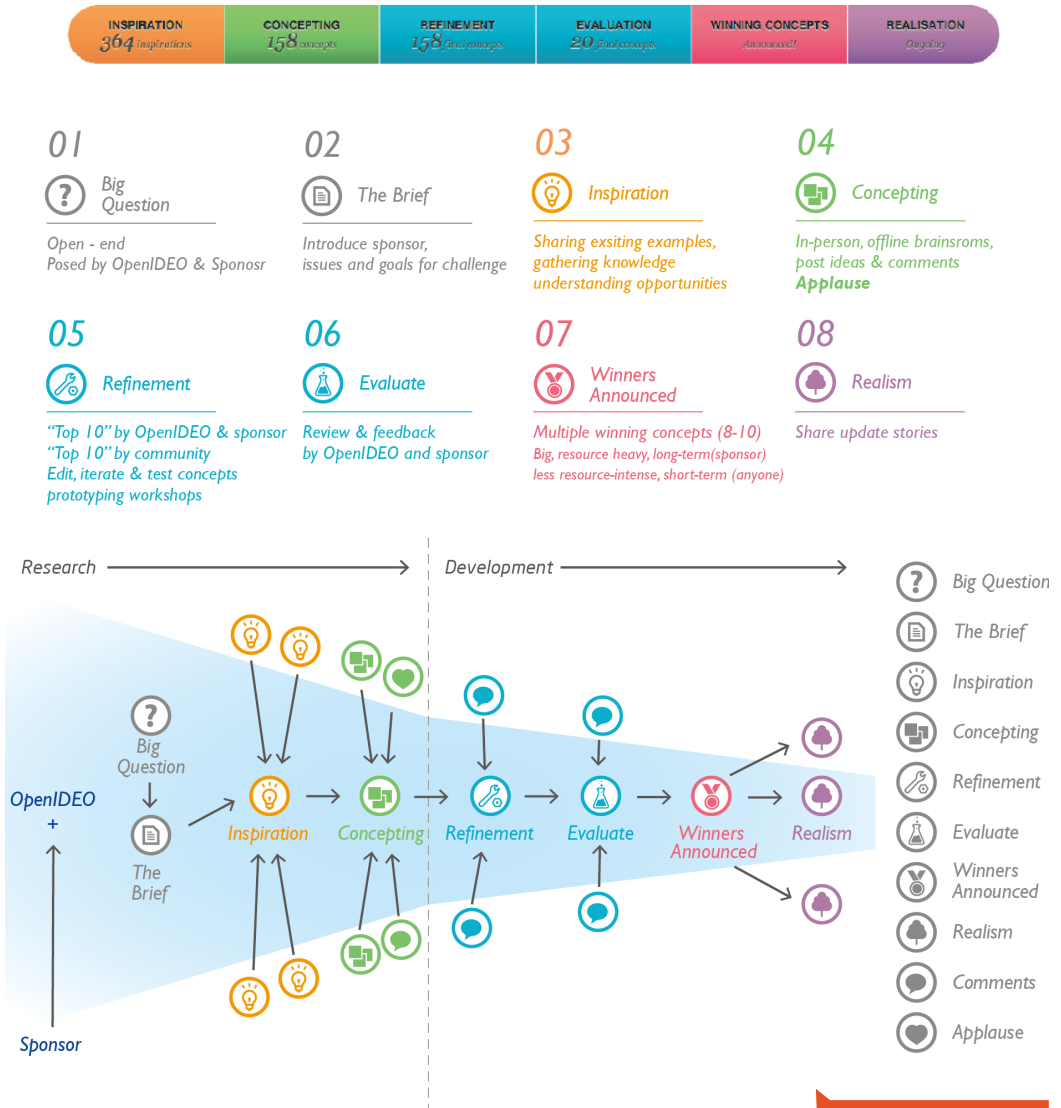


Figure 4.3.3  
Innovation process of  
OpenIDEO,  
Source: author

phase, The facilitators will reframe the challenge and community members post descriptions of their ideas along with supplementary material, like sketches, diagrams or photos of the concept. There will be in-person offline brainstorming launched, community members will post the achievements from brainstorm in OpenIDEO, then these ideas would be commented by many other community members, people could give “applause” to the ideas that they think is great. Thus, the better ideas would be developed through crowds’ comments and advises;

#### 3. Refinement:

During the refinement phase, a series of “top 10” concepts would be selected by OpenIDEO and the challenge’s sponsor, another series of “top 10” concepts would be selected by the community, these two series of “top 10” concepts would be edit, iterated, test, and prototyped in this phase;

#### 4. Evaluation:

Then these top concepts would be reviewed in the evaluate phase, both OpenIDEO and challenge’s sponsor would both give feedbacks, the community still could give comment as well;

#### 5. Winning concepts:

After refinement and evaluation, about eight to ten winning concepts would be announced at the winners announce phase, then among these winning concepts, the concept that has higher resource requirements and need long-term implementation would be in charged by the sponsors, while the concepts that are less resource-intense and could be launch in short term would be open for anyone to take and implement;

#### 6. Realization:

Then in the last phase of realism, the sponsor or participants who taken the concept could share the updated stories and communicate with the community on OpenIDEO.

On the list of challenges or each page of challenges, there is a process bar for each challenge, so it is also clear for outsiders or newcomers to know how far this challenge has been progressed and where they could join in the challenges.

### 4.3.4. Community Thriving

#### *User-generated Management Style*

OpenIDEO has created an online platform in a user-generated management styles, it means that OpenIDEO successfully encourage its users to create most of the contents on the site. OpenIDEO designed the platform in a way that community members could easily interact with others. The manage team works as gatekeeper instead of a producer.

#### *Design Quotient*

One of the most representative tools for motivation is the Design Quotient. During the whole open innovation process on OpenIDEO, to encourage people to engage in the challenges and form the community,



the Design Quotient was created for participants, it looks like a badge belongs to each users. When users participate and give feedback through the process of challenges, points would be given to their Design Quotient according to their performance, it is clearly shown on their Design Quotient that what are participants' strengths, in which phase they prefer to contribute more, how much have they engaged on the platform, etc. And according to users' Design Quotient, they could be typified as inspirers, concepters, evaluators, or collaborators; it will help the participants to better find their roles in the collaborations. Further more, participants also could show their Design Quotient to their friends or others through their social networks to display what they have done. It is also recommend that the Design Quotient could be used in curriculum vitae, since the Design Quotient represent one's design capability and engagement for social issues.

### **Toolkits**

The OpenIDEO site designed a series of tool for collaboration and having conversation with others, which generate a collaborative atmosphere for building on each other's ideas. On the challenge webpages, users could download toolkits that might be useful for their offline activities, for instance the "brainstorm in a box toolkit" and "Inspiration interview toolkit" could be found and downloaded from the sidebar<sup>2</sup>.

OpenIDEO has published a short guide, the OpenIDEO University Toolkit, for newcomers and veterans, mainly for students and teachers. This guide explained what is OpenIDEO shortly, introduced the design process of OpenIDEO, and teaches students a smart way to collaboratively create and share ideas.

OpenIDEO added feature of The Collaboration Map<sup>3</sup> to connect inspirations and ideas that are related to an other in OpenIDEO. It provides an inspiring way to check ideas that have been created on OpenIDEO. And tools like Google analytics have been used effectively here to monitor real-time data usage and to generate enormous feedback<sup>4</sup>.

### **Interactions of OpenIDEO community:**

OpenIDEO has built its User Forums to have interactions and communications with users. From the OpenIDEO User Forums<sup>5</sup>, author

2 <http://www.openideo.com/challenge/creative-confidence/brief.html>, 19 March, 2014.

3 <https://openideo.zendesk.com/entries/392173-Introducing-the-Collaboration-Map>, Jan, 2014.

4 Ikem Charles, "How IDEO used the metrics of design & design thinking for effective collaboration: a case study of OpenIDEO.com", 2011.

5 <https://openideo.zendesk.com/>, Jan, 2014.

aware of the some reasons of why part of the OpenIDEO visitors only remain as a lurker in OpenIDEO. A visitor named Bill Scheurer<sup>6</sup> said that his reasons are OpenIDEO hasn’t opens itself up enough to become an action platform, for now OpenIDEO stays as the gatekeeper for initiating challenges. Bill pointed that the users lives in the community also wants to act in the community.

From the above case probing, author thinks that the crucial design features that make OpenIDEO inviting and fun to use are as follows:

- The innovation process in OpenIDEO is interactive and logical moving forward.
- OpenIDEO has a rewards system that provides various and diverse motivations for community members to participate in the creation process.

Table 4.3.5 Key points conclusion of OpenIDEO’s community building

OpenIDEO	Offline	Online
1. Community Initiation	Determining questions: - Purpose: Social good - Audience: creative thinkers	Establish Communication Channels: - OpenIDEO website - Social networks - Emails
	Establish Communication Channels: - the impact of IDEO	Various motivations: - cause: solve the challenges - social: interaction with others globally / meeting new friends - efficacy and learning: Learning design skills and challenge-related knowledge - Achievement: reputation, benefits for career, publicity, etc.
2. Community Engagement	- Offline teamwork - Offline course - Offline Open storming	Leverage the power of crowd: Online design process - Inspiration (crowd intelligence) - concepting, refinement (crowd creation) - evaluation, winning concepts (crowd voting)
3. Community Thriving	Implementation: Concepts could be implemented in the reality by anyone	Utilize retention tools: - Interaction: OpenIDEO Forum - Regulation: Design Process
		IPR management: - Open data: Ideas and concepts could be used by anyone - Creative Commons: University toolkit, etc.

6 <https://openideo.zendesk.com/entries/22637726-OpenIDEO-Community-Action-Platform,Mar, 2014>.

### **IPR management**

All the winning ideas would be open for everyone to reuse and redesign, all the concept created on OpenIDEO are protected by Creative Commons License.

#### 4.3.5. Conclusion of OpenIDEO case study

One of the strengths of OpenIDEO is that they provide practical and nice guidance for all the community members' online activities and offline activities, people clearly know how to proceed in the next step and will not lose direction in the crowdsourcing activities.

## 4.4. SFC – A cross-disciplinary collaboration case in Shanghai context

### 4.4.1. the introduction of SFC

Sino-Finnish Centre (SFC) is a joint effort of Tongji University in China and Aalto University in Finland. SFC locates in a teaching building in Tongji University in Shanghai. It engaged great effort in creating a strategic paradigm in innovative education, research and practice. Now SFC has already gained impressive achievements in disciplinary collaboration that brings students, companies and researchers together. SFC create a tangible environment in the campus, called "Design Factory", which is an ideal space to inspiring participants and offering learning experience through various activities. Numerous courses, workshops and lectures have been organized in SFC, ranging from product design, innovation and sustainability to business management etc. Through the approach of hosting events, SFC forms an ecosystem consists by leading scholars and future talents from Aalto, Tongji, other SFC key partner universities, leading companies, organizations and researchers, and so forth.

Since SFC has already became a mature platform for cross disciplinary collaboration, it is a perfect case for BiDL to learning about how to organize off-line activities, attract various participants, and cooperate with leading scholars and companies. Further more, as SFC and BiDL have the join connection of Tongji University, it is possible for BiDL to seek support from SFC, SFC is a valuable external resource for BiDL's development, the target community members of SFC and BiDL overlaps a lot, both of them need students, scholars to participant activities, cooperate with companies would be even more better.

### 4.4.2. Community initiation

#### **Determining questions**

The purpose of SFC is to create a strategic paradigm in innovative education, research and practice. According to author's interview with Professor Lou, building SFC is also to create an inspiring space for creative learners and collaborators.

The main community members of SFC could be categories into three types: students, teachers, and organizations that not belong to traditional educational circles, such as firms or governments.

The main challenges for SFC is Manage relationships with various stakeholders and attract participants for SFC events

After building the design factory space in Tongji's campus, the critical task is to have active "contents" in the physical space. To create "contents", SFC needs to acquire users and enlarge its impact.

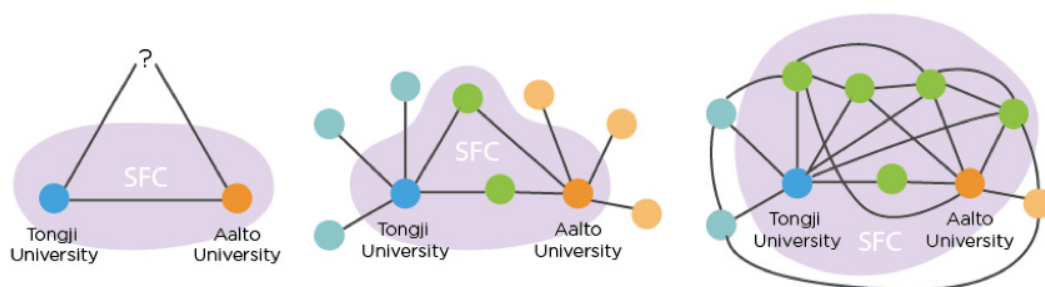


Figure 4.4.2  
Partner network  
building process of SFC,  
Source: author

#### **Construct multi-dimensional network**

Since SFC is a production by two universities' collaboration, the initiate resources for SFC were from Tongji University and Aalto University. Besides the support funding, more importantly, the two universities have their respective networks. The Following picture shows the process of constructing academic network between Tongji and Aalto. At the beginning, the SFC intended to have a third party besides Tongji and Aalto, then it is found that Tongji have its own partner network and Aalto also has its own, and there are several universities has connection with both Tongji and Aalto, so these university were ease become partners of SFC, and increasing partnership have been built through SFC, thus a multi-dimensional network has been formed, which is unlike the triangle model they conceived at the beginning. The multi-dimensional network provides channels for SFC to connect with external resources. (See Figure 4.4.2)

#### Acquire students and teachers members

Author considers the students and teachers of Tongji and Aalto University as internal users of SFC, then how to acquire active internal users is critical for building the open innovation community as well. Nowadays SFC have organized various teaching and research projects, at the initial phase the management team of SFC put massive effort in disseminating information of projects to acquire users, these information was disseminated through paper media, internet tools, and even face-to-face visit, once the students get the information and they would participate SFC's activities if they feel interested in. Then gradually the authority departments have accepted SFC and start to support SFC, now some of the courses of SFC have been included in the official teaching system of D&I college, the students could earn credit by registering these course, which provides another motivation for them.

#### Build collaborative relationship with firms

SFC's management team put a lot effort in contact and negotiates with firms initiatively. All of the external resources need the management team to strive for themselves. In the negotiation, SFC was very clear about how to build win-win situation. For the firms, SFC could provide a platform for them to have collaboration directly with multi-disciplinary college students and teachers. Additionally, SFC also offers firms channels to find talented students that fit their needs or suit their culture efficiently. For the students who participate the research projects with firms, they also acquire experiences that could help them grow better in the future career. SFC defined their collaboration strategy as future-oriented, and they noted that SFC's advantage is to assemble talent people with diverse background, so SFC could help the firms to consider future possibilities, rather than just thinking solutions regards to current problems.

According to the interview author had with the SFC manager Fan Fei, the key of success collaboration with firms is to lead the students and teachers efforts to match with the firms' expectation. It is vital to make firms understand that they could gain what they want by working together with universities on the platform of SFC, especially for foreign companies, SFC is a platform that firms could have fluent communication and get rid of cultural and political obstacles.

#### **Communication channels**

To disseminate the information in much wider scope and communicate with users more efficiently, SFC has built various communication channels. Now the main communication channels of SFC are Internet-based, including Weibo, Wechat, douban, Facebook, Renren and SFC' official website. Email communication is important for daily management work in SFC as well.

SFC takes advantages of different communication tools. Among these online channels, SFC uses Weibo most frequently, almost update post on Weibo everyday, for now there are 2403 posts have been sent through Weibo, and SFC has 4852 followers on Weibo. The reason why SFC prefer to use Weibo as the main communication tool is that, besides disseminate information, SFC could get direct comments and feedback on this platform, interactions become very convenience and effective. The SFC's followers also interact with each other on Weibo, which is good for forming the community. With the thousands users on this platform, SFC already could create great impact. SFC has applied public account of Wechat, which could send multimedia message or newsletter to its followers on Wechat, while compare to Weibo, Wechat is a more private platform, followers could received information by following the SFC public account, but they could hardly have communications with each other. The strength of Wechat is that most of people use it as a mobile application, so the peer-to-peer dissemination largely improve the efficiency. SFC usually uses Wechat as a media tool to send news of events. Fan Fei, the manager of SFC, said that the usage of different social platform depends on the different user groups to a great extend.

#### Gain support from government

In the ecosystem that SFC created, governments also has been involved. The Shanghai municipal government and Espoo municipal government both provide supporting to SFC. For SFC, the most important supporting from governments is the funding. Sometimes governments would provide resources for SFC, and giving even a title that announce some of SFC's events are part of governments activities could already shows governments' support.

#### **Motivations**

Cause: collaboration with firms makes it possible for realize participants' ideas, especially for students, realizing ideas means self-actualization to some extent.

Achievement motivations:

- Student could earn credits by register SFC courses
- Non-cash-prizes;
- Publicity on SFC's publication
- Opportunity to work with leading companies

Social motivations:

- Interacting with others with similar interests
- Scholars could disseminate their academic achievement to young talents

Efficacy and learning motivations:

- Opportunity to exercise one's skills
- Learn new knowledge

- Receive feedback for improvements
- Ideal space work individual learning and group work

### 4.4.3. Community Engagement

#### *Innovative courses*

The projects in SFC include research projects and teaching projects. Most of the research projects are collaborative projects with firms. There are various forms of activities in SFC, including speeches, workshops, seminars, “Tongji on Tracks”.

To foster the spirit of innovation, SFC encourage its manage team to have self improvement study along with working. It is advocated that the team members could write papers to summarize their success or failure experiences and share with others.

SFC usually organizes projects that meet the current trends or has the topic that community members have strong interests in, thus the community members always feel the activities in SFC is fresh and attractive. But the managers may have little experience about the trendy topic, such as entrepreneurship. To manage the project well, SFC has the strategies to cooperate with the organizations that have mature experience in this field.

#### *Open Organizational strategy*

The current management structure of is quite flat, and the manage team always have an open mind about organizational construction. Now several virtual labs, research labs, startups and companies have been constructed on the platform of SFC. Integrating these stakeholders of different fields could generate creative sparkers. To these organizations, SFC plays a role as incubator. For example, the lab of critical art-science practice (CASP) has been incubated on the platform of SFC in 2013, which is the first lab that SFC has built. The birth of CASP benefited from the open innovation activities of SFC. It starts from that SFC has the intention to create a cross-disciplinary lab, then during the communication with several scholars and talents that come to SFC for projects or courses, it is found that some of them have same ideas with SFC, after making settlement of a certain direction, a new lab has been built by joint effort.

### 4.4.4. Community Thriving

#### *Interactions with students*

SFC has developed multi-ways to interact with its community members. Usually in the end of the SFC courses or workshops, students would receive questionnaire to give feedback to SFC management team. Besides the questionnaire survey, community members also could give

feedback on other social media tools.

When talking to the potential development of online platform, Fan Fei said that the official website of SFC has been keep developing for years, there are new features or content keep updating all the time. In the future, the direction of official website improvement is to adding interaction functions.

### **Features of Online website**

SFC has been putting a lot effort to manage its activities and develop the courses systematically, providing clear information for community members is vital. People could find orderly information from SFC's official website, for instance, there is a working calendar that shows all the courses running in SFC, users could get detailed information of the specific courses by click on the title of the course, additionally, users also could add the time and location information of the course to their Google Calendar directly through the SFC calendar. The calendar feature makes users more clear of course schedule in SFC, and offers convenience for users. Leading people to manage this information by their daily management tool could make SFC closely linked to their life. Besides, there is a guidebook on the website for everyone to read<sup>7</sup>, it shows the regulations in SFC, which gives the community members rules to follow, they would be what is encouraged to do and what is not.

### **Exhibition**

At the end of every semester, all the SFC's courses of this semester would have a small-scale exhibition, the form of presentation including models, panels, and PPT. SFC has a routine of publishing an annual report every year to summarize and share the achievement, and these annual reports have been published on SFC's website for free downloading.

### **Gamification**

SFC creates a place not only for innovate and learning, the community members also could have fun in the SFC. Many courses are teaching in a fun way, for example, the TOT (tongji on tracks) course ask students and teachers to take the course on a train that moving from Shanghai to Helsinki, students and teachers live together and have the fun course during the travelling time.

### **IPR management**

The IP ownership depends on specific project, in some projects the IP would be completely owned by the firms that launched and sponsored the project. Under some circumstances, IP could belong to both the firm and university, it means that teachers, students and firms all could use or publishes the achievements, while the classified information could not

<sup>7</sup> <http://sinofinnishcentre.org/beta/booklet/?lang=en>, Feb, 2014.



Table 4.4.5 Key points conclusion of SFC's community building

SFC	Offline	Online
1. Community Initiation	Determining questions: - Purpose: create a strategic paradigm in innovative education; inspiring space - Audience: students, teachers, and organizations (governments, firms, etc.)	Establish Communication Channels: - SFC website - Social network: Weibo, wechat, renren, douban, Facebook - Email
	Establish Communication Channels: - Universities (international communication; domestic communication) - Firms - Governments	Various motivations: - cause: self-realization - social: communicate with others - efficacy and learning: improve expert skills - achievement: credit, working experience, publicity, etc.
2. Community Engagement	- Open courses - Projects - Workshops - Open space	- Distant course / workshop - Life-size / Skype /email
3. Community Thriving	- Exhibition - Utilize retention tools: interaction, such as survey of course feedback - Gamification: having fun courses	Utilize retention tools: - Features on website: course calendar - Interaction: get feedback from social network - Regulation: guidebook
		IPR management: - owned by the creators - owned by the firms

be disclosure.

#### 4.4.5. Conclusion of SFC case study

Today, SFC become a mature cross-disciplinary open innovation platform, which have incubated an ecosystem consists of academic circles, firms, and governments. While the strong impact of SFC is not generated in one day, it also grows gradually by its effort and open strategy. For other organizations that are just at their initial phases, SFC is a successful case at the aspects of how to attractive and sustain community members. Trying hard to make use of every possible resources and connect to every possible potential users are the points author has learnt from this case. More over, since SFC has close collaborative relationship with D&I College of Tongji University, and BiDL is a design lab belongs to D&I College, author thinks that BiDL could consider SFC as an intermediary or platform, and actively participate in SFC's activities that related to biomimicry. The community members of SFC could also be BiDL's

Table 4.5.1 Open Innovation community building comparison

Open Innovation Community Building Process						
	P&G		OpenIDEO		SFC	
	Offline	Online	Offline	Online	Offline	Online
1. Community Initiation	- Consider determining questions - Establish offline communication channels	- Establish online communication channels - Generate various motivations	- Consider determining questions	- Establish online communication channels - Generate various motivations	- Consider determining questions - Establish offline communication channels	- Establish online communication channels - Generate various motivations
2. Community Engagement	- Collaborate with external partners across the P&G	- Leverage the power of crowd: crowd intelligence, crowd voting	- Location-based group works: offline teamwork / brain storming, which could support the online design process	- Leverage the power of crowd: crowd intelligence, crowd creation, crowd voting	Local activities: Open courses / projects/ workshops/ Open space	- Use online communication tool to organize activities with local students
3. Community Thriving	- Implementation	- Utilize retention tools: interaction / regulation - IPR management: closed data	- Implementation	- Utilize retention tools: interaction / regulation - IPR management: open data	- IPR management: vary from the specific circumstances - Implementation - Gamification - Utilize retention tools: interaction	- Utilize retention tools: interaction through social network

potential community members as well.

## 4.5. Comparison matrix – factors, similarities and requirements

The matrix above listed the main activities of three cases that author studied in this chapter. It is shown that all of these three cases of open innovation community have activities happen online and offline along the community building process. While, they may have different focus, for instance, the P&G have spent much effort to develop both online and offline open innovation system, they use the web as channels that could acquire external resources, and the development process is not

Table 4.5.2 Open Innovation community performance comparison

Open Innovation Community Performance			
	P&G	OpenIDEO	SFC
Openness	At the front end, everyone could submit ideas and join the contest	Everyone could join the challenges along the whole innovation process	The activities open to students (offline activities)
Diversity	Various community members: P&G, suppliers, individuals, universities, startups, SMEs, research labs, etc.	Various community members: creative thinkers, people who has different backgrounds.	Various community members: students, teachers, firms, governments, universities, etc.
Networking	<ul style="list-style-type: none"> <li>- Various communication channels: P&amp;G sits, social network (LinkedIn, Twitter)</li> <li>- Proprietary networks</li> <li>- Open networks</li> </ul>	<ul style="list-style-type: none"> <li>- Various communication channels: OpenIDEO site, social network (Facebook, Twitter, LinkedIn, Google Plus)</li> <li>- Networking with sponsors</li> </ul>	<ul style="list-style-type: none"> <li>- Various communication channels: SFC site, social network (Facebook, Weibo, Renren, Wechat, Douban, etc.)</li> <li>- Networking with Universities (international &amp; domestic)</li> <li>- Networking with firms</li> </ul>
Knowledge creating & sharing	<ul style="list-style-type: none"> <li>- Seeking external great ideas and technologies;</li> <li>- Part of the P&amp;G's IPs could be Licensed and put into the market through OI intermediaries.</li> </ul>	<ul style="list-style-type: none"> <li>- Concepts are created by community members</li> <li>- Everyone could disseminate, use and redesign the concepts.</li> </ul>	<ul style="list-style-type: none"> <li>- Multidisciplinary collaborative projects that people could work together to create ideas</li> <li>- The community members shares the knowledge together</li> </ul>
Value Capturing	<ul style="list-style-type: none"> <li>- P&amp;G select and improve the external ideas to implement into market</li> <li>- Licensing</li> </ul>	<ul style="list-style-type: none"> <li>- Everyone could implement the concepts</li> <li>- Sponsor companies would implement concept</li> </ul>	<ul style="list-style-type: none"> <li>- Firms would implement ideas into market or in the future</li> </ul>

transparent to the public. While, OpenIDEO emphasis the power of online community more, so correspondingly, they built an open platform that everyone could interact with others. And SFC pays much more attention about the offline community, thus the web channel is more like a propaganda tool for them.

Compare the three different cases, they provide different types of motivation, which leads to different relationship with community members, and the sustainability of the community also varies with the satisfaction of community members. For instance, in the case of P&G, among all the participants who submit their ideas and join the contests, only few of the contributors could get rewards, thus the main benefiter in the community are P&G themselves and some contributors, the benefiter are much less than the contributors. Comparably, all the participant could get credit of Design Quotient and having fun of participate, everyone could join the innovation process, and even lurkers could be inspired with the ideas and reuse the concepts. So in the case of OpenIDEO, the benefiter are more than contributors. While in SFC, people who join the community could get benefit from the activities. Author suggests that the relationship between contributors and benefiter could somehow explain why the OpenIDEO's online

platform is much active than P&G's online platform.

## 4.6. Chapter conclusion

Author thinks that the web platform is a method to disseminate information as wide as possible, it could support basic activities such as data collections, inspiration, and conceptual discussion and so forth, how deep participants would engage on the web platform depends on the web design to a great extent, the platform designers should consider following questions when they design the web:

- Who are the potential participants?
- What types of activities that the participants are expect to do on the platform?
- How to make better use of internal and external resources?

It is essential to built the community where your potential members usually stay, P&G use the technology intermediaries, such as InnoCentive, to look for promising technology; OpenIDEO needs creative thinkers with all the different backgrounds, so it opens to everyone; SFC is a cross-disciplinary teaching platform, thus it construct networks with various universities. Built the particular communication channels to reach the certain type of community member that was an important step after understands where are the potential members.

Even the online activities have wide and strong impact, the local face to face meeting has the impact of improving the activities to a more practical level, it could enhance the existing relationship that connect though the web platform. Author suggests that the web-base activities and the face-to-face activities have mutual impetus, and it is critical for community forming to manage online and offline activities in a mutual supportive way.

As the Figure 4.6 shows, Six key points author analyzed also could offer solutions to the corresponding open innovation community characters. For instance, when think of how to realize the openness character of open innovation community, the community organizer should consider the determining questions in a right way at the beginning. Answer these questions, include “where is your audience now?” and “Where will you reach out to them?”, determines the community would be build through an open approach. Thus the character of openness, diversity, and networking would be acquired.

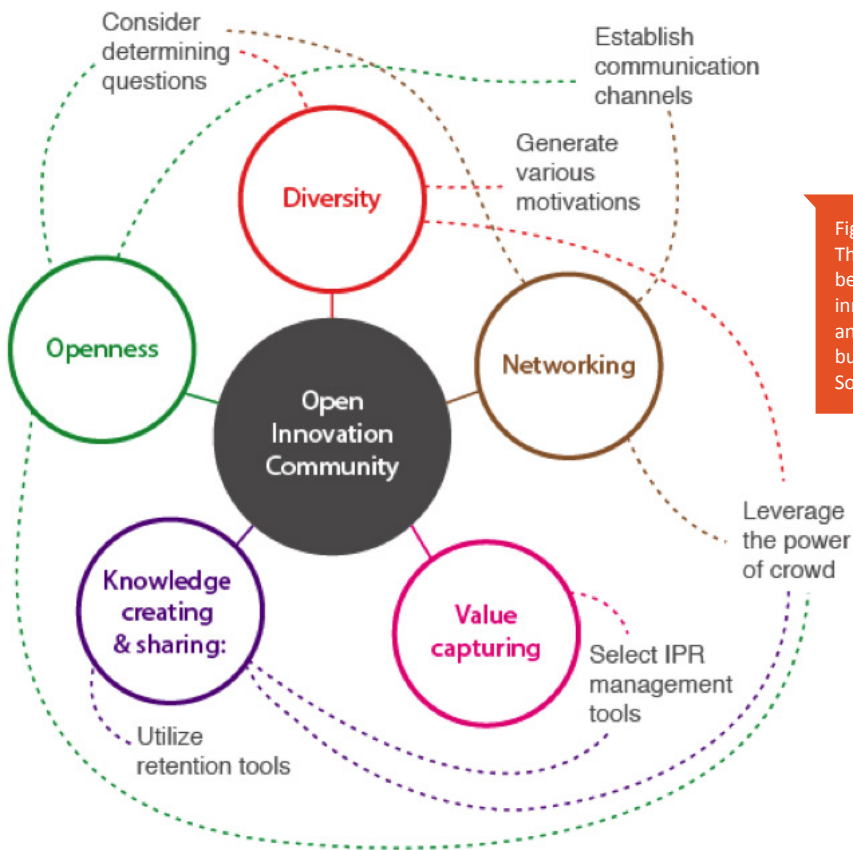


Figure 4.6  
The relationship  
between open  
innovation attributes  
and six community  
building key points,  
Source: author



# OPEN INNOVATION COMMUNITY GUIDELINES

# 05

## 5. Open Innovation Community Guidelines

From the literature review and case study, author has investigated the community building process and several key points that are useful to build open innovation community. In this chapter, author would overview how to realize the attributes of open innovation community along the community building process.

### 5.1. Guidelines of OI community initiation

#### ***Consider the determining issues:***

At the initiation phase of community building, firstly, it should be aware that the if the purpose is to build an open innovation community, thus the attributes of open innovation community should be realized along the process.

At the initiation phase, some preparation work should been done before the online platform has been construct, community organizer should consider determining questions, which includes:

- What is the purpose of the community?
- Who would be the community members that the community open to?
- Where are the potential community members?

These questions determine if the community has the openness and diversity attribute. As an open innovation community, the community members should not only include internal people, the external audience should also be involved in, and community members with different background could bring diversity to the community.

#### ***Establish communication channels***

After the determined the potential community members, community members should think about how to reach potential community members. Building communication channels is an effective way to reach community members, and both the online and offline channels worth the community members to put effort in. The online communication channels includes official website, social networks, online intermediaries, and so forth. While the offline communication channels could be realized by building cooperative relationships with external partners. The establishment of communication channels would form a multi-dimensional networking for the community, the community is not separated, instead, the community would be connect with many external resources, which present the networking attributes of open innovation.



### **Generate various motivations**

It is not enough to only reach the potential community members, motivating potential community members to come to the community is a critical issue for initiate community. Thus, how to motivate people to come to the community becomes a key question in this phase. As there are diverse potential community members for the open innovation community, the motivations for them should also various from their needs, characters, and interests, thus various motivations should be offered. The motivation types should be planed to fit certain type of people. Cause motivation, social motivation, efficacy and learning motivation, and achievement motivation could be evaluated and selected to motivate potential members. To be noticed, the motivations through online community channels and offline community channels should be distinguished.

## **5.2. Guidelines of community engagement**

### **Communication channels**

In the community engagement phase, the main task for communication channels is to create opportunities for facilitate and promote interactions. The communication channels for online activities could disseminate related information, facilitate online communications and involving more community members, which could have positive impact on the offline activities. The offline communication channels could lay the foundation for offline collaboration, which also could boost the offline activities.

### **Various Motivations**

The purpose of presenting motivations for community members in community engagement phase is to motivate people to engage in the community activities, which include both online and offline activities. The community organizers should think about what motivations could motivate members engage in the activities more actively. The relationships of contributors and benefiteres should be considered thoughtfully.

### **Leverage the power of crowd**

Based on the wide spreading online communication channels, the community could reach massive audiences. The key questions need to be considered are “what do you want from the crowd?” and “how to take advantage of the crowd?” Then correspondingly, the suitable crowdsourcing types could be selected and implemented into the community. For instance, if the community needs crowd to be involved in the knowledge creation process, then the crowd-creation could be

a proper alternative choice. Leveraging the power of crowd presents the openness and diversity attributes of open innovation community, it promotes the knowledge creating and sharing as well. Since crowdsourcing needs the power of web-based tools to realize, most of the activities would happen on the foundation of online platform. While under many circumstances, the online activities also have connections with the offline activities.

### **Offline activities**

How much does the community emphasis on the offline activities depends on the determined community members, if majority of the community members join the community from various locations, then the offline activities could serve as supportive activities to complete the things that could not fulfilled by the online platform, location-based subgroups activities could be an alternative choice, and face-to-face activities could have positive impact on problem solving. While, if the offline community channels were easier access to the majority community members, then it would be more effective to have face-to-face activities, and the online platform still could be used as a propaganda and interaction tool. In summary, the offline activities could facilitate knowledge creation and sharing, it is important for open innovation community engagement as well, and the offline activity could be mutually supportive for online activities.

## **5.3. Guidelines of community thriving**

### **The power of crowd**

In the community thriving phase, the crowd continues have impact on the community. Once the crowdsourcing has been implemented, the crowd becomes a critical source for the community. The community members not only could create and share knowledge, they also could become the information disseminators, refer the community to their acquaintance, and contribute to the community stability and extension.

### **Utilize retention tool**

Some retention tools could be utilized to sustain the community, such as interaction, guidance and gamification. From interacting with the community members, community managers could acquire the information of community members' needs, which would give insights for further community construction; for instance, community managers could modify the user motivations and communication channels according to the feedbacks. Guidance is about to setting rules in the community, let the community members be aware of what is encouraged to do and what is not, it also would be helpful for the newcomers to join the community in a short time. Gamification could raise the community

members' interest in a relatively long period, and keep them from getting boring. The retention tools should be applied in both online and offline activities.

### **Select IPR management tool**

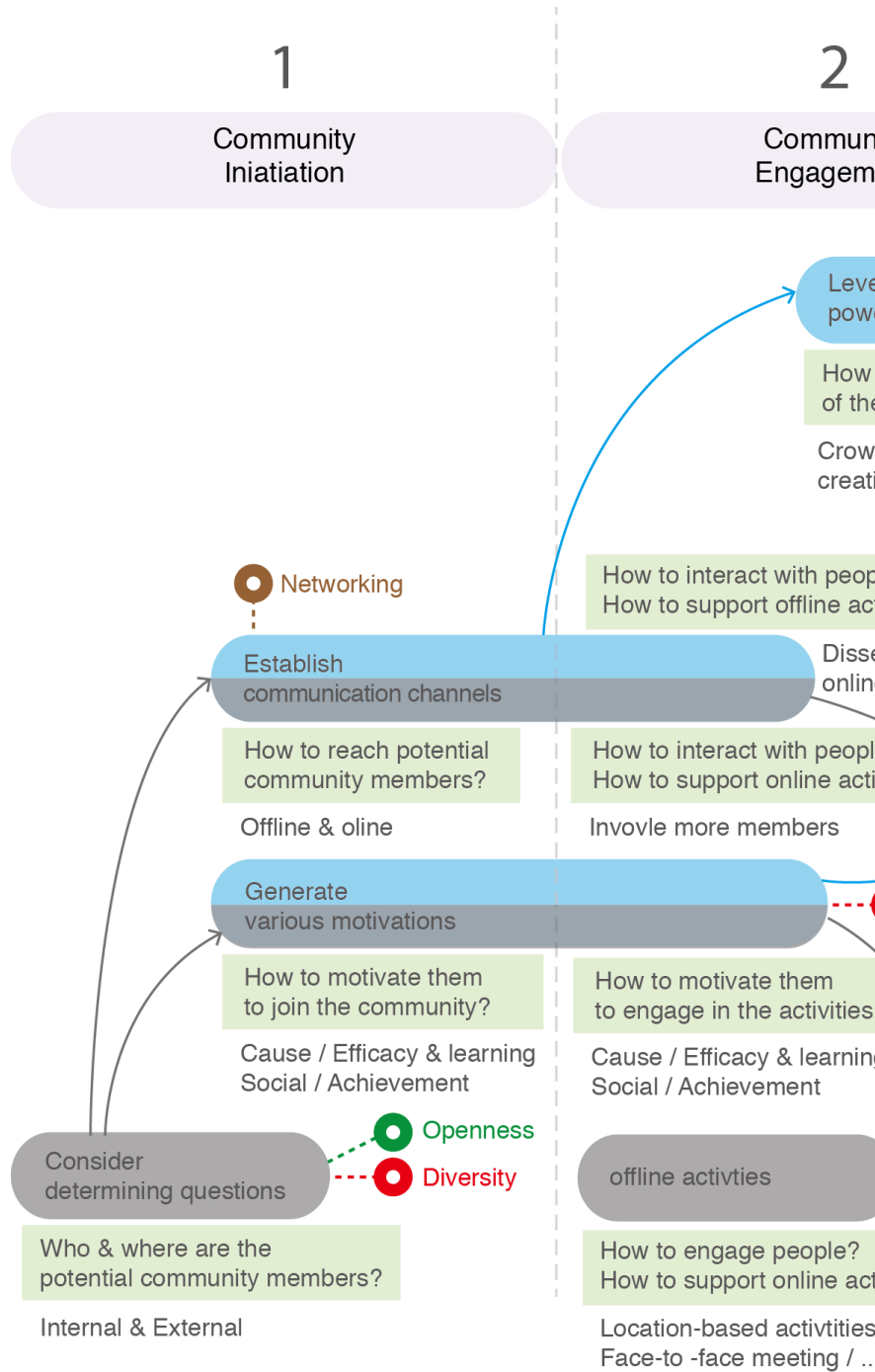
After the community engagement, there should be some intellectual property that has been generated in the community thriving phase, and the core issue is about how to deal with the intellectual property created by the community. The community manager could deal with the partners and community members about how to manage the IP, and the IP management method should be clear to the whole community. Manage the IP in an open approach could facilitate the openness of the community, and it also promotes the knowledge creating and sharing, for instance, giving community members open access to IP could create learning motivation. Using tools like Creative Commons also could help the community to capture IP values. When planning the IP management method, online and offline IP should also be involved into the consideration.

### **Implementation**

As an open innovation community, value capturing is one of its attributes. How to realize the value of community? Implementation is one of the approaches to capturing value. Meanwhile, implement the ideas generated by community could create motivations for community members and make them feel self-actualization.

## **5.4. Guidelines conclusion**

Figure 5.4 shows the diagram of the open innovation community building guidelines. There are eight key points in the whole community building process, and each of these key points has different relationships with online and offline activities as author explained in the previous guidelines, the online activities have been marked in blue, while the offline activities have been marked in grey. The attributes of open innovation community that realized by different steps have been marked in the diagram as well.



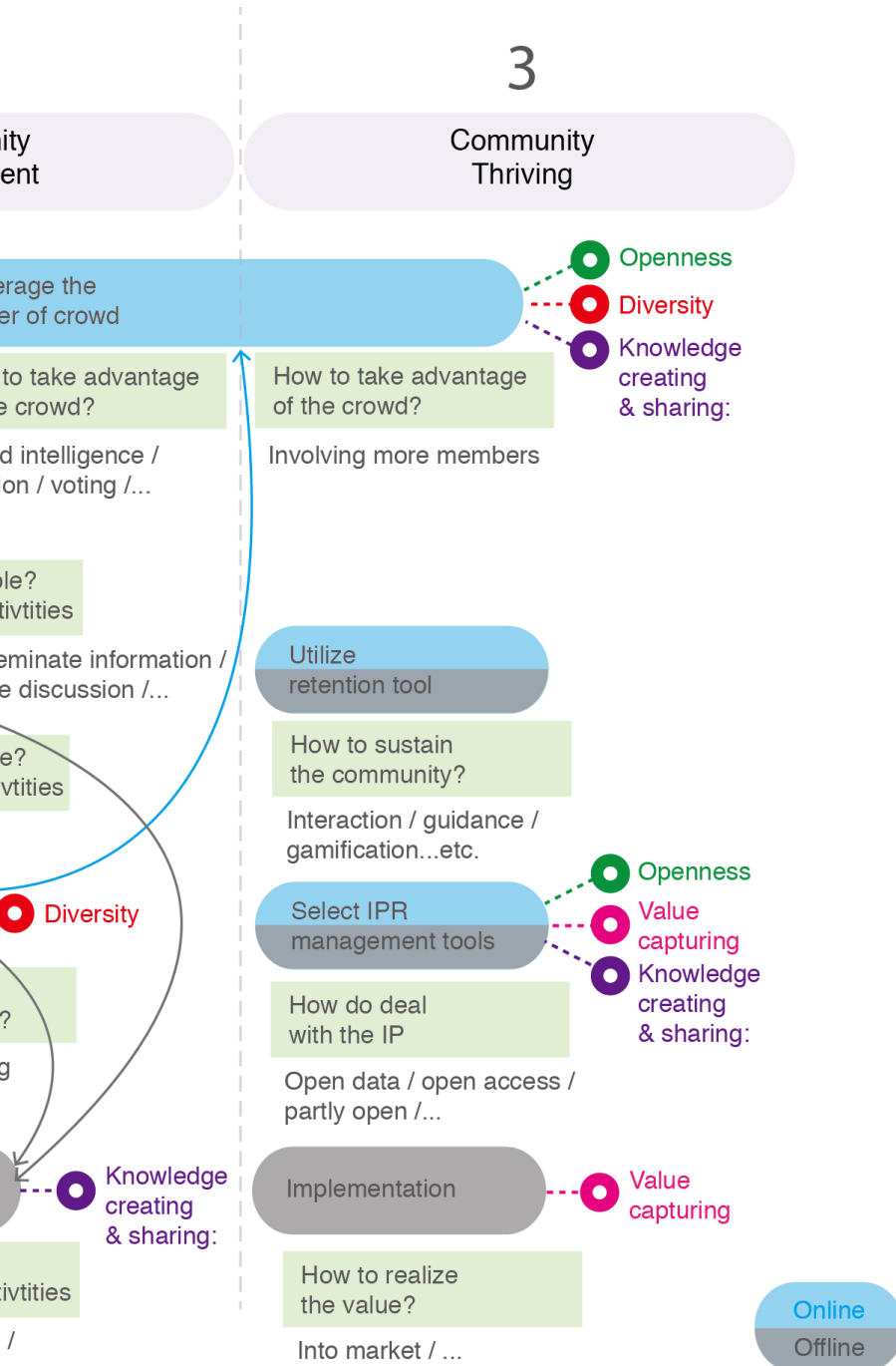


Figure 5.4  
The diagram of open  
innovation community  
building guidelines,  
Source: author



# BIDL CASE ANALYSIS

06

## 6. BiDL Case Analysis

### 6.1. Overview of Biomimicry

A biomimicry primer, Janine M. Benyus, defined the term “biomimicry” as “learning from and then emulating natural forms, processes, and ecosystems to create more sustainable designs.”

Biomimicry is cross-disciplinary by definition. This key feature of biomimicry requires a cross-disciplinary, collaborative, cooperative way of working. Under most circumstance, designers may lack of capacity and experience to understand knowledge of other disciplinary, such as the microbiological processes of photosynthesis, the physical principles and math to calculate the efficiency of the energy gain. It is already hard to integrate all this into design for designers solely. Besides, if designers want to implement their biomimicry design work into the reality or the market, they would need support from engineers and business experts as well. Therefore, biomimicry is a subject that has the requirements of different professionals from different occupations and expertise to collaborate towards the same goal.

There is one similar point of open innovation and biomimicry, both of them is about to changing the mindset. Freya Mathews (2011) indicated that according to the philosophy of biomimicry, it is more wise that human should learning how to live with nature peacefully instead of against nature, and imitate nature’s system to build human’s system, the philosophy advocates that human and nature should blend into one. This philosophy has a lot of common points with Chinese ancient Taoism philosophy, which makes Freya considered that biomimicry would be more easy to fit into Chinese culture and society even than in European world. Author also wants to emphasis that for design activities, nature is an enteral source of inspiration.

### 6.2. Research context

BiDL lab was born in the College of Design and Innovation (D&I) at Tongji University, Shanghai, in 2012. The lab is currently under construction at its initiate phase by Professor Leuba with his team at Design and Innovation College (D&I) of Tongji University. The main research areas of BiDL are biomimicry and biomimetic design. Biomimicry as a fast-emerging, cross-disciplinary science and engineering practice demands



both internal source in design school and external source from other disciplines, interdisciplinary collaboration would be one of the key activities of BiDL. The Leaders of BiDL wish the lab could work in an open innovation community in the near future. In this thesis, Author set BiDL as the design case for applying open innovation into cross disciplinary research, before planning the open innovation scenarios for BiDL, author will investigate the facts of BiDL to dig the real needs and to understand the context of BiDL in this chapter.

The manage team of BiDL is leaded by Professor Leuba and consisted of five to six college students, and the students are mainly volunteered for the manage job, most of their backgrounds are related to design. For now, Professor Leuba in charge of domain works of BiDL, he pointed that since the students are volunteered for the BiDL works, they are extremely possibly to quite the work once they graduate from the university, and their efficiency always be easily affected by the assignments of courses they have in the college. It is shown that when the examination week or the vacation comes, the events and activities in BiDL become much less active. It is because that on one hand the students has much less free time to contribute to BiDL's work, on the other hand, Professor Leuba also hardly be occupied by BiDL all the time. Therefore, author considers a self-management or user-management mechanism would be a suitable model for BiDL to operate more sustainably, the biomimicry related activities would not be faded out once the Leader of BiDL or student managers are not operating the platform.

As Figure 6.2 shows, for now the construction of BiDL is still in the stage of community initiation, BiDL team had put a lot effort in constructing

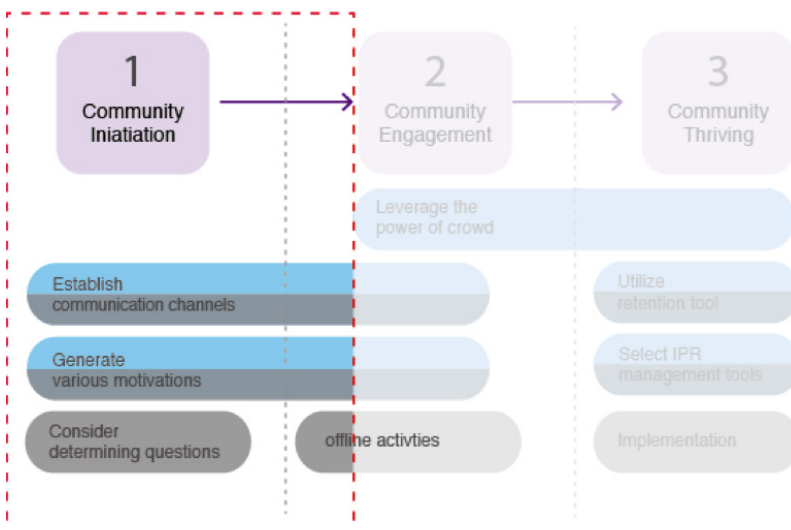
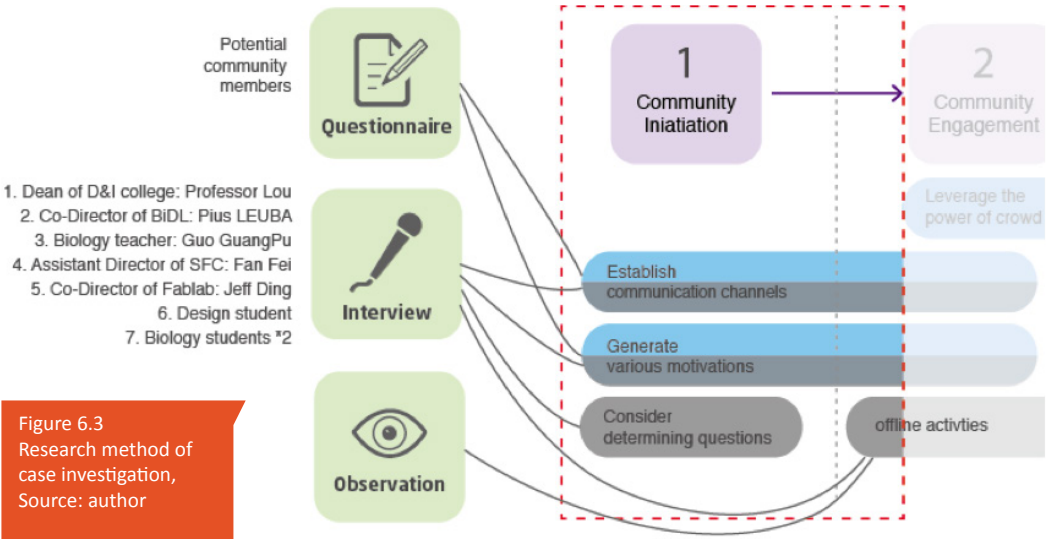


Figure 6.2  
Current stage of BiDL's  
community building,  
Source: author

communication channels and trying to organize biomimicry activities. Author shall analysis what BiDL has done and what the impact of these endeavors, especially investigate the current communication channels and the effect of motivations offerings, and then the factors related to offline activities, should also be investigated.

### 6.3. Research methodology

To understand what is the current circumstance of BiDL, what BiDL has done and haven't done about the community, author used three main research methods for the case research, which includes Questionnaire, Interviews, and Observation. (See Figure 6.3)



#### Questionnaire

The research tool of questionnaire has been used to investigate the online behavior and related motivations of potential community members. The Questionnaire has been disseminated and collected by web-based tools. The responders are all fits into the definition of BiDL's potential community members, and most of the responders have design or biology backgrounds that have the capability to contribute to biomimicry.

#### Interview

Several interviews were conducted with stakeholders of BiDL,

experienced community organizers, and potential community members. The total number of people who had interviews is 8 people. From these interviews, author could find insights about how the determining questions, gain clues of establish community channels and generate various motivations for BiDL, and analysis the feedback from offline activities.

### **Observation**

During the thesis research period of time, author works together within the BiDL team, and attended BiDL meetings from September of 2013 to March of 2014. The purpose of observation is to evaluate the offline activities conducted by BiDL, and gain insights of the BiDL management work.

## **6.4. Data collection and Analysis**

### **6.4.1. BiDL's stakeholders**

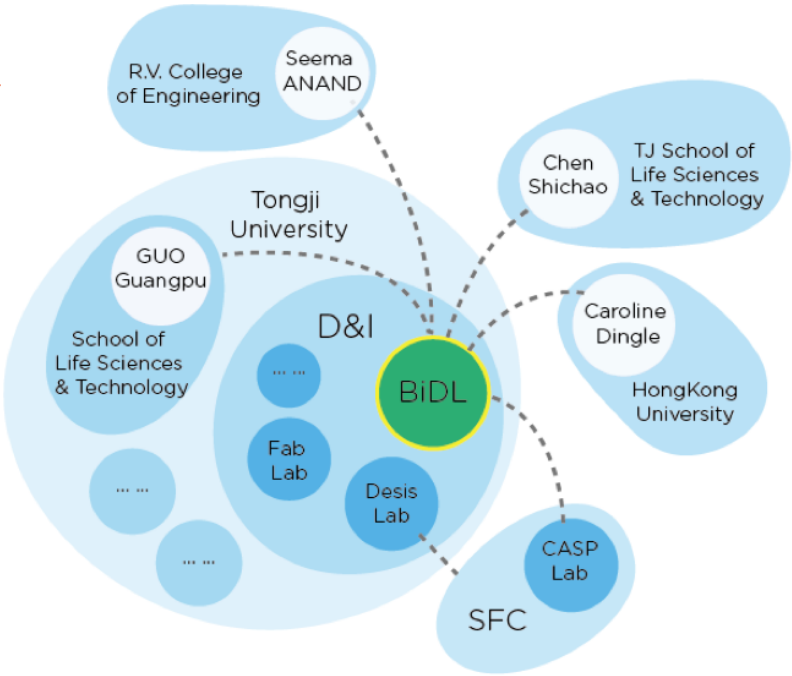
According to the data that author acquire from the interview with Professor Leuba, the director of BiDL, the main expected participant of BiDL could be categorized into two big types: individuals and organizations. Individuals includes students that from internal of D&I college and external of D&I college, teachers that from internal of D&I college and external of D&I college, experts related to biomimicry, and any individual who feel interested about biomimicry this subject. While the organizations refer to other sustainable or biomimicry academic insititutions, green design firms, innovation compaies, government, etc.

There are three different types of stakeholders in the map: 1) educational institutions, 2) firms, 3) green organizations (non-profit).

#### **1) Educational institutions**

Figure 6.4 clearly shows that BiDL is an academic research lab belongs to D&I college of Tongji University, so other colleges of Tongji University has relatively easier access to become BiDL's external resources, and now BiDL already built connections with several professors from Tongji's life Sciences and Technology School, Professor Guo GuangPu, an biology expert, has strong interest in design field and has the willing to bring biology student into the collaboration with design students. Professor Seema Anand is an biomimicry expert and an architect from India, she is also engaging in organizing a biomimicry network in India, cooperation with the India biomimicry network would assist BiDL to has a more international view and wider-range of impact. BiDL should put effort on harness similar connections with educational insititutions to acquire

Figure 6.4.1 .1  
Environment of  
Educational institutions,  
Source: author



human resources like students and scholars. The CASP lab, affiliated of SFC, is a bio-art / bio-design lab, the resource it needs is overlaps with BiDL to some extent, both of CASP and BiDL needs participants from design and biology sectors. For this reason, CASP has the potential to become one of the partners of BiDL.

2) Firms

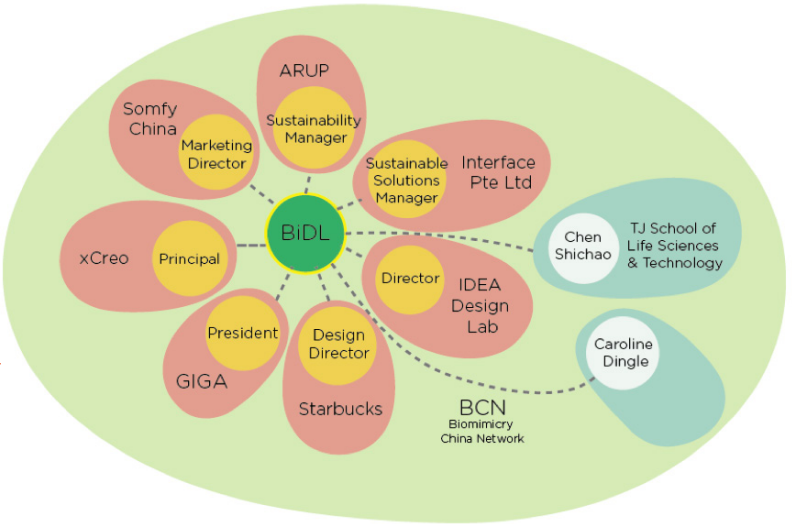


Figure 6.4.1.2  
The Biomimicry China  
Network,  
Source: author

Professor Leuba wishes to organize a Biomimicry China Network (BCN) through BiDL, the BCN would be consisted by firms and academic institutions. Now the managers or directors of several firms have already confirmed to join BCN. These firms are all interest in biomimicry and sustainable design, which as the same interests that bring them into the BCN. More over, these firms would be critical resources for BiDL's development, author thinks that these firms could bring projects, becomes partners or sponsors of BiDL, or implement great biomimicry ideas into market. (See Figure 6.4.1.2)

### 3) Green organizations (non-profit).

Besides BCN, BiDL also has connection with a Biomimicry India Network (BIN), which is organized by professor Seema. And since BiDL's main content is about biomimicry this subject, it is essential to be related to authorized institutions in biomimicry field, such as Biomimicry 3.8. For now because of new rules of Biomimicry 3.8, BiDL could hardly become one of its affiliate institutions, while the open resource provide by Biomimicry 3.8 still could benefit BiDL a lot. Since various non-profit biomimicry networks have similar goals, author suggests that BiDL should seek opportunities to connect with such network and build partner relationships. (Figure 6.4.1.3)

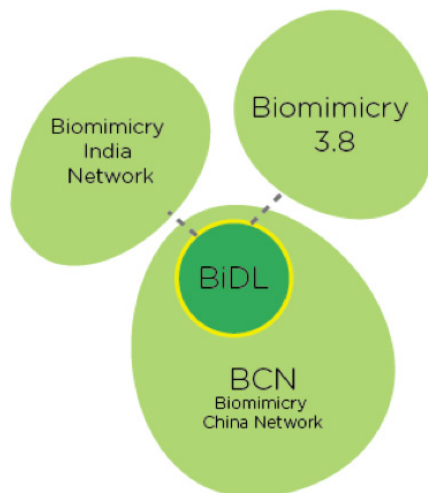


Figure 6.4.1.3  
Connections of  
BiDL with green  
organizations,  
Source: author

Author had an interview with Professor Leuba about the partners of BiDL. When talking to the partners of BiDL, Professor Leuba said that since each partner has its own agendas and goals, the cooperation between these partners is going to be different. We could create greater value if we could understand the reasons of collaboration, what we have

in common, the weakness and strength of each partner, etc. For instance, both BiDL and BIN are short of funding, but we have different resources that we could share to help each other to create bigger impact.

#### 6.4.2. Online platform for potential community members

##### **BiDL's official website**

BiDL has its own official website (<http://bidl.tongji.edu.cn/>) available for people to understand what BiDL lab is, to publish the up-to-date news of BiDL, and to disseminate the knowledge of biomimicry. This website works as a window of BiDL for outsiders to know the lab and biomimicry subject more comprehensively.

Moreover, now there is a BiDL's Wiki platform under construction. The initial purpose of building this wiki platform was twofold:

1. managing teaching processes of Professor Leuba's courses, including publish news and assignments of courses, managing the homework uploaded by the students.
2. Jointly creating, exchanging and managing sustainability content related to design, ultimately creating a database, not least of biomimicry and biomimetic design content.

The reasons of why BiDL choose wiki to build its teaching management platform are as follows:

- Wiki is a mutual technology for build open online platform that crowd could contribute and edit the content, and there are many successful cases of wiki education platform.
- There are many wiki extensions could be installed on the wiki platform, BiDL could choose suitable extensions according to BiDL's needs for the platform, for instance, according to the openness BiDL should acquire, extension of access control could be installed, and functions like online discussion blocks also could be added if BiDL has the needs.

There are some weaknesses of the current BiDL's wiki platform that we want to improve:

- The user interface of the platform needs to be improved, for now, the webpage interface looks not very user-friendly, the navigation bar seems haven't be categorized very clearly.
- Users need to know some "tricks" of how to add links on the pages
- The potential of BiDL's wiki platform haven't been sort logically, for now the platform still in the Beta version, everything is on the trail. The BiDL team needs to has a clear aim of what are the functions the platform really needs, since this would not only be an course management platform, the BiDL team still hope that this wiki could be used for building

online communities and cross disciplinary collaborations.

- The current users for the platform are the students would sign for Professor Leuba course, more users need to be attracted to this platform. There are still big steps to community construction.

While in the process of constructing the online platform, the BiDL team realized that there are much more potentials of the online platform than just managing the teaching process of courses, especially since BiDL wants to contribute to help building a Biomimicry China Network (BCN), which would definitely lead to an wide range collaboration.

### **Social networks**

As author summarized before, the range of community members are mainly the students and teachers from design school and biology school. Therefore, author designed questionnaires and send to individuals that fits BiDL's potential community members definition, the purpose of this questionnaire is to investigation these key points:

- Which social networks do they usually engage in?
- What are the common behaviors when they use social networks?
- What are the motivations that motive them most?

Around with these key points, author designed and disseminated a web-based questionnaire to investigate the real situation to find out how to reach the main potential audiences for BiDL's online platform and to understand the online behavior of them better. Dozens of questionnaires had been disseminated through digital ways including using Wechat, and questionnaires are open to everyone on the web. The main group of people who filled the questionnaires is consisted by college students, others including teachers and designers. Since the goal of BiDL is to become an authority institution in China, the questionnaire has been designed for Chinese participants.

The original questionnaire could be found in the appendix, it has been send through Internet on February 2, 2014, and author had collected the data on February 24, 2014 with the result from 86 responders. Considering the main potential individual community members are design and biology students, author disseminated the questionnaire to students from D&I College and Biology College in Tongji University. The responders includes 46 bachelor students, 33 Master students, 2 teacher, and 5 people who work out of campus. Since the expected community members would have diverse knowledge background to support the community, so author also included participants from other expertise, for instance, medicine, business, engineer and law. (Figure 6.4.2.1)

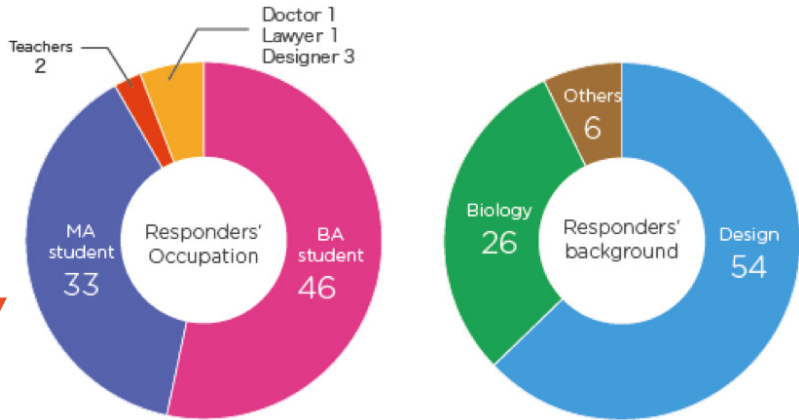


Figure 6.4.2.1  
Basic information of  
responders,  
Source: author

The main purpose of this questionnaire is to investigate the visiting behaviors of social networks and the motivations of visiting. Thus author listed the social networks that most popular recently, and then the responders have been asked to give score (value from 1 to 5) to each social network to evaluate their frequency of visiting. Author listed 10 popular social networks, which including Renren.com, Weibo, Wechat “Moment”, Douban.com, Zhihu, Guoker, Wikipedia, Linkedin, Facebook, Twitter. Then author asked all participants to give score for each network, “1” means “never”; “5” means “extremely frequently”. According to the statics, participants who have design background prefer to visit Wechat “Moment” (4.54), Weibo (3.63), douban.com (3.59), and Renren.com (3) more frequently, while for biology major paticipants, the top 4 social networks are Renren.com (4.31), Wikipedia (3.58), Wechat “Moment” (3.92), and Weibo (3.58).

They also answered questions about in which way do they usually visiting the social network, for example, do they only reading the contents, or if they would comments on others’ content, or even create new contents to the website. The 26 design background responders more prefer to visiting following website by reading: Wikipedia (79.63%), Zhihu.com (68.52%), and Douban.com (38.39%), they would like to comment or edit content on WeChat “Moment” (94.44%) and Weibo (50%). In this question, the biology students like to read contents on Wikipedia (83.33%) and Douban.com (41.67%), and they also like to contribute contents on social networks such as Renren.com (88.46%), Wechat “Moment” (84.62%), Weibo (80.77%).

The data of the questionnaire shows that social networks have attracted both biology students and design students, they especially would like to contribute on Wechat “Moment”. Websites like Wikipedia and Zhihu.com



need visitors have certain knowledge to gain the ability to edit or create contents, therefore even they are quite popular for people, and majority responders still prefer to visit the websites as lurkers. (See Figure 6.4.2.2) Users' online behaviour.

Now using the Internet-based tool as learning and communication means has been widely accepted. In the survey, responders make the answers about their preference while they are doing long-distance collaboration. Their answers shows that design students and biology students have similar preference in this question. Students from both of these two major like to use "instant typing chatting" as the communication tools most when they have to collaborate in distance, design students give score of 4.41, and biology students give score of 4.54. The next choice for them is emailing, the score from biology students is 4.15, and design



Figure 6.4.2.2  
Social network visiting  
situation,  
Source: author

students’ score is exactly the same. Then design students give score of 3.63 to “instant talking chatting”, biology students’ score is a little bit higher as 3.38. The “instant video chatting” is much less popular, which gains the score as 2.3 from biology students and 2.08 from design students. In the comparison, the “cloud driver” service is a little bit useful for responders, since the “cloud driver” offers an online space for storing collaboration files. And few responders use the online forum (1.91) and project management website (1.55) as an effective communication tool to solve problems. Based on the results of the survey, author suggests that when students doing the long-distance collaboration, they are more likely to choose an effective tool that could support instant communication, the visual communication is less necessary that speaking communication. One of the advantages of typing chatting or email is that these tools could save the record of communication, people would not missed any important information, and they even could check the record after the conversation. (Figure 6.4.2.3)

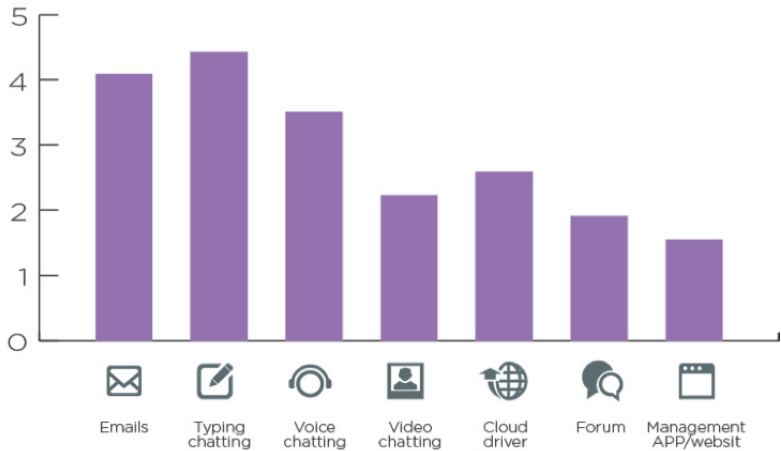


Figure 6.4.2.3  
Collaboration way for  
long-distance,  
Source: author

For the learning behavior, author also investigates questions about when these potential community members have problems during their study process, which way do they prefer to resolve the problem? Majority (89.53%) of the responders would firstly seeking help from searching engines or online knowledge repository, such as Google, Baidu, and Wikipedia. 67.44% responders consider seeking help from friends who specialized in this area as another way to solve the problem, while 41.86% responder would also like to ask help from their teachers. For the tools of online forum, 58.81% of responders would post questions on website like Zhihu.com and waiting for answers. Besides the above problem-solving channels, a few responders would like to go to the library and seeking answers from literatures. (See Figure 6.4.2.4)

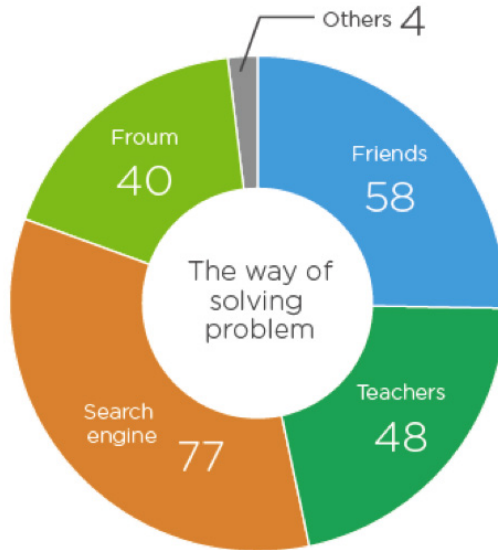


Figure 6.4.2.4  
Way of asking for help,  
Source: author

### 6.4.3. Motivations research

Hutch Carpenter (2011) suggested that a success crowdsourcing goal has two essential qualities, one is a clear request of the community, the other is clearly identifies actionable outcomes for the best submission<sup>1</sup>. After the participants aware of the goal of crowdsourcing, then they would think about what is in it for them and what are the benefits for them. Human motivation is a complex issue, and the answer of how to sustain the community is multi-faced. For BiDL participants, the motivations could be very diverse, for design students, they may want to learn more knowledge about biomimicry or seek for external help to solve problems in biomimicry field; for biology students, they may want to gain design related capabilities; for companies, they may have the desire to cooperate with young talented students.

In the mage-trend of social networking, people tend to spend an increasing amount of time in sharing and receiving information through online channels, thus online communities formed along with this phenomenon. Move over, “Where is BiDL’s audience now: where do they spend most of their time?” is one the key questions when defining the community members for BiDL. To answer this question, as author investigated in the last section, the most influential and popular social

<sup>1</sup> Hutch Carpenter, Motivating the Crowd to Participate in Your Innovation Initiative, 2011, P77.

networks in China currently is Wechat, Renren, ZhiHu and Douban. Thus author analyzed these four social networks to investigate the user behaviors and motivations of BiDL's potential community members. The purpose of following analysis is to understand which online activities people would like to participate and what are the corresponding reasons.

According to the results from author's questionnaire research, motivations for the students participating in social network from strongest (5) to weakest (0) are as follows:

- 1) Catching up with the trends and news (4.1)
- 2) Getting to know your friends' recent situation (4.07)
- 3) Gaining new knowledge (3.95)
- 4) Show the recent situation of yourself (3.2)
- 5) Benefit for career developments (3.07)
- 6) Meeting new people (2.98)
- 7) Monetary rewards (1.66)

It is showed that the priority motivations for students are learning and social motivations, the intrinsic incentives motivate them better. For young students, they usually would like to pay much attention on the things that they interested in, and the information of new trend that happens in their expertise area usually would trigger their interests.

While the social motivation is encompassed by two aspects, one refers to the activities that could reinforce the current relationships, for instance, communicating with existing friends, the responders showed more interests about acquaintance and less interest of meeting new friends. Another aspect of the social motivation is about showing oneself to others.

Besides, gaining benefits for their further career would be one of the powerful motivations. Especially for the students who want to seek for more help to their further career development. In this point, OpenIDEO could be considered as a good reference of setting career motivation, they create Design Quotient as an evaluation tool to demonstrate community members' capabilities of different aspects, and then this Design Quotient could be regard as a capability certification and be shown in the CV. In the comparison, the monetary reward, which is the extrinsic motivation, does not have vital impact on students' responders.

In the last section of the questionnaire, author asked responders if they think Biomimicry is interesting. The biology students showed more interest about Biomimicry than design students, they give the score of 3.85, and while design students's average score is 2.96. But both biology students (2.92) and design students (1.96) think that they haven't have deep understanding about Biomimicry yet.

According to the interviews with biology students, besides the general social networks, there are some professional websites for biology study,

Table 6.4.3 Motivations of popular social networks in China

Social Network	Motivations
ZhiHu	<p>Achievement:</p> <ul style="list-style-type: none"> <li>- Publicity: the excellent Q&amp;A would be published on ZhiHu Newspaper.</li> </ul> <p>Social motivation:</p> <ul style="list-style-type: none"> <li>- Catching up with the trends and news</li> </ul> <p>Efficacy and learning:</p> <ul style="list-style-type: none"> <li>- Gaining new knowledge</li> </ul>
RenRen	<p>Social motivation:</p> <ul style="list-style-type: none"> <li>- Catching up with the trends and news</li> <li>- Show the recent situation of yourself</li> <li>- Getting to know your friends' recent situation</li> <li>- Meeting new people</li> </ul>
WeChat	<p>Achievement motivation:</p> <ul style="list-style-type: none"> <li>- Monetary rewards (discount information, etc.)</li> </ul> <p>Social motivation:</p> <ul style="list-style-type: none"> <li>- Catching up with the trends and news</li> <li>- Show the recent situation of yourself</li> <li>- Getting to know your friends' recent situation</li> <li>- Meeting new people</li> </ul> <p>Efficacy and learning:</p> <ul style="list-style-type: none"> <li>- Gaining new knowledge through friend's share.</li> </ul>
Douban	<p>Gaining new knowledge</p> <p>Catching up with the trends and news</p> <p>Show the recent situation of yourself</p> <p>Getting to know your friends' recent situation</p> <p>Meeting new people</p> <p>Benefit for career developments</p>

which are frequently visited by biology learners, such as PubMed<sup>2</sup> and DXY<sup>3</sup>. While design students also have their design professional online source.

#### 6.4.4. Previous offline activities

<sup>2</sup> <http://pubmed.cn/>

<sup>3</sup> <http://www.dxy.cn/>

During the period of time that author worked in the BiDL team, several events were host by BiDL in the campus, such as Open Forum and the Design Challenge competition seminars. The attendances include students and experts from multi-disciplinary who have interest in biomimicry. Author joined one of the teams for the Design Challenge Competition, which is a contest host by Biomimicry 3.8. Thus author gained the access to observe the cooperation between design students and biology students, and interviews also have been conducted with competition participants. Author has found out that since the competition demands long-period effort of participants, and no credit could be earned through the participation, thus only their interests in biomimicry design attracted most of the participants, while their motivations getting decreased gradually in the design process. From the interviews, author gets to know that the reasons of losing motivation are as follows: The teams almost has absolutely freedom to decide their time schedule and if they would like to attend related seminars, even though there are some biomimicry seminars have been host during this period, there were many who didn't attend the seminars. Some teams has even given up after several month, one of the biology students complained that actually the compulsory guidance from supervisor is very important. Feedback shows that the creativity of design students makes biology students feel more interesting about the teamwork, and the endeavor and rich biological knowledge base also make biology students become the backbone in the team.

#### 6.4.5. Insights from Biology perspective

BiDL is a biomimicry research lab built by designers who want to develop biomimicry from design perspective, while biology is still regarded as the knowledge bases for biomimicry, and plays vital role in this subject. The BiDL community have to invite biology researchers to join in, thus considering about how to construct the community from biology perspective is very important.

Author had an interview with Guo Guangpu, a biology teacher from the School of Life Sciences and Technology of Tongji University. Since Guo had 4 times of cooperation experience with D&I college, including several joint courses with BiDL, he also has strong interest of cross-disciplinary collaboration and bring innovation to biology education, author considered him as one of the key person that could bridging design major and biology major in Tongji University. And because the Tongji's biology students have locational closer connections with BiDL, and they are easier to received BiDL's information, author assumes that they have very high potential to become the first batch of BiDL's community members. Then it is quite essential to understand their learning behavior and investigate in which way they could have better collaboration with design students.

In the interview with Guo, the following questions were mainly discussed:

**- What is the conventionally learning journey of Biology students?**

Author has learnt from the conversation that, unlike the design students, biology students have to spend most of their time on doing experiments in labs and reading literatures. Usually the biology students would choose their study directions and starts their lab study when they become sophomore students, either they choose biology information or biology technology, the later direction has closer connection to biomimicry. The fourth year of college life would be fully occupied by graduate thesis. Generally speaking, the freshman and sophomore students have more open mind and free time for cross-disciplinary collaboration than junior and senior students. Mr. Guo also mentioned that he hopes biology students could have more opportunities of having innovative exercise to acquire a flexible and outgoing mind. It is quite important for biology students to participate in SITP program (Students Innovation Training Program), Since SITP has positive impact on students and teachers academic career, it always has a high participant rate – about at least half of the biology students would be involved in the SITP program.

There is a student association in School of Life Sciences and Technology, named as “Green Giant”. Mr. Guo is the teacher who is in charges of the main management work of “Green Giant”. The purpose of “Green Giant” association is to widespread biology knowledge, let students experience the beauty of natural with fun, and create the belonging sense of environment. The main activities of this student association include making wildlife specimens, plants orienteering, speeches, exhibition, species observation contest, ecological survey and so forth. Students gained various achievements from previous events, and they also made electronic atlas of plants to share part of the achievements with others.

**- The role of biology in cross-disciplinary collaboration**

Besides biology, many other disciplines are also advocate people to learn from nature, including medicine, environment, and architecture. Now even though the collaborations between the Life Sciences and Technology School and other schools are not very pervasive, the value of biology knowledge has been realized by other disciplines. Life Sciences and Technology School has closest relationship with Medical School, serve for and combine with Medicine. Besides Medical School, they also collaborate with Environment School, Ocean Science School, and College of Architecture and Urban Planning. In these collaborations, the teachers

and students of Life Sciences and Technology School usually provides technical support in the joint programs. Mr.Guo pointed out that when other expert, who do not has much biology background, works on a biology-related program, it is very common that he would trying to apply some so-called biological principle that is actually against the real biological principle, which is why the collaboration needs to become more close and interactive, and people needs to acquire basic biological knowledge as the collaboration bases.

#### **- About online platform**

Usually the biology students and teachers use online platform when they need to search literatures, online database is popular among them, such as CNKI and Blackwell. And the Wikipedia is also widely used among biology students and teachers.

There is a website has been under construction for four year by Guo. The initiate purpose of this website is to provide a platform to share course resources with biology students, including papers, videos and ppt. Now Guo also intends to develop this platform for students to exhibit their achievements and communicate with others.

#### **- Feedback about last few times of cooperation with other colleges or schools, including D&I.**

One of the reasons of why Guo also trying to connect with Design and Innovation College (D&I) is that he wants to search for new program, and it would be great if D&I could participate a joint program that could apply for SITP program.

The previous collaborations gave the participated students and teachers an impression that the design students have stronger imagination and creative capability. This kind of cross-disciplinary collaboration could open a window for biology students to experience the world from different perspective and acquire inspirations. From the feedback of students, the biology students do feel quite interesting about design.

While the biology students also feel the differences between disciplinary are vital, sometimes the conflicts of different working behaviors or thinking modes are unavoidable, but the key of collaboration is we need to be clear about our common purpose, and we have to work together to overcome the conflicts and coordinate cooperation for the common purpose. Otherwise, in author's view, at least we need to define our purpose and be clear about what we could benefit from the collaboration respectively, and then make sure that our respective purpose and benefits not conflict with each other.

#### **- The future collaboration between biology and design.**

As Guo suggested, more free time and open mind make the first year and second year students to be better participants for the collaboration.



Most of the biology students put lots of effort on earning credits, reading literatures, writing papers, and participating compulsory courses to fight for chances of postgraduate recommendation and study abroad. And teachers in each school also have pressure of teaching and academic assessment.

To attract these biology students into collaborative programs, there are there different approaches:

- One is to attract students by their real interests. Even though the activities organized by students' associations could not give students credits, they still would like to join the events. It is because they really feel these events meet their interests.
- Another is to organize a project that not for fun, but also could benefit for their applicant of postgraduate recommendation and study abroad, for instance, biology teachers and design teachers running a joint project that could earn credits or could be applied as SITP.
- The third approach is to apply the production - learning - research concept. Guo pointed out that now the learning and research activities are quite mature in Chinese universities, while the school projects usually have little connection to the firms and few of projects could have practical implementation as achievements. Under this circumstance, students usually feel lack of incentives, so they are only working for graduation.

Author thinks that these three approaches also refer to various different motivations for biology students:

- Cause motivation: their personal interests
- Achievement motivation: credits, awards
- Achievement motivation: the value of outcome

Move over, it is essential to find balance of needs from different schools, the time span of the project would be an issue that should be taken into consideration. Usually the time span of biology project would be one academic year (two semesters), while the design project generally lasts for one semester. The program organizer should be clear about how to integrate students of different majors into the program.

He also point out that for better collaboration, design students at least needs to acquire some basic knowledge of biology. According to his experience of collaboration with Architecture School on several Eco-city projects, many non-biology-background people applied little biological principles in the projects. Since the national productivity is growing, the needs of ecological construction would gradually raised, and correspondingly, the demands of acquire basic biology knowledge for design people would raise as well.

Collaborative programs is one of the approaches to keep the community active, besides the programs, there are various activities could also have positive impact on sustaining the community, including workshops, seminars, speeches that hosted by students themselves.

Table 6.5 SWOT analysis of BiDL

	Helpful To achieving the object	Harmful To achieving the objective
Internal	Strengths	Strengths
Attributes of the Organization	<ul style="list-style-type: none"><li>- BiDL has resources of students in Tongji University.</li><li>- BiDL has a student management team which would be helpful for community building work</li><li>- Abundant hardware source in D&amp;I college could be used by BiDL</li><li>- Funding from D&amp;I college for BiDL</li><li>- BiDL has its own official web site as propaganda tool.</li></ul>	<ul style="list-style-type: none"><li>- For now, BiDL is not very clear about what project should be host.</li><li>- The team management is loosen, the team managers do not have clear responsibility for certain field</li><li>- The team are mainly consisted with design background people, people with other backgrounds are needed</li><li>- BiDL lacks of collaboration experience with other disciplinary.</li></ul>
External	Opportunity	Threats
Attributes of the environment	<ul style="list-style-type: none"><li>- The mage-trend of open movement makes knowledge creation and value capturing could be achieved in an open approach</li><li>- The BCN offers BiDL a supporting networking with rich resources</li><li>- Biomimicry is an subject that getting rising public attention</li><li>- Social media has significant impact on disseminate information and forming community.</li></ul>	<ul style="list-style-type: none"><li>- The biomimicry industry hasn't become mature in China</li><li>- The mind-set changing of biomimicry would take a lot effort</li></ul>

### 6.5. SWOT analysis and conclusion

Internal of BiDL includes BiDL's management team, BiDL's community members (both of individual members and organizational members), while external of BiDL means BiDL's potential member who haven't joint in the community yet, and the outer develop environment for BiDL.n this chapter, current situation of BiDL has been researched and analyzed from various perspectives, it has been found that BiDL has needs and

intentions to build its own open innovation community. Specific reasons as follows:

(1) Needs for openness: Under circumstance of fast-developing society, academic world also develops more and more open. Design also become more collaborative and cross disciplinary, designers are seeking for more interactions with external world.

(2) Trend of networking: Now Internet becomes one of people's common learning and entertainment tools, which also bring possibilities for using online platform to manage teaching programs and collaboration projects. OpenIDEO is a brilliant reference of building online community. BiDL could also take advantage of this trend.

(3) Diversity: Nowadays, people have gradually realized that it is not enough to only rely on the internal strength to innovate, there are much more valuable resources existing in the external world. The main research object is biomimetic design, which need not only the power of design, but also need support from many other disciplinary, such as biology, chemistry, engineering, and so forth. Creating a diverse community could benefit BiDL's research and development.

(4) Value capture: BiDL, an academic institution that affiliated in Tongji University, should try to gain support from government and firms to capture its value and realize its practical impact. The aim BiDL's research is to create a more sustainable future of humanity, and then only after generating more interactions and collaborations with society and firms, it will be better to generate practical meanings.

(5) Knowledge creating and sharing: BiDL hopes its researches could be beneficial to social development, and it is also one of BiDL's purposes to promote biomimetic design. With the current development of the open source movement, the internal resources is encouraged to shared with public, which would contribute to development of industry and society.

Therefore, it is inspiring and critical for BiDL to build its open innovation community, which could attract people who interested in biomimicry into the activities that creating and sharing related knowledge. BiDL has its strengths and weakness, in the process of building community, BiDL should makes better use of its strengths and improves its weakness.



# BIDL OPEN INNOVATION COMMUNITY DESIGN

07

# 7. BiDL Open Innovation Community Design

## 7.1. BiDL's community initiation

### 7.1.1. Determining questions

#### **Purpose**

According to the interview that author had with Pro.Pius, he pointed out that the goal of BiDL changes constantly, but the core value of BiDL is the spreading of the concept of biomimicry, and as the approach to sustainability among the college, student, teachers, and Tongji University, etc. And even create business values. While BiDL also has its contradiction, as the organizer has the already been delivering courses in Tongji University, the teaching is one of the easiest goals to be achieved, although teaching is the secondary goal for BiDL. The main goal of BiDL is to actively create the knowledge for designers and spread that knowledge, and launching research or co-creation with the firms that do biomimicry things would be the biggest goals, because it creates practical knowledge that could actually bring social values.

In summary, the purpose of BiDL's open innovation community is:

- To provide a place where people who interested in biomimicry design could do better
- Spreading of the concept of biomimicry
- Developing biomimicry solutions for environmental problems

#### **Define the community members**

Individual members include students from multidisciplinary (includes design, biology, business, etc.), Teachers from multidisciplinary (includes design, biology, business, etc.), companies, individuals who are interested in biomimicry

Organizational members include firms, governments, NGOs. Author thinks that the BiDL should take advantages of its several networking, and expand relationships among these networks (See Figure 7.1.1).

#### **Main challenges**

- Cross-disciplinary collaboration: how to attract participants from different disciplinary and form community
- Seeking cooperation with companies
- Initiate and pushing forward project on the platform
- Connect the online platform and offline activities to mutually support each other.
- Utilize the online platform works as a window to publish news, attracted more participants, and provide a space for conversation.
- Bring virtual ideas into reality, makes participants bonded more firmly and have more concrete feeling
- Sustain the online community.

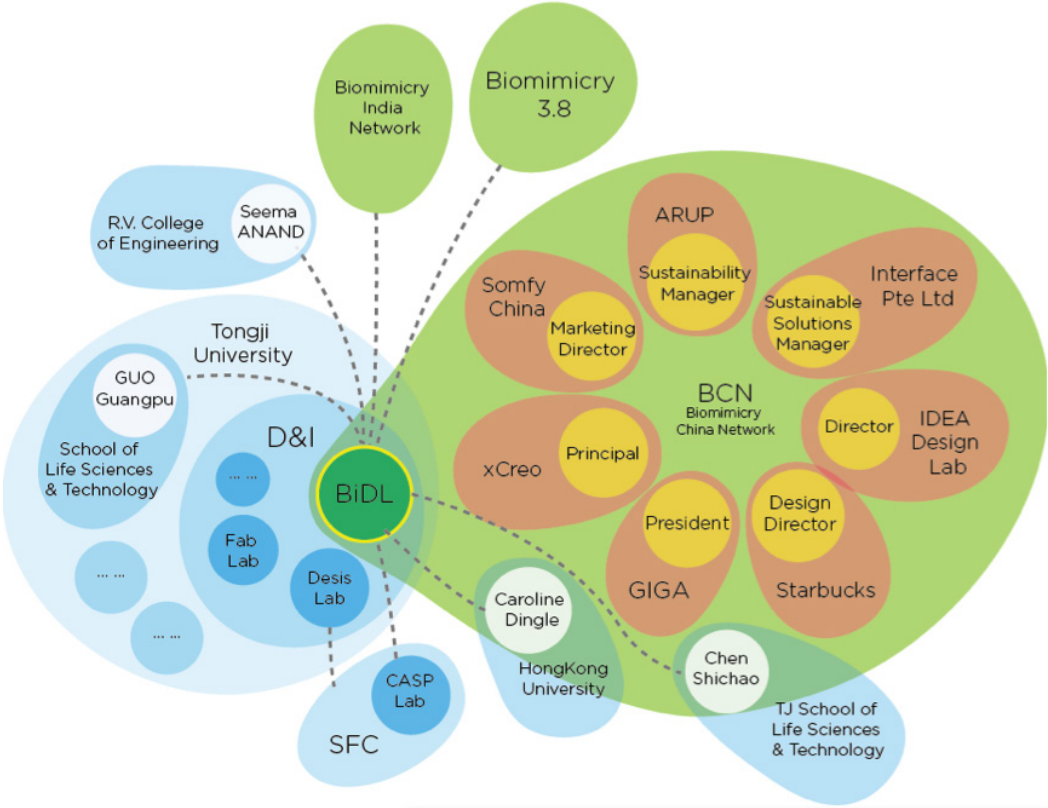


Figure 7.1.1  
Collaboration networks  
of BiDL,  
Source: author

### 7.1.2. Various Motivations

The intrinsic motivation for BiDL's community members could be:

Cause Motivations:

- Contribute to biomimicry field
- See the improvement in environment sustainable development

Achievement motivations:

- Acquire better reputation in design community;
- Badges or ratings for participants performance
- Students could get credit for their course
- Publicity

Social motivations:

- Meeting people who share the same value and interests;
- Suitable platform for co-creation

Efficacy and learning:

- Learning knowledge about biomimicry;
- Gain capabilities that are useful to career

### 7.1.3. The Communication channels of BiDL

#### (1) Online channels

Author develops communication landscape for BiDL. The diverse channels always linked to different contents that attract different users. Three main channels are considered in this case: web, social, telecommunication.

**Web:** web platform is a critical channel for BiDL to connect with external resource, and it is a great space for interaction happens and for community construction. BiDL's official website and BiDL's wiki are both under construction, It is essential to harness these web platforms to attract participants and form community through offering various motivations.

**Social:** Nowadays, along with the fast developing social media in China, several social networks entering people's life. Author points out that BiDL should take advantage of the impact of these social networks, build channels with them to attract participants. The representative social networks which has potential participants for BiDL are Renren, Weibo, and Douban, etc.

**Telecommunication:** it is a way of peer-to-peer communication, sending community members the latest news is a common method to create



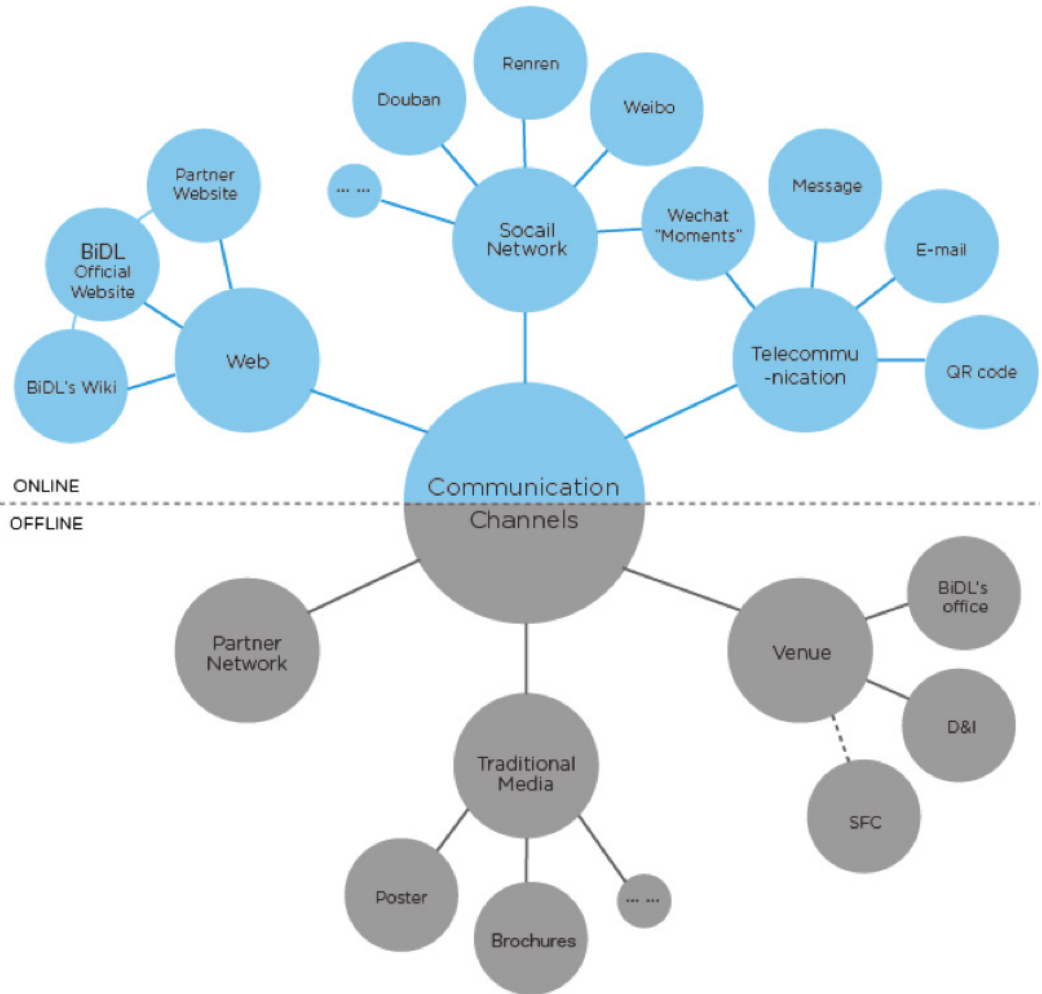


Figure 7.1.3  
Communication  
channels of BiDL,  
Source: author

membership feelings. Especially now mobile communication plays a vital role in people's daily life, it seems that there is a higher volume of user engagement for mobile devices, so the popular mobile applications, such as Wechat or QR code, are need to be considered as communication channels.

## **(2) Offline channels**

BiDL's offline channels mainly include traditional ways of broadcasting and organize location-based activities. The main type of offline channels could be categorized into three types:

Partner network:

BiDL should build the relationship with external organizations. To form long term partner relationship, BiDL should send team members to communicate with external organizations, especially with firms, universities, governments.

Traditional media:

Some location-based traditional media still have strong power of disseminating information, for instance, poster and brochure. These traditional media have great impact on local potential participants.

Venue:

The community member also could join BiDL's activities in physical venue. Even though the technology development makes massive online collaboration possible and popular, the local face-to face meet up still could not be completely replaced. And the location based activities also could be a kind of support for online activities.

## **7.2. BiDL's community engagement**

### **7.2.1. Communication channels**

#### ***Tactic: Transfer the course taker to community members***

To acquire BiDL's community members, author thinks the resources of college students should be firstly taken into account at the initial phase of community construction, since the students who registered Professor Leuba's courses would be the first batch of users of the online platform, these students would be the human resources that contribute contents to the platform, while because of that they are compulsory to use the platform to some extent, thus how to engage them into further activities that are rarely relevant to the course would be an important issue for sustaining the community.

And in the case of BiDL, it is a challenge to maintain the student users after their graduation, if the web platform only stays as a course manage

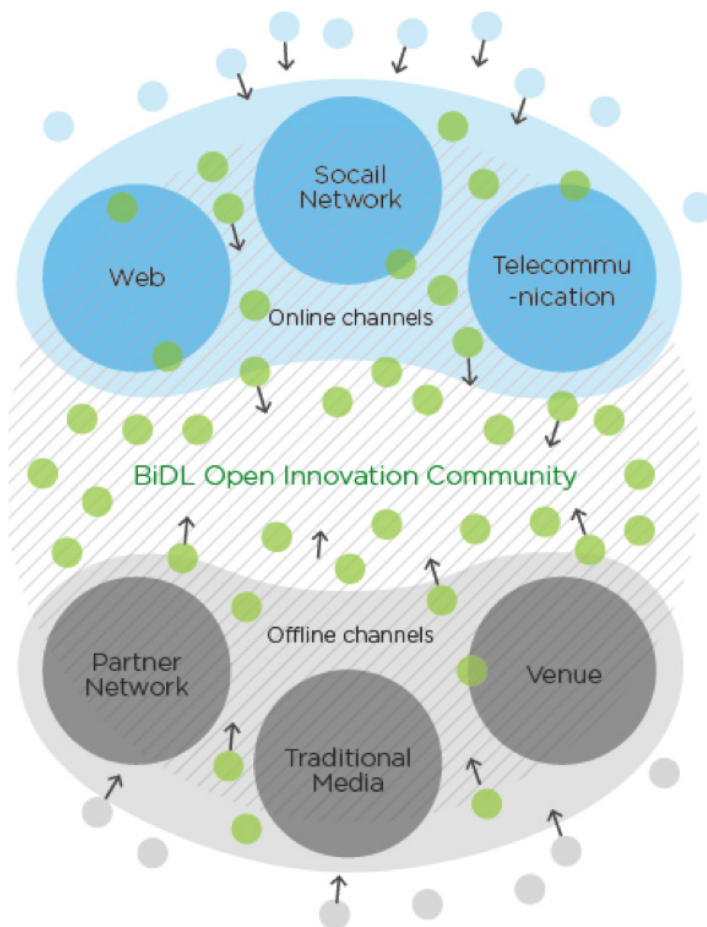


Figure 7.2.1  
The impact of BiDL's  
communication  
channels,  
Source: author

platform, then the students probably will drop it soon after the courses ended. While if BiDL could provide more motivations for them, such as becoming a source of knowledge that they feel interesting, so BiDL may keep having some of their attentions after the course ended. The key point of this tactic is to build BiDL's internal resources. The students could be considered as lead users of BiDL's community, since they are the most contributors on the platform, and they participant in knowledge sharing activities and they also have the capability to disseminate biomimicry information and knowledge through various channels, such as social networks.

In the long term, author advocates that after the students graduation, part of them would have their careers started in their specialized field, they may bring projects from the companies that employed them to BiDL, or they will pursuit further study which would give them insightful thoughts in their study field. These assumptions is to describe author's point that the students user might be a type of users that have most potential among other users. Along with their growing paths, they have the potential to become a bridge between campus and the society.

Through the process of disseminate BiDL's and biomimicry information through multiple communication channels, including social network. The goal is to raise wide-range social attention and to bring diverse users to the BiDL platform. The potential users in this phase could include creative thinker, citizens, sponsors, government, producers, NGOs, firms and so forth. Bring the diversity to the community could generate an ecosystem of the community and create more possibilities.

### 7.2.2. Leverage the power of crowd

#### ***Extend community through communication channels***

The community members of BiDL have the power to disseminate the information about BiDL to outside through channels like social networks or other media, for instance, they could invited their friends who have interests in biomimicry. Author consider biomimicry as a subject that not set making profit as the ultimate goal, but providing solutions for public good, under this circumstance, our target potential community members would most likely to be attracted by their intrinsic interest for this subject itself, or people who has the sense of social duty that makes them feel they are responsible to contribute their power to achieve the ultimate goal of solving social or environmental problems. Usually people gathering in social network and formed communities by similar attribute, for instance, IT engineers more likely to engage in open source software community, and designers like to spend time on design-related online community. In the logic of people clustered by their interests, then BiDL's community members would have joined other external communities

which share the similar value and interest, these external communities would be an effective accepters of biomimicry information, thus disseminate biomimicry information through BiDL's existing users would be a very effective approach.

As author mentioned before, BiDL should conceive a wide-range of community channels that connect multiple social networks, local environment and related platforms. Through various channels, the current community members could refer BiDL to their friends or propagandize BiDL's information; for example, community members could share their project results through social network, renren.com or Wechat. Then others who interested in Biomimicry would have the opportunity to know BiDL platform and chose to become members of the community. More over, it would be terrific that firms or NGOs could be attracted through these channels as well, since they have the power to bring external resources and project into BiDL's community.

### **Create a pool of ideas for knowledge sharing**

The ideas from community members should be sharable with others. The immature ideas could be "exhibit on the shelf", and others could built on these ideas to bring more possibilities and develops these idea

### **7.2.3. Offline activities**

After acquiring users on the platform, it is critical to have active events running on the platform. Events like projects or course could engagement participants into the clusters, and it also creates lots opportunities for community members to have communications with each other. Different types of events have different impact on community members. (See Figure 7.2.3)

#### **Training**

According to the interview with Guo Guangpu, the biology teacher who has experience of collaborate with multi disciplinary, people who do not have biology background need to have gained basic biological knowledge to apply biological principles appropriately. In case the community members who has few biological knowledge may have misunderstanding with biological principle, BiDL should organize training programs to keep all the community members on the same page, and the person who gives training programs could also be one of the BiDL's community members, thus the internal interactions could be promoted as well. More over, the content of training programs should not be limited by biological knowledge, basic knowledge of design and business or other disciplinary. The goal of training program is to provide approaches for people to learn and understand biomimicry better and deeper, then create an atmosphere of gaining basic sense of biomimicry related knowledge. The cross-disciplinary communication also would be benefited. The training program should deliver comprehensive basic biomimicry knowledge

to community members systematically, and it is also a preparation for further cross-disciplinary engagement.

### **Open Course**

Unlike the training program, the courses that BiDL provide should be more professional. And more importantly, the courses should be open for everyone who has interest in biomimicry. If BiDL provides courses on the platform, then the participants' motivation would be their interest in learning biomimicry knowledge, in this case most of the participants would benefit from the course and feel relatively satisfied, this kind of motivation would retain them on the platform even after the course, they would expect the next course.

### **Workshop**

BiDL could organize some short-term workshops to gather creative thinkers to BiDL's platforms. Participants could create inspiring ideas through brainstorming during a relatively intense period.

### **Outdoor activities**

BiDL community could organize outdoor activities to bring fun elements into the community, and it also could promote the biomimicry knowledge spreading in a vivid way. The outdoor activities could be collaborated with biology student associations.

### **Read and Share**

Biomimicry is an advanced discipline, so participants may lack of basic knowledge. Organize reading meetings could provide opportunities for community members to communicate the insights that they get from literatures, which could promote learning efficiency.

### **Exhibition**

Organized exhibitions of BiDL community's achievements could not only spread biomimicry knowledge, but also could encourage community members to further engage in community activities. (Figure 7.2.3)

Figure 7.2.3  
Offline activities for  
BiDL community,  
Source: author



## 7.3. The BiDL's community thriving

### 7.3.1. Utilize retention tools

#### **Interaction with the community members**

Through the communication channels, the BiDL team should have more interactions with the community members to probe what do they need and what are attractive to them, therefore it is clearer to know how to sustain the community. After interacted with community members, it would be clear of about what are members' needs and wants. They BiDL's manage team should try to satisfy them according to their needs and wants, when then BiDL's resources permit. For instance, if one of community members has strong interest about the topic of transportation, then this topic could be voted in the community, if it gains many supporters, then BiDL could share related teaching resource on the sites, start a discuss on this topic, or launch related course to the members.

#### **Guidance**

Since the team of BiDL has few human resource and the information flow is expected to be active and massive. Author thinks BiDL should manage the BiDL community in the user-generated style, it means that the platform users would be the main force to create and edit contents to the website. Since now, BiDL is building a wiki platform, which is naturally suitable for user generated management style. Thus for BiDL's wiki, the community members would be encouraged to contribute biomimicry related information, while the BiDL teams need to check the information with other community members.

It is essential to set rules for users to understand what is encouraged to do and what if not, it would help the community grows in a sustainable and regular way.

#### **Gamification**

BiDL could provide tools or information for community members to study biomimicry better, for instance, BiDL could post links of external biomimicry database, news for biomimicry related forums, the slide or videos of biomimicry course. The ownership could be build from creating an individual space, each community members could save their favorite articles or discussions.

### 7.3.2. IPR management

For the consideration that part of the intellectual property belongs to the creators, and need to be preserved properly. Thus the official website and wiki platform are both built based on Tongji Server, so the security of the information could be guaranteed.



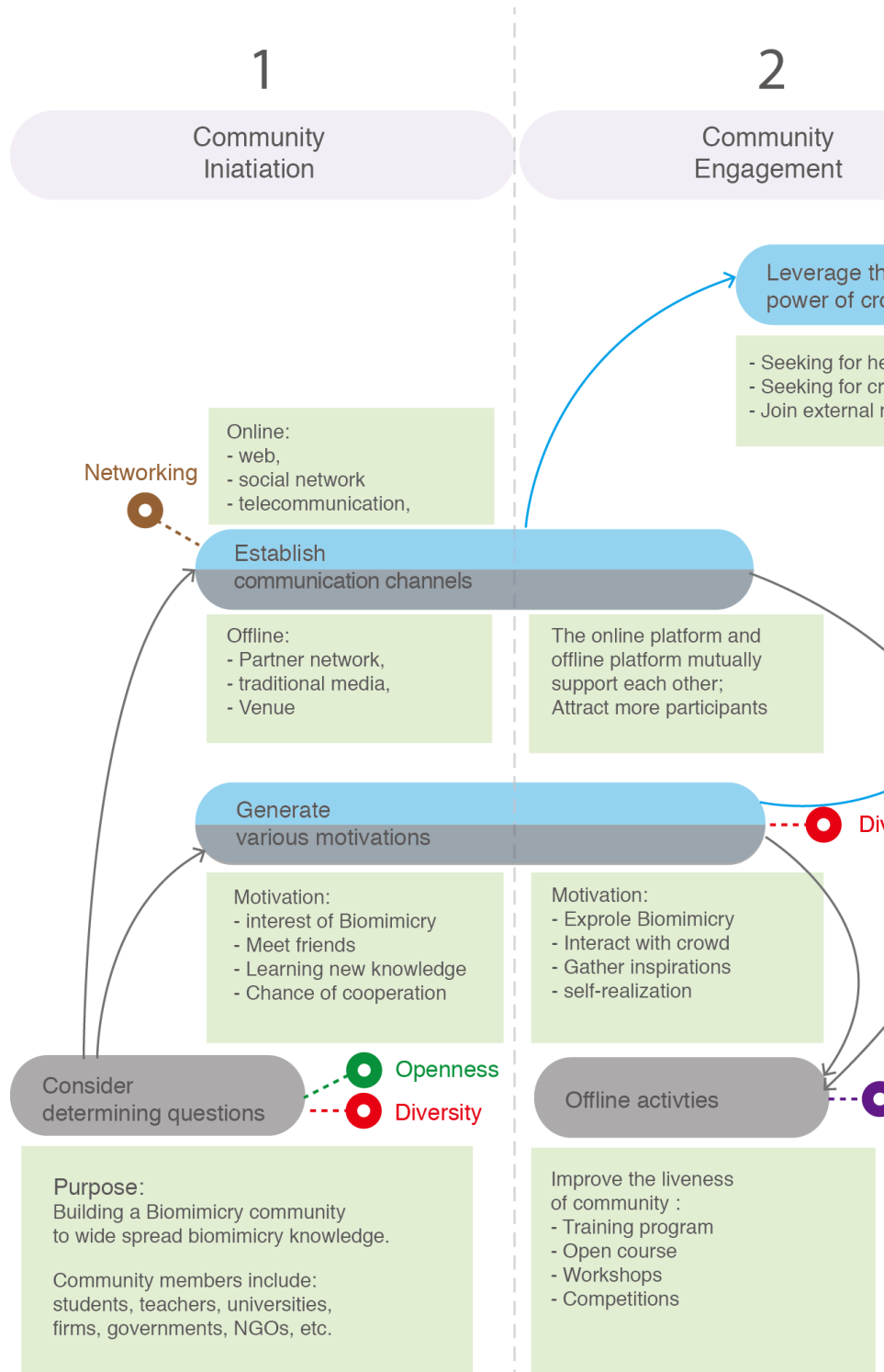
According to the interview with Professor Leuba, he suggests that the research outcome and good ideas need to be shared with the world., and BiDL should try to cover the cost and make it as open as possible.

### 7.3.3. Implementation

As a success open innovation community, BiDL needs to have the capability of capturing value. Thus one of the key questions is how to realize the academic or market value of great ideas. In the previous case studies, author analyzed that collaborate with firms or governments for research projects could improve the enthusiasm of students' participation. For instance, among these diverse community members, it is critical to collaborate with firms, because the firms have the capability to implement ideas into reality, it could give BiDL's community members motivations to putting further effort on the activities. Without the firms, many great biomimicry ideas might still stay on paper; the schools projects are going to ends up only with a presentation as usual, and then would be eventually forgotten.

## 7.4. Diagram of BiDL's OI community building process

In the previous paragraphs, author discussed the key points that should be considered during the community building process of BiDL. The Figure 7.4.1 summarized eight key points along the process and reflect the open innovation community attributes as well.



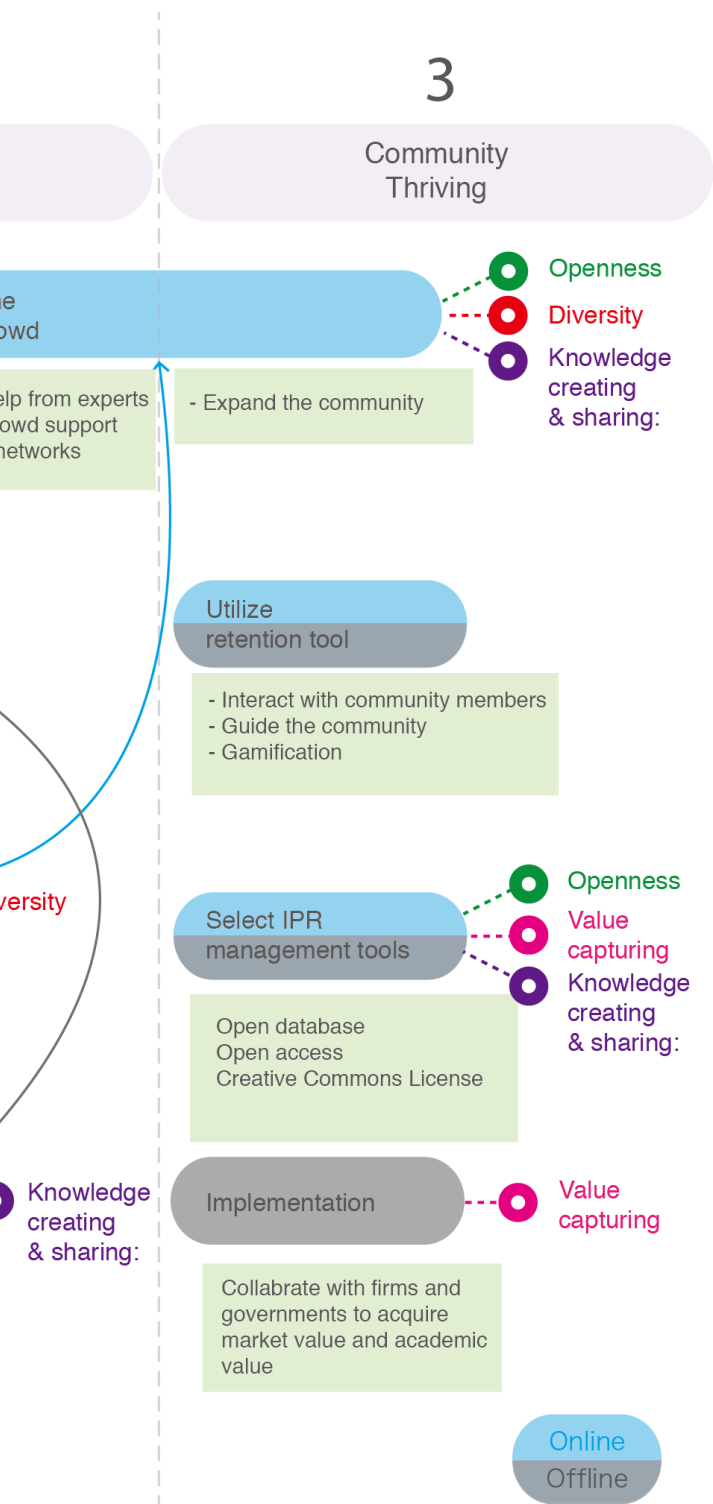


Figure 7.4.1  
Eight key point along  
the community building  
process,  
Source: author

Figure 7.4.2 summarized the movements that could realize BiDL community's "Open Innovation" attributes.

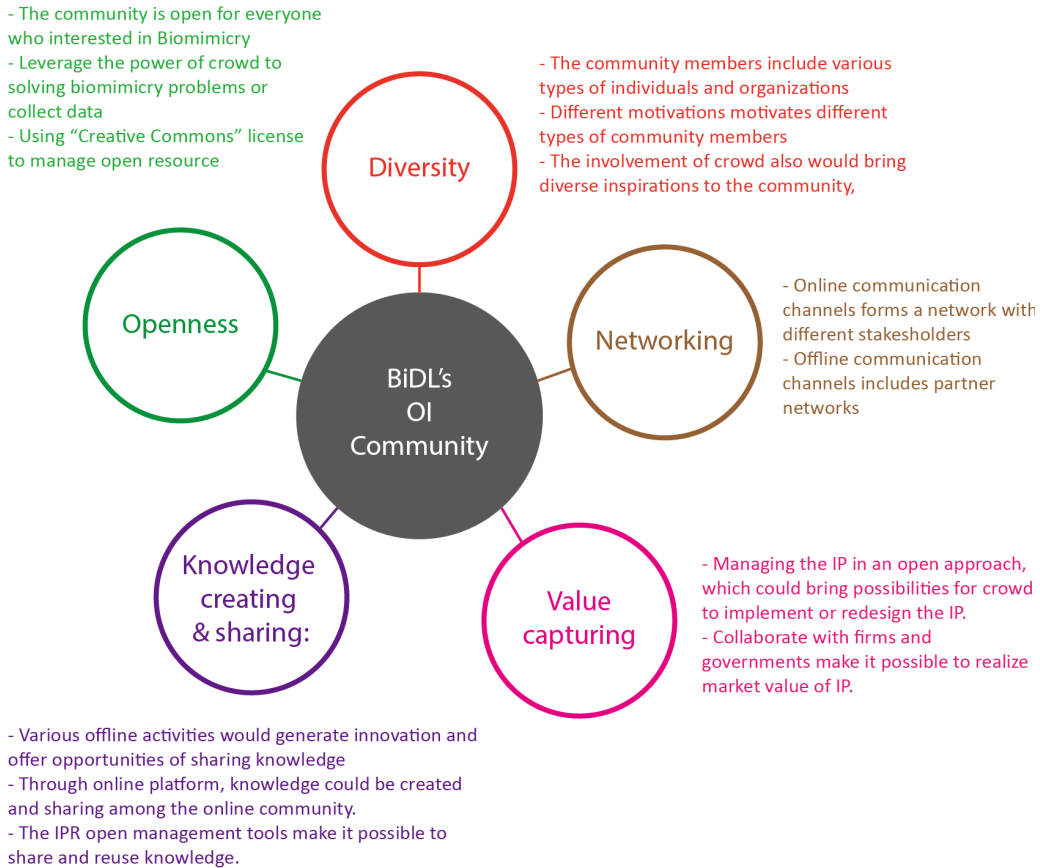
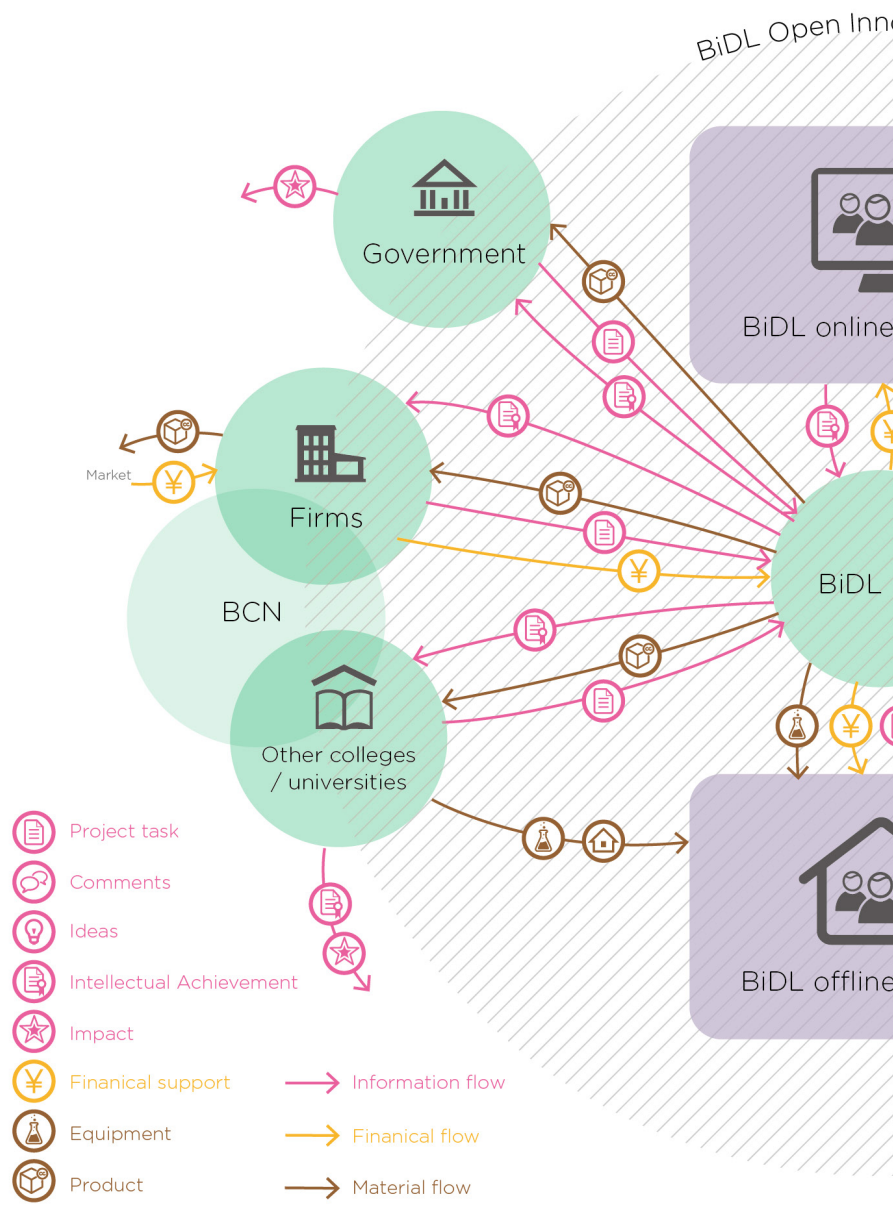


Figure 7.4.2 movements that realize BiDL community's "Open Innovation" attributes, Source: author

Figure 7.4.3 shows the system map of BiDL's community. The community members of BiDL are mainly gathered through online platform and offline platform. In this system, the boundary of the community is permeating, the community is open to the outside, everyone is welcome to join the activities. The organizational community members include firms from BCN, government, and colleges. They could bring financial support and projects to the community. During the process of launching activities, the online platform and offline platform should mutually support each other. Move over, the BiDL lab plays as an role of facilitator in the community. Through this open innovation way of community management, BiDL not only could gain external resource, but also could create great impact of biomimicry.



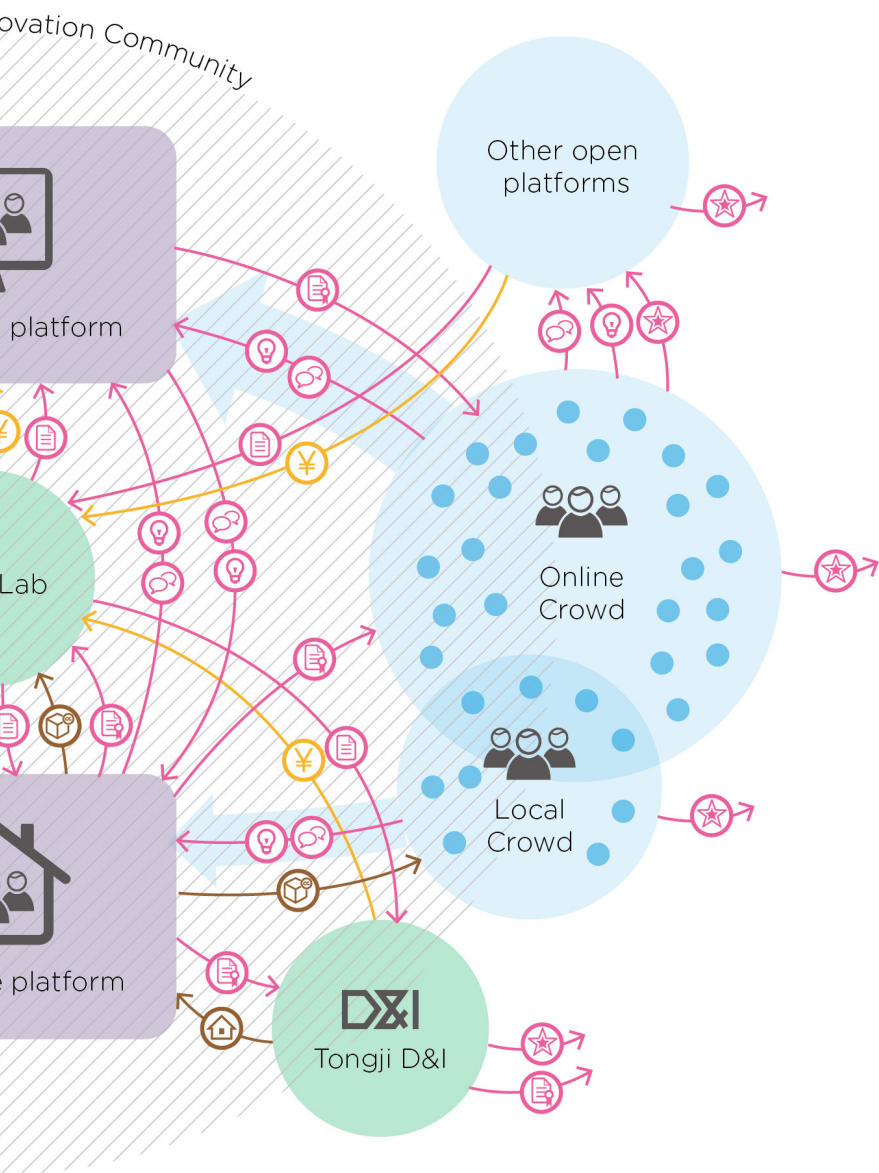


Figure 7.4.3  
System map of BiDL's  
community,  
Source: author

## 7.5. Online platform design

### 7.5.1. Function analysis

For the online platform design, author thinks it is essential to determine what are the required functions of the online platform. Author analyzed the community member's activities, and then setting the required functions according to their certain activities, thus the required functions would satisfy users' basic needs.

Figure 7.5.1.1 shows different individual community members come from different sources. For instance, cooperative governments would offer partners and experts to collaborative projects in BiDL community; students, teachers and many other experts would join the community from cooperative universities or colleges; Local crowd is consisted with various types of participants. The main individual participants could be categorised into five types: students, teachers, experts, partners and amateurs. Table 7.5.1.1 shows the analysis of users' activities.

Figure 7.5.1.1  
BiDL's community  
members sources,  
Source: author

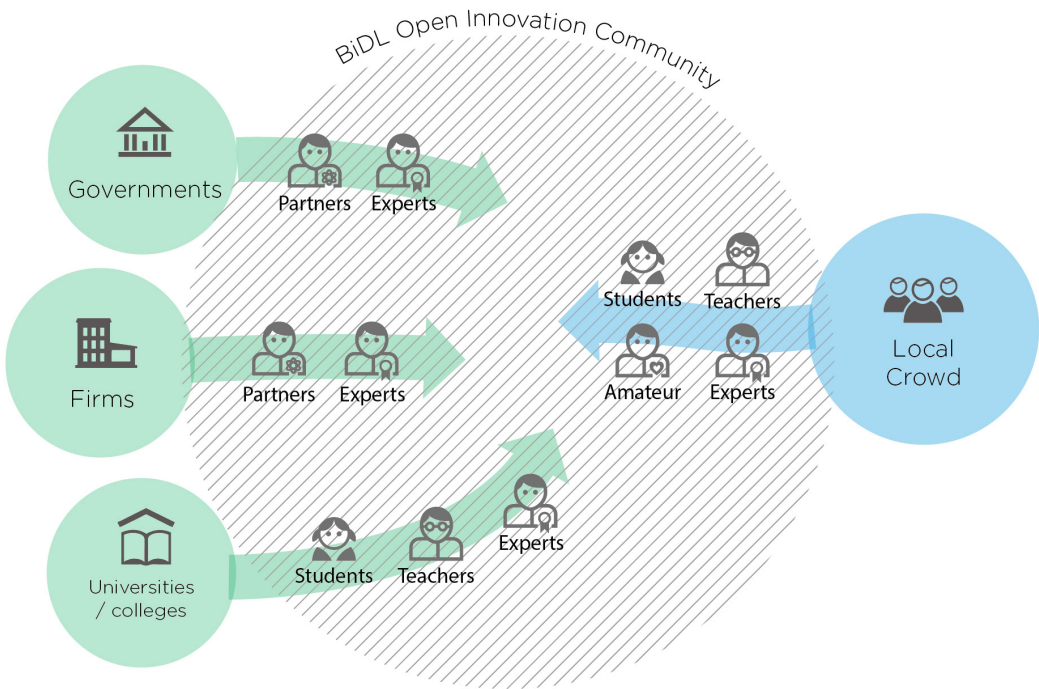




Table 7.5.1.1 Users's activities analysis

Individual community members	Activities	Required Functions for Platform
<b>Students</b> - Students who participant the course - D&I students who do not participant the courses - Tongji Students from other colleges (biologist, chemist, architect, etc.) - Students from other universities / colleges	- Managing homework - Group communication - Information exchange - Open source of insparitions, articles, etc. - Task management - Making new friends - ... ...	- File upload / download - (Real time) chatting / comments - Inbox function / note - Open source database - Timetable / calendars for group work - Individual page - Exhibit space for excellent work - Compare tools
<b>Teachers</b> - D&I teachers - Tongji teachers from other colleges (biologist, chemist, architect, etc.) - Teachers from other universities / colleges	- Publish the news - Managing students' homework - Communication with students - Seeking for collaboration opportunities - Publish research outcome - ... ...	- Blogs - Discussion forums - Contact list - Inbox / private message - (Real time) chatting / comments - Individual page - Assessment tools to evaluate students' performance - Open source database
<b>Experts</b> - biologists - chemists - designers - transportation experts - economic experts - ... ...	- Communication with others - Information exchange - Seeking for collaboration opportunities - Join the workshop - ... ...	- Contact list - Open source database - Inbox / private message - (Real time) chatting / comments - Individual page
<b>Partners</b> - Supervisors come from the cooperative organizations	- Communication with others - Information exchange - Review achievements - Join activities of project - Evaluate performance - Provide support	- Contact list - Assessment tools to evaluate - Comments
<b>Amateurs</b> - Participants who have interests in knowledge related to biomimicry	- Making new friends - Join the workshop - Communication with others - Information exchange - Open source of insparitions, articles, etc.	- (Real time) chatting / comments - Inbox function / note - Individual page - Open source database

According to the table above, the main activities could be categorized into four functional blocks (See Table 7.5.1.2 and Figure 7.5.1.2):

Table 7.5.1.2 Four functional blocks of BiDL's online platform

Functional blocks	Description
Course management	Providing an online space to managing all the activities, resources, conversations and projects of biomimicry courses. Bring in internal and external resources, content, and tools related to the courses, which could help teachers to efficiently make announcements, create assignments, share resources, and help the students to engage in the courses, foster discussion and community. The assessment tools represent the performance of students and the progress of the project.
Project based learning	The project in this block is more coming from external resources; collaborations with firms and external academic institutions are expected. Students have the opportunity to be inspired to acquire a deeper knowledge about biomimicry in this section.
Social networking	The main mission of this block is for fostering and extending communities on the BiDL platform. Community members could show their contributions, exhibit achievements, and discuss interesting topics related to biomimicry, and share thoughts with friends through social networking channels to external platforms.
Repository	Since Biomimicry is an advanced cross-disciplinary subject, it is essential to integrate relevant resource and build a biomimicry repository for further researches, especially for biomimicry beginning learners. The repository could apply open data and open access strategies for community members. The BiDL's repository could have connections with external resource, such as asknature.org. The excellent students works or ideas also could be integrated into the repository. And the physical library should be included as a part of the repository as well. The main mission of repository is to provide a convenient and efficient access for biomimicry related data, promote further researches by sharing resources.

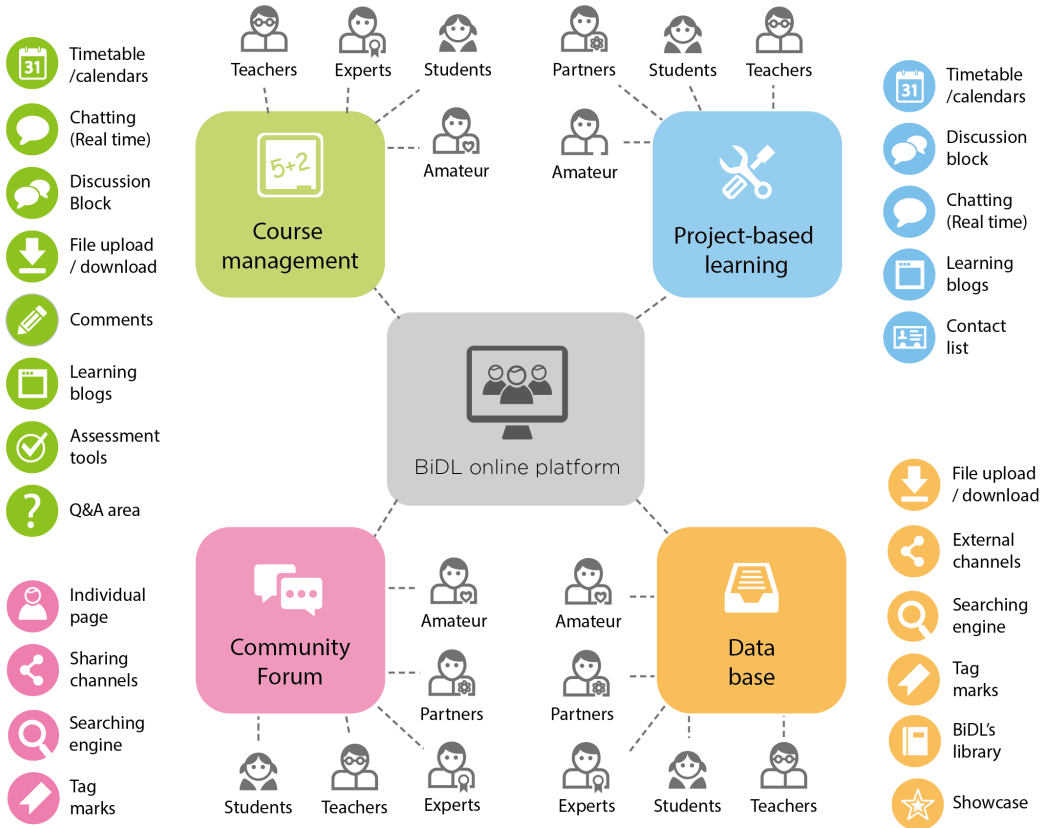


Figure 7.5.1.2  
Four functional  
blocks of BiDL's online  
platform,  
Source: author

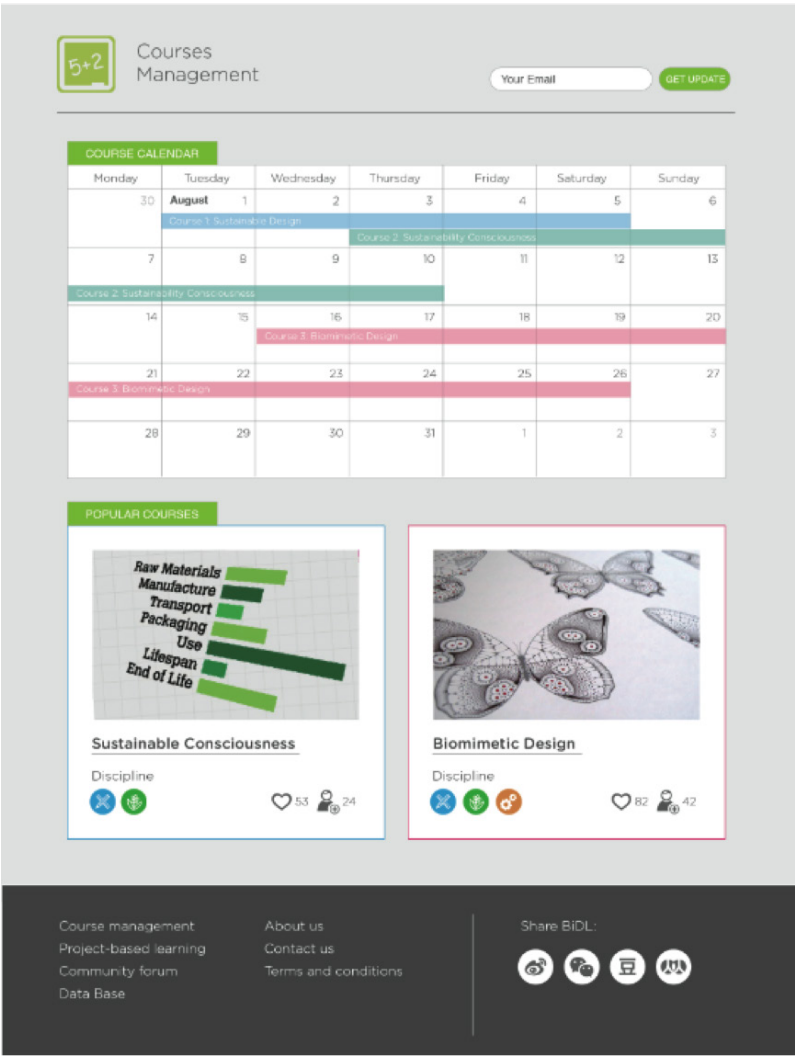
### 7.5.2. Webpage design

The webpage design should satisfy community members needs and connect BiDL with the external networks. According to the function analysis in the previous paragraph, author designed the following draft webpage layouts for BiDL community:



Figure 7.5.2.1  
Webpage design:  
Home page,  
Source: author

Figure 7.5.2.2  
Webpage design:  
Course management  
main page,  
Source: author



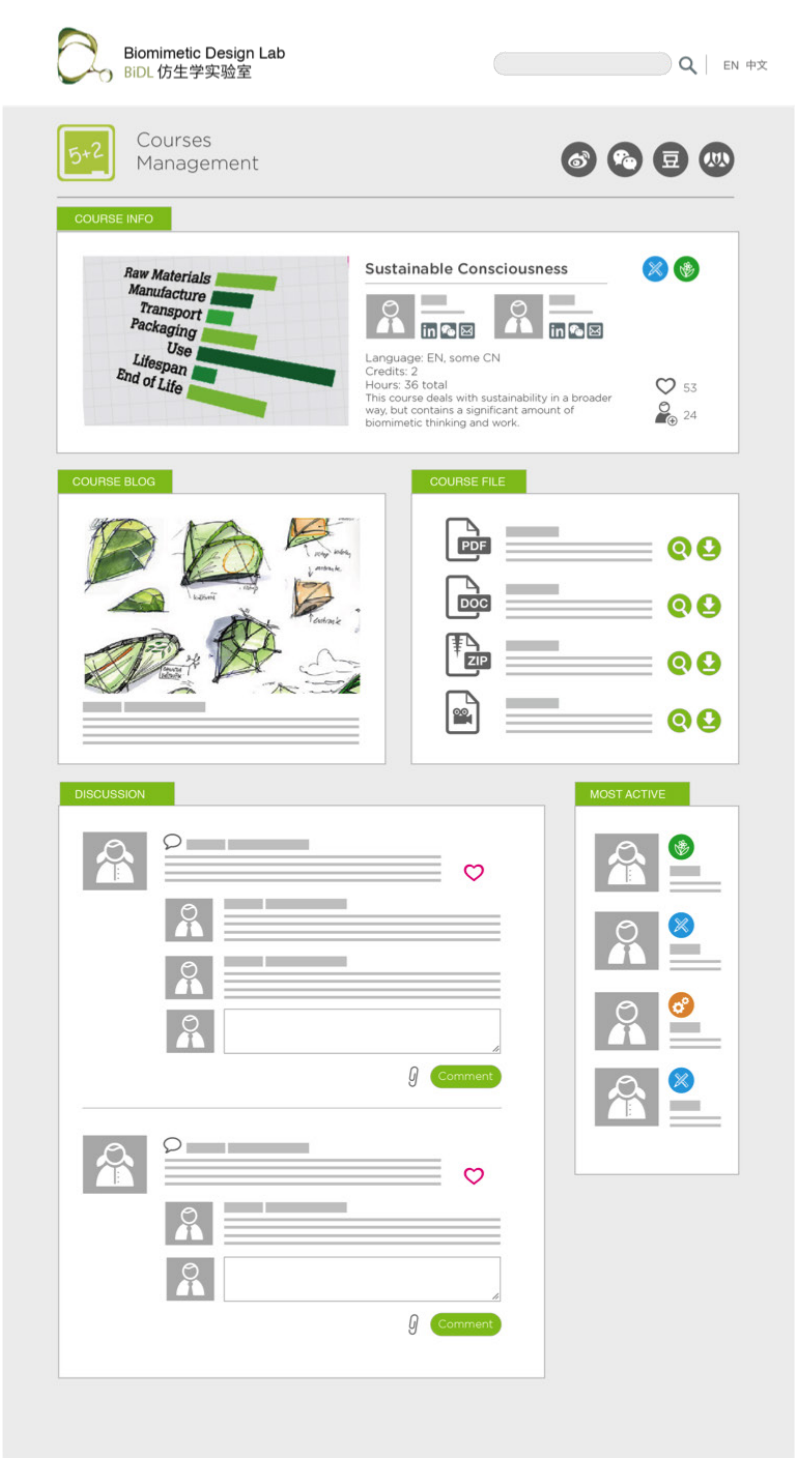



Figure 7.5.2.3  
Webpage design:  
Course page,  
Source: author

Figure 7.5.2.4

Webpage design:  
Project management  
main page,  
Source: author




Projects-based  
Learning

GET UPDATE

PROJECT CALENDAR


Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
30	August 1	2	3	4	5	6
7	8	9	10	11	12	13
Project 1						
14	15	16	17	18	19	20
			Project 2			
21	22	23	24	25	26	27
Project 2						
			Project 3			
28	29	30	31	1	2	3
Project 3						

POPULAR PROJECTS



Project 1


Partner / Sponser:



GIGA | 循绿


♡ 53

👤 12



Project 2

Partner / Sponser:



♡ 82

👤 19

Course management

Project-based learning

Community forum





Data Base

About us

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Terms and conditions

Share BiDL:

Open innovation community for cross-disciplinary research collaboration: scenarios for the Biomimetic Design Lab (BiDL) at Tongji University

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Figure 7.5.2.5  
Webpage design:  
Project page,  
Source: author

Figure 7.5.2.6.  
Web design: forum  
page,  
Source: author



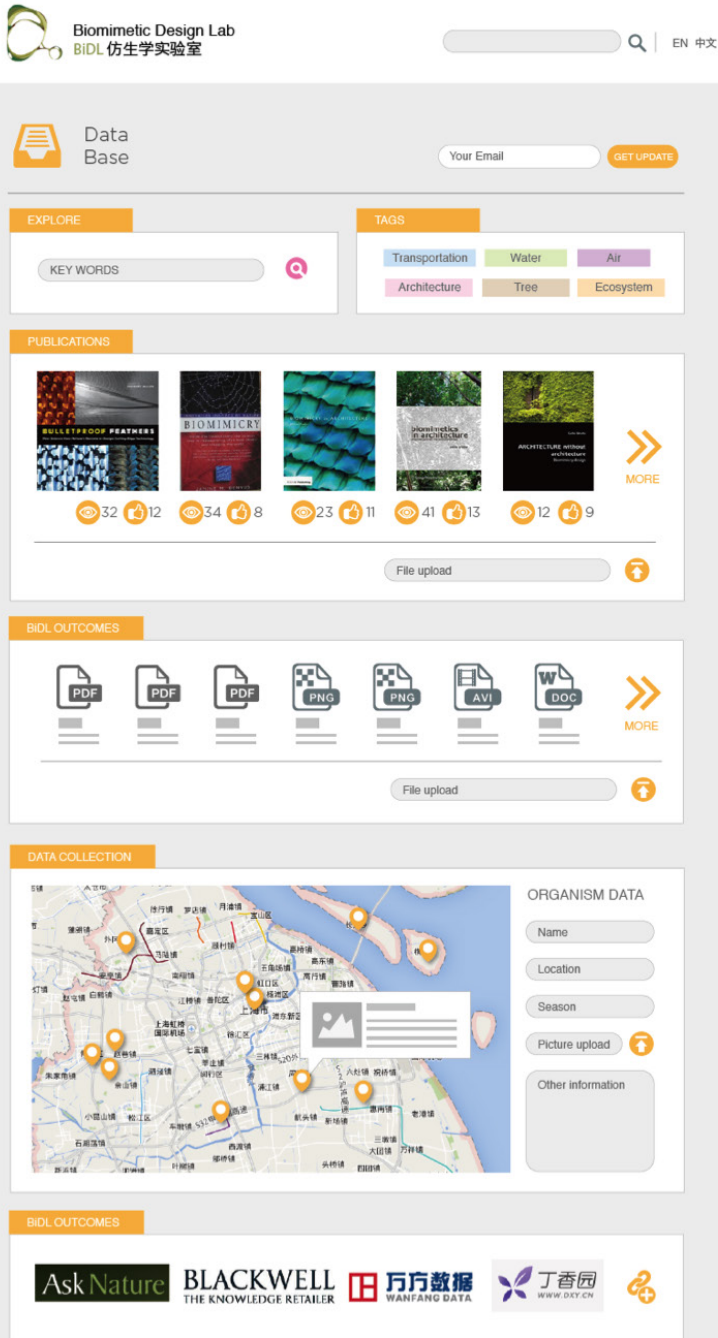


Figure 7.5.2.7  
Web design: data base  
page,  
Source: author

## 7.6. Conclusion for BiDL case

In this chapter, author investigated how to apply the community building guideline into BiDL case. Since BiDL is currently in the initiation phase and just has achieved progress, the community planning is more emphasize on the community initiation phase and community engagement phase. The planning is aimed to provide practical guide for BiDL to develop its community based on the current achievements.

According to the open innovation community building guideline, these key points of building BiDL's open innovation community have been discussed. The purpose of BiDL community is to disseminate biomimicry knowledge. BiDL community is open to everyone who interested in biomimicry, the main potential community members have been sorted into individual members and organizational members, these two types of community members plays different roles in the collaboration. Motivations for different community members were discussed, certain needs of specific community members have been considered. BiDL's community members were more likely to be motivated by intrinsic motivations, for instance, interests of biomimicry field. When building the communication channels, both the impact of social network and traditional media were taken into account. Various offline activities have been planed to bring liveliness to the community. More over, author discussed the community members' activities and analyzed the corresponding functions for online platform. In the last paragraph, author illustrated the webpages design for BiDL community's online platform.





# CONCLUSION

08

# 8. Conclusions

## 8.1. Research conclusion

“What would happen if, instead of 500 designers globally solving problems, we had a network of 50,000?” This question was how OpenIDEO, a successful open innovation community, started in 2008. It also made author think when “Open innovation community” has become a mega-trend in various industries, how exactly open innovation communities were built and how to motivate crowd to innovate. This thesis study reflects the process of building open innovation community for cross-disciplinary collaboration research.

The scope of literature review covered definitions of open innovation and community, history and background of open innovation, and related terms of open innovation. Based on the literature review, author concluded five main attributes of open innovation community, including openness, diversity, networking, knowledge create and share, value capture. It was also noted that there are three phases of community building process, which are community initiation, community engagement, and community thriving. Moreover, author suggested that various key points should be considered along the community building process.

To study the open innovation more comprehensively, three cases were studied in the thesis, which reflected different aspects of open innovation community. P&G’s “connect and develop” program showed how firm built extensive channels to external resources. OpenIDEO was an example of how to organize online open innovation community. The case of SFC was a reference for forming open teaching platform. These three cases supplemented previous discussion about key points of building open innovation community and provided author an opportunity to acquire practical insights. Based on the literature review and case study, the guidelines of building open innovation community were generated, which advocated that during the community building process, there are eight key points need to be considered: (1) consider determining questions; (2) built comprehensive communication channels; (3) provide various motivations; (4) leverage the power of crowd; (5) plan offline activities; (6) utilize retention tools; (7) select IPR management tools; (8) implementation. Further more, these key points could reflect the attributes of open innovation during the community building process.



BiDL's biomimicry community was the design case in this thesis, which was also an applied case of community building guidelines. Biomimicry is a cross-collaboration discipline by definition, and BiDL's community had desire of involving members with various backgrounds. In the case analysis chapter, research methods of interview, questionnaire, and observation have been used to probe the needs and environment of BiDL. It was found that as an academic institution that was affiliated of Tongji University, BiDL had adequate resource of students and teachers, who had potential to become BiDL's community members. It appears that the connections with external organization were relatively inactive and the community was to some degree lack of enthusiasm, taking into account that few intensive activities have been organized. More importantly, collaboration in biomimicry field is not just bringing multi-disciplinary people together, having a common recognition and shared knowledge base are the keys of initiating BiDL's community. Besides, opportunities and platforms of interactive learning and creation were vital conditions that could activate community. Under such circumstance, author discussed each key points in depth and proposed detailed suggestions for BiDL's community in the case design part. Additionally, BiDL's online platform was designed as a prototype for guidelines.

In summary, the focus of this thesis is to investigate guidelines of building open innovation community that suits cross-disciplinary collaboration research, and further to discuss their practical meanings. To realize the open innovation community, community organizers should not only follow guidelines, but also need to check attributes of open innovation while implementing key points. More importantly, it is critical to foster the open culture in the community, which would bring open mindset into community, and then the "open innovation attributes" would not just floating on the surface or remain as a form, but take a deep root into the community. In addition, community organizers should manage the relationship with stakeholders in view of networking and system. To innovate better and more sustainable, extensive resources should be considered while building the community, while more connections should be built in the trend of open innovation. All in all, it is critical to explore various interests points to attract diverse community members, and gather them together with same vision or similar goals, then remember to leverage the power of crowd along the process of building and sustaining community.

## 8.2. Further research

This thesis is a distinct attempt to study how to apply open innovation principle on building community for cross-disciplinary collaboration

research. There are eight main key points of building open innovation community summarized in this these, while, following these key points is not the exclusive approach for building open innovation community. Other possibilities could be probed in the further research. More over, issues about how to foster open innovation culture in the community also worth to be further investigated.

In addition, for the open innovation community development in biomimicry sector, the collaboration of biology and design have been mainly discussed in this thesis, since theses two are the two major disciplines that related to biomimicry, while disciplines like engineer and business also have their impact on biomimicry innovation. Other disciplines besides biology and design also need to be considered into the collaboration in the further research. Besides, when discussed the collaboration between design and biology, author focused more in the academic environment, investigations in the social environment needs to be further probed.

Further more, the case design of BiDL is more focus on the community initiation and engagement phase, and key points of community thriving phase such as implementation and IPR management could be probed deeper as well.





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# FIGURES & TABLES

# Figures & Tables

## Figures

Figure 2.3 Five attributes of Open Innovation Community, source: author

Figure 3.1.1 User acquisition lifecycle  
Source: Lauren Perkins, 2013

Figure 3.1.2 Community development process  
Source: <http://course.feverbee.com/communitydevelopment.pdf>, Feb, 2014

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Source: Dr. Ruth E Brown, 2001

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# APPENDIX

# Appendix

## Appendix I

Table: Comparison of the most popular social networks in China:

Social Network	Description	Key activities
<p>ZhiHu (知乎)</p> <p><a href="http://www.zhihu.com/">http://www.zhihu.com/</a></p>	<p>ZhiHu has many similarities with Quora, individuals could post any kinds of questions on the website, and people with different background would reply to the questions if they feel interested and they happen to know the answers. The crowd would also vote for the answer which they think is the best, and according to the voting, better answer would be showed on the position that more near to the top, and the answers with few supporters would be folded on the page. As now the pacing of live become increasingly high speed, people prefer to getting information within their small pieces of time, so the small paragraph of textual Q&amp;A not only provide people a way of gaining new knowledge, but also an approach to fulfill pieces of time with fun. Along with more and more engagement with users on the website, communities have been formed according to users' diverse interests. When a user starts to register on ZhiHu, it is highly recommended for users to choose the categories of their interest and complete their background, especially their majors, then the website could display information according to users' personal interests, people with certain background with is corresponding to some questions or people who has excellent answers before would gain authority in certain knowledge area, even would be invited to answer questions.</p>	<ul style="list-style-type: none"> <li>- Ask questions</li> <li>- Answer questions</li> <li>- Comment on other's answers</li> <li>- Reading interesting Q&amp;A</li> <li>- Invite experts to answer questions</li> <li>- Interests feed</li> </ul>
<p>RenRen (人人)</p> <p><a href="http://www.renren.com/">http://www.renren.com/</a></p>	<p>Renren.com, known as Xiaonei Network, is one of the most famous social networks in China currently; it is dubbed as a Chinese version of Facebook. RenRen Network becomes widespreadly popular since 2007. Even though the website changed its former name from Xiaonei, which means "inside campus" in Chinese, to Xiaonei, which means everyone in Chinese, the fact that the majority users are young people, especially college students, has not changed with the name, after the students enter the society, they tend to be less active on the website and their attentions have moved on to other social media which fits their social circles better. Thus the main type of information shared on the website are topics around the lives of young people.</p>	<ul style="list-style-type: none"> <li>- Post images, essays, status, etc.</li> <li>- Comment on others' new posts</li> <li>- Share interesting posts</li> <li>- Contact with friends</li> <li>- Play online games</li> <li>- Adding friend by personal information such as name, school, hometown, etc. or recommendation</li> </ul>

<p>WeChat (微信)</p>	<p>WeChat is designed by Tencent in China, is a multifunctional communication application. Following the first release in January 2011, WeChat has developed globally along with the function of supporting more than 15 different languages, such as Chinese, English, Spanish, Japanese. The main function of WeChat is texting and hold-to-talk voice message, now along with the fierce competition in the field of interactive social media, Tencent actively keep developing new features to WeChat, one of the most dominate features is the “Moment”, users could post their photos and sayings to “Moment” to share updated news with their friends, these information could only be viewed with the users who are “friends” with each other. Besides the “Moment”, WeChat also develop several different types of user accounts with different function to conceive a system of users, including individual account, service account and subscription account.</p> <ul style="list-style-type: none"> <li>• Individual account: is the most common type of user accounts, normally is used by individual users to communicate with their friends and post their news to the “Moment”.</li> <li>• Service account: this type of account is generally used by organizations which would like to provide service to customers, for instance, ICBC bank has applied WeChat service account to provide service similar to web-bank to WeChat individual users.</li> <li>• Subscription account: this type of account is more likely to be used by individuals, especially famous people, or organizations which want to disseminate information.</li> </ul>	<ul style="list-style-type: none"> <li>- Daily communication: instant chatting tool</li> <li>- Post images, essays, status, etc.</li> <li>- Comment on others’ new posts</li> <li>- Share interesting posts</li> <li>- Play online game</li> <li>- Make online payment</li> <li>- Adding friends by contacts such as phone number or QQ number.</li> </ul>
<p>Douban (豆瓣)</p> <p><a href="http://www.douban.com/">http://www.douban.com/</a></p>	<p>It is a Chinese SNS (social networking service) website launched in 2005. Douban.com is open for both registered and unregistered users. For unregistered users, douban.com is a good place to find ratings and reviews of books, films, and music, while the registered users are allowed to create contents related to books, music, films, Douban.com has the service of recommendations about books, films, or music that users probably like according to their review record. More over, registered users also could initiate events and create interest groups on the website. Douban.com started become popular among minority young people who love culture and arts, while now it already famous for majority of people.</p>	<ul style="list-style-type: none"> <li>- Find ratings and reviews of books, films, and music</li> <li>- Rate and write reviews of books, films, and music</li> <li>- Follow interest online groups</li> <li>- Sign up for city activities.</li> <li>- Listening Douban.fm</li> <li>- Post images, essays, status, etc.</li> <li>- Comment on others’ new posts</li> <li>- Share interesting posts</li> <li>- Pay attention to or share selected products’ information which have links to online market</li> </ul>

## Appendix II

### Questionnaire: Open innovation for disciplinary collaboration – Research of digital platform users

1. What is your gender?

A. Male B. Female

2. What is your occupation?

A. Bachelor student

B. Master student

C. Teacher

D. Others: \_\_\_\_\_

3. What is your profession?

A. Design related

B. Biology related

C. Physics / Chemistry related

D. Transportation

E. Others: \_\_\_\_\_

4. How often do you participate the social networks listed below: 1→5  
("1" means "never"; "5" means "extremely frequently")

A. RenRen

B. Weibo

C. Wechat

D. Douban

E. Zhihu

F. Guoker

G. Wikipedia

H. LinkedIn

I. Facebook

J. Twitter

5. Besides the social networks have been mentioned above, what  
other social networks do you often visit: \_\_\_\_\_

6. In which the social networks do you often contribute or edit  
contents? (For instance, posting comments, uploading documents,  
etc.)

A. RenRen

B. Weibo

C. Wechat

- D. Douban
- E. Zhihu
- F. Guoker
- G. Wikipedia
- H. Linkedin
- I. Facebook
- J. Twitter
- K. Others: \_\_\_\_\_

7. In which the social networks do you only reading the contents?

- A. RenRen
- B. Weibo
- C. Wechat
- D. Douban
- E. Zhihu
- F. Guoker
- G. Wikipedia
- H. Linkedin
- I. Facebook
- J. Twitter
- K. Others: \_\_\_\_\_

8. What are the main motivations for you to participate the social network?

- A. Gaining new knowledge
- B. Catching up with the trends and news
- C. Show the recent situation of yourself
- D. Getting to know your friends' recent situation
- E. Meeting new people
- F. Monetary rewards
- G. Benefit for career developments

9. What are other motivations for you to participate the social network: \_\_\_\_\_

10. Which way do you prefer when you encounter difficulties in your study or work?

- A. Seeking for help from friends who specialized in this area
- B. Seeking for help from teachers who specialized in this area
- C. Using search engine (e.g. Google, Baidu, Wikipedia, etc.)
- D. Posting questions on related forums (e.g. Quroa, Zhihu)
- E. Others: \_\_\_\_\_

11. Which way do you prefer for long-distance collaboration work?

1→5 ("1" means "never"; "5" means "extremely frequently")

- A. Email
- B. Instant typing chatting
- C. Instant talking chatting
- D. Instant video chatting
- E. Cloud drive
- F. Forum
- G. Professional project management website / APP

12. Besides the ways mentioned above for long distance collaboration, what others communication ways do you usually prefer:

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11. About Biomimicry: 1→5 (“1” means “few”; “5” means “very much”)

- A. How much do you interested in biomimicry?
- B. How much do you understand biomimicry?



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