

Toolkit
Using Inventions in the Public Domain

Tool 3
Voice of the Customer

WIPO

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In this document we will explain how to use the Voice of the Customer tool and interpret the results. The voice of the customer is discussed in sub-section 4.1 "Market Data and Research" under section 4 "Market Opportunities" of Module III in the WIPO publication *Using Inventions in the Public Domain: A Guide for Inventors and Entrepreneurs* (2020). It is also discussed in section 9 "Design" of the publication, where the use is to refine the design requirements for the product or service. Here, it is used for ideation.

What is the voice of the customer?

The voice of the customer is literally that. It is what current and/or potential customers say about what benefits, tangible features and augmented features they want from a product or service, and why. It may also include their use cases. In short, it is their needs and requirements. Most times, if you are willing to listen to customers, they will tell you what they need. The customers you want to talk with and listen to are in the targeted market segments mentioned in the project charter.

The Voice of the Customer tool guides you through identifying and interviewing a target audience relevant for your new product development (NPD) project. It also helps you extract salient information that can be useful for the ideation and design of your product or service, and develop your market entry strategy.

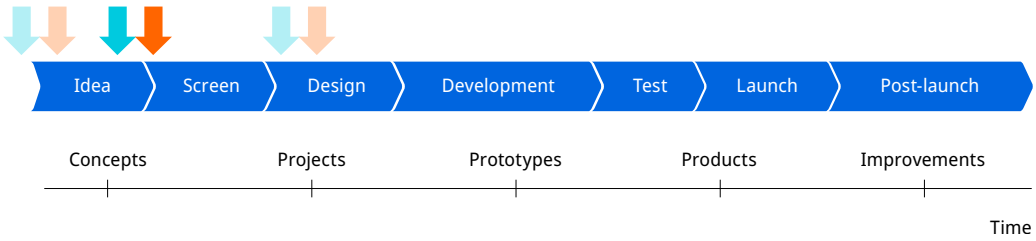
By collecting and helping you analyze information from potential customers and end-users, and from observations by experts, the Voice of the Customer tool can be used to address adoption risk; in other words, whether the intended customers will buy a product or service, and whether end-users will deploy it. This tool helps you determine if the assumptions about customers in the project charter are correct, and to further clarify what core benefits, tangible features, augmented features and other factors could affect the buying and use of a product or service like the one you are developing. When used early in the NPD process, guidance from the Voice of the Customer tool can influence how you design a product or service to meet customer requirements in a way that might increase the likelihood of purchase and use.

Suppose you are a craftsperson making woolen sweaters. To diversify your products and increase production, you are considering an automated machine which can be programmed to do custom work. Less labor and more products could mean higher sales and revenue. But will your potential customers buy these new products if they are not handmade?

The only way to know is to do market research. It is not enough to use the internet to search for trends; you must talk to current and potential customers and end-users to get a feel for what people want, today and in the foreseeable future. It is also useful to talk to experts who track your targeted market, as they may have better knowledge of relevant factors over mid- and long-term forecasts. Interviews with potential customers would allow you to test their views on products that look handmade but were created by a machine.

In your discussions, you may also learn about better ways of moving forward. An expert may tell you about a patent for an invention that allows you to provide a custom-made product that looks handmade but at a far lower cost. You can then determine whether the patented invention is in the public domain where you want to conduct business and sell your products, or if it is available for licensing. By listening to the voice of the customer, you gain information that you can use to mitigate risk and gain confidence that your product will have a competitive advantage in the market targeted.

Figure 1: **Stages and gates. The blue arrow shows where the Voice of the Customer tool is most commonly used, early in the Idea stage. The lighter blue arrow indicates that it can also be used even earlier to help develop the NPD project charter and action plan. The blue arrows (light and dark) indicate when to begin using the tool. The orange arrows (light and dark) indicate when the tool needs to be completed in order to be used as part of a gate review where a Go/No Go decision is made before moving to the next stage. The lighter arrows in the Design stage indicate that the tool can also be used early in that stage to focus on what specifications buyers and end-users will likely want for a product or service like the one you are developing.**



The data for the Voice of the Customer workbook comes from interviewing current customers who are using a similar product or service, potential customers (buyers), potential end-users, and experts on the relevant markets and customer segments for your product or service.

We recommend conducting two kinds of market research to prepare for interviews. The first kind is web research using terms such as “problem,” “need” or “requirement” and the generic name for the product or service described in the project charter. The objective is to get a general understanding of the needs and requirements of your potential customers and end-users by knowing the problems and challenges they face when working in areas where your product or service is relevant. Web research also helps you learn any jargon the people you interview are likely to use.

The second kind of market research is called a “concierge test.” This requires a field trip to visit a few actual users and potential customers of this type of product or service, at their place of work. There is a world of difference between discussing a product or service during a phone call, and actually watching someone use it. In a concierge test, you ask the people you are visiting to show you how they do their job while explaining what they are doing, so you gain insights that help you design a better product or service. In this approach you are acting like a hotel concierge, but instead of finding tickets or restaurants, for example, you are finding a product or service that satisfies the “request” of potential customers and end-users.

You can use the templates provided in the Voice of the Customer tool for interviewing current and potential customers and end-users, or to help you structure your discussions during a concierge test. You can also use them to suggest what to look for when doing web research as part of your market research.

How do you conduct interviews and enter data in the Voice of the Customer tool?

To conduct interviews, semi-structured interviewing is recommended. In this social scientific method, the questionnaire is for the interviewer to consult during the interview, but it is not given to the interviewee or read verbatim to them. The questionnaire is there to make sure you collect the data you need during your discussion with the interviewee. By structuring the interaction as a discussion, you can follow the flow of conversation to explore what is important to them, without losing sight of what you want to learn. This approach also allows for serendipity, as remarks or observations by the interviewee may open a new line of questioning.

Use the questionnaire as a guide. Feel free to add questions or modify them to better meet your needs. For example, if your preliminary market research uncovered issues specific to your product or service, you may want to add questions that relate to these issues. The critical objective is that you come away with a solid grasp of what core benefits, tangible features and augmented features are likely to be critical determinants of buying and use behavior for the product or service you are developing.

The questionnaires provided in the Voice of the Customer tool are designed to help you gain the critical information you need from each source, and they cover positive aspects such as what core benefits, tangible features and augmented features would be desirable, as well as negative aspects such as potential roadblocks, problems or competitors. Each questionnaire provides a set of questions that you will explore with each interviewee to assess the possibility of a competitive opening for the new product or service you want to develop. Using the appropriate questionnaire for each type of interviewee means that you will seek and gather, as much as possible, the same data from each. That will allow you to compare and analyze the results from these interviews to identify which requirements and issues are most important.

In the workbook we have provided two tabs for interviews with current or potential customers, two tabs for interviews with potential end-users, and two tabs for interviews with experts. There is no strict rule on how many people to interview, so you are free to decide the number of interviews and copy blank tabs to create as many as you need for each type of interviewee. There is also no hard and fast rule on what types of interviewees you should select. For example, for some products or services the potential customer (buyer) and potential end-user are the same person. For other types of products or services, a customer may purchase the product or service and then distribute it for others to use. If the potential customer and potential end-user are different, you might want to interview potential customers to get their perspective on making the decision to purchase, and then interview potential end-users to learn their needs and concerns.

One way to improve interviews about your product or service is to use a method known as “fishing” over the series of interviews. It is called fishing because you use what you learn in one interview as “bait” to get answers in the next one. In the fishing method, after each interview you modify how you ask the questions and steer the discussion to reflect what you have learned in the previous interview(s). At some point you find no further modifications are needed. That is usually when you have the understanding you are seeking, and it tends to occur after four to eight interviews.

Be aware that markets are dynamic. Customer and end-user needs and requirements change over time. What respondents say they want at time t does not mean they will want it at time $t+1$. In your discussions with customers, end-users and experts, you should probe for the factors which could lead to changes from what they are telling you today.

Figure 2 is from the Voice of the Customer workbook using the biofuels example, and illustrates questions and answers from an interview with an expert in the relevant market and customer segment.

Figure 2: Example of an expert interview ("Expert interview 2" tab) from the Voice of the Customer workbook using the biofuels example.

Expert on competitive opening	
Name	ATI
Title	Executive Director
Organization	Crop Farm Bureau
Phone	777-666-555
Email	Ati1@farmbureau.country.org
Importance of need(s) being addressed	We are all discussing biofuels in the agriculture sector, but there hasn't been much progress in countries like ours yet. Stronger government incentives may be necessary to achieve widespread adoption of this technology. The core issue is the start-up costs: who will cover them? While everyone likes the idea of free fuel, energy independence, and an additional cash product, many of our members view it as unrealistic at the moment, especially given concerns about drought in some areas and excessive flooding in others.
Key specifications and features to emphasize for this niche	While the system may work well in the lab, it needs to be demonstrated in field conditions, where maintaining low maintenance and minimal operation can be more challenging due to differing environmental factors. Sophisticated equipment is often limited, particularly outside of very large corporate farms. For perspective, some of our mid-sized and many small farm members don't even have internet access. The system should be cost-effective and demonstrate efficacy with various types of waste. Additionally, it needs to be operable and repairable by a reasonably skilled farm mechanic. I should have emphasized that it must be affordable both in absolute terms and in terms of quick return on investment.
How long do end-users expect a product like this to last before it needs replacement? If consumables are required, how frequently are they purchased, and in what quantities?	Consider this: if I install a fuel tank on my farm, it lasts a couple of decades. Therefore, if this product doesn't last at least as long, it seems inadequate. Many farms use 30-year-old trucks and tractors, which sets another benchmark for expectations.
Price and pricing factors: what price would you expect to pay for such a product in this niche?	For the sake of argument, let's say I spend a couple of thousand dollars a year on fuel. In that case, this product, considering all consumables, repairs, and maintenance, needs to cost less than that annually. It must also be significantly cheaper so that the user can clearly see how they will recoup the purchase price within their desired payback period.
Key competitors	Anaerobic biodigesters, compost piles, and biofuel producers who purchase crops or crop waste and remove it at no cost to you.
How would you introduce a product like this one to the market?	We are always seeking interesting content for our meetings and journals. Consider making a presentation and submitting an article. We do give preference to sponsors and those who place ads. I would also recommend reaching out to our Farm Technology Committee to see if they are interested in evaluating your work. Please note that there is a fee for this evaluation.
How important are factors such as delivery, installation, training, warranties, affordable consumables, credit for purchasing, and after-sales service for customer satisfaction?	All of these factors are important. Ultimately, it's a matter of making the product affordable, easy to acquire, and simple to use.
Potential roadblocks to introduction	First, there must be no regulatory issues related to air or water pollution, or health hazards to people, animals, or plants. Second, the product needs to offer a compelling value since composting is still an option. Third, you must prove that it works as advertised; otherwise, potential adopters may be reluctant to take the risk.
What problems should be anticipated in making customers and end-users aware of this technology, and in their acquisition, usage, maintenance, and disposal or recycling of the product after its useful life?	Assuming that the fungi, organisms, or other digesting agents and their by-products (excluding fuel) have no associated issues, I don't foresee many problems. As mentioned earlier, we offer a platform to publicize your product. Many companies sponsor our meetings, place ads in our journals, and provide presentations and articles.
Additional insights	I'm sure others have advised you to focus on larger farms first. Additionally, I'd recommend working with national agricultural universities and their demonstration farms. The next generation of farmers is likely to be more open to innovation, especially if they have learned about it during their courses.

Here are a few tips for conducting voice of the customer interviews:

- Whether you are contacting someone by email or phone, it always helps to have a name and a reason for contacting them. If you are not sure who to contact, you can often research people online. Begin by looking at people in companies and other entities that you think will be relevant for your product.
- If you are stuck, search the web for people who are committee chairs or officers of relevant trade and professional groups, who have given papers at a conference, or who have written an article. In addition to searching associations and societies, online trade journals can be helpful. After you have done this kind of background research on a person, you can use this information as an introduction when you contact them.

- If you are calling a company, institution or government agency and do not know the specific individual you want to talk with, find one of the senior people in management and ask the operator to speak with their secretary or assistant. Explain you are conducting market research and not selling anything. Further explain that you would like to better understand their needs, so you can design a product or service useful for potential customers like them. The secretary or assistant will likely know who to refer you to.
- Try to keep your conversations brief and somewhat informal. You should be able to get your answers in no more than 10 to 15 minutes.
- When you contact someone and they say they cannot talk at that time, ask when a good time would be, and follow up then. If they say they are the wrong person or don't want to talk to you, ask who a better person might be to contact. If they tell you, ask if you can mention the referral.
- Always consider when a good time is to call. Early mornings before people start their daily tasks, or mid-afternoons when they are ready for a break can work well. However, remember that this will depend on how respondents arrange their workflow.
- If the interview goes well, always ask if you can contact them again if you have a follow-up question. We will explain why below.

You may want to know hard numbers, such as the price someone would pay, or the desired value for a measurable requirement such as low power consumption, British thermal unit (BTU) content of fuel, or weight. If the person being interviewed says they have no idea of actual measurements, probe for a benchmark or alternative way of expressing the value being sought. Note that in the expert interview shown in Figure 2, when asked about price, this expert had no idea. When probed with a follow-up question about what a desirable price would be, the expert indicated that farmers need a quick payback period (that is, the length of time required to recover the cost of an investment, in this case the biorefinery). With this insight we might call back the subject of potential end-user interview 1, a farm foreman, and ask him about payback periods. The response is shown in Figure 3.

Figure 3: **Response about payback periods in potential end-user interview in the Voice of the Customer workbook using the biofuels example (see "End-user interview 1" tab).**

Price and pricing factors: what price would you expect to pay for such a product in this niche?	No more than the cost of a large pickup truck. If I had to delay replacing a truck that pulls a trailer to market for a year, it would be worth it. I generally prefer to replace equipment a little earlier to be on the safe side. However, if I couldn't replace that truck when planned, it would be problematic, as I wouldn't be able to get the product to market if the truck suddenly fails. Regarding the payback period we prefer for a pickup truck, it depends on how much hay we are growing and how frequently we take animals to the slaughterhouse. Ideally, we'd like to see a payback period of just two or three years, but realistically, given the current drought conditions, it's more likely to be a couple of years longer.

Based on combining the information we gained from the expert, and the potential end-user's answers to our follow-up questions shown in Figure 3, you might conclude that the payback period for the mini-refinery should be around two to five years in the farm sector. That brings it into line with the payback period of other major equipment purchases. Using the fishing method, we might increase our confidence in the payback period by asking the next farm customer or end-user we interview if a payback period of three to five years seems attractive.

How do you process information from the interviews?

After completing your interviews, you will capture what you have learned with the aid of the last two tabs of the workbook. The first of these is the tab entitled "Customer requirements." To complete the worksheet on this tab, enter the names of the people you interviewed on row 3 under the appropriate headings. Next, read through the interviews and extract what you see as the customer requirements that are important to these people. Enter each requirement in an appropriate row in column B next to the label (column A) indicating what the requirement is related to, namely "Performance," "Ease of use," "Price" or "Other." For each requirement you enter, rank how important it is for the respondent in the corresponding cell under that respondent's name, on a scale of 1 (low importance) to 3 (very important). If a requirement is not relevant for that person, use NA (not applicable). The worksheet has embedded functions designed to compute the average importance of a feature across all respondents, and that computed result will appear in column C. Figure 4 shows a completed "Customer requirements" matrix from the biofuels example workbook.

Figure 4: The "Customer requirements" tab of the Voice the Customer workbook using the biofuels example.

Customer requirements

	Importance to respondent / Customer requirements	Average importance on a scale from 1 (low) to 3 (high)	Current customers	Future customers and end-users				Experts		Other
				JGH	MNE	XYZ	DWG	ABC	ATI	
Performance	Wide range of waste that can be treated	2.333333333		3	3	1	1	3	3	
	Efficiency of biofuel production	2.5		3	2	3	1	3	3	
	Flexible production rates	1.333333333		2	2	1	1	1	1	
	20 to 50 year usable life	2.666666667		3	3	3	1	3	3	
	Meets regulations and standards for fuels	3		3	3	3	3	3	3	
	No adverse environmental or health impacts	2.666666667		3	3	1	3	3	3	
Ease of use	Does not require much training	2.666666667		3	3	3	3	1	3	
	Ease of transport	1.333333333		3	1	1	1	1	1	
	Little maintenance and monitoring time required	2.5		3	3	3	3	2	1	
	Customer support	2.333333333		2	2	3	3	2	2	
Price	Purchase price	2.6		3	3	3	NA	2	2	
	Operation costs	2.4		3	2	3	NA	2	2	
	Payback period	3		3	3	3	NA	3	3	
Other	Better than competing technologies	1.8		2	2	1	NA	3	1	
	Addressing skepticism of customers	2.6		1	3	3	NA	3	3	
	Energy independence	2.4		2	2	3	NA	3	2	

The tab entitled "Design specifications" imports and redisplays the findings from the "Customer requirements" tab in column B (list of features identified as customer requirements) on the left side, and column D (computed average importance of each feature in column B) on the right side. Between these columns is column C, "Specifications." In this column you will enter the metric you will use to measure how well you are meeting the customer requirements. This metric now becomes a primary input for developing the formal design specifications. Figure 5 shows a completed worksheet for "Design specifications based on primary sources," from the "Design specifications" tab of the biofuels example.

Figure 5: The "Design specifications" tab of the Voice of the Customer workbook using the biofuels example.

Design specifications based on primary sources

	Customer requirements	Specifications	Importance
Performance	Wide range of waste that can be treated	Moisture content, size, relative mass	2.333333333
	Efficiency of biofuel production	Energy output/energy consumption	2.5
	Flexible production rates	Speed range in hours	1.333333333
	20 to 50 year usable life	Years	2.666666667
	Meets regulations and standards for fuels	Relevant standards, highlighting British Thermal Units (BTUs), viscosity, and emissions	3
	No adverse environmental or health impacts	Emissions, particle size, organisms must be safe	2.666666667
Ease of use	Does not require much training	Training time	2.666666667
	Ease of transport	Size of vehicle needed	1.333333333
	Little maintenance and monitoring time required	Labor time per month	2.5
	Customer support	Customer support hours and personnel	2.333333333
Price	Purchase price	Currency	2.6
	Operation costs	Cost per month	2.4
	Payback period	Years	3
Other	Better than competing technologies	Cost per liter of fuel	1.8
	Addressing skepticism of customers	Independent test laboratory results	2.6
	Energy independence	Barrels of imported oil not needed due to one unit running full-time for one year	2.4

How do you interpret the data in the Voice of the Customer tool and use it in your NPD process?

Customer requirements that emerge from your interviews, as well as other market research, should be aligned with the "Product or service being developed" and "Targeted customer segments and why they will use it" sections of the project charter. These customer requirements based on primary sources should validate what is said in the project charter and provide a starting point for developing more detailed design specifications. If they do not, there is a problem.

In some cases, the feedback from interviews for the voice of the customer does not clearly conflict with the product vision in the project charter but rather, it redirects your focus to benefits and features that are more important to customers and end-users. In such a case, you have a choice of actions. You can either modify the project charter (and the action plan) to reflect this refocusing, or you can restart NPD by drafting a new project charter and action plan. On the other hand, if there is a clear conflict between what you are learning from the voice of the customer and the product vision in the project charter, then you should probably halt NPD and think about whether it is even worth refocusing this initiative.

Even if NPD is abandoned because of what you learned from the voice of the customer, that does not mean the effort was wasted. You can still use what you have learned from the abandoned NPD initiative to start a new NPD initiative using a different product vision which better targets these customers and end-users. Even if you abandon the whole idea of this NPD initiative, if it appears destined to fail, it is better to end it early when few resources have been spent, rather than later when there will be a much bigger sunk expense.

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