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UNLOCKING THE POTENTIAL OF INTERDISCIPLINARY TEAMS

Satu Rekonen

Key points

- Interdisciplinary teamwork in innovative projects poses various types of challenges for the team. In addition to the variety in team members' skills, knowledge, and ways of working, project- and people-related uncertainty and ambiguity are present in many forms.
 - Making the most out of an interdisciplinary team and being able to proceed with a project characterized with ambiguity and ill-defined problems requires courageous behavior.
 - The demanding nature of work in interdisciplinary innovative projects calls for people skills that enable rich and efficient communication and indicate emotional intelligence.
 - In order to make the most out of the interdisciplinary team, practices supporting open communication and a trustful atmosphere need to be built early on.
-

Much of the work we conduct, especially in innovation, essentially takes the form of a project. Even if we are not involved in an explicitly formalized project, our work still often has the essential qualities of a project, such as a set duration and a team that comes together temporarily for a period of time. Also, the focus is shifting from multidisciplinary work, where each collaborator preserves his or her field of expertise and ways of working, to a more interdisciplinary collaboration, where team



members from different disciplines approach a problem or solution in an integrated manner. Having been immersed in this complexity through researching and facilitating the work of interdisciplinary innovation teams, including dozens of feedback sessions and interviews, I attempt to flesh out some of the issues I have found to be important in enabling a team to work efficiently and successfully towards its goal.



The gains and pains of interdisciplinary teamwork

It should not be a surprise to anyone that having multiple disciplines represented in a development team provides value through a variety in perspectives and approaches along with a broader array of expertise, skills, and knowledge.¹ Through this variety a wider range of possible solutions to the problem at hand can be achieved,¹ which can lead to highly successful and disruptive innovations and creative outputs.² There are countless examples through the known history of innovations where combinations of different bodies of knowledge have been at the core of novel and valuable outcomes. Cognitive diversity in terms of knowledge and skills also means broader access to information and knowledge.³ When an individual has contact with a diverse group of people, the likelihood for obtaining knowledge about different approaches to the problem at hand is greatly increased. Functionally diverse teams also offer greater access to different types of information not only through the self-contained information of team members' functional background but also from diverse external personal networks.⁴ Communicating with others in the field enhances the understanding of the area and facilitates the generation of approaches that are feasible, appropriate, and unique.⁵

However, things are not so simple and diversity does not only have positive consequences. *Bringing together people with different backgrounds who chase different aims, possess different skills and capabilities, and use different working styles guarantees challeng-*

ing circumstances for teamwork. Interdisciplinary teams often experience a clash of views, interests, goals, and values as different disciplines have their own culture, a domain-specific language, along with discipline-specific practices and ways of working, among others factors.⁶ For example, when developing a new product, aesthetics, shape, and emotional impact might be the drivers in the decision process for industrial designers, while engineers pay more attention to such things as function, cost, and complexity.⁷ Cagan and Vogel⁷ illustrate the difference between engineers and designers by noting that, while engineers are trained to think in terms of what is “right,” designers, on the other hand, are trained to explore and think in terms of what should or could be, not what is.

While team member diversity brings a variety of viewpoints and allows the consideration of a wider range of perspectives, it does not, however, ensure this. If these team processes are not well understood and properly managed, the differences in skills and knowledge may lead to significant interaction difficulties among team members.¹ The differing viewpoints that are essential in promoting creative new ideas and in making well-informed decisions are also possible sources of conflict that waste the team's time and cause interpersonal challenges and frustration.⁴ Task conflict, meaning differences in members' viewpoints regarding their tasks and activities,¹ can create problems if the differences in opinion block the progress of the team or if they turn into person-related issues.⁸ Considerably differing perspectives—or disagreements—may turn into more emotion-based reactions.⁹ The ability to keep disagreements task-related and not let them turn into emotional conflict is key. This requires that the team is capable of collaborative commu-

nication and that there is a supportive atmosphere within the team.

Team member diversity can also have an effect on the initial degree of satisfaction within the team since members may not identify as strongly with a team consisting of people perceived as different as they would with a team of similar others.² Team members who hold the same perspectives may be easily drawn to each other, which may lead to the segmentation of the team. By drawing boundaries within the team, the development of trust is blocked which can again lead to a more frustrating team experience. A lack of team identification, emotional conflict, or the absence of psychological safety (i.e., the absence of a shared belief that the team is safe environment in which to speak up without the fear of negative judgment¹⁰) may also make members less willing to contribute their ideas and knowledge to the team.² In order to benefit from the diversity of knowledge, experience, and perspectives, team members need to recognize the need for both their own and other's input to good performance in order to understand the contribution of dissimilar others and, furthermore, to be able to integrate these contributions in a valuable manner.¹¹ On top of this, motivational aspects play an important role: *unless team members recognize their inputs as indispensable and valuable, they may have the tendency to free-ride or think their contribution is irrelevant.*¹² This is likely to lead to a situation where the full potential of the diverse team is left unutilized.

Ambiguity, uncertainty, and the need for courage

To come up with novel and innovative solutions, interdisciplinary teams must be ready to face ambiguity and uncertainty, which are present in different forms along the span of a project.¹³ First of all, teams are working with challenges that are often “wicked”; ill-defined and characterized with a high level of complexity and uncertainty about the “correct” solution to the problem at hand.¹⁴ Often the situation in innovative projects is that neither the goal nor the means of reaching the goal are known at the outset.¹⁵ In order for the team to move forward in the uncertain terrain it needs to take action despite the discomfort of uncertainty and high risk of failure.¹⁶ This means that the team needs to create the necessary information and learning along the way through iterative prototyping, modeling, and simulation that explore different alternatives.¹⁷ In addition, help seeking¹⁸ and expressing one's point of view¹⁰ are needed. All these actions also expose team members to personal risk, for example the risk of appearing incompetent or disagreeable.¹⁹

Interdisciplinary teams are assembled to pool diverse expertise. To solve complex challenges, we want to have people in the team who bring their different knowledge and perspectives to the table. This means that the starting point in interdisciplinary teamwork is information asymmetry, which means that team members have distinct, unshared information. For the team to be able to benefit from the diverse set of skills and capabilities, it is important that team members freely and willingly share their unique information and perspectives. How-



ever, this privately held information does not get automatically shared with other team members as teams have a tendency to focus their discussion on information that is commonly possessed in the team.²⁰ When it comes to innovative projects where the interdisciplinary team needs to be able to solve complex and ill-defined problems, the integration of each member's information and expertise is key. Individuals may at times falsely assume that certain knowledge is commonly known and be unaware of others lacking some of the knowledge they have. Often these insights that come from deep understanding of one's discipline and seem so obvious that explaining their reasoning may not occur to them, are also the ones that create misunderstanding and conflict. People also fear exposing their ignorance in front of experts from a different discipline, which may lead to a situation where "stupid" questions are never asked and that privately held information is never shared.²¹ What is obvious to, for example, designers may be entirely unfamiliar to those with a business background, which is why reasonable questions may come across as ignorant.

As the solution space in innovative projects is usually vast and there is rarely only a single possible solution, multiple alternative solutions need to be generated, analyzed, and decided upon in an iterative process.⁶ The process of innovation is a rhythm of search and selection, exploration and synthesis, cycles of divergent thinking followed by convergence.²² The two fundamental types of activities—widening the problem or solution space (i.e., divergent thinking) and narrowing down (i.e., convergent thinking)—require the team to adopt different approaches and mind-sets in their teamwork and communication. In a divergent phase, the team needs to take different perspectives and be able to openly communicate

their ideas and utilize their variety of knowledge and capabilities. On the other hand, as the team needs to narrow down the problem or solution spaces the team needs to evaluate make selection between possible alternatives to proceed with. Here, it is important that the different perspectives from different disciplines are considered and that team members are able to explain and rationalize their point of view. *The quality of both the divergent and convergent activities depends on how openly and freely the team members share their unique (background-related) information and bring up their points of view.* In both types of activities, the ability to communicate one's views and ideas and, on the other hand, the will to understand and respect others' perspectives are crucial. The more information the team has available to build on, the more likely it is to come up with a novel and valuable solution.

Additionally, the changing needs of innovative projects require team members to adapt to varying requirements.²³ This means that the role of team members rarely remains the same throughout all the phases of the project. Rather, rethinking and reflecting on one's role is required as the project proceeds. For example, the early phases of the project where the nature of work is more explorative requires different kind of approaches compared to the later phases, which are usually more structured and goal-oriented.²⁴ Naturally, some team members have strengths in the early phase activities while others have strengths in the later ones. Finding one's role in a complex interdisciplinary innovative project may not be easy and the longer it takes, the more difficult it might get.²³ In addition to finding an appropriate role, team members often come to feel uncertainty regarding to the role they have taken.²⁵ A team member in a semester-long student design project described his feelings as follows:

At times I've been worrying about my own input in the sense that I wonder if I am being crazy and creative enough because I wonder if that's what they really expect from me since I am the designer. Sometimes I doubt whether I am fulfilling the expectations I am supposed to.

This role-related uncertainty may impede people from utilizing their unique skills and knowledge in the project. As team members represent different disciplines, they should be able to act as an expert of their field and courageously bring their points of view and skills to the table. Also, as team members usually do not have extensive knowledge of all the other disciplines, it is the duty of each member to make their skills and knowledge explicit to others. Innovative interdisciplinary projects require utilizing skills that are not required in projects with people from similar functional backgrounds. One needs to be able to present one's point of view clearly to others and dare to disagree in order to ensure that all aspects are being taken into account. When taking into account the circumstances that team members are dealing with, it is undeniable that working in interdisciplinary innovative projects requires courage in many forms. One could say that interdisciplinary innovative projects force you to get out of your comfort zone. However, the fear of failure or appearing incompetent to others may impede the participation of team members. Brené Brown, a research professor at Houston Graduate College and the author of the best-selling book *Daring Greatly*, describes vulnerability as being the birthplace for creativity, innovation, and change.²⁶ She defines vulnerability as emotional risk, exposure, and uncertainty, and as something that is often seen as a weakness in ourselves but as courage in others. The key question then becomes how to create an environment where

people feel safe to feel vulnerable and uncertain, and courageously take the needed action despite their uncertainty.

The key challenges of interdisciplinary teamwork in innovative projects

- Dealing with a variety of skills, knowledge, and ways of working
- Going through phases that are very different in nature
- Facing ambiguity and uncertainty in different forms
- Taking action despite the discomfort of uncertainty and high risk of failure
- Confidently bringing one's expertise and capabilities to the project
- Utilizing skills that may not have been needed in previous projects



The cornerstones of utilizing the potential of an interdisciplinary team

Taking into account the challenging circumstances one must deal with when working in interdisciplinary innovative projects, surprisingly little attention is typically paid to soft skills. Teams are typically busy pushing the project forward, which places the focus on the more concrete aspects such as building prototypes and ensuring the project is on schedule. The more intangible aspects—such as taking the time to consider how the team is doing as a team, or sharing and hearing how everyone is feeling about the project and their roles in it—are often neglected.²⁵ After all, it is the soft skills, or people skills, that facilitate the utilization of the range of expertise within the team. Soft skills support teamwork by enabling efficient communication and understanding the feelings team members go through in different phases of the project.²⁷ For example, shedding the uncertainty related to team members' roles in the project is likely to be more effective when emphasis is put on sharing and understanding the perspectives and feelings of the individual team members rather than focusing on formalized task allocation and role specification.²³ The better the team members understand (or are willing to understand) the differing points of view of others and the contributions of dissimilar others, the better the chances of making the best out of the diverse team. Based on my research and experience, successfully harnessing the power of an interdisciplinary team is dependent on four foundational constituents: 1) an awareness

of the knowledge and skills within the team, 2) an enabling atmosphere, 3) shared ways of working, and 4) constructive feedback.

Being aware of the spectrum of skills, knowledge, and expertise in your team

Often the first obstacle in utilizing the knowledge and skills in an interdisciplinary team is simply not being aware of them. Especially in newly formed teams, the team members are not well aware of the knowledge and skills the other team members have. In innovative projects, it is not only the professional skills accumulated through education or working life that matter. When there is no single correct answer for the problem to be solved, “thinking outside the box” is needed and the whole range of experiences gathered during one’s life is potentially useful in providing valuable insight to the problem at hand. This is why it is important to make time for the team to get to know each other and each other’s backgrounds well enough. The better and sooner team members know each other’s history, experiences, and capabilities, the easier it is to utilize those throughout the project. It is the responsibility of each individual to bring their expertise to the table, as others coming from other disciplines and backgrounds cannot be well aware of it. However, telling others what one’s skills are and what value one can bring to the project might feel difficult, especially if team members do not know each other from before. Convincing others of the value one can bring to the project gets increasingly difficult as the project proceeds, which may lead to detached team members or “free riders.” Hence, providing time early on for the team to get to know each other is essential.

Questions to discuss and reflect on within the team:

- Consider your life: what have been its meaningful moments or turning points? What have you learned and gained from these?

- How have the different time periods and experiences in your life affected the development of your professional skills?

- How have they built up your personal strengths and other capabilities?

Building an atmosphere that enables stepping out of one’s comfort zone

As the value of interdisciplinarity lies in the variety of perspectives, skills, and knowledge, they not only need to be acknowledged but also to be put into use. Having a supportive environment where team members are willing to share their points of view is the second essential condition for this. Putting in the effort at the start of a project to create a supportive and appreciative atmosphere is vital. My research has indicated that teams that spend more time at the beginning of the project getting to know each other and creating a feeling of togetherness (often in an informal manner) were less affected by setbacks taking place in the later phases of the project. You could say that the foundation for solid teamwork is built during the first steps of the project. Establishing a supportive environment does not necessarily require significant effort. It also develops through small acts: words of encouragement and appreciation, asking others for opinions and showing interest towards them. What I have come to notice is that positive experiences are important, especially early on in the

project, as the initial reactions of others can have a long-term encouraging or discouraging impact on the willingness to share one’s point of view. For example, if a shy person feels that her or his opinion was not taken into account in the first place, she or he is unlikely to feel very confident about sharing her or his views again later on.

Questions to discuss and reflect on within the team:

- What are your hopes and fears regarding the project?

- When are you at your best when working in a team? For example, what kind of support do you need from your teammates in different situations?

- What does being supportive and appreciative mean to you on a concrete level? How do you yourself act when you are being supportive and appreciative?

Creating common ways of working and behavioral norms

Behavioral norms (i.e., the expected ways of behaving and the level of quality when working in a team) are created early on during a project.²⁸ Project leaders and teams that accept flimsy excuses for substandard performance—such as not completing tasks on time, defensive shrinking of responsibility and people arriving late—create a reputation and an acceptance of mediocre outcomes. Usually it is the things that might seem self-evident or not worth considering that are most easily neglected during the project and cause the most frustration in the interaction between the team members. Such things as how often the team meets, what the team’s channels for



communication are, and how many hours the team expects everyone to put into the project on a weekly basis (or how much people are able to put in the project) should all be considered with the team at the beginning of the project. The better the practices reflecting the desired ways of working in the team are established at the beginning of the project, the better they stick and serve throughout the project. For example, even if a pronounced need for open communication is already recognized during the early steps of the project, it probably never becomes a natural, well-rooted way of working in the team if there are no established practices that aim to support this purpose.²⁵ It is possible to build the kind of culture desired within team, but acting according to what has been agreed upon usually requires some reminding. On the other hand, maintaining and strengthening the ways of working and behavioral norms agreed upon within the team is only possible when the team members are aware of them in the first place.

Questions and points to discuss and reflect on within the team:

- What do you find most important when working together as a team?

- Take a moment to consider your previous experience on working in a team: What has worked well? What has not worked?

- Create three guidelines/values that your team agrees to follow. Provide concrete examples of actions where acting according to these values is realized.

Providing positive and constructive feedback systematically

As established in the previous chapters, the need for open and constructive communication is highlighted in interdisciplinary teamwork. If we consider the building blocks of creating a supportive atmosphere it all comes down to how we interact and communicate with each other. Communication is in many ways the foundation of success in projects but also one of the most challenging aspects. As noted by Edmondson and Nembhard,⁴ team member diversity should foster creative tensions and disagreements that are mediated through collaborative communication and exploration, which will again result in more innovative outcomes. If these creative tensions and disagreements are avoided, the risk is that deeper exploration—and thus potential novel solutions—might be left unseen and the value of interdisciplinary teamwork remain unutilized. Accordingly, the limited participation of any team member means that valuable information and inquiries are lost and that unproductive communication can hinder learning and innovation.⁴ This again highlights the need for establishing structures supporting open communication among team members, which is especially important in interdisciplinary teams where differing and competing viewpoints are essential in promoting creative new ideas as well as being possible sparks to ignite conflicts that waste the team's time and cause interpersonal challenges.

There are a number of reasons why providing both positive and constructive feedback should be well established as a way of working in an interdisciplinary team. First of all, when there is an open and trustful atmosphere, it is easier for people to act courageously and also to be vulnerable, in other words, to engage in

activities that involve, for example, a risk of showing them to be incompetent. In innovative projects, it is difficult to avoid this since they call for individual and collective creativity, which requires team members to feel safe to share their ideas, thoughts, and doubts related to the project. In the end, the level of participation in a team depends on how freely people feel they can share their unique information or bring up their own perspectives among the team. Second, it seems that when people receive positive feedback on their work they become more confident to give their all for the project. Further, others may recognize strengths or potential in us that we are not able to see ourselves. We may become blind to our strengths and others might be better at recognizing them in us. This is especially important in creative projects where one needs to utilize different kind of skills and capabilities. Finally, interpersonal challenges are often sparked by never explicitly addressing misunderstandings or single occasions where someone felt assaulted. These experiences easily build up into beliefs and assumptions about how we see others or how they see us. The risk is that these assumptions are never explicitly brought up, which might lead to energy being wasted on issues that never existed in the first place. Assumptions may be person-related (what I think about others, what they think about me) or task-related (Am I doing the right things or doing things right?).

Facilitated team feedback—the “I like, I wish” method

I like, I wish (<http://ilikeiwish.org/>) is a facilitated team feedback method in which team members provide and receive both positive and constructive feedback on both individual and team levels. The sessions follow a systematic format promoting psychological safety that has been developed through

dozens of sessions organized for interdisciplinary teams since 2011. These feedback sessions offer support for the internal communication of interdisciplinary teams working with challenging and innovative projects with the main purpose of increasing the feeling of togetherness and forcing the team to take the time to reflect on everyone's role in the project and how they are bonding together as a team.

The roots of this method sprang from the period from 2008 to 2009 when I was part of an interdisciplinary and international team in a master's level product development project course at Aalto University. During that time, I was studying in business school and the whole world of rapid prototyping and thinking-by-doing was something very new to me. It was difficult for me to find my role in the project and I felt a desperate need to understand what my team members saw as my role, strengths, and potential contribution to be in the project. But as we were busy with pushing the project forward and I was unsure as to whether anyone else felt this could be useful, I never spoke about my thoughts out loud. However, it turned out that when I later conducted interview studies in two master's level product development courses, the interviewees frequently expressed very similar thoughts and feelings. The majority of the interviewees described a need for receiving feedback regarding one's role and contributions in the project. Since then I have witnessed this need and the benefits of a systematic method in dozens of feedback sessions on several different interdisciplinary student courses as well as in professional teams. I am constantly amazed to see the effect these sessions have within the teams; how the shared understanding and the feeling of togetherness among the team increases, how the individuals in the team become more confident as they come to realize



the strengths and the value the others see in them. I have come to recognize the centrality and necessity of constructive feedback in interdisciplinary teams. Many of the self-doubts team members have about themselves and the assumptions they make about

what the others in the team are thinking frequently prove to exist only in the team member's mind. Typically, all that is required to get rid of these disturbing issues is to take the time and speak them out loud in a safe setting.

I LIKE WISH

I like, I wish in a nutshell:

- The method is based on having a facilitator who is not a member of the team. In this way she or he is able to create a neutral setting. The main role of the facilitator is to provide a framework where it is safe and easy for the team to openly give feedback to one another. A safe and trustful atmosphere is critical and the facilitator has a big role in establishing this.
- The method consists of three parts: writing down feedback individually, sharing the feedback, and reflecting on the feedback. Feedback will be only be written and provided to the team members that are present in the session.
- Team members will be sharing (and receiving) both positive and constructive individual- and team-level feedback. Positive feedback (“I like ...”) refers to the strengths seen in a team member / team whereas constructive feedback (“I wish ...”) is about the potential seen in a team member / team that has not yet been fully utilized during the project.
- Sharing the feedback starts from individual-level positive feedback and everyone will share their “I likes” with the one person at a time. It is important that the “I like” round will not be interrupted at any time. The person receiving the feedback can share his or her feelings and thoughts after the round.
- After everyone has shared their “I likes” with everyone, the team will move on to sharing individual-level “I wishes” in a similar manner, then to team-level “I wishes,” and finally to team-level “I likes.”
- It is important to reserve time at the end of the session to give everyone an opportunity to share their feelings regarding the session as well as to give time to reflect on the feedback shared.
- The detailed instructions for facilitating an I like, I wish team feedback session can be found at the webpage <http://ilikeiwish.org>.

Checklist for capitalizing on the potential of an interdisciplinary team!

1. Be aware of the full range of capabilities within the team and make sure to utilize them

Why? The value of a diverse team is in its heightened ability to solve complex tasks through the broad array of expertise, skills, and knowledge but only when it is being properly utilized. The skills that others can bring to the project may not only be related to their educational backgrounds but also to their life experiences, passions, and hobbies.

2. Make your skills, knowledge, and experience explicit early on in the project

Why? Only in this way is the team able to utilize the expertise and knowledge. The further the project proceeds, the more difficult it is to change the perceptions others have and promote your skills to others.

3. Create common ways of working and team culture at the very beginning of the project

Why? Practices built early on stick and serve throughout the project. However, these mutually agreed practices need to be cultivated along the project.

4. Remember to give both positive and constructive feedback to your team members

Why? Without feedback people do not know if they are doing things right and/or doing the right things. Positive feedback also increases the confidence and strengthens the motivation of individuals.

5. Be open to everyone's ideas—whether they are feasible, crazy, funny, or seemingly impossible—without judging them immediately

Why? The level of participation in the divergent and convergent activities depends on how freely people can share their unique knowledge and bring up their own perspectives within the team.

6. Make sure that the atmosphere within the team is appreciative, encouraging, and supportive

Why? People feel more confident to open up and freely share their thoughts in such an atmosphere. Establishing this kind of an atmosphere comes from small things: words of encouragement and appreciation, and acts of help.

7. Make it more than just about work

Why? Teams that spend more time at the beginning of the project getting to know the team members and interacting informally are likely to be less affected by the setbacks that occur in the later phases of the project. Organizing informal gatherings with your team might help to keep the feel of togetherness, even through tough times.

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*All you need is love,
design, business,
engineering, and...*

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