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CO-CREATION**

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Managing experimentation-driven projects

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WORKING IN UNCERTAINTY

Managing experimentation-driven projects

Lotta Hassi
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Key points

- Experimentation is a key innovation activity, and it is fundamentally different from planning-driven work. Project management needs to understand these differences and adapt the managerial support to fit the requirements of experimentation-driven projects.
- In order to successfully navigate experimentation-driven projects, managers must understand the requirements and roles of the different actors involved in the process: the individuals, the team as a whole, and their role as managers.
- From the perspective of an individual, experimentation requires a certain set of psychological characteristics, relevant technical know-how in experimentation, and certain cognitive abilities.
- A team’s ability to act as an information processor, and to learn and create information from the experiments is highlighted in experimentation-driven projects.
- A project manager needs to prepare the team for the iterative nature of experimenting and hold back the team’s urge to “close the idea.”

An experimentation-driven approach to innovation

Creating new innovative solutions—be they new products, services, or business models—is not a clean, straightforward process. It is messy, uncertain, and ambiguous. It is a process where we do not know the outcome of the process at the outset and we do not know how to get to that outcome. There is uncertainty regarding all the necessary things that we need to know in order to create a good plan and execute it successfully. That is why innovations cannot be realized through rigorous planning. You cannot plan what you do not know. Instead, innovations are created through a process of experimentation, where innovative solutions emerge from iterative prototyping, simulating, and modeling activities that explore different alternatives¹.

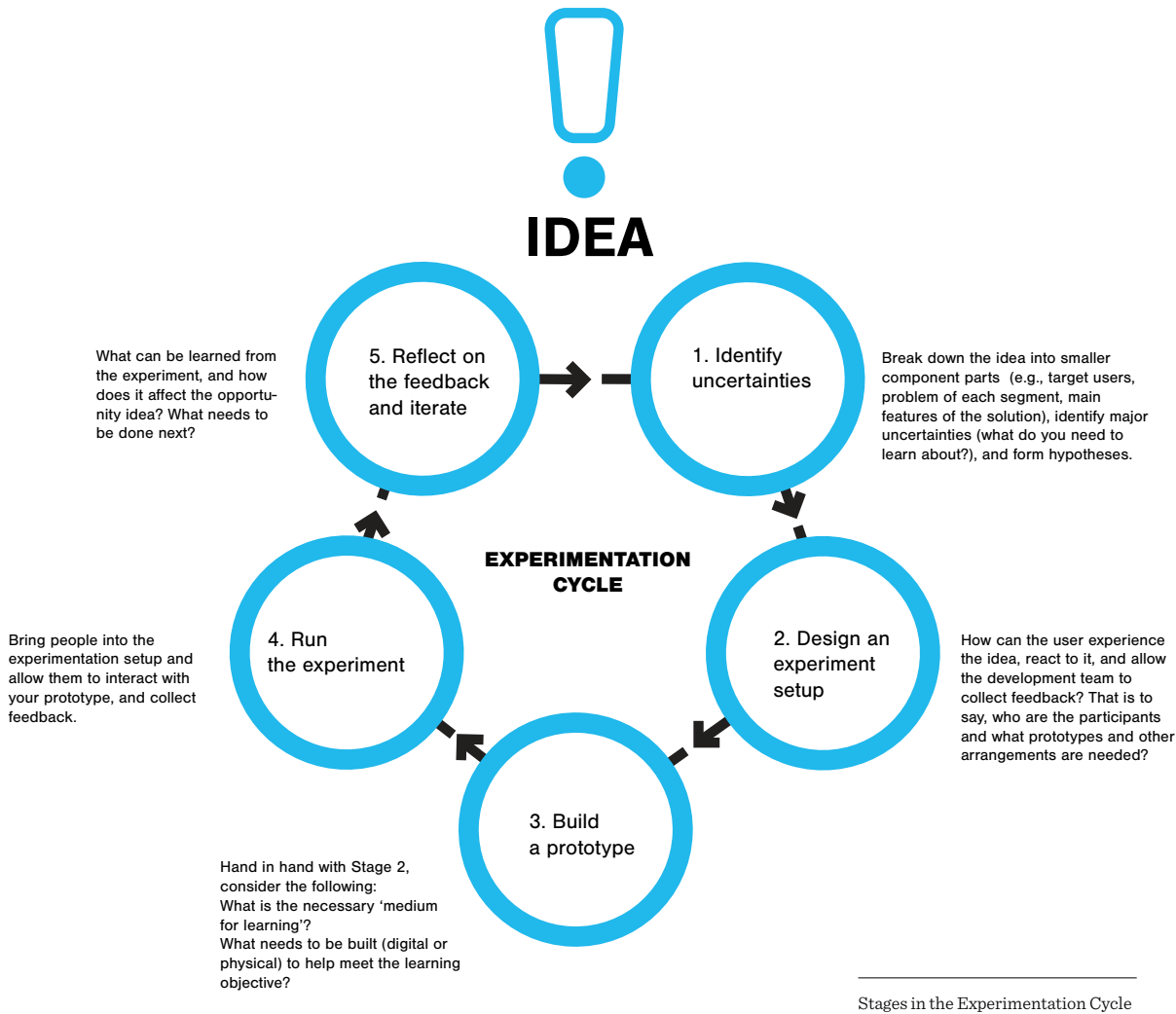
Although experimentation is a fundamental innovation activity and nothing new as such to the management world, most innovation activities in organizations are characterized not by experimentation, but by planning—choosing a desired outcome and a course of action at the outset of the project, and then designing and executing a project plan based on them. Planning-driven approaches, such as the well-known Stage-Gate model², are intended for situations where there is enough information to make a plan at the beginning of the project. A development team knows, for example, “what” to create and “how,” and can hence deduce the result that should be created³. In other words, the level of uncertainty is relatively low.

But when creating something truly novel, a project team does not have enough information to make a plan that would lead to the successful execution of a project. The customer requirements, how they should be addressed, and with which technologies—the “what” and the “how”³—are unknown. Even the customer group itself might be unknown. There are more questions than answers, and that is why the planning-driven approach does not offer adequate support⁴. The information the team is lacking has to be created through explorative experiments, where the project proceeds one step at a time, reflecting on the new information that is generated and redirecting the course of the project based on this information.

Being skilled at experimentation, in addition to planning, matters if an organization aims to stay at the forefront of innovation by introducing innovative new offerings. Yet, there are numerous, deep-rooted, barriers to making experimentation an established approach to innovation in organizations. For example, there is a lack of management tools that would allow and support the reformulation of objectives along the project⁵, incentive systems that are inconsistent with the objective of experimentation⁶, and a lack of skills for designing effective and efficient experiments⁷. To make experimentation an established approach to innovation, these kinds of internal obstacles need to be overcome. Further, there is very little previous research on what experimentation requires from the people involved in running the experiments: the individuals that form a team, the team with its internal dynamics, and the closest management who are leading both the individuals and the team.

The starting point for experimentation-driven innovation is the combination of the objective to create something novel with the lack of the necessary information to do so. Therefore, the goal of experiments is to help you learn what to create and how. An experimentation cycle (pictured below) begins by identifying uncertainties in the idea: Which aspects

of the desired solution are assumptions and not validated knowledge? You then proceed to designing an experiment that allows you to learn whether your assumptions are correct. As new information is obtained from the experiments, the project goal and the course of action are flexibly adjusted based on this new information.



Let us say that you are developing, for example, a new service and you notice that the channel you are thinking to use to reach the target market is based on an assumption. You need to validate this choice before moving forward and spending more time, money, or effort in developing the solution further. You design an experiment setup where information about your solution is placed in one location of the intended channel, and you stand by, observing if and how it reaches the target audience. The learning provided by an experiment is those aspects of the outcome that the person conducting the experiment did not (was not able to) know, or foresee or predict, in advance. The learning is used to revise and refine the target of the development activities, and progress is made in this way, iteratively, towards an acceptable result.

The key success factor in the experimentation-driven approach is to keep the cycle small and fast; the learning should come early and often since changes early in the project are less costly than those that come later in the project. Effective learning cycles are focused, fast, and they create learning. If there is no focus, you risk developing the non-critical parts when you should be working on the make-or-break parts of the solution. If there is no speed you risk running out of resources, or investing more than you can afford to lose if the experiment reveals your solution does not have the future that you had planned. If you do not collect learning, you are just keeping yourself busy but not doing anything of value⁸. *Therefore the objective of experiments is always to create the maximum amount of relevant learning with the minimum investment of resources.*

What, then, is a failed experiment? People often say that an experiment failed, when they actually mean that the idea they had, and experimented on, did not

work as they intended, or did not generate positive feedback. This is not a failed experiment but a failed idea, and therefore in the context of learning it can even be considered a success (now that you know what does not work, you will not keep spending further resources in the development of an idea, or part of an idea, that does not have a future). A failed experiment is one that does not produce new or relevant information. Naturally, the failure of ideas is not the goal, the success of ideas is, but failures cannot be completely avoided when creating something novel. Therefore, they need to be considered as a natural part of the process and accepted as such. There has to be a genuine possibility for “failure,” that is, finding out that something does not work as intended and changing the outcome and the route to that outcome based on what has been learned through that “failure.” Such an option is hard to maintain if too much is invested in the idea—or if the people in the project have fallen in love with the idea.

Life in experimentation-driven projects: What does it require from the people involved?

When an organization aims to adopt an experimentation-driven approach as a way of working, management plays an important role. The most promising scenario for fostering innovative attempts throughout an organization would be when managers at all levels are aligned in their support for such behavior⁹. Top management most strongly shapes an

organization’s structures, processes, and culture, but it is the immediate managers (e.g., project managers) who usually put those alignments into action. Role modeling has been emphasized as being important in showing what is valued and accepted in the organization^{10,11}. Through their behavior, managers can show what is valued and appreciated behavior in an organization¹². Hence, the way project managers behave and communicate can either encourage or discourage experimentation.

In order to successfully navigate experimentation-driven projects, managers are well-served to understand all of the levels of actors involved in the process: the individuals, the team as a whole, and their role as managers (see the illustration on the right). On the individual level, it is often relatively easy to convey to people that experimenting (instead of mere planning) is a good way to proceed. However, transforming that intellectual realization into behavior is challenging. We have often witnessed a tenacious hesitation, like an invisible force, keeping the people in project teams from moving from conceptual thinking to the practical action that experimentation requires: leaving the safety of the office, getting in contact with the potential customer, and receiving feedback on the idea being developed.

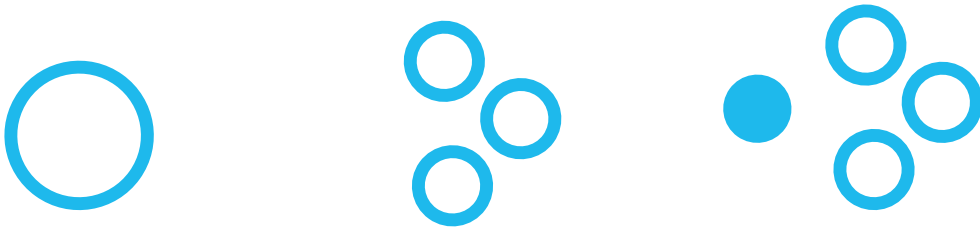
This behavior of people in experimentation-driven projects stems from three areas. First, experimentation taps into a different set of emotional resources than a planning-driven project does. It requires a certain set of psychological characteristics from the people running experiments. Second, what keeps many people from getting out of the building and running an experiment is the lack of relevant know-how. They do not have the knowledge of how to design and execute experiments. Third, experimentation

requires certain cognitive abilities, namely the skills to process information. Each of these requirements are discussed in more detail below.

On the other hand, no matter how capable the individuals might be at experimenting, at the end the team needs to be able to move forward as a team. Working in an experimentation-driven project, where the team needs to create information and learn through iterative experiments, team members need to take action despite the discomfort of working together in an uncertain environment with a high risk of failure¹³. When the goal is to develop innovative and novel solutions, learning by experimenting is a crucial part of the process. This necessitates both help seeking and the freedom to express one’s point of view without the fear of negative judgement¹⁴. Hence, in addition to being able to take action despite the prevailing uncertainty and ambiguity, team members working in an experimentation-driven project have to face interpersonal risks, such as appearing incompetent or disagreeable¹⁵. Psychological safety has long been recognized to be important when it comes to innovative work^{10,16}. Baer and Frese¹⁶ for example emphasize that people are more courageous in proposing new ideas and taking initiative—key behaviors in experimentation—in environments that provide a personally non-threatening and supportive climate. In our empirical work, it also became clear that the way in which team members react towards others’ ideas and suggestions matters a great deal and affects the likelihood of an idea ever evolving into an experiment. Teams that build more on each other’s ideas, provide positive comments and show enthusiasm towards others’ ideas have more fruitful discussions. On the other hand, we have also seen how non-supportive reactions work: On most occasions, they kill the discussion before it ever really starts.

Leading the individuals and the team as a whole in creative efforts, such as experimenting, requires manager behaviors related to both leading the work and leading the people. Our observations have also proven that supporting experimentation requires both people-related actions (supervisory support in the form of providing a mandate to experiment, continuous encouragement, and preparing an appropriate mindset) and task-related actions (the

coordination of experiments through creating supporting structures, the leeway to experiment, and facilitating experimenting) from the project manager. We next explore each of these individual, team, and managerial requirements in more detail.



INDIVIDUAL

- **Cognitive abilities:** iteration between conceptual and abstract thinking, divergence in thinking
- **Psychological characteristics:** attitude towards failure, uncertainty tolerance, openness to learn
- **Experimentation know-how:** identifying uncertainties, designing valuable experiments, collecting learning

Factors affecting experimentation behavior at different levels

TEAM

- **The experienced level of equality in the team**
- **Collaborative sensemaking**
- **The experimentation mode**
- **The team’s attitude towards further development**

PROJECT MANAGEMENT

- **Supervisory support:** the mandate to experiment, continuous encouragement to experiment, preparing an appropriate mindset
- **Coordination of experiments:** creating a supporting structure, the leeway to experiment, facilitating the process



Individual-level factors

Mental flexibility and divergence

As experimentation is essentially a learning process, the ways one processes information—that is to say, one’s cognitive abilities—make a difference. Successful experimentation involves moving flexibly between conceptual and practical thinking. One needs to maintain the connection between conceptual thinking at a higher abstraction level (e.g., the overall objective and vision related to the idea) and the practical thinking of a lower abstraction level (e.g., the testable elements of a potential solution and practicalities of an experiment setup), and move swiftly between these two levels. This constant iteration between conceptual and practical thinking can be demanding, especially if one is significantly more adept and comfortable in one type of thinking over the other.

One also needs to stay open to exploring different possible directions for the development of the idea—the different formats it could take—before closing in on a final format. An urge to converge early on one option or format hinders the ability to experiment on different options because it closes one’s mind to other possible solutions that might be better suited to the needs of the project. Often, people fall in love with the first idea that comes to their mind, they do not leave room for other possibilities to arise or to be considered and rush to study the implementation of that first idea. Divergence in thinking ensures that possibilities are not ruled out hastily, without consideration, and that ideas are given time to evolve to their best potential.

Accepting failure and surprises as a natural part of the process

Failure and unexpected events are a natural part of the process that cannot be avoided. Yet most people have a natural avoidance of failure, not to mention avoiding acknowledging and sharing their failures. Overcoming these social barriers (the psychological reactions towards failure) is one of the most important prerequisites for experimentation¹¹. An individual’s attitude towards failure affects his or her willingness to experiment with alternatives in the first place. It also affects how willing he or she is to share and explore received critique—which is key in order to contribute to the learning of the project.

Exploring unknown territory is like trying to find your way in darkness: It requires uncertainty tolerance. This is about the ability to keep moving comfortably without a detailed plan, allowing the plan to emerge through the experiments—those different encounters in the darkness. And while fumbling about, one must maintain the sensitivity to flexibly adapt the direction based on the learning from the experiments. The required information can only be created by continuous efforts to move forward through experiments. If one gets paralyzed by the uncertainty, the entire projects stops as well.

Furthermore, making the most out of the experiments—that is, collecting all potential new information—calls for a mindset that is open to learning. People who are open to learn are comfortable about having explorative, open-ended conversations that are aimed at learning more from others and the results of the experiments. The opposite would be people incapable of reflective conversations or postponing judgment and unreceptive to findings

that do not support their viewpoints. This would hinder the overall learning in the project.

Aiming for effective learning

Successful experimentation naturally requires specific know-how on how to run effective and efficient experiments. Here, the ability to identify uncertainties is the starting point. It is the first step in deciding both whether or not to start an experiment and what the experiment should focus on. To identify uncertainties, one must break down the idea into smaller components, evaluate the uncertainties within those component parts, and identify the so-called make-or-break parts—that is to say, those uncertainties that could potentially “kill” the entire idea. People often struggle in realizing what the most important uncertainties at a given moment are. As a result, they then focus on experimenting with non-relevant parts of the solution, which wastes valuable time and does not move the project forward.

Once uncertainties are identified, the next difficulty is often related to designing valuable experiments, that is, experiments that create the needed learning with the minimum investment of resources (time, money, effort). It is easier to design a large, long, costly experiment than it is to figure out how to create the necessary learning with the smallest possible action or arrangement. The less resources spent on a project, the easier it is to make changes within it when results show that change is needed. Even when the experiment is well designed, people often have difficulties with collecting learning from the conducted experiments, that is to say, with identifying the information that is valuable for the project at hand. People tend to overlook unexpected information or do not realize the value it has. A

common mistake is to purely look for “go” or “no-go” signs—either full acceptance or disapproval of the suggested idea—rather than look for pointers on how to tweak the idea in the following rounds of experiments.

Development team related factors

Being appreciative and supportive is the starting point

The experienced level of equality among the team members affects team behavior. Team members might put more weight on some team member’s opinions than on others, such as those having longer working experience or those who are higher in the hierarchy of the organization. Even though all participants were equally inexperienced when it came to experimenting and there were purposefully no project managers in the projects we studied, we noticed that the existing hierarchy was still there in the background, affecting the dynamics in some of the teams. The more experienced team members seemed to be more confident in holding on to their ideas or bringing them up in the first phase. This led to a situation where the perspectives of all team members were not equally taken into account or heard in the first place. However, when it comes to innovative projects, where there is no one correct answer or direction to take, giving space to the idea that someone in the team is “more correct” than the others threatens the utilization of all of the creative potential the team has. Hence, we can conclude that a supportive climate—meaning one in which such things as the reactions of team members towards others’ ideas and suggestions, as well as seeing everyone as equally capable—are not only important in



coming up with ideas but also when the team needs to take their ideas into practice.

Creating shared awareness and understanding

The team's ability to act as an information processor is highlighted because the development team needs to learn and create information through iterative experiments. Experiments are conducted in order to create relevant information and to learn whether to continue with the chosen idea or not and, if it is to be continued with the idea, what things need to be taken into account. *If the team is not learning from experiments, experiments are just quickly implemented ideas that make the team no wiser.* The team needs to be capable of creating shared awareness and understanding related to their project, and the information and learning that experiments have created. This collaborative sensemaking¹⁷ is highlighted in experimentation-driven projects because the essence of experiments is to create the maximum amount of relevant learning. Collaborative sensemaking is the process of overcoming knowledge gaps that prevent the team from moving forward towards the desired goal. It can be characterized as a continuous effort to understand an ambiguous and uncertain context that may involve people, objects, places, and events¹⁸. On a concrete level, in order for the team to overcome the existing knowledge gaps, it needs to take the time after each experiment to reflect on the outcome, recognize the relevant issues that provide the needed information, and anticipate the needed future actions in order to move forward and to overcome the obstacles. This includes having the ability—as a group—to reflect and present explorative questions in order to keep the idea open, taking enough time for discussion, and also giving room for critical thinking about the team's actions.

The willingness and ability to conduct experiments

Being good at reflective discussion and keeping the idea open does not guarantee that the team is capable of conducting valuable experiments. *No matter how good the team is at noticing what needs to be experimented with next, there is sometimes “an invisible barrier,” something that prevents the team from actually getting the experiments started.* The team needs to be able to move from the discussion and thinking to the concrete doing, acting on the recognized experimentation possibilities. Hence, the team needs to be in a so-called experimentation mode. An experimentation mode refers to the team's willingness and ability to conduct an experiment once the need for it has been recognized. It is important that the team has both the will and the ability. We have come to see that sometimes the team is only conducting experiments because they are encouraged to do so, rather than because they see it is valuable or because they are willing to learn. In fact, they might be thinking that conducting several experiments is nonsense, that they already know what they need to know in order to implement the idea and that conducting new experiments will not bring about significant information. We have observed situations where teams were conducting (invaluable) experiments just for the sake of doing something. The key is in acting for the sake of the critical learning required for the project and being able to recognize the elements or uncertainties worth exploring and experimenting with. Interestingly, our experience shows that although the team might be well capable of recognizing the key uncertainties, it is another story whether the team ever actually gets down to experimenting or not. They might get stuck on the thinking level and this mysterious invisible barrier prevents the team from realizing their valuable experimentation ideas.

Avoiding over-eagerness to close up

Experimentation is an iterative process. Let us say the team has conducted one experiment from which they received valuable information regarding their idea. The team might take the time to reflect on the outcome and create shared understanding related to the key uncertainties that the experiment tackled. But what might also happen is that the team is so satisfied with the successful experiment that they are not willing to go there again. Human nature seems to strive to wrap things up. It is much more tempting to stop experimenting and carry “the project” through rather than stay open to possible further development and additional experiments. Sometimes a lack of openness can result from the team suspecting that conducting another experiment would not offer any new valuable information—that it would be a waste of time and resources. If the team (or a dominant member of a team) is very confident of the idea being “ready,” there is usually little motivation to open it up again and to test different parts of the idea. Hence, *the more confident the team is about the readiness of the idea, the less willing they are to keep the idea and their minds open to further development.* Experimentation is a lot about the team's attitude towards further development. The eagerness to close up an idea can be seen in the way the team discusses the idea and in the way they react towards the comments and suggestions coming from outside the team (for example from facilitators or supervisors). If the team is very confident about the readiness of the idea, the discussion becomes more about rationalizing why there is no need for further development and shooting down new suggestions rather than building on others ideas or seeing other possibilities. The team might even respond arrogantly towards suggestions for further experimenting that come from outside

the team as they feel that this would only draw their attention and effort away from the essential activity (i.e. the realization of their idea).

Project management related factors

Providing explicit permission and showing interest

In a planning-driven organization, people are used to asking permission to develop their ideas further, which can take a long time and hence inhibit the agile development of ideas. Encouraging conducting experiments starts with a mandate to experiment, that is to say, explicit permission and authorization to conduct experiments that leaves no questions about whether it is a desired way of working or not. Our studies have shown that when employees feel they have a mandate to initiate the first steps to learn more about a possible solution and in doing so generate valid initial proof for their proposal, they will not only bring more valid arguments to the table when discussing the next steps but also maintain their team's energy and excitement towards the project better. Hence, having permission to actually act on your ideas has an important effect on team well-being. However, providing a mandate to experiment is not enough. Especially when it comes to organizations that are not familiar with experimentation as a way of working: Showing continuous attention and interest towards experiments is highlighted. This means simply asking the people about the experiments, about what have they learned from them, and reminding people to continue conducting new experiments when required.



Ensuring people are aware of the nature of experimenting

Development teams need to be prepared for the iterative nature of experimentation-driven projects, that is to say, for conducting several experiments and going through the experimentation cycle over and over again. What we have come to notice is that if this is not communicated properly, the people involved might feel that conducting further experiments means they have failed because they were not able to nail down all the uncertainties related to their idea with the one experiment they conducted. Further, if the people are not mentally prepared for conducting several experiments, they will most probably lack the motivation to do them and be eager to “close the idea” sooner. The urge to implement one’s idea directly seems to be very strong. In addition to recurring experimentation cycles, the development team needs to be prepared to face the fact that experiments may not support their initial idea, meaning that they might need to update it or even come up with a new one. This is often seen as a failed experiment, although it has given important information early on about whether or not to take the initial idea further. Hence, the project manager needs to ensure that the people involved in the project are prepared with an appropriate mindset, meaning that they are well aware of the features of experimenting from the very beginning.

Enabling focusing on the essential

The essence in experimenting is to capture the learning it provides. This alone requires a lot of thinking and reflective discussion (time and effort from the team). The less the team needs to put effort into thinking about operational practicalities—such as

when the team is supposed to meet, when will the experiments will be conducted, and what is the desired activity and outcome in each stage—the better they can focus on the essential. This is why it is important to ensure that the team, together with the project manager, will take the time at the beginning of the project to create their ways of working and to ensure that there is a common understanding on the deliverables at different stages. The better these supporting structures for experimenting are created during the first steps of the project, the less attention they require later on.

Knowing how far the team can go on their own

Closely related to the supportive structure is the leeway to experiment. This refers to the team being fully aware about the resources in use and the level of autonomy they have. For example, the development team needs to know whether they have a budget to build a prototype for the experiment and in which kind of situations they need to ask for formal permission (e.g., if the experiment is conducted in a collective space of the company) in order to move forward with their experiments. When a culture for experimenting does not exist in the organization, the issues mentioned above may become hindrance to taking action.

Ensuring learning

Keeping the idea open and objectively analyzing the results of the experiment seems to be challenging. Facilitators that are not part of the team play a big part in ensuring the team is keeping the idea open and reflecting objectively on the results of the experiment. We have witnessed that an external facilitator helps the team to reopen their idea to different pos-

sible solutions and gets them convinced about the importance of conducting more experiments. With a kind forcing from the facilitator, the attitude and approach of the team towards the project can change notably. Hence, facilitating experimentation may be needed in order to make sure the team takes the time to reflect on the experiments in order to collect the learning and to be able to update the idea.

Guidelines for Managers

Establishing appropriate conditions for experimentation in an organization requires addressing different factors on the levels of individual, team, and project management. Establishing a process for experimentation, training the personnel with the necessary experimentation know-how, and providing access to necessary resources are key, but managers also need to consider factors related to team dynamics and the cognitive abilities and psychological characteristics of the individuals, as well as consider how to best orchestrate the experiments and provide the room and support that the exploration requires.

First of all, managers should signal that constant and early experimentation is desired, and that failures are unavoidable and necessary for learning by encouraging the identification and analysis of failures. Psychological safety has been noted to play a significant role in supporting experimentation because it reduces the fear of failure; it helps to overcome the psychological reactions that most people have towards failures¹¹ and in that way promotes experimentation. Earlier studies have

shown that in organizations where failures are expected and accepted as a part of learning, people tend to talk more easily about their mistakes¹⁰. This is central when it comes to experimenting, since talking about mistakes, or failures, ensures that they also produce learning. In fact, failures should not be seen as mistakes since they produce new information— learning—which is the goal of experimenting¹. Accepting unsuccessful trials as a necessity for innovation and as unavoidable outcomes of experimenting is a precondition for achieving an experimentation-driven approach.

As experimentation is an iterative process, the team and the individuals need to be emotionally prepared for the uncertainty and iterative nature of the experimentation approach. Reflection is a fundamental part of creating learning in experiments. Whereas designing and running an experiment creates information, reflection is needed to collect that information and to make it useful for the project by building on the learning. Without reflection, learning (the key success factor of experimentation) does not happen. However, to an unprepared mind, the continuous reflection and redirection of the project are very likely to cause frustration as well as a loss of motivation and interest, resulting in the stagnation of the project. Managers need to explain the nature of the work to the team up front and ensure that time is taken to reflect on the progress (i.e., the accumulation of learning) throughout the process. This allows the individuals to comprehend and appreciate learning as a measure of progress in experimentation. As reflection has such a significant impact on the project, managers need to provide a supporting structure, time, and guidance in order to ensure systematic reflection.



Further, from an individual's point of view, experimentation requires courage, tolerance of uncertainty, and the ability to face failure. All of these characteristics are emotionally demanding and more present in experimentation-driven situations than planning-driven situations. Therefore, understanding the emotional experience of experimentation and providing the appropriate support to meet these demands are particularly important in the experimentation approach. Managers need to remain sensitive to the emotions that surface throughout the different stages of the experimentation cycle and meet them with both adequate support and acknowledgement that they are a natural part of the process.

When running experiments, teams often experience difficulties in identifying events and signs that are potential learning points. Especially events that do not support the initial assumptions of the project team (i.e., events with cognitive dissonance) are easily overlooked and events supporting the thinking of the team are given more emphasis (i.e., there is confirmation bias). Also, teams tend to disregard significant comments or behaviors that seem insignificant simply because they have not been studied before and the team is not yet aware of their potential impact. These instances further underline the need for time, structure, and specific support to be given to both the reflection upon and interpretation of the experiments. In order to be able to provide the needed support (both technical and emotional) for the team, experimentation requires a project manager who has a deep understanding of the nature and requirements of experimentation.

Rules of Thumb for Managers

1. Give a clear mandate to experiment in explorative projects: communicate clearly the desired behavior and lead by example.
2. Ensure the team knows their leeway to move on with experiments without asking for formal permission (inform about, e.g., the money available for building prototypes and the time they can use for conducting experiments).
3. Communicate that unsuccessful experiments are unavoidable and a necessary part of learning. Intelligent failures are acceptable, even desirable. Share information about failures as well as successes. Encourage identifying, analyzing, and learning from failures, for example, by “blameless reporting.”
4. For teams that do not yet have much experience in experimentation, help them understand the iterative nature of the approach before starting the project in order to avoid frustration and loss of interest. Consider, for example, sharing a visualization of the process of a previous project, the path that team went through as they learned through experiments.
5. Guide the team over the “invisible barrier” from abstractive thinking to concrete action by, for example, setting an expected mean time from idea to experiment.
6. Provide structures and processes for reflection and knowledge sharing. For example, take the time for this key activity by facilitating weekly meetings—reflective project reviews. Ask team members to also share their emotional experience (e.g., nervousness when facing the customer, the excitement created by an important new learning).

7. Create the time and setting for open and explorative conversations amongst the project team in order to ensure the team does not converge prematurely, for example by promoting explorative What if ...? questions.

8. Show a continuous interest towards experiments by being present and asking questions, as well as by being understanding about any moments of frustration or doubt.



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About the authors

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The background is a solid purple color. There are several circles of different shades of purple. A large, light purple circle is in the center. Around it are four smaller, darker purple circles, one in each quadrant. The text is centered over the large central circle.

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

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