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# ‘VOICE OF THE PRODUCT’ TO SUPPLEMENT ‘VOICE OF THE CUSTOMER’

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### Abstract

This paper addresses a problem often experienced when generating product ideas. In particular, the ideas generated frequently do not yield successful products. One of the main reasons for this is that the voice of the customer (VOC) is the main input for generating and screening new product ideas. However, the VOC may incorrectly reflect customers' wants and needs, especially in the case of a truly novel product; that is, a product that has never before existed. The author is proposing to supplement the VOC with the more objective 'voice of the product' (VOP), which is derived using TRIZ tools, such as the Trends of Engineering Systems Evolution. The paper includes two brief case studies illustrating the importance of using VOP.

*Keywords: Idea generation; new product development; NPD; TRIZ, trends of engineering systems evolution; TESE, voice of the customer; voice of the product.*

### 1. Introduction: VOC is not a perfect tool

Generating new product ideas is the initial and the most critical stage of the entire new product development (NPD) process. Any wrong idea at this stage, if developed further, will result in an unsuccessful product, thereby wasting both the time and the money invested in its development.

Current best industry practices, such as the Stage-gate process [1] and Six Sigma [2], rely heavily on the Voice of the Customer (VOC) as the main input for generating and screening new product ideas. Customers' needs and wishes are further translated into the required functional and technical parameters of the product using, for example, the Quality Function Deployment (QFD) tool [3], which also uses the VOC as an input.

The VOC is usually defined either as a tool/process for capturing customers' wants and needs [4]; or, as the customers' needs and wants themselves [5]. In this paper, the second definition is used, as it is more applicable to the topic here.

VOC is supposed to yield the true needs and wishes of customers to be addressed by the new product once developed. However, being a subjective tool that relies on focus groups, interviews and surveys, the VOC may incorrectly reflect customers' wants and needs.

No wonder that even though gathering the VOC has become a standalone best industry practice, accepted by most companies as the foundation for generating ideas for NPD, there is a lot of scepticism related to its efficacy [6].

There are people who think that VOC is just another term for market research; many people think that VOC simply does not work [7].

This scepticism is backed by numerous examples of incorrect predictions and decisions made with regard to the future of particular new products. Some of these predictions have become famous [8], as, for example:

- “There’s no chance that the iPhone is going to get any significant market share.” (Steve Ballmer, former CEO of Microsoft, 2007.)
- “There is no reason anyone would want a computer in their home.” (Ken Olsen, co-founder and president of Digital Equipment Corporation (DEC), 1977.)

These predictions were made by top managers of large companies who were definitely aware of the VOC collected within their companies. The VOCs, upon which their forecasts were made, apparently were incorrect.

The predictions in these cases relate to completely new products with features and functionality that have never existed before. When developing such products, the risk of capturing the wrong VOC is high and should be supplemented by another, more objective tool, such as ‘voice of the product’ (VOP), as described below.

## 2. Voice of the product (VOP) and how it supplements VOC

In this paper, the voice of the product is understood as an objective trends/next steps in product evolution, rather like a product’s technical “needs” and “wishes”. Ignoring these trends in the NPD process could well lead to product failure – just like ignoring the VOC.

The idea of using VOP instead of VOC when market information is unattainable (e.g. when customers’ needs are latent or the product is genuinely new) was explored by Jacob Goldenberg and David Mazursky in 1999 [9]. These authors suggested a template approach to identify how a product will evolve in the future, and to predict future market needs.

Using the Trends of Engineering Systems Evolution (TESE) in TRIZ makes it possible to reliably predict how the product’s “wants” and “needs” evolve, and, so, using a TESE-based VOP was proposed [10] as a better input than VOC for NPD.

Indeed, ignoring the VOP could easily lead to the failure of a new product on the market, since the product either will not be able to meet customers’ true needs and wishes, or will be defeated by a more advanced product. On the other hand, if only VOP is used as a guide, other, non-technical, VOC-related factors may also impede the product’s commercialization, no matter how advanced the product is.

Hence, neither the VOC nor the VOP should be ignored in the NPD process. Fig. 1 illustrates how the author is proposing to combine the VOC and the VOP approaches to yield more reliable ideas for new products at the initial stage of the NPD process.

As shown in Fig. 1, a combined VOC+VOP approach involves the following steps:

- Defining the input for NPD. This yields a tentative definition of the target market, target customers for the product and the target product type, which is defined broadly (e.g. ‘a wristwatch’ or ‘a WiFi unit’), without specifying its features in detail. At this step, all input is usually generated by the marketing group of the company conducting the NPD.
- Identifying the VOP. This step yields (1) a specific target product to be improved, (2) the features, functionality and performance that can potentially be achieved. A top-level algorithm for identifying these items is shown in Fig. 2. Details of this algorithm were proposed by the author in 2006 [11] and further enhanced in 2007 [12]. This algorithm ensures that the target product (a) has enough resources for improving its value so as to satisfy the VOC better than competing products; (b) when launched, it will be in demand on the target market and it will remain in demand for long enough to bring profit.

- Identifying the VOC. This is done concurrently with identification of the VOP. At this step, all existing VOC tools can be used. Additionally, the Main Parameters of Value (MPV) analysis [13] is performed in order to discover some latent needs of the customers that the product will potentially be able to satisfy.

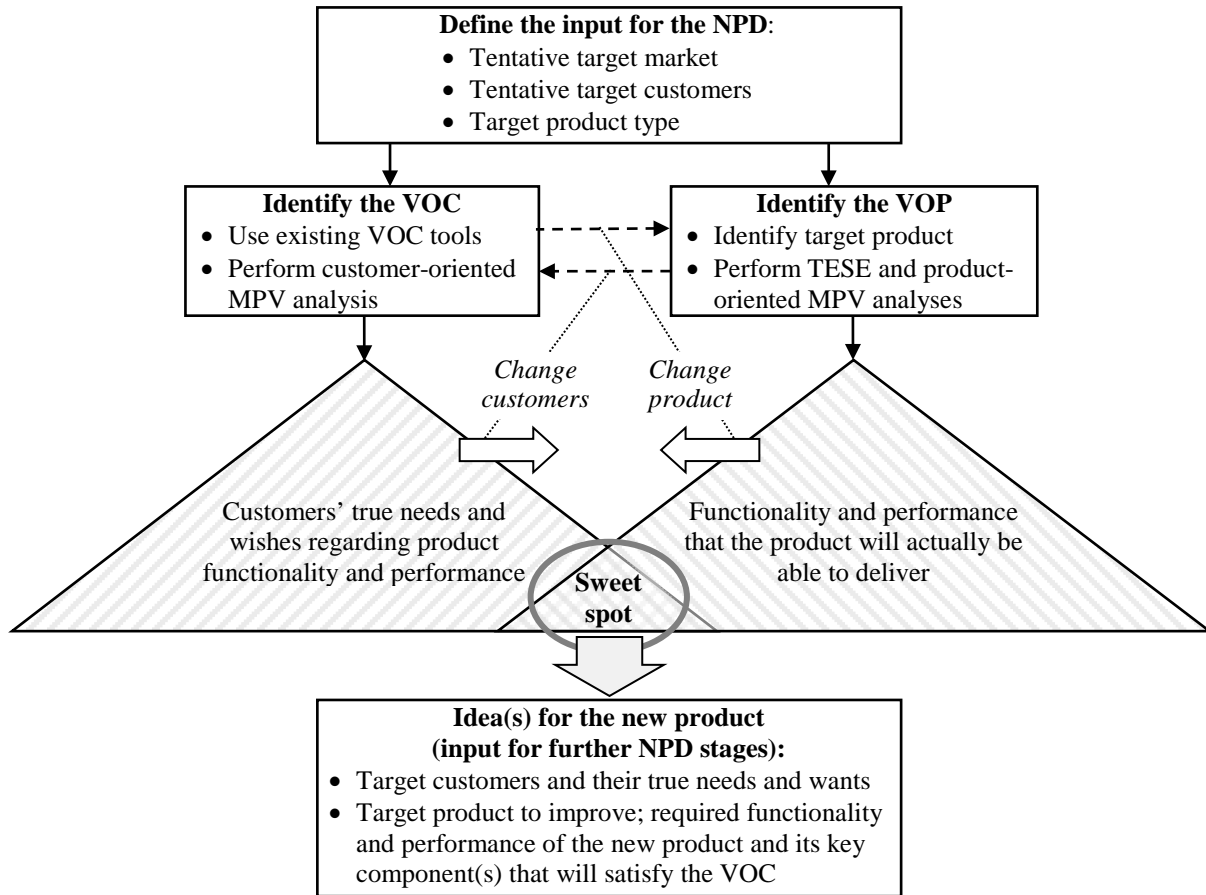


Fig. 1. Combining the VOC and the VOP at the new product idea generation stage

As can be seen from Fig. 2, an MPV analysis plays an important role in identifying the target product by discovering new main (or additional) function(s) that the target product could potentially perform.

Fig. 1 shows that the most promising idea(s) for the new product are located in the sweet spot where the VOC and the VOP overlap. If they do not overlap, then the new product, i.e. VOP, cannot satisfy the VOC and it does not make sense to proceed further with this NPD. Ideally, the VOC and the VOP would coincide fully.

It is important that there is an interaction between the VOP and VOC teams, which is shown by dashed arrows in Fig. 1. This assumes that the VOC or the VOP, or both, may be quickly adjusted (i.e. target product or target customers may be changed), based on feedback from the two teams, so as to make them overlap as much as possible.

This approach significantly reduces the risk that a new product, once developed, will not meet customers' needs and wishes. Additionally, it yields a more detailed idea for a new product than 'VOC-centric' approaches, thus facilitating further new product development from the idea through to a commercial product.

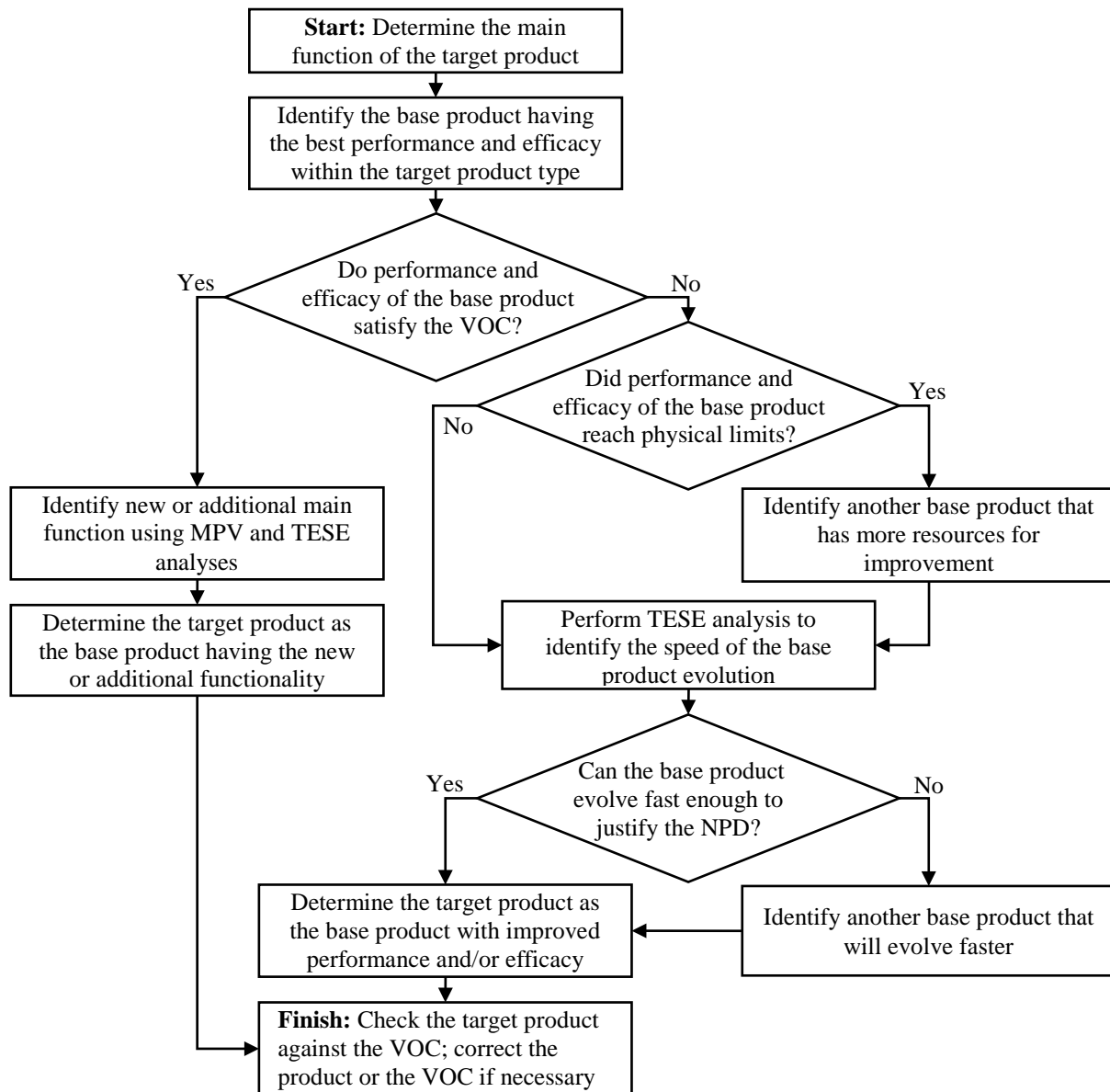


Fig. 3. VOP: top-level algorithm for identifying the target product and its features

## 4. Discussion and case studies

Supplementing the VOC with the VOP has been successfully practiced in TRIZ-consulting projects and internal initiatives within GEN3 Partners [14]. The importance of introducing the VOP to support the VOC is illustrated by two brief case studies below.

### 4.1. Case study 1: Smart Watch for athletes and fitness-oriented users

In the beginning of 2008, GEN3 took internal initiative aimed at discovering ideas for a new product. The author was involved in this project as a leader.

The input for this NPD was as follows:

- Target market was tentatively defined as the Russian market
- Target customers - athletes and fitness-oriented users
- Type of new product – a sport wristwatch that can be worn during exercise.

The preliminary VOC captured from athletes, trainers and doctors in sport medicine indicated that all athletes and fitness-oriented users want to make their training as efficient as possible.

For this purpose, athletes were using heart rate monitors (e.g. those by Polar or Suunto) incorporated into a sport wristwatch to correct their load during training and make it more efficient. Athletes and coaches reported that they were happy with their heart rate monitors. So, the VOC seemed to be satisfied with existing products.

In fact, following the algorithm shown in Fig. 2, GEN3 performed an MPV analysis that revealed that a sport wristwatch could potentially measure parameters more informative than heart rate. These parameters were hemodynamics - stroke volume and cardiac output (CO). The VOP, then, was identified as the need to measure these hemodynamic parameters.

The graph in Fig. 3 shows that heart rate always increases as the athlete's load increases, while stroke volume begins dropping when the load exceeds a certain level. At this time the CO stops growing directly proportional to the heart rate, reaches its maximum, and then actually decreases while the athlete's load continues to increase. This is a dangerous situation and an athlete could collapse or even die if he or she does not decrease the load immediately.

Hemodynamic parameters (either stroke volume, or CO, or both) make it possible to identify the optimal load, providing maximum training efficiency while avoiding dangerous overload (see Fig. 3). The optimal load for each workout should be set individually as there are many factors affecting it, such as how the athlete slept, how he or she exercised the day before, what he or she ate, etc. A safe, optimal load cannot be calculated based solely on heart rate data.

When the GEN3 team went back to the athletes and coaches who had previously said they were happy with their heart rate monitors, and asked if they would like to have the capability of monitoring CO and/or stroke volume instead of or in addition to heart rate, the respondents became very enthusiastic. They had not known this functionality could be in a sport wristwatch because CO and stroke volume are normally measured with large, stationary equipment. This GEN3-collected VOC satisfied the VOP.

Based on this input, the GEN3 team checked the feasibility of incorporating a hemomonitor in a sport wristwatch and came up with an idea for a new product, shown in Fig. 4.

With this idea, GEN3 approached several Russian investment funds hoping to raise money for further development and commercialization of this product.

Each of these funds collected its own VOC by interviewing fitness trainers, asking them if their clients would buy a sport wristwatch that measures CO or stroke volume.

Their VOC was negative: the trainers said that people are not educated enough to know what these parameters are and why they are important. Also, they said that advanced athletes already have heart rate monitors and are happy with them; other fitness enthusiasts do not need any fitness gadgets; and nobody wants to bother with uploading and analyzing his/her data in the cloud. The overall verdict was that nobody would buy GEN3's hemomonitor.

As a result, no funds were invested in this product, and the development was cancelled.

Recently, however, fitness gadgets such as trackers and advanced sport watches have become very popular in Russia, and this market is growing rapidly. Users like these gadgets - they upload their data on the Internet, analyze them, share them and compete with other users.

Large companies are currently working on more and more advanced watches for health and sport, e.g. Samsung has recently announced its Simband [15] that is claimed to feature an ability to measure blood flow (i.e. hemodynamic) parameters.

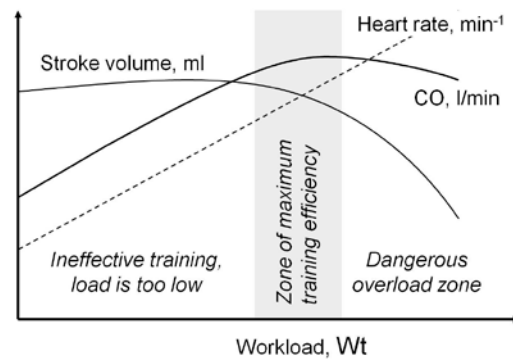


Fig. 3. Cardiac output (CO) and/or stroke volume as a new MPV for athletes

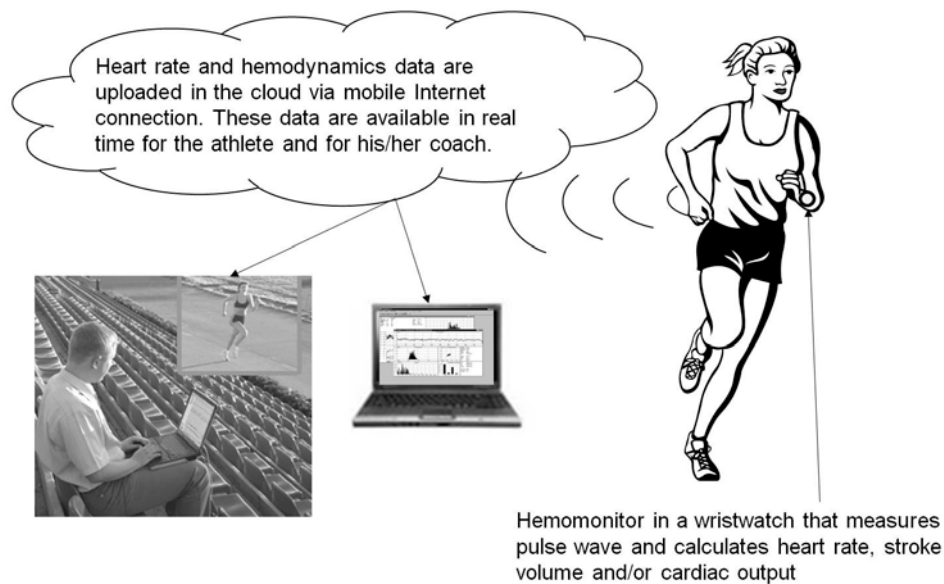


Fig. 4. Idea for a new product: a sport wristwatch that monitors hemodynamics

These facts probably indicate that the identified VOP was correct and should have balanced the contradictory VOC data; nevertheless, the decision to kill the development was based solely on the investors' VOC, which was incorrect.

#### 4.2. Case study 2: Smart antenna for WiFi units

In the beginning of 2000, GEN3 performed a project for a California-based startup company, Airgain, Ltd. The project was aimed at improving performance of a WiFi system, and determined that the key component responsible for the WiFi system performance is its antenna.

GEN3 generated the idea of using a smart antenna (SA) that is a high-gain directional antenna, able to automatically (by using special SA software in the WiFi unit's internal controller) steer its beam towards the direction with the best signal quality.

The identified VOP revealed that in order to deliver the maximum WiFi performance, an SA

1. "Needs" as much space (or area) as possible. Ideally the SA should occupy the whole outer surface of the unit's case;

2. “Needs” to be carefully integrated in the WiFi unit so that other electronic components would not obstruct antenna elements;
3. “Wants” to have multiple antenna elements (some should be oriented vertically; some – horizontally).

This means that the entire WiFi unit should be designed around an SA.

Airgain then made the strategic decision to commercialize the SA as a separate product and sell it to ODMs and OEMs for use in their WiFi devices. However, these customers were more interested in low cost, small size and low profile than high antenna performance, which is quite opposite to the SA’s VOP.

As a result, Airgain had to ignore the VOP and sacrifice its SA performance for the sake of the VOC data. Eventually, most of Airgain’s antennas became non-smart, low-cost, stamped metal elements.

In contrast to Airgain, another company, Ruckus Wireless, which adopted the idea of using an SA in WiFi devices in 2004, focused on developing and selling its own SA-enabled WiFi units, thereby satisfying the VOP perfectly.

The customers Ruckus selected, however, were different from Airgain’s. They were organizations and service providers who needed to provide seamless WiFi coverage within a large area for many users simultaneously (e.g. on university campuses, in stadiums and arenas). These customers were not concerned about the size and height of antennas. Their VOC was concerned about the WiFi performance, which fully coincided with the SA’s VOP.

Both companies, having started their businesses with the same idea, have yielded a sustainable and profitable business. However, as shown in Fig. 5 and Fig. 6, Ruckus consistently generates about ten times more revenue than Airgain. The author attributes this difference to the fact that Ruckus’ approach satisfies both the VOC and the VOP, while Airgain’s meets only the VOC.

These two case studies show that it is typical for the VOC to dominate in the business decision-making process, which may easily lead to rejecting promising ideas for a new product or selecting the wrong customers for the product.

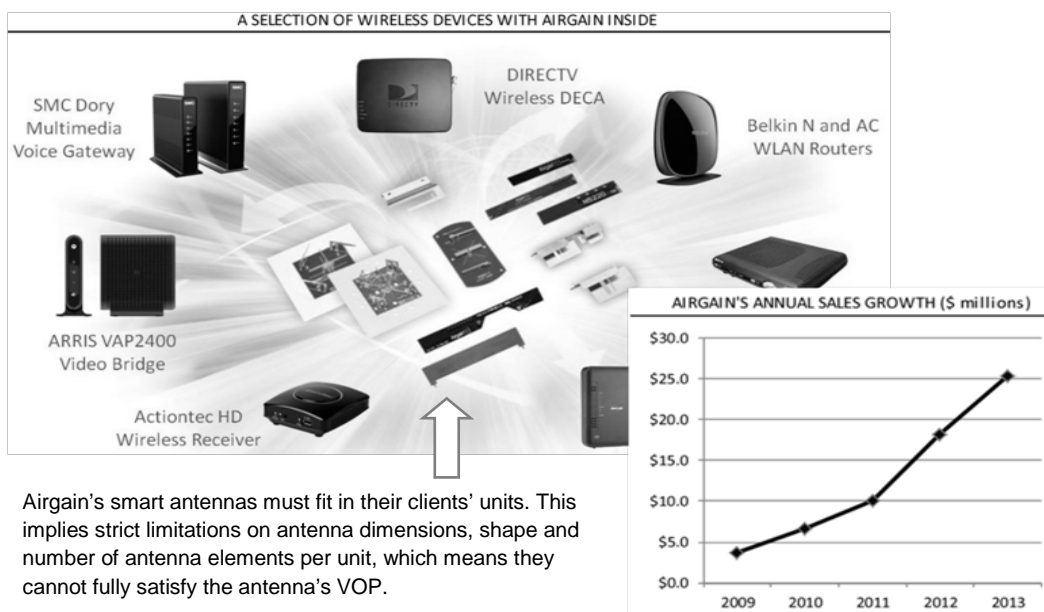


Fig. 5. Airgain antennas and revenue [16]

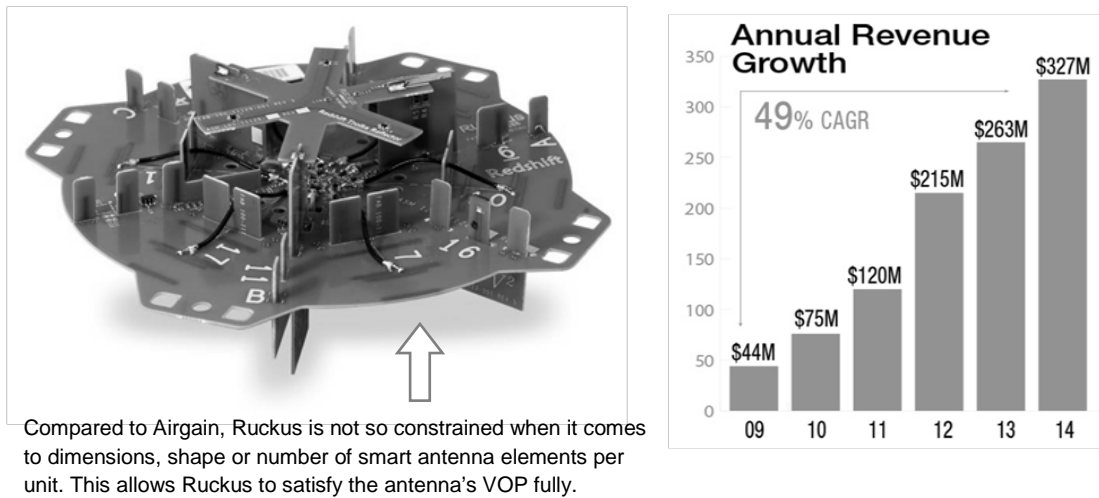


Fig. 6. Ruckus antennas and revenue [17]

## 5. Conclusions

The Voice of the Customer frequently fails to correctly reflect customers' wants and needs when the product to be developed is truly innovative and the customers have no experience with this product or are not aware that such a product could exist.

To supplement the VOC and avoid rejecting promising ideas for a new product or accepting wrong ideas, a TRIZ-derived Voice of the Product may be used at the initial NPD stages.

The proposed algorithm for identifying the VOP will help in discovering new functionality and features of the new product that correspond to the objective Trends of Engineering Systems Evolution and at the same time satisfy the VOC.

The author believes that the approach described in this paper may represent a useful tool that can make developing and screening ideas for new products much more efficient because it:

1. Promises a noticeable reduction in business risks associated with NPD, which is achieved by satisfying both the VOC and the TRIZ-derived VOP at the same time;
2. Does not require significant effort to implement as it keeps intact the general structure of typical NDP processes, as, for example, it does not affect the structure of the Stage-Gate process – the most commonly used NPD approach.

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## References

1. Stage-Gate International, "New Product Development Process". The official site of Stage-Gate®, [http://www.stage-gate.com/knowledge\\_stage-gate\\_full.php](http://www.stage-gate.com/knowledge_stage-gate_full.php), accessed April 2015.
2. Pyzdek T. The Six Sigma Handbook, Revised and Expanded: A Complete Guide for Green Belts, Black Belts, and Managers at All Levels. USA, The McGraw-Hill Companies, Inc., 2003. eBook available: <http://www.gmpua.com/QM/Book/The%20six%20sigma%20handbook.pdf>, accessed March 21, 2015.
3. El-Haik B., Roy D. Service Design for Six Sigma. Hoboken, New Jersey, John Wiley & Sons, Inc., 2005.

4. iSixSigma.com, “Voice Of the Customer (VOC)”. iSixSigma Web site, <http://www.isixsigma.com/dictionary/voice-of-the-customer-voc/>, accessed April 2015.
5. WebFinance, Inc., “Voice of the Customer”. BusinessDictionary Web site, <http://www.businessdictionary.com/definition/voice-of-the-customer.html>, accessed April 2015.
6. Katz G. “Hijacking the Voice of the Customer”. PDMA Visions Magazine, January 2006, p.8, [http://ams-inc.com/wp-content/uploads/2013/11/voc\\_hijack1.pdf](http://ams-inc.com/wp-content/uploads/2013/11/voc_hijack1.pdf), accessed April 2015.
7. Katz G. “Hijacked again!” Quirks Marketing Research Review, December 2013, [http://bluetoad.com/display\\_article.php?id=1577621&id\\_issue=186082](http://bluetoad.com/display_article.php?id=1577621&id_issue=186082), accessed April 2015.
8. Pretz K. “Five Famously Wrong Predictions About Technology”. The Institute, December 19, 2014, <http://theinstitute.ieee.org/ieee-roundup/opinions/ieee-roundup/five-famously-wrong-predictions-about-technology>, accessed April 2015.
9. Goldenberg J., Mazursky D. "The Voice of the Product: Templates of New Product Emergence". Creativity and Innovation Management, 1999, Vol. 8, # 3, pp. 157-164.
10. Mann D. “Unleashing the Voice of the Product and the Voice of the Process”. The TRIZ Journal, June 3, 2006, <http://www.triz-journal.com/unleashing-voice-product-voice-process/>, accessed April 2015.
11. Abramov O.Y. “Market-Oriented Forecasting of Engineering Systems Evolution”. Journal of TRIZ (English version), April 2006, No. 2(15), pp. 13-17.
12. Abramov O.Y. “ Selection of Engineering System for Improvement”. Proceedings of the TRIZ Developers’ Summit 2007 (TDS-2007), Moscow, July 18, 2007, pp. 31-34, (in Russian), <http://www.trizland.ru/trizba/pdf-books/TRIZ-summit2007.pdf>, accessed April 2015.
13. Litvin S.S. “Main Parameters of Value: TRIZ-based Tool Connecting Business Challenges to Technical Problems in Product/Process Innovation”. 7th Japan TRIZ Symposium, September 9, 2011, Japan TRIZ Society Web site, [http://www.triz-japan.org/PRESENTATION/sympo2011/Pres-Overseas/EI01eS-Litvin\\_\(Keynote\)-110817.pdf](http://www.triz-japan.org/PRESENTATION/sympo2011/Pres-Overseas/EI01eS-Litvin_(Keynote)-110817.pdf), accessed April 2015.
14. GEN3 Partners, Inc., “Developing Products for Emerging Markets – Avoiding the Traps that Can Derail Growth”. White Paper, GEN3 Partners Web site, <http://www.gen3partners.com/insights/white-papers/product-innovation>, accessed April 2015.
15. “Samsung's Second-Gen Simband Wearable Features More Robust Sensors and Sweatproofing”. CNET, November 12, 2014, <http://www.cnet.com/products/samsung-simband/>, accessed April 2015.
16. Crystal Research Associates, LLC, “Airgain: Executive Informational Overview”. October 7, 2014, [http://cdn2.hubspot.net/hub/150154/file-1797586699-pdf/docs/Airgain-Executive-Informational-Overview-10-7-2014\\_1.pdf](http://cdn2.hubspot.net/hub/150154/file-1797586699-pdf/docs/Airgain-Executive-Informational-Overview-10-7-2014_1.pdf), accessed April 2015.
17. Ruckus Wireless, Ink.: <http://www.ruckuswireless.com/company/background/business>, <http://www.ruckuswireless.com/technology/beamflex#gallery>, accessed April 2015.