



## SIMPLIFIED PRODUCT VALUE MEASUREMENT FRAMEWORK FOR SMALL AND MEDIUM SIZED ENTERPRISES

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**ABSTRACT. Background:** The emergences of global markets have increased competition worldwide. For Small Medium Sized Enterprises with limited resources to sustain in what is already a very competitive market there is a need for strong and continuously increasing Product Value to reduce business risks and revenue losses and to increase market share and customer satisfaction. To fulfill this need, Product Value Measurement is necessary to characterize the current status and further improvement. It is not easy to obtain the measures about the Product Value because its many features have qualitative characteristics. We need simplified but result oriented systematic framework to measure it while considering the measurement purpose and how to measure and why do it.

**Methods:** How to design this is the main aim of this research paper. In this paper, GQM (Goal-Question-Metric) method as a measurement framework is introduced to measure the Product Value for Small Medium Sized Enterprises along with case study to represent that this framework was effective.

**Results and conclusions:** The proposed Model was effective for focusing on the essence of measurement and for avoiding extra excessive data not necessary for doing the effective measurement.

**Key words:** Product Value, Product Value Measurement, Supply Chain, The Goal Question Metric (GQM) Model, Small Medium Sized Enterprises.

### INTRODUCTION

Small and medium sized enterprises (SMEs) are backbone of a healthy and prospering economy. Small and medium sized enterprises (SMEs) exhibit distinct characteristics that differentiate them from the majority of their larger counterparts [Storey 1994]. Research has shown that SMEs which link operations to their business strategies outperform the competition [Argument, Harrison, Wainwright 1997]. This research paper is for SMEs' entrepreneurs to sustain and grow in this global market by introducing Simplified Product Value Measurement Framework for measuring Product Value Attributes. The difference between what a customer receives from a product and what

he pays is equal to 'product value'. Greater is the magnitude of this parameter, more drawn and inclined is the customer to have the offering.

The organization goodwill is heavily dependent on his products value. "However, without careful measuring of products value, a firm is unable to accurately assess whether its current products are meeting the needs of the firm and customers. A product performance expectation can be defined as "a specific statement of a business practice regarding the results anticipated or required from a product's performance in relation to the customer". Product Performance Measurement is process of choosing desired performance measures and generating a combined measurement of these. However the desired Product Value attributes

such as Customer Satisfaction, Ease of Use and Reliability etc. are difficult to collect and quantify. Thus in case of measuring attributes which have qualitative characteristics also [Joni 2008], we need to think of the measurement purpose and the reasons why we perform this measurement to avoid the redundant and excessive measurement data. Then, it is necessary to establish measurement framework to decide what, why and how data can be collected for product value management.

After a quick view to the questions "what is product value measurement?" and "why to measure the product value?" another important question can be stated as "how to measure the product value?" In this pursuit, we need a systematic approach adequate for evaluation and improvement based on effective measurement. In this paper, the author having worked as Head Of Materials Department in one of the reputed Sports Goods Industry with in India for more than 14 years has introduced the GQM(Goal-Question-Metric) approach as a simplified measurement framework to measure product value for small and medium sized enterprises.

## LITERATURE REVIEW

Products represent the tangible, market-based focus of all marketing efforts only a few studies have applied the efficiency concept to assess the performance of products. However, efficiency should not be considered a supplier-related concept only - considering the financial return on a product's manufacturing and quality costs - but first and foremost a demand-oriented one. Ultimately, creating products that fulfill the needs and expectations of customers reflects the basic idea of marketing. Consequently, the economic value a customer obtains by purchasing a product has to be investigated and optimized. This value becomes higher if a product provides a set of demanded characteristics (outputs) for given expenditures (inputs) in an efficient manner. Offering products that create superior customer value can be seen as a prerequisite to establishing profitable customer relationships, which in turn enhance corporate value. To assure a realistic product evaluation all

characteristics from which utility is derived and which determine product choice need to be considered. Customer satisfaction and human resources are repeatedly cited as critical measurement areas [Eccles 1991, Kaplan, Norton 1992, Fitzgerald, Moon 1996].

Hence, product efficiency in the sense of customer value consists of a multitude of purchase-relevant components, including qualitative attributes [Zeithaml, 1988; Fernandez-Castro and Smith, 2002]. Only a few empirical attempts have been made to make such a broader construct of product efficiency operational [Staat et al., 2002; Fernandez-Castro and Smith, 2002; Bauer et al., 2003].

## THE GQM MODEL

In this paper, we introduce the GQM model for measuring external, demand-side concept of marketing efficiency and investigating which return (features) a customer receives on his or her investments for purchasing and using the product. GQM handles the problem of how to decide, what to measure to reach your goals. It is a method invented by Prof. Victor R. Basili, Dr. David Weiss and Prof. Dr. Dieter Rombach. GQM is based on the idea of goal-oriented measurement and therefore it is a top-down approach. In this case, top down approach means that start with improvement goals, try to make them measurable and finally to be able to reach them.

GQM Model defines a measurement framework on three levels:

### *Conceptual level (goal)*

A goal is defined for an object for a variety of reasons, with respect to various models of quality, from various points of view and relative to a particular environment.

### *Operational level (question)*

A set of questions is used to define models of the object of study and then focuses on that object to characterize the assessment or achievement of a specific goal.

*Quantitative level (metric)*

A set of metrics, based on the models, is associated with every question in order to answer it in a measurable way.



Fig. 1. GQM Paradigm  
 Rys. 1. GQM paradygmat

Thus GQM emphasizes the need to establish an explicit measurement goal that is specific to the process activity or product characteristics that is to be assessed, define a set of questions that must be answered in order to achieve the goal, and identify well-formulated metrics that help to answer the questions.

The GQM Model has several advantages: It helps to:

- ensure adequacy, consistency, and completeness of the measurement plan and therefore of data collection.
- manage the complexity of the measurement program. Increased complexity occurs when there are too many attributes to measure and too many possible measurement scales for each attribute.
- stimulate a structured discussion and promote consensus about measurement and improvement goals, which is a prerequisite for measurement success.

Basili described his six-step GQM process as follows:

1. Develop a set of corporate, division and project business goals and associated measurement goals for productivity and quality
2. Generate questions (based on models) that define those goals as completely as possible in a quantifiable way
3. Specify the measures needed to be collected to answer those questions and track process and product conformance to the goals
4. Develop mechanisms for data collection
5. Collect, validate and analyze the data in real time to provide feedback to projects for corrective action
6. Analyze the data in a post mortem fashion to assess conformance to the goals and to make recommendations for future improvements

**MEASURING PRODUCT VALUE BY GQM MODEL**

*Where to start and where to focus?*

Product Value: The difference between what a customer receives from a product and

what he pays is equal to 'Product / customer value'. Greater is the magnitude of this parameter, more drawn and inclined is the customer to have the offering.

- Customers buy on perceived value,
- Value is defined as Benefits relative to Cost,
- Benefits include all non-cost attributes: Product, Service, Relationship and Image,
- Benefits, costs, and value are perceived by customers relative to competition.

The current level of performance is how well product is performing now with respect to

that attribute. The Desired level of Performance reflects business priorities and can be set by "shooting ahead of the competition" or by adopting improvement goals that each contributing unit commits to attain.

Product Value comprises following main components:

- Product Performance: Features, Ease of Use, Reliability, Performance, Longevity
- Product Price
- Delivery, Installation and Service
- Customer Relationships

Table 1. GQM for measuring Product Value in Cosco (India) Limited  
Tabela 1. Zastosowanie GQM do pomiaru wartości produktu w Cosco Ltd (Indie)

OBJECTIVE	GOALS	QUESTIONS	METRICS
1. Measure Product / Customer Value	1.1(a) Product Features -Expected Features -Exciting Features	1.1.1(A) - Is Product fulfilling customer basic needs? - Is product offering more than its other companions?	1.1.1.1(A) - Capture and loss of new customers - Sales order cycle time response rates
	1.1(B) Performance - Quality	1.1.1(B) - How is product quality? - Is product quality changing	1.1.1.1(B) - Product return rates - Worth What paid for quality consistency
	1.1(C) Reliability -Durability -Life -Maintenance	1.1.1(C) - How often does product fail to perform?" - How is product life? - How is product maintenance requirement? - How is the availability of spare parts	1.1.1.1(C) - Mean time between failures or Mean time to repair - Customer Reported Problems - Repair Service Call - customer reported problems with availability of spare parts
	1.1(D) Ease of Use	1.1.1(D) - How often do customers complain about the Ease of Use?	1.1.1.1(D) Surveys of customers' perceptions of Ease of Use?
	1.2 Product Price -Reasonable cost	1.2.1 - How often do customers complain about Product Price?	1.2.1.1 - Reasonable cost - Service Call Rate or Warranty Repair Rates
	1.3 Delivery, Installation and Service -Availability -Ease of Installation -Ease of Service	1.3.1 - Are delivery dates slipping? - How often do customers complain about Installation? - How often do customers complain about Service?	1.3.1.1 - Surveys of customers' perceptions of availability and ease of installation? - Service call response times
	1.4 Customer Relationship -Responsiveness -Customer Satisfaction Survey	1.4.1 - Is this product is satisfying customer needs? - How quickly customer problems are being addressed?	1.4.1.1 - customer complaint levels - Speed of customer call answer and response - Customer loyalty

**Translating Product Value attributes into Metrics and Measurements by the application of GQM Model based framework**

To apply GQM Model for Product Value Measurement for Small Medium Sized Enterprises", the following steps are needed:

- Characterize the environment  
In this step we characterize the context in which we have to undertake improvement programs
- Identify measurement goals

Develop data user goals and associated measurement plans. This step starts by capturing the goals of the user group and using the goal template. Using this template, each goal is described.

- Generate meaningful questions  
Develop meaningful questions that define those goals as completely as possible in a quantifiable way
- Specify the metrics needed to be collected  
This step specifies the metrics needed to be collected to answer those questions. Select metrics related to defined goals. This includes defining its measurement scale and its range
- Develop mechanisms for data collection  
Here methods used for collecting data, Questionnaires, surveys, checklists, interviews, documentation review, focus groups etc. can be used.
- Data analysis and interpretation  
Analyze data from the viewpoint of the defined objective. Write down feedback regarding (under studied) objective to increase Product Value for corrective action and make recommendations for future improvements. In this step, the indicators which are measure or combination of measures that provides insight Product Value is derived.

We applied GQM Model to measure Product Value for one of the reputed Sports and Fitness Co. (Cosco India Limited, Gurgaon, Haryana, India) and the results are represented in Table 1.

## CONCLUSIONS

For Small Medium Sized Enterprises with limited resources to sustain in this global market there is a need for simplified but result oriented systematic framework to measure product value attributes (including qualitative also) while considering the measurement purpose and how to measure and why do it. To design this we introduced GQM Model as a measurement framework and applied this systematic approach to know the measurement purpose and how to measure and why do it. This Model was effective for focusing on the essence of measurement and for avoiding extra

excessive data not necessary for doing the effective measurement.

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## UPROSZCZONA METODA OCENY WARTOŚCI PRODUKTU DLA MAŁYCH I ŚREDNICH PRZEDSIĘBIORSTW

**STRESZCZENIE. Wstęp:** Wymagania stawiane w wyniku globalizacji rynków spowodowały zwiększenie poziomu konkurencji na całym świecie. Utrzymanie się na takich rynkach przez małe i średnie przedsiębiorstwa posiadające ograniczone zasoby, oznacza potrzebę silnego i stałego zwiększania wartości oferowanych produktów, aby zmniejszyć ryzyko biznesowe jak również, aby zwiększyć swój udział rynkowy i poziom zadowolenia własnych klientów. Aby osiągnąć ten cel, niezbędne jest prawidłowe scharakteryzowanie obecnego stanu oraz koniecznych usprawnień. Ocena wartości produktu jest procesem złożonym, gdyż wymaga uwzględnienia wielu cech jakościowych. W związku z tym zachodzi potrzeba uproszczenia metody tego pomiaru.

**Metody:** Celem pracy jest zaprojektowanie metody pomiaru wartości produktu. Metoda GQM (Goal-Question-Metric) została zaprezentowana jako metoda pomiaru wartości produktu dla małych i średnich przedsiębiorstw. Zostało również omówione studium przypadku reprezentujące zastosowanie proponowanej metody.

**Wyniki i wnioski:** Proponowany model jest efektywny dzięki koncentracji na istocie pomiaru jak również uniknięciu gromadzenia dodatkowych zbędnych danych, niemających istotnego wpływu na efektywność procesu pomiaru.

**Słowa kluczowe:** wartość produktu, ocena wartości produktu, łańcuch dostaw, model Goal Question Metric (GQM), małe i średnie przedsiębiorstwa.

## EINE VEREINFACHTE METHODE ZUR PRODUKTBEWERTUNG IM KLEIN- UND MITTELSTAND

**ZUSAMMENFASSUNG. Einleitung:** Die im Ergebnis der Märkte-Globalisierung bestehenden Markt-Anforderungen hatten einen wachsenden Wettbewerb weltweit zur Folge. Die Aufrechterhaltung ihrer Marktposition durch klein- und mittelständische, bestandsärmere Unternehmen bedeutet eine starke kontinuierliche Werterhöhung von angebotenen Produkten zwecks der Verminderung des Business-Risikos, der Vergrößerung der Marktanteile sowie der Erhöhung des Niveaus von Zufriedenstellung ihrer eigenen Kundschaft. Um dieses Ziel zu erreichen, ist die richtige Ermittlung des gegenwärtigen Zustandes und notwendiger Verbesserungen unentbehrlich. Die Bewertung des Produktes stellt einen komplizierten Prozess dar, denn sie erfordert Berücksichtigung von mehreren Qualitätsmerkmalen. Im Zusammenhang damit besteht eine Notwendigkeit, die Methoden der Bemessung von Produktwerten zu vereinfachen.

**Methoden:** Das Ziel der Arbeit ist es, eine Methode für die Bewertung eines Produktes herzustellen. Die GQM-Methode (Goal-Question-Metric) wurde als eine Methode für die Bewertung der Produkte in klein- und mittelständischen Unternehmen konzipiert. Bei der Gelegenheit wurde auch ein Anwendungsfall der vorgeschlagenen Methode besprochen.

**Fazit und Ergebnisse:** Das vorgeschlagene Modell erscheint als effektiv dank der gezielten Ausrichtung auf das Wesen der Bewertung sowie auf die Vermeidung von zusätzlichen entbehrlichen Daten, die keinen wesentlichen Einfluss auf die Effektivität des Bewertungsprozesses ausüben.

**Codewörter:** Produktwert, Bewertung des Produktes, Lieferkette, Modell von Goal Question Metric (GQM), klein- und mittelständische Unternehmen (KMU)

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