
User clinic formats and their value contribution to innovation projects

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Abstract: Decisions to innovate are decisions to invest. The object is to achieve maximum output with minimum investment. This requires recommendations on methods that will identify the most promising ideas early on. Scarcely any past management credo achieved the same broad relevance as customer centricity. However, business enterprises have had problems with its realization. Studies indicate major shortcomings in implementation – especially in innovation projects. Customer centricity requires the generation of information. Many traditional market research instruments are, however, unsuitable for assessing the potential for innovative products on the market, since target customers' imagination is finite. At user clinics, intensive customer integration makes it possible to glean dedicated information about their needs and make statements about innovation success potential. This paper supplies a theoretical foundation for the user clinic model, three different application formats, two case studies from the telecommunications industry and the role they play in innovation profitability analysis.

Keywords: innovation; product development; customer integration; user clinic; profitability analysis; prospective value tracking; customer insights; triangulation; psychology; mental model.

Introduction

Innovation profitability analysis tries to avoid negative costs by assessing innovation success and the relation between expenditures and earnings. Investment decisions rely on a prioritization of innovation ideas to be established as budgeted projects. In order to anticipate innovation profitability, recommendations based on adequate, replicable, and transparent measures and methods need to be applied. The challenge is to identify the right, most promising ideas with the highest market potential. Especially for highly innovative products an assessment is not easy. Not only do initially unknown details and obstacles introduce uncertainty into the development process, but the iterative specification and evaluation of ideas and products through potential customers might not deliver valid data because today's customers might not be able to imagine future products in use.

Customer integration has been widely accepted as an inevitable moment of innovation management. Still, its realization remains difficult, and especially in innovation projects studies point out serious shortcomings that we intend to address and overcome with new methods. The "risk of incrementalism" refers to the experience that innovative product ideas are being rejected by potential customers while existing products score higher and are being gradually improved (Tauber, 1974). Another aspect is the missing applicability of the classical market research methods. Traditional market research instruments (standardized techniques including extensive written surveys and quantitative forecasts) have often proved inadequate to assess the market potential of innovative products and services (Trott, 2002; Wind and Mahajan, 1997). There are two main reasons for this. First, traditional methods have often proved too superficial and tend to cleave to the past (e.g. Day, 2002). This makes them less suitable for identifying latent or future user needs. Second, conventional approaches concentrate on evaluating specific solutions and assume that target groups already have sufficient knowledge of the products in question (e.g. Hoeffler, 2003). Another problem consists in missing measures of the value contribution provided by new customer research methods like the ones we describe.

The so-called user clinic addresses these shortcomings and proposes valid methods and measures to evaluate highly innovative concepts. The paper provides a theoretical foundation based on cultural and learning psychology for the user clinics model, it advances current approaches to user clinics and introduces new clinics formats as well an approach to measure the value of the clinics for innovation.

2 The user clinic concept

Introduction to the user clinic method

The term "user clinic" is not self-explanatory. It is based on the fact that test persons are not interviewed at home or on the phone as in traditional market research but invited to a special location (e.g. development laboratory), where they give the "patients" – namely product ideas – a full check-up and diagnose their "efficiency".

The goal of the user clinic is to obtain sound information on future market acceptance of products before they come to market in order to reduce the possibility of failure.

Typically, a user clinic is divided into three phases: 1) recruitment of participants from a specific target group, largely depending on the clinic's focus, 2) collecting and evaluating data and 3) implementing the results. Between 150 and 300 potential customers will usually be invited to supply information on the innovation being tested. Test persons are introduced to the subject by experienced moderators at sequentially arranged stations, with support from product managers, engineers, psychologists or marketing experts from the innovating company. Intensive interaction with the moderator and staff enables testees to find out about and test the potential product in depth. The ideas they assess may have reached any development stage – from a general outline of a product trend to a full product concept or even a fully functioning prototype. After this learning phase, testees are able to submit a sound product evaluation. The assessment is based on various complementary methods and statistical procedures that substantiate result stability. The entire process can take between 90 minutes and three hours. The innovating company can also invite business partners and other stakeholders to attend.

The user clinic helps to offset the deficiencies of traditional market research, assess new innovative products and generate vital information on the needs of future product users. This is largely achieved with three aspects: an intensive learning phase, interactivity and a multi-method approach.

Elementary elements of the user clinic concept

Learning phase

A valid assessment and adoption of completely new innovations requires learning processes (Binsack, 2003). User clinic participants face a difficult task. First they must understand how the new product functions, not on the technical side but for them as users. Then they must isolate the product from the clinic context and transfer it to their everyday environment. This environment is not their present one but a foreseeable future scenario with its infrastructure and conditions. User clinics make use of the psychology of learning to empower testees to make sound statements on new products. Key aspects are the possibility of multiple representations and support in building mental models.

The psychology of learning has long focused on cognitive developments. This field distinguishes between speech (language/symbolic), analog (image or perception-based) (Anderson, 1996) and action representations during the acquisition of knowledge. Thus, for example, the meaning of “hill and valley” can be expressed in hill-walking as action, and by looking at pictures as analog acquisition, while the relational logical structure (hill as the opposite of valley) is the speech representation. It is assumed today that simultaneous or successive multiple representation often supports learning processes (Edelmann, 2000), and helps to describe objects completely and with greater precision. Even though there is evidence that information representation is not necessarily linked to a sensory modality, it can nonetheless be assumed that multi-model learning materials will instruct individual testees and, more so, heterogeneous groups faster and more suitably than simple verbal speech information.

Consequently, verbal descriptions in the form of texts or presentations should never be relied on solely for potential innovations in user clinics but should be supported by illustrative materials, visualizations, storyboards or prototypes. Experience prototypes enable active engagement with innovative products. Communicating the main experience

qualities is more important than technical implementation in functional demonstrators. If no prototypes exist yet for the planned innovation, sketches or video animations can be used along with text descriptions to illustrate concepts and use cases. Diagrams are usually used instead of realistic pictures to focus testees' attention on key processes and product features rather than details.

Mental models are (in relation to scientific models) simplified models of reality cross-sections, which are usually developed following direct experience with an issue. Above all when the issue is relatively complex - as is the case with technical innovations - it is easier to orient to holistic/analog forms of representation that integrate language-, image- and action-based knowledge.

"Mental models are internal simulations of external processes ... they are a subjective knowledge structure with a functional character, i.e. they make it possible to deal with tasks and problems" (Edelmann, 2000).

The brief but intensive multi-model learning phase in user clinics is designed to empower interviewees to develop mental models of innovative products and to make sound evaluations from their subjective standpoints.

Rich interaction

To ensure that testees pass the initial learning phase successfully, they can put questions about the functionality or other aspects to the moderator or other employee. Documentation of these questions can be used as a valuable information source for further product development. Non-verbal signals such as facial expression and gestures provide revealing information on first impressions of topics and concepts.

The topics and concepts can also be discussed further in focus groups to enhance and secure the testee's understanding. This also helps to identify barriers early on and to develop comprehensive understanding for the user's view of the presented theme.

Multi-method approach

The clinic model is based on the triangulation principle. The term triangulation has been taken from land surveying (aiming at a measurement point from at least two locations at a known distance from each other) and applied to empirical research methodology. In triangulation, different methodical accesses are linked with their theoretical perspectives in order to approach an analysis object with different methods or via different data sources. If the same or similar results are achieved with different approaches, this usually serves to validate the analysis results. Flick (2008) emphasizes that complementary or supplementary views enable a broader understanding of the research object.

This is the strategy pursued in user clinics. The focus lies on deploying different survey and evaluation methods. These are always combined in clinics in order to estimate market risk as comprehensively as possible, for instance by recording pragmatic and hedonistic use motives as well as relevance of and interest in specific services. As with many other survey techniques, converging statements may help while diverging statements (little interest but high pragmatic and hedonistic benefit/use?) are motivation to reflect critically on the underlying assumptions and theories. Different approaches are also pursued with questions about global use cases, strengths and weaknesses of individual features or a comparative prioritization of features. The combination of open

and closed questions reveals statistical distributions in the survey sample as well as reasons for their preferences. Furthermore, different analysis models, for instance conjoint analyses, the Kano model and the AttrakDiff method are suitable for making additional statements.

Conjoint analysis (cf. detailed explanation in Teichert, 2000; Backhaus et al., 2006) is one of the methods most frequently deployed in innovation market research. It is mainly used to determine optimal product features during new product planning and/or fix prices (Hartmann and Sattler, 2002). The Kano model is used to structure customer requirements for future products and assess their impact on customer satisfaction. Kano et al. (1984) distinguish between customers' must-be, one-dimensional and delight requirements. The Kano model identifies product criteria that have the most positive impact on customer satisfaction. It is therefore very useful in identifying the product features that are worth investing in during the continuing development process (Hinterhuber et al., 1997). The AttrakDiff method is used to evaluate interactive products (Hassenzahl et al., 2003). It ascertains product attraction by measuring its pragmatic and hedonistic qualities (Hassenzahl et al., 2008). AttrakDiff makes it possible to optimize the user-friendliness and thus the perceived attraction of an interactive product. These analysis methods enable us to scrutinize potential innovations from different vantage points. They are applied for specific tasks in the user clinic.

3 Types of user clinics

This section presents three possible types of user clinics, the difference lying in the point at which they are used in the innovation process and their different objectives.

Insight clinic

The insight clinic is used at the start of the innovation process, during the exploration phase, the vague initial stage of an innovation project. During the early phases, innovation market research should concentrate on needs more than solutions (Katz, 2004). The object should be to comprehend the work and life situation, the unsolved problems and wishes, etc., of present and future customers. This is achieved in so-called customer insights – vivid descriptions of unsolved problems or unfulfilled wishes, seen from the customer's perspective.

The main focus is on current, latent and future needs. Whereas future needs do not exist in the present, current and latent needs are already existent. Current needs are already articulated and known, latent needs however (relatively) unknown and thus not easily expressed (Kleinschmidt et al., 1996). Ascertaining latent and future needs involves special challenges, since it demands a specially deep, empathic understanding of target customers and their action scenarios (Kärkkäinen et al., 2001). If latent and future needs are identified successfully, they can be transposed into product ideas offering major market potential.

The analysis object for which customer insights are being sought is still not a concrete, evaluable product idea but a broader topic area. This topic area could be an investigation into a current trend or a topic that affects the near future (e.g. "How will we communicate 20 years from now?").

During the insight clinic, 20 to 30 test persons pass several “insight stations”, at which the target topic is illuminated using various methods. The focus here is not on questionnaires and statistical methods but on techniques that help testees grasp the topic from an unusual or a new stance, and to develop a deeper understanding of participants’ needs. This could mean that test persons are required to build their idea with Lego bricks, the Lego bricks being a medium that helps them to think out of the box. They then present and explain their creations, providing insights into participants’ thought patterns and motivation. A deep understanding of customers’ current and future needs in this area can be achieved by using mean-end chains based on the laddering technique (Braunstein et al. 2000).

The special strength of the insight clinic is that it generates topic-related dedicated customer insights, and reveals and understands latent and future customer needs. Since these needs are initially the only results available, the insight clinic does not supply any concrete pointers to new products. The diffuse clinic results can only be transformed into product ideas in a second step.

Evaluation clinic

The evaluation clinic is used later in the innovation process - during the product or concept selection phase – in which potential innovations are already available as ready concepts, prototypes or even as fully functioning products. There are three different types of evaluation clinics: 1) the conventional evaluation clinic, 2) the lower-cost mini clinic, which can be implemented faster, and 3) the online clinic format.

Conventional evaluation clinic

Its purpose is to avoid wrong decisions of the first and second types (Eliashberg et al. 1997). Wrong decisions of the first type occur when investments are (still) made in a project despite low anticipated success potential. Wrong decisions of the second type mean that a potentially successful product idea exists but that management does not (continue to) invest in the innovation project and thus fail to exploit the chance of market success. The primary goal of the evaluation clinic is therefore to gain information that will reduce the risk of making the wrong decision and supply statements on product concepts that will be pursued and those that will be abandoned. The analysis object is thus no longer an abstract general topic but concrete evaluable product concepts.

As in the insight clinic, test persons pass through a multi-level process in which up to 25 product concepts are presented by a moderator and supported by visualizations, prototypes or mock-ups. Participants then have the chance to try out the prototypes themselves, test them in depth and ask questions. This comprehensive learning phase leads to deeper understanding and makes it possible to assess concepts reliably. Evaluation takes place with a programmed questionnaire based on the triangulation principle. In order to gain stable results for the analysis methods used (e.g. conjoint or AttrakDiff), between 150 and 300 persons are needed. Alongside the questionnaire, interviews and group discussions can provide more detailed information on participants’ evaluations. The additional collection of personal data makes it possible to obtain detailed information on adoption behavior and involvement of the target group, and thus to classify concepts by their short-, mid-, and long-term relevance for the product

roadmap. Observation of participants testing prototypes can also supply information on their learning behavior, and reveals first conclusions on product user-friendliness.

The evaluation clinic is suitable for identifying products with the highest success potential for specific target groups. However, the quantity of tested concepts allows only limited detailing in each concept evaluation. If the object is to acquire further information, for example on adoption barriers or on detail topics, the evaluation clinic is only conditionally suitable.

Mini clinic

The mini clinic is the lowest-cost variant of the conventional evaluation clinic. It is designed to enable prompt feedback on product idea developments, for example in workshops. Consequently, ideas are only available in concept format, e.g. as worded concepts supported by storyboards. A moderator explains these to the test persons, who again have the chance for questions and interaction. The goal of evaluation is to use basic rating scale surveys supported by open questions to gain initial information on the attraction and relevance of the concepts.

Along with the prompt and less detailed evaluation of product ideas, cost efficiency is a key component of the mini clinic. It operates without complex questionnaires and prototypes, and far fewer participants are needed since the methods used are less complex.

Online clinic

Another less expensive variant of the conventional evaluation clinic is the online clinic, which combines the advantages of the evaluation clinic and the online survey. Test persons are invited to participate in an online survey via e-mail. This is more convenient for testees, since they can take part anywhere at any time. The interactive component of the evaluation clinic can also be realized for the online variant by providing a range of different communication channels. Conceivable options are a permanently available hotline, a discussion forum or a live chat, in which testees can put their questions on the presented concepts or questionnaire. However, testees are not willing to spend too much time on an online study so filling out the questionnaire should not take longer than 30 minutes. This restriction means that not more than five to ten product concepts can be assessed. It is important to find the trade-off between the number of use cases to be evaluated and the required depth of product evaluation. A basic evaluation as used in the mini clinic and based on simple rating scale questions is conceivable, on the other hand the tools used in the conventional evaluation clinic, e.g. conjoint or Kano analysis, could also be applied to a small number of concepts. The online clinic again targets cost-efficiency, which is easily realized thanks to the online format and the shorter questionnaire.

Deep dive clinic

Another feature of the product selection phase is the deep dive clinic, which subjects concepts selected during the evaluation phase to a detailed review.

The main focus here lies on identifying and analyzing acceptance barriers. Acceptance of an innovation is a precursor to adoption. Acceptance can be defined as the

expression of an individual's subjective attitude to facts and implies positive readiness or behavior (Hecker, 1997). Resistance to innovation is a special form of intrinsic human resistance to change, and is based on functional or psychological barriers (Ram and Sheth 1989). The newer the innovation, the more likely it is to meet with resistance and rejection among target customers. Early identification of potential acceptance barriers makes it possible to take concrete steps to reduce them. In the deep dive clinic, acceptance barriers are identified on the basis of various touchpoints. Touchpoints are the interfaces of a product, a brand or a service with a customer before, during and after purchase. These could be contacts with sales staff at the POS, mailings or various advertising formats (Spengler and Wirt, 2009). In the familiar, moderated and interactive study design, testees are guided through different touchpoint stations in order to identify potential barriers that could occur in conjunction with the selected touchpoints. In the area of product awareness this could mean knowledge or comprehension barriers or, in the concepts, lack of confidence in the concept or preference for competitors. Another information deficit in innovations concerns the price sensitivity of potential customers. Price sensitivity is based above all on the benefit that an innovation offers customers. For complex innovations it is sometimes hard to estimate the benefit for target customers. Ascertaining information on the price sensitivity of target customers is therefore a particular challenge (Bergstein and Estelami, 2002). Applying the price sensitivity meter (PSM) method (Van Westendorp, 1976) may help to ascertain initial information on price preferences.

Along with analysis of barriers, the deep dive clinic can evaluate the limited number of concepts to a deeper level, and glean more detailed information, e.g. on user friendliness, product modifications or optimal bundling of individual functions.

The deep dive clinic enables a complex detailed evaluation of the product and its user-friendliness. The detailed analysis means, however, that not many more than five potential innovations can be tested.

4 Use cases

This section presents a use case example of conventional evaluation and an online clinic from the telecommunications industry. These clinics were held at Deutsche Telekom's central R&D development, the Deutsche Telekom Laboratories.

Interactive Mobile TV - Evaluation Clinic

To improve customer loyalty, mobile providers are increasingly offering interactive mobile TV formats, which are seen as a key service and unique selling proposition for future revenue generation (Seong 2008; Barrett 2006). Interactive mobile TV (IMTV) aims to replace classic passive linear TV with a stronger non-linear TV experience that can also be used on mobile devices.

The Deutsche Telekom Laboratories held a series of evaluation clinics with potential IMTV customers in order to gain empirical data to evaluate 18 new services. To obtain a sufficient base for preference measurement, a total of 180 test persons were recruited and divided into five segments of 36 persons corresponding to the Group's own customer segments. The clinic was divided into three modules (mobile entertainment, interactive mobile TV Services and mobile TV). First, participants experienced an intensive learning

phase, in which the IMTV services were explained in detail using visualizations and demonstrators to convey the service ideas. Handouts were also distributed, which testees could use as reminders during the subsequent survey. Participants were then asked to evaluate the services presented to them. The questions were programmed in an online questionnaire, which testees filled out on the laptops provided. These questions were used as the basis for an adaptive-conjoint analysis and a choice-based conjoint analysis in order to gain statements on user expectations for the attributes of the individual services.

This evaluation clinic helped to identify four highly promising services. These were then implemented in the further product development process. Eleven services were rated as not worthy of further development. In addition, three strategic adopter categories were defined (early adopters, majority and laggards; see Rogers 2003). Short-, mid- and long-term roadmaps were then created on the basis of adopter-specific preferences.

Social Networks – Online Clinic

Social networking sites such as Facebook and LinkedIn are fast gaining popularity. Member communities worldwide boast the highest growth rates among the most popular Internet activities (Nielsen, 2009). Due to the steadily growing number of providers, it is becoming increasingly difficult for users to manage the individual networks in which they are members.

Deutsche Telekom develops various services designed to simplify the administration of different social network sites. An online clinic was to enable customer-centric further development of services during the product specification phase. A total of five services were assessed by 300 persons, who had to be registered in the different networks before they could participate. To compensate for the lack of live moderation and interaction with testees, different communication channels were set up. Questions could be sent to a special hotline and e-mail address as well as discussed among participants and with a moderator in a forum set up specially for this purpose. Many open questions were included to give participants as many chances as possible to communicate verbally as needed. The clinic-typical learning phase involved a presentation of the services on storyboards, which showed the product idea in image sequences and a detailed written explanation of individual functionalities. The questionnaire used Kano analysis, the AttrakDiff model, and open and rating scale questions to query the attractiveness of the services. A conjoint analysis (best-worse measurement) helped to prioritize individual features and services, and price preferences were analyzed using van Westendorp's PSM method. The concepts evaluated in the online clinic were clearly prioritized and one concept identified as especially attractive. All concepts met with high customer acceptance at all evaluation levels. Three clearly differentiable segments were formed (enthusiasts, interested and rejecters), and information gleaned on perceived competitors, price expectations and requirements for use of social networks.

5 Impact on the innovation profitability analysis

Trying to anticipate and quantify willingness to pay user clinics already provide for data that is used with market data to estimate innovation profitability. In order to analyze the contribution of user clinics to innovation profitability a value tracking system is necessary, which systematically tracks costs and benefits of the clinic.

While for technical developments a project-oriented value tracking is widely established a comparable approach within the existing literature on user research (Bias and Mayhew, 2005) is hard to find. The development of a new approach for a value tracking system poses a number of challenges: clinics may serve to avoid misdirected investments or prioritize ideas. This added value does not show up in project oriented value tracking and is quite speculative to estimate in the long run. As well since clinic results may suggest a lower estimated project value, the value tracking should stay at least partially independent of individual projects in order to avoid conflicts of interest.

Three ways of measurement are imaginable. Not only to measure the added value for clinics, but for a whole range of customer integration methods.

- A qualitative assessment: A qualitative description of the created added value, focusing on goals and results of the applied method, challenges/ problems and finally the added value.
- A resource allocation approach: The number of man days invested in a project is taken as the basis for evaluating the value of a customer integration method. The share of in-vested man days into a project is the share taken from the revenue forecast of a project.
- A share-based approach: A pre-defined, fixed share of the estimated revenue of a project is assigned for each customer integration method in order to measure the added value. The 'size' of this added value depends on the complexity of the method (extent) and the quality and significance of its results.

While each approach is suitable for some projects, a combination of qualitative assessment with the share-based approach proved to be the most viable solution. It works as follows: Depending on its complexity and significance, a fixed share is calculated. Taking the total estimated revenue of an innovation into account, a value for the customer integration method can be deducted. The complexity of a method is divided into 4 categories. The relevant category depends on the number of invested man days (external + internal). The impact of results and reduction of market uncertainties/ risks is divided into 6 categories and depends on the assessment of the project field manager.

The following table shows the current ranges for complexity and impact of the different clinic formats:

Table 1 Different clinic formats and their complexity and impact range for profitability analysis.

<i>Method</i>	<i>Complexity (e.g. invested man days)/ extent</i>	<i>Reduction of market uncertainties/ risks and impact of results</i>	<i>Share of value in %</i>
Insight Clinic EvaluationClinic	1-3	2-4	2-12
Conventional Evaluation Clinic	2-4	5-6	10-24
Mini Clinic EvaluationClinic	1-3	4-6	4-18
Online Clinic EvaluationClinic	2-3	4-6	8-18
Deep Dive Clinic	2-4	5-6	10-24

Source: Inhouse.

If, for example, the total value of a project is 100 units, and an insight clinic (complexity 1, impact 3) for requirement specification and evaluation, as well as a deep dive clinic (complexity 3, impact 5) has been performed a total percentage of 18 is assigned to the total value of the project.

The advantage of the approach is that all results of the applied method are condensed and tracked at the same time. It delivers a concrete value to make results more tangible and is easy to implement without affording a case-by-case assessment and evaluation of the added value. On the downside we acknowledge that monetarization of added value will always depend on subjective assessments and also its dependence on the correctness of the given revenue forecast.

6 Summary

In an overall assessment, the user clinic method is characterized by a deep understanding of customers, their needs and usage situations. User clinics succeed in overcoming the weaknesses inherent in traditional market research, namely the risk of incrementalism and a tendency to cleave to the past. An in-depth learning phase using visualizations and prototypes as well as direct interaction enables customers to familiarize themselves with new product ideas and thus to submit reality-based evaluations. The triangulation principle makes it possible to scrutinize each problem from various sides and to make a sound analysis. Direct interaction with the customer gives Development, Marketing and

Sales staff, and possibly other stakeholders, valuable direct feedback on product ideas. One restriction to be noted is that the limited sample size means that user clinics are not suitable for differentiated market potential analyses and may offer only limited representativity. In addition, the live clinic formats involve major organizational effort, since different parties and a larger sample of testees have to meet up on the specified dates.

We distinguish between three types of clinic. 1) The insight clinic provides customer insights, as well as information on current, latent and future requirements for a broader but product-related topic area. 2) There are three different types of evaluation clinic: the conventional evaluation clinic, the mini clinic and the online clinic. The conventional evaluation clinic enables firms to identify promising product concepts for specific target groups from a broader concept range and to classify them for the short-, mid- and long-term in the product roadmap. The low-cost mini clinic supplies prompt initial evaluations on product concepts generated at short notice, while the online clinic collects detailed information at low cost on the attractiveness of a limited number of concepts using an online concept survey. 3) In the deep dive clinic, extensive knowledge is conveyed in order to simulate the adoption process as realistically as possible for a limited number of concepts and to show potential barriers.

The value-tracking method presented above contributes to innovation profitability analysis based on the complexity of the clinic type deployed and the resulting decrease in uncertainty. The theoretical discussion was expanded and substantiated through a psychological foundation. The user clinic was used to evaluate new media and online services in the telecommunications industry. These empirical projects demonstrate the performance of user clinics and illustrate the role they play in innovation profitability analysis.

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