



Research for Innovation

Combining research methods
to inspire user-centered innovation

Mission Statement

New technologies, new business models and customer needs are opening up vast opportunities in industries worldwide. While the future seems to promise almost unlimited disruptive growth potential, existing management and industry practices are being challenged by the same developments.

How can companies harness the potential of these changes and use them for the continual success of their business? It is crucial to understand the new technology developments and learn how to apply them so that firms, economies and societies will reap the benefits of the technological transitions before us.

Within the framework of our **Deloitte Innovation Trends** series, Deloitte features research that provides deep understanding of the technological transitions. This research also provides a thorough understanding of emerging business models and the implications they hold for both industry and the wider economy.

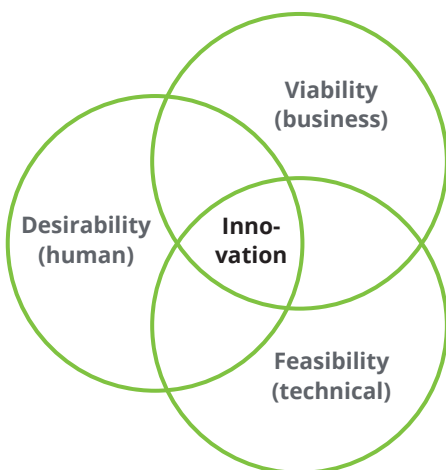
Executive Summary

In this age of digitalization, when the pace of change seems unrelenting and to be gathering speed, identifying the best innovation methods is indispensable to the continued good fortunes of any business. Implementing the best innovation methods, including research for innovation, is a matter of applying the right method at the right time within the innovation cycle.

Innovations arise at the intersection between user needs and economic and technological changes. Changing social behaviors, investment flows, patent research, as well as news reports, all mirror the dynamics and discussions happening within the economic, political and societal spheres. These can be used by businesses to identify emerging trends.

However, it is the market – customers and their individual needs – that ultimately determine the trends and offerings that will prevail. Research for innovation is a powerful tool that provides business with both macro- and micro-level insights into the market. It tracks trends, as well as those traits and indicators necessary for developers to understand emerging user needs and how these may eventually materialize in the market.

Different research methods influence and enrich each other as part of this process: understanding user needs (desirability) influences the way we look at technical solutions (feasibility), business models (viability) and vice versa. Therefore, there are multiple approaches to gaining different perspectives relevant for creating new products, services, experiences and business models.

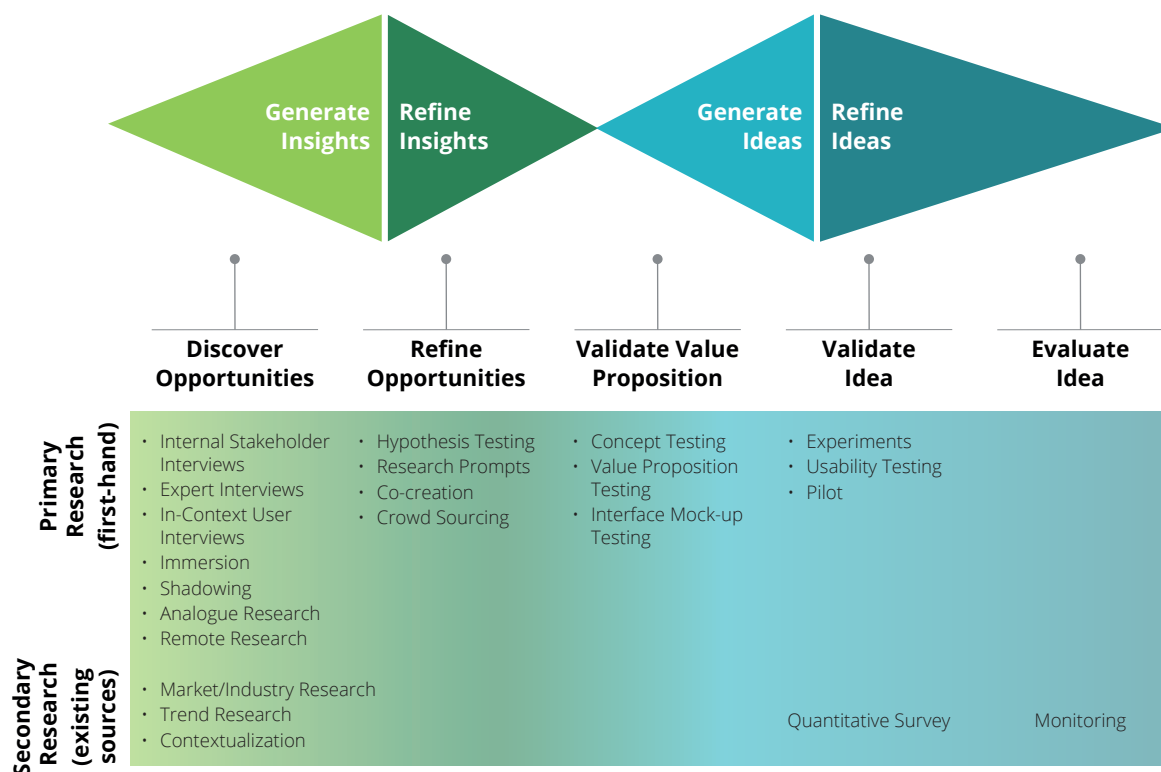


Research for innovation can inspire designers and developers by informing them, fostering a common understanding and providing a clearer view on a topic so the complexity is reduced along with any underlying uncertainty. Nevertheless, research for innovation does not guarantee success by itself. Implementing research for innovation to successfully develop new ideas for future needs also demands empathy, interpretation, experience, design skills and well implemented iterative cycles.

1. Research Activities – Overview

In this paper, we present different research activities and approaches that support the development process of new products, services, experiences and business models. The research phases described are: discover opportunities (III), refine opportunities (IV), validate/test value propositions (V), validate/test ideas (VI) and evaluate ideas (VII).

Research Methods Supporting the Development Process



* Research formats described here can be mixed for better results instead of applying either one or the other.

2. Discover Opportunities

Two research approaches support this phase – one examines the market, industry and trends through secondary research, the other considers the user perspective through primary research. The two approaches work best when combined.

A. Primary Research

Primary research is firsthand research that gathers new insights into what people actually do, how they think and the choices they make. The goal is to provoke new approaches to solutions through the insights and learnings gathered during stakeholder and expert interviews, as well as through immersive interviews and observations with consumers and users.

Looking In: Internal Stakeholder Interviews

Internal interviews with stakeholders enable teams to quickly understand the client's perspective on the challenge, provide insights into main "pain points" and the efforts made to solve the challenge. Interviews should be scheduled early in the process and are, ideally, conducted face-to-face.



Time per interview: 60 min

Sample size: Depending on the challenge and size of the team working on a solution. The client should appoint 3–5 participants to discuss the subject

Profile: Leadership and senior leadership, project leads, project team members

Looking Out: Expert Interviews

Expert interviews gather targeted information from knowledgeable sources. This is focused research that can act as a starting point for further desk research. Interviewees may be industry specialists from within the client company, but they can also be externals (such as from universities or from consultant firms) that provide a different perspective on the challenge. Ideally, expert interviews are conducted face-to-face. In contrast to user interviews, expert interviews are shorter in timeframe and questions are asked more directly.



Time per interview: 45–60 min

Sample size: 1–3 participants

Profile: Internal industry experts, external experts on trends, consumer behavior, forces of change or technology experts and researchers

In-Context User Interviews

User research is a powerful tool for identifying stakeholder needs. Ideally these face-to-face interviews are conducted in an environment familiar to the stakeholder, such as work, home or club house. Known environments stimulate natural and easy conversations that can provide greater insights into someone's life, routines and habits. The aim is to see how things fit together in the context of an individual's life, and gain more "show and tell" experience about the roles, motivations, interactions, decision making resources and personal preferences of the individual.

Interviews focus on collecting stories and anecdotes, and uncovering contradictions between what someone says and does. They also seek to understand the motivation behind actions and, ultimately, discover new ways to examine problems. The interview is informal in tone and supported by a conversation guide that structures the conversational flow. Questions are open-ended to allow interviewees to talk about what's important to them.

Sessions should be recorded with research teams consisting of two or three people, one of who will lead the interview while the others record it and take notes. The time required per interview varies. Normally teams can stop an interview if they are at the point where they are not learning anything new or if a series of interviews are repeating similar patterns.



Time per interview: 60–90 min

Sample size: 14–18 participants

Profile: Even mix of gender, age, income and geography (city vs. rural area, south vs. north) including extreme users and non-users



Analogue Research

With analogue research, teams seek inspiration from different fields and apply it back to their challenge. Analogies can be found anywhere, such as in nature, related business fields, science fiction and even art. For example, if a project team seeks to redesign the processes of a hospital emergency room they could analyze the setup of pit stops in Formula 1 car races. This research could offer insights into design for fast processes in environments where every second counts. Depending on the challenge, analogies can be more or less difficult to find. At times they arise naturally, but teams may also need to brainstorm to identify suitable potential analogies.

Immersion

Another research method is immersion and similar firsthand experiences that enable the knowledge base to be quickly ramped up. This also helps make the abstract more tangible. In order to avoid biases, immersion should always be used in addition to user interviews; in fact, teams should find a balance between immersive activities and user interviews. To allow for objectivity, it is recommended that teams be split during different immersive activities. The different experiences should be shared afterwards.



Time: Depending on the type of immersion
Sample size: Ideally, every team member should participate

Shadowing

Shadowing allows researchers to gain insights not only into what users say, but also into what they do. Typically, during a shadowing exercise, participants are given an assignment, such as buying an item. The researcher accompanies the participant, observes the participant's actions and asks questions during the assignment or after it is completed. Depending on the challenge and the research questions, shadowing can be time and resource intense taking anywhere from several hours to several days.



Time: 1 hour–3 days
Sample size: 1–3 participants
Profile: Users that are extreme in the manner they conduct an activity

Remote Research

Research prompts can be used as an addition to user interviews, either before or after the actual interview.

Possible prompts are:

- Online/offline diary: Participants maintain a diary over a time period to capture routines and thoughts according to a given task
- Image and video upload: Participants upload images or videos of objects, situations or people that relate to the challenge
- Geo-localization maps: Participants tag their position to indicate where they are at a certain time of the day and what they are doing
- Polls: Participants receive short polls during the day triggered by where they are or what they do.

B. Secondary Research

Secondary research helps identify underlying drivers of change or motivation that cannot be detected through user research.

Market/Industry Research

A review of players and stakeholders provides a baseline of the market situation. This delivers insights into how the market may develop and the direction stakeholders could turn.

Internal and external sources, including databases on industry insights, consumer markets and benchmarking studies, can provide a basic understanding on the initial context of a topic. Understanding the market landscape, the broader market forces and dynamics, as well as the positions of various competitors, is crucial to innovation work in specialized and competitive markets.

Trend Research

An overview of broad industry trends provides informational insights into “adjacent” activities and underlying causes of developments or changes. This understanding can give impetus towards developing solutions. It can also offer an understanding of the top-level drivers of change or causes for action and behavior. Every topic, be it social, technical, political or emanating from the business world, can be analyzed based on the information available. This can be either through direct measurable or by measurement of latent information, which materialize in measurable metrics or data points.

Taking a quantitative, analytical view on trends allows the origins of certain consumer or customer behavior to be tracked to obtain new insights about needs

or expectations. Trend analysis uses two predominant methods. The first involves expert interviews inquiring into macro trends. The second uses software-based artificial intelligence techniques to search through news and patent databases, as well as company investment activities, for developments, patterns and insights.

Today, artificial intelligence based software is replacing such labor-intensive and sometimes subjective manual searches. This technology can readily identify patterns and trends in news reports, patents and investments. Such research can reveal, for example, that major players are betting on the future of intelligent in-car assistants and provide indicators as to how various competitors believe this can best be achieved.

In addition, while macroeconomic and industrial development might seem irrelevant for user-centric design, broader economic developments can influence the attitudes and consumption behavior of individuals.

Contextualization

Using different types of research, trends can be brought into perspective and their hypothetical future implications extrapolated in terms of consumer expectations and use cases in the industry. Such contextualization can be used, for example, if blockchain technology has been identified as a specific technology trend, which is of concern for a specific group of customers or consumers. Contextual searches can be conducted on news discussions to identify the benefits to certain businesses as well as barriers to its implementation in various industries.

This method is similar to trend analysis. Indeed, the same type of artificial intelligence based software is used. Key words, representing observed trends, are defined so as to bring specific topics to light in their relevant context. From this, analysis is conducted on how the topic of interest may apply to other industries, in which environment it is best applied and what challenges or opportunities are associated with it.



3. Refine Opportunities

After a first round of inspirational research, it is recommended that a second round be conducted. This should be a more focused approach to prioritize and select options and to refine the first research findings and hypotheses. If the project timeline is tight, it is helpful to combine the activities described above so as to gather as much information as possible in a short time.

A. Hypothesis Testing

During research, the team can analyze results and answers so as to refine their questions more precisely. As part of this, they can develop hypotheses and test them with a more targeted selection of interviewees. A hypothesis can then be tested on potential customers to see if it actually meets the deduced needs of the stakeholders.

For example, to test stakeholders' needs, research teams can initiate a keyword advertising campaign on Google AdWords. Through this, the interest of customers can be measured by how frequently people conduct searches regarding the problem the team is trying to solve and by measuring how many click on the Google AdWords campaign.



User: Focus on target users, consider approaching some users from the first round of research in this round

Sample size: 12–24 participants

B. Research Prompts

Hypothesis testing is often accompanied by research prompts in order to dig deeper into certain topics by allowing participants to articulate their attitudes and display behavior. Again, at this stage, researchers want to go beyond what people say by provoking and observing user's reactions.

In one case, to understand people's reactions towards sharing private images online, participants were presented an app in the form of a paper prototype. Participants were told that, if they took a selfie with the app, the photograph would be immediately posted to a public online platform. By analyzing the reaction of participants, it is possible to deduce the willingness of people to share photographs online and their reasoning for doing so.

C. Co-Creation

Co-creation exercises are an approach to generate ideas together with the research participant. The advantage of co-creation is that it builds early ideas directly on feedback provided by the participant. This can then be iterated and refined on the spot. Co-creation sessions can be conducted in one-to-one interviews with the research team or as group sessions.

In groups, participants build on the ideas of others and are not limited by one perspective. Sessions can be structured as following:

- Introduction: This is what we are working on
- Hypothesis testing: This is what we now believe, here are early ideas

- Ideation & prototyping: What would your perfect solution look like? Try to visualize it.

If conducted in groups, teams should be split into pairs for ideation and prototyping to allow for the creation of different ideas. This should be followed by a share-back session and a plenary discussion.

D. Crowd Sourcing

Crowdsourcing is a powerful tool to tap into internet-connected communities and have them conduct assigned tasks. This method has been growing steadily in recent years and is based on the idea that a function, once performed by employees, is now outsourced to an undefined (and generally large) network of people in the form of an open call.

The benefits can include faster design and prototyping, higher quality and access to new pools of external talents. When undertaken in a coordinated and successful manner, this can decrease the cost of innovation. "Deloitte Pixel™" is one tool developed as part of this approach. It zooms into an issue or problem and breaks it down to its core components or pixels.

Once pixelated, each component of work can be executed in collaboration with leading crowdsourcing vendors. This approach means the staffing between crowdsourcing and traditional resourcing can be optimized to gain efficiencies while delivering cohesive solutions that include attaining feedback from a crowd and generating ideas.

4. Validate Value Propositions

At this point, teams should have a strong understanding of the value proposition of the service or product they are designing. Still, many decisions need to be taken before the actual launch. Research methods used at this stage are designed to support teams in making decisions, evaluating theories, and refining discoveries and ideas.

A. Concept Testing

Whether a novel product or service becomes successful is determined by how useful or attractive it is for the user. Neuroscience can track the judgments people unconsciously make when exposed to a new value proposition, idea or concept. Scientific evidence shows that the unconscious estimate of a representative group is a reliable predictor for future product acceptance of a larger group – above and beyond that indicated by questionnaire-based methods.

Furthermore, technology that tracks people's responses with millisecond accuracy pinpoint, which elements of a novel product are attractive, motivating or engaging and those that are not can be identified with pinpoint accuracy. Tradition research can be imprecise as it relies on people's memory of a situation and the way they express those recalled judgments verbally, thereby always adding a source of imprecision.

Neuroscientific tools include:

- Eye tracker: measures eye movements to determine what people focus on, what draws their attention or how they navigate, such as through a store or a software interface
- Electroencephalography (EEG) cap & data analysis: when placed on someone's head, this assesses brain activity relating to such matters as motivation or attention
- Facial coding: analyzes emotional responses by assessing facial expressions through a normal laptop camera
- Galvanic skin response: tracks physical arousal such as stress response via a device attached to the wrist
- Reaction time-based tests: measures reaction times to on-screen images or texts via click speeds on a key board or mobile device
- Standardized psychological questionnaires

An example of neuroscientific research is the incentive schemes used by companies to motivate and retain human resources. With a new generation entering the work force, novel bonus scheme concepts can be tested for their acceptance by employees.



The concepts are explained with video scenarios. A neuroscientific approach measures the emotional responses displayed by employees or a representative target group to the scenarios. Elements perceived as either motivating or disengaging can be detected. This approach allows implicit judgments to be readily identified which, although they of central interest to employees and employers, would be difficult to communicate through traditional research methods. The company can then use these insights to determine their choice of a novel incentive scheme.



Sample size: To receive statistically sound results, a minimum group of 20 participants is required

Profile: Participants should be representative of the target group

B. Value Proposition Testing

During this phase of development, teams seek to identify which products, services, and features users most want. This assists with designing the best value proposition for the largest possible market. Concept and value proposition testing is a popular technique used to validate or invalidate experiments with products and services by showing different versions of a product to customers at the same time.

The goal is not to build two different products when performing the tests, but to create near identical versions of an MVP (Minimal Viable Product) that differ by one

or two variables. The performance of both versions is then measured to see which works best. Teams typically run multiple tests to validate or invalidate hypotheses, and then use results to improve the next experiment.

C. Business Model Testing

After testing the products, services, and features to identify those that users most want, design teams should focus on the business side by determining how much various customers are willing to pay for the value proposition. Teams experiment with potential customers to verify that they can generate revenues from the value proposition. One quick and price effective method of achieving this is to set up a fake-sales website to test if customers will actually open their wallets to pay for the features they say they desire.

D. Interface Mock-up Testing

Once the value proposition of the product or service is defined, the project team prototypes different versions of mock-ups. Mock-ups are early prototypes made of cardboard or other low-fidelity materials and used to acquire feedback from users about the design and functionality in the design process.

Mock-up testing provides valuable feedback about functionality, usability and an understanding of the basic design idea. Testing a low fidelity prototype instead of presenting a seemingly finished product has the positive side effect of triggering honest feedback as the user feels that he or she can still contribute to the development process. Feedback sessions with users can be conducted with either one user at a time or as part of a group conversation. They can be designed as interviews around the

mock-up, but can also include creative elements if participants are given pen and scissors to edit the mock-up according to preferences.

In addition, mock-up testing can be supported by neuroscience to provide highly detailed insights about user behavior and perception. Within the development of financial dashboards, for example, low-fidelity prototypes are common. Companies frequently face the challenge of providing employees with an intuitive and easy-to-understand dashboard to make reliable business decisions. Employees can test the mock-up while their eye movements and brain activity are recorded. Highly detailed insights are then gained from the user perspective to allow the mock-up to be further shaped to simplify information layout and effectively guide visual focus so that it ultimately matches user expectations. Lastly, this approach provides quantifiable and objective metrics to help improve mock-ups on the journey to becoming a user-friendly product.



Without neuroscience

Time: 30–45 min for single interview, 60–90 min for a group interview

With neuroscience

Time: 45–60 min for one user

Profile: Participants should be representative of target group if possible

5. Validate ideas



At this point of the development process, the research methods shift from a generative to a more evaluative approach. After an understanding of user behaviors and patterns is attained, now it is time to assess the idea itself and prove options. Teams want to understand if their idea really works, if people use it and how they can create a highly intuitive and user-friendly service or product.

A. Quantitative Questionnaires

One way of collecting quantitative data to validate ideas are questionnaires. Each respondent is asked to respond to the same set of questions. The teams may ask participants to compare two ideas with each other, to rate an idea or to rate one feature over another. Again, the goal of a questionnaire is not to find out something new, but to validate ideas on a larger scale or to prove that they are wrong.

Questionnaires can be completed offline or online. Increasingly they are also being completed on mobile devices. If conducted on a small scale (<100 respondents), teams can easily manage the setup of the questionnaire themselves by using online research tools. If undertaken on a larger scale, it is advisable to outsource the questionnaire to a professional market research agency with programming capabilities and a large database of potential participants.

B. Experiments

Once the team has validated its idea in theory, they should test whether people will actually use it in real-life. This reality check is provided by experiments where the teams simulate the user's experience to understand, if and how people are using a service or product. The experiment should be easy enough to be

manageable for a small project team, but as close as possible to the idea that the team wants to test.

If the team, for example, wants to test a service, it can build a simple website as a touch point with the customer. The backend as well as the service execution, however, is done manually without the user noticing it. Sometimes, it makes sense, to only test the core features of an idea. Before designing such an experiment, the researchers should agree on the key metrics to measure and plan in evaluative surveys and user interviews to evaluate the experience.

C. Usability Testing

Usability testing helps to discover if the implementation of a product or service actually corresponds with user needs. It is therefore recommended that extensive usability testing be undertaken with two or three versions of functional prototypes. This enables “touch and feel” tests of the almost-ready product so as to understand how users experience it.

Unlike interviews designed to encourage users to talk about their behavior or preferences, usability testing measures actual performance on mission-critical tasks. Under such testing, comments such as “I really like the website!” will be invalid if the user cannot figure out how to actually complete a purchase.

Typically, participants are given a scenario (“Imagine you are on holiday and want to log in to your bank account”) followed by a set of typical users tasks (such as recovering a lost password) or the most important conversion goal (from the perspective of the website or application owner) – making a purchase.

Perception of elements within, for example, a new car can be evaluated using a mobile neuroscientific set-up. The excitement related to fast acceleration can be detected using novel technologies that measure the user experience. To this end, a cap similar to over-sized headphones is worn whilst testing the product. Other settings include perception of new stores, online shops and many others – both within a three-dimensional and online setting.



Time: 30–45 min

Sample size: 15–20

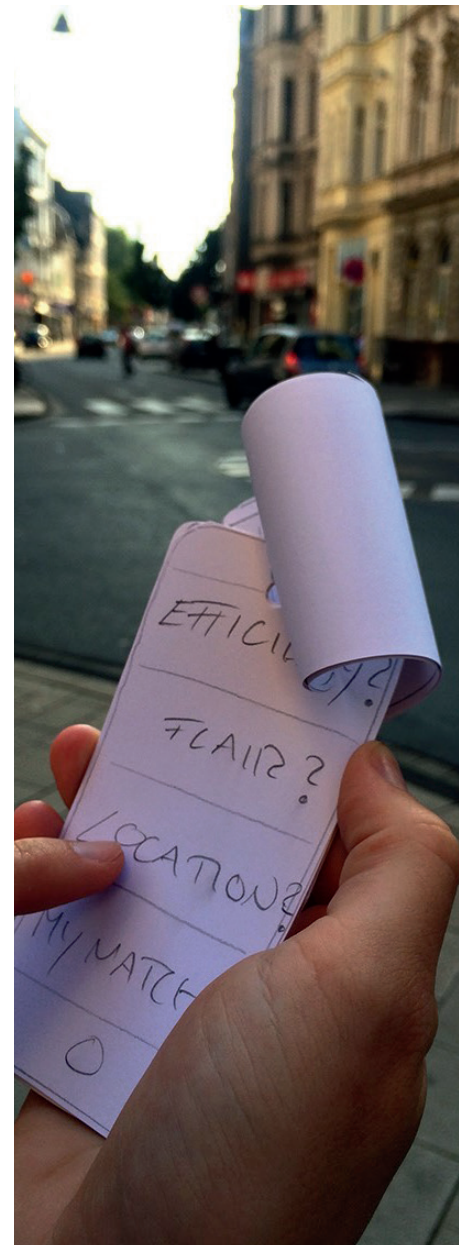
Profile: One or more user groups from target audience

D. Pilot

Pilots are a low-risk way of testing business ideas before a full-scale launch. They are as close to the actual idea and the real-life context as possible, but are typically smaller in scale and limited in geography, time or the customer segment they target.

Pilots are a great opportunity to learn – not only for the project team and but also for the client company. The outcome of a pilot project should be a clear indication to the organization on how best to proceed. On the other hand, even if a pilot fails, teams can learn from the experience and share them with the rest of the company to avoid making the same mistakes again. The better companies become at quickly piloting and testing new ideas, the faster they can become at innovating.

To ensure time efficiency and focus, teams should decide early on a launch date and then calculate backwards to determine when to do what.



6. Evaluate Ideas

After the product is launched, many companies think the job is finished. It's not. Now monitoring is required to understand what works and what doesn't. By tracking and measuring defined targets businesses learn to iterate ideas and ultimately to scale them. Companies like Zalando have been immensely successful in scaling because of their inherent principle to track and measure every new feature they release: there is accountability – for both success and failure.

Before teams start measuring arbitrary items and throwing numbers around, it's critical that everyone involved agrees on key metrics before the launch. This means not only setting and agreeing to a specific set of goals, but also determining how to measure progress towards them.

When launching an online product, teams should measure which features are being used by users and how often. A comprehensive tracking tool for websites, blogs and apps is Google Analytics, which is easy to set-up and can literally track everything. To make it usable, it is important to identify key metrics, track them and to put them into perspective. Hence, teams should prepare a table to compare such aspects as marketing efforts and new feature launches with usage data. Users can also be invited to give feedback interviews or quick online surveys to provide understanding beyond the basic data and figures.

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“ Hi Joe. Thanks for purchasing a new **Toaster Fridge**.

Continue press ENTER

1 → How often do you use your **Toaster Fridge**

☐ A Daily ☐ B Weekly ☐ C Monthly

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7. Outlook

User requirements will change over time as well as new technologies arise and other societal changes occur. Thus, innovation needs to acknowledge these forces and bind them into the innovation process of developing new products, services and business models.

Understanding the user needs (desirability), the technical solutions (feasibility) and potential business models (viability) is key for successful innovation.

Different methodologies can be applied along the journey from discovering and refining opportunities to validating value propositions and evaluating ideas to finally validating ideas.

Some methodologies can be applied synchronously, others need to be executed sequentially in order to inform specific phases of the research.

Overall, as users are at the core of most innovation projects, the portfolio for a successful innovation project can be as diverse as the user groups involved. Developing the right approach requires a good set of methodological experts as well as experience in order to drive innovation successfully.



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