

# Universal classification of goods and services for marketing and logistics

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**Abstract.** The paper pays attention to the limited opportunities of small businesses in the development of product promotion programs and logistic schemes. Most entrepreneurs turn to specialized firms or hire specialists. We propose to develop an algorithm (and in further program) for determining the product class, which can be used by any entrepreneur. After determining the product class, the user will be offered the entire suitable list of promotion tools including 4 groups: advertising, promotion, public relations, direct marketing and variants of delivery: types of vehicles, routes. This article attempts to solve the first problem - to develop a universal classification of goods and services. The classification includes 18 classes of goods and services.

## 1 Introduction

Small and medium-sized enterprises are often called the backbone of the European economy, contributing to job creation and economic growth [1]. Small business is the foundation of development in a capitalist society and brings the market closer to a state of perfect competition. Therefore, the support of small business is a very important aspect of economic development. In European Union in small business employed 88.8m people (66.9% of the total employment), and generated 58.1% of total added value. In Russia employed more 18m (25,6%).

The main criteria of determine a small enterprise is the average number of workers for calendar year. In Russia is: up to 100 workers inclusive, in Europe – less 50 employers [1, 2].

Important role of small enterprises and their marketing actions (including social media marketing) we can see in the many papers [3, 4, 5]. Small enterprises meet a lot of problems of various kinds. The main one is the lack of money, especially for the first period of work, when the base of regular customers is just being formed. These problems general in different countries, for example in Indonesia small enterprises have such problems including access to capital, market provision and increased human resource capabilities [6]. The company's product may be wonderful, but customers must be not only informed about it, but also recaptured from competitors [7].

As many Russian researchers note, less than 50% of small enterprises have been in existence for more than 3 years. Thus, the use of funds should be aimed primarily at increasing sales and profit growth, effective competition with medium and large enterprises. This may lead to a stabilization of the financial situation and an increase in the

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number of small businesses in various sectors of the economy. Thus, effective promotion of goods and services is a very important issue [9, 10, 11].

Promotion of products is a set of means which allow an organization to communicate with society: to inform a real and potential customers, suppliers, intermediaries about its products and services; to form its market position, to stand out among competitors, to create a brand. Undoubtedly, promotion is the engine of trade. As mention the scientists from Indonesia: «The use of the marketing concept based on the digital marketing gives the best wish to develop into a center of economic power» [12].

Usually, there are two ways to solve the issue of product promotion - consulting firms working in the market, or hiring specialists.

In addition, it is possible to create a third approach - to use an algorithm for selecting ways to promote products, which could form the basis of a software product. The algorithm will allow users to determine a set of tools for promoting each class of product that the company produces and choose from this set the most suitable, available or appropriate in a its situation. Also, this algorithm (or program based on it) will allow novice businessmen to evaluate their opportunities, plan a budget.

To achieve this goal, we need to solve three tasks:

- create or select a universal classification of goods and services;
- determine the maximum list of promotion tools;
- distribute the list of promotion tools between classes of goods and services.

In this article, we consider the solution to the first task – the development of a universal classification of goods and services.

During analyzing scientific materials two main classifications of goods and services were identified. One of them is given in ISO 9000, the second-in the works of Philip Kotler [13, 14].

According to ISO 9000 there are two kinds of company goods – product and service.

The product conclude hardware (it is tangible and its amount is a countable characteristic), processed materials (they are tangible and their amount is a continuous characteristic), Hardware and processed materials are often referred to as goods. Software consists of information regardless of delivery medium.

The software contains information and is usually non-material, it can be approaches, operations, procedures. They can be documented or undocumented.

The hardware is material, it loses its consumer properties gradually, but don't change its form.

The processed materials lose their shape and are destroyed when used.

Service are generally intangible. The service is the result of at least one action in interaction between the supplier and consumer interact. It may include:

- activities carried out on material products supplied by the consumer;
- activities carried out with the consumer;
- activities carried out on non-material products supplied by the consumer;
- creating favorable conditions for consumers.

Thus according to ISO 9000 we have 4 types of company products.

Many products contain elements that belong to different product categories. Whether a product is assigned to a particular category depends on the element that dominates the product. However, this classification is too general for using in the context of our task and too far from marketing.

Let's turn to the few levels classification, which is in the works of Philip Kotler [14].

1 type of classification is product using period: short-term, long-term.

2 type of classification is kind of consumer:

- basic consumer (b2c),
- industrial costumer (b2b).

Consumer goods (b2c) can be divided based on consumer behavior (table 1).

**Table 1.** Classification of consumer goods

Types	Subtypes
1) Convenience goods	The consumer make a purchase frequently, with minimal effort to compare the goods. 1) goods of constant demand (milk, bread), 2) goods of impulse purchase (chocolate, magazines), 3) goods for emergency situation (umbrella).
2) Pre-selection products	During of choosing and purchasing a good the consumer carefully compares the suitability, quality, price, and appearance. 1) homogeneous (refrigerators, TVs), 2) heterogeneous (clothing, furniture).
3) Special-choice products	A product with unique characteristics or a specific brand, the consumer is willing to spend extra effort to purchase it (car brands, luxury items)
4) The goods of passive choice	The consumer does not realize them, usually does not think about buying them (insurance, funeral services)

Industrial goods (b2b) can also be divided into types: materials and components-fully used in the production process; capital assets-partially included in the product; auxiliary materials and services – not included in the final product. Look through their subtypes (table 2).

**Table 2.** Classification of industrial goods

Types	Subtypes
1) materials and components	1) raw materials (agricultural and natural resources), 2) finished materials and components (materials after certain processing).
2) capital assets	1) stationary structures (various structures – factory complex, stationary industrial installations-generators, machines), 2) auxiliary equipment (movable factory equipment and tools, office equipment).
3) auxiliary materials and services.	1) auxiliary materials and services (working materials-coal, paper, and materials for maintenance and repair-paint, nails), 2) business services (maintenance and repair, legal advice, advertising).

As we can see this classification differs from ISO 9000 classification. The main criteria here is type of customer and his behavior, the main criteria in ISO 9000 – construct of goods, dominated elements. Combining classifications will allow us to take into account the physical properties of products and their functional properties.

All classifications demand on the user to have a good understanding of the topic and a deep knowledge of the subject. Thus, most novice businessmen, faced with the problem of product promotion, do not have special education and special knowledge, so it is difficult for them to solve this issue on their own. They have several options:

- 1) to contact an advertising Agency for consultation;
- 2) to study the necessary literature and choose the most suitable means of promotion;
- 3) to train in specialized courses;
- 4) to hire a marketing specialist.

Therefore, the creation of algorithm (or program) of automatically selecting options for promoting goods and services would be useful and cost-effective for entrepreneurs.

Based on these classifications, we propose a universal classification of goods and services, whose task is to cover all possible types of goods within 18 classes.

We offer the following algorithm:

- the user selects the criteria for their product in several steps,
- this determines the final class of product,

marketing (P. Kotler).

The list of possible means of promoting products include recommended tools and the importance of a particular promotion tool may differ from the situations.

The classification of goods and services has a hierarchical structure.

### **Level 1. Class of costumers**

Purpose which class of buyers the product is aimed at, ordinary consumers or manufacturers.

We have identified 2 groups of products - for ordinary consumers and for industrial use.

- Consumer-goods and services (b2c) purchased by the end user for personal use.
- Goods for industrial purposes (b2b) – goods and services purchased by a market entity for business use or further processing.

### **Level 2. Product class**

It is the most General category of products.

- Material goods – they are completely transferred to the consumer's ownership and lose their shape over time. In other words, these are all material classes of products, they features are based on their physical properties.

- Services - any activity or benefit that one subject can offer to the other. It is intangible and does not transferred to ownership of the customer, moreover the customer can't reproduce it right. In other words, the user owns the service for the entire time it is provided, but does not receive it as his own.

- Information and software products are often intangible, they are contain information and can be include approaches, operations, procedures, programs. They can be documented or undocumented. This class of product includes intellectual property.

### **Level 3. Lifetime**

It describes the duration of use of the product.

There are two classes of product: goods and services characterized by a short service life and a long service life.

- Single-use or short-term-goods, they completely lose their properties, shape and function in one or more uses, or gradually lose them over a short period of storage time.

- Multiple-use or long-term-goods, they gradually lose their properties, shape, and perform their functions over a long period of time of use or storage.

For this level of classification, the abstract concepts "short" and "long" are used. We intentionally did not define their quantitative boundaries, since this is difficult at the moment and requires additional research. The service life of each product can be directly linked to the duration of its life cycle. So food is consumed once, and production equipment performs its functions for a long time.

### **Level 4. Product**

It is a more detailed product level of our hierarchy.

We suggest determining two classes of product on this level.

- Finished goods – they are completely ready for use or application without pre-processing, preparation, etc.

- Raw materials, components and materials – they are an addition to another product, without which they are not of practical use, or require pre-processing, preparation before their use by the consumer.

### **Level 5. Class of choice**

Determining product classes based on customer behavior. Usually it is strongly dependent on the product's price category.

- Simple selection-products are characterized by minimal effort to compare and select them.

- Pre-selection-products are characterized by a high degree of attention to their selection.

**Table 3.** Classification of consumer goods and services

1. Class of costumers	2. Product class	3. Lifetime	4. Product type	5. Class of choice	Description
Consumer goods and services (b2c)	Material goods	Single-use	Finished goods		Consumer goods that are completely consumed or lose their properties during one or more uses. For example, semi-finished products, ready-to-eat food, household chemicals
			Raw materials, components and materials		Raw materials, consumer-grade materials that are completely consumed or lose their properties during one or more uses. For example, the raw meat , grain, building products, spices, petroleum products
		Multiple-use		Simple selection-products	Consumer goods that are completely consumed or lose their properties over a long period of use. They are characterized by minimal effort to compare and select them. For example, tableware, umbrella, garden tools
				Pre-selection-products	Consumer goods that are completely consumed or lose their properties over a long period of use. They are characterized by a high degree of attention to their choice and comparison. For example, household appliances, furniture, and clothing
				Special selection-products	Consumer goods that are completely consumed or lose their properties over a long period of use. They are characterized by a very high degree of attention to their choice and have unique characteristics. For example, jewelry, cars. Real estate: buildings, structures, structures, plots, and other real estate used for residential, household, and other non-productive purposes
		Services	short-term-goods		
	long-term-goods				Activities for satisfying consumer needs and desires that can be fulfilled in the long term. The service fulfills the entire period of its provision. For example, higher education services, medical insurance
	Information and software products	short-term-goods			Information, software, and entertainment products for consumers that lose their useful properties in a short period after one or a few uses. For example, daily Newspapers, informational reviews
		long-term-goods			Information, software and entertainment products for consumers that lose their useful properties gradually over a long period of time. For example, computer games, some kinds of movies and books

**Table 4.** Classification of industrial goods and services

1. Class of costumers	2. Product class	3. Lifetime	4. Product type	5. Class of choice	Description	
Goods for industrial purposes (b2b)	Material goods	Single-use	Finished goods		Direct industrial goods that are completely consumed or lose their properties during one or a few uses. For example, office supplies, agricultural fertilizers	
			Raw materials, components and materials		Raw materials, industrial materials that are completely consumed or lose their properties during one or a few uses. For example, fuel, raw materials for production	
		Multiple-use		Simple selection-products		Industrial goods that are completely consumed or lose their properties over a long period of operation. They are characterized by minimal effort to compare and select them. For example, work inventory and clothing, hardware components, and office furniture
				Pre-selection-products		Industrial goods that are completely consumed or lose their properties over a long period of operation. They are characterized by a high degree of attention to their choice and comparison. For example, machine tools, computer equipment, auxiliary equipment
				Special selection-products		Industrial goods that are completely consumed or lose their properties over a long period of operation. They are characterized by a very high degree of attention to their choice and have unique characteristics.
						For example, new production lines and innovative products. Real estate: buildings, structures, plots and other real estate items that are used in production and other profit-making activities; non-commercial activities related to the provision of services to the public
	Services	short-term-goods			Activities for satisfying the needs of the industrial sector, which can be performed for one or a few uses. The service expires after the satisfaction of the need. For example, legal consultation, urgent preparation of tax reports, courier services	
		long-term-goods			Activities for satisfying the needs of the industrial sector, which can be fulfilled in the long term. The service fulfills the entire period of its provision. For example, accounting outsourcing, cleaning organizations, security companies	
	Information and software products	short-term-goods			Information, software, and entertainment products for industrial use that lose their useful properties in a short period after one or a few uses. For example, daily information reviews on various professional topics, corporate espionage	
		long-term-goods			Information, software and entertainment products for industrial use that lose their useful properties gradually over a long period of time. For example, computer programs and applications, professional publications and instructions (forms of ready-made documents on fire safety), databases	

- Special selection-products are characterized by a very high degree of attention to their choice, have unique characteristics.

Thus, we obtained a classification of goods and services with a description of each of the 18 classes (table 3, table 4).

You can notice that the classification levels are not symmetrical. This is due to the specifics of the resulting classes of goods and services.

To work with this classification, you can use the selection algorithm based on questions and suggestions. The user will set the class of their product and get a recommendation with a full list of promotion tools. The promotion tools will include 4 blocks: advertising, promotion, public relations, and direct marketing.

There is no doubt that this classification is not sufficiently detailed, but it is universal. And it can be used as a basis for developing an algorithm for selecting tools for promoting products and services and allows to any user determine his product.

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## References

1. European investment fund. European Small Business Finance Outlook [On-line] [https://www.eif.org/news\\_centre/publications/eif\\_wp\\_28.pdf](https://www.eif.org/news_centre/publications/eif_wp_28.pdf)
2. Tadviser. Government. Business. IT. Small business of Russia Small entrepreneurship [On-line] [http://tadviser.com/index.php/Article:Small\\_business\\_of\\_Russia](http://tadviser.com/index.php/Article:Small_business_of_Russia)
3. S. Chatterjee, A. Kumar Kar, Why do small and medium enterprises use social media marketing and what is the impact: Empirical insights from India, *International Journal of Information Management*, **53**, (to be published) <https://doi.org/10.1016/j.ijinfomgt.2020.102103>
4. Cardinali, S., Travaglini, M. & Giovannetti, M. Increasing Brand Orientation and Brand Capabilities Using Licensing: an Opportunity for SMEs in International Markets, *Journal of the Knowledge Economy*, **10**, 1808–1830 (2019) <https://doi.org/10.1007/s13132-019-00616-1>
5. T. Chandrayanti, S.R. Nidar, A. Mulyana, M. Anwar, Credit accessibility model of small enterprises based on firm characteristics and business performance, *International Journal of Entrepreneurship*, **23** (2019), EID: 2-s2.0-85078796887
6. I Djabbar and S Baso, The development of small and medium enterprises in North Kolaka Regency, *IOP Conference Series: Earth and Environmental Science*, **382**, (2019) <https://doi.org/10.1088/1755-1315/382/1/012033>
7. B.K. Fawzee, F.R. Sofiyah, I. Sudardjat, I. Muda, The role of technology marketing micro business, small and medium enterprises (Smes) agents for repurchase intention and its impact on the community satisfaction (case in Indonesia), *International Journal of Scientific and Technology Research*, **8**, 1724-1730 (2019), EID: 2-s2.0-85077314760
9. T. Fejling, E. Torosyan, O. Tsukanova, O. Kalinina, Special aspects of digital technology-based brand promotion, *IOP Conference Series: Materials Science and Engineering*, **497** <https://doi.org/10.1088/1757-899X/497/1/012027>
10. V. Vilken, O. Kalinina, A. Dubgorn, Specificity of high-rise construction and real estate markets in the regional economy: An analysis of Russian practice (example of St.

- Petersburg), *E3S Web of Conferences*, **33**  
<https://doi.org/10.1051/e3sconf/20183303012>
11. S.Evseeva, O. Kalchenko, O. Evseeva, Innovative projects for sustainable development of cities (case of Saint-Petersburg), *MATEC Web of Conferences*, **170**  
<https://doi.org/10.1051/matecconf/201817002007>
  12. B.K. Fawzee, F.R. Sofiyah, I. Sudardjat, I. Muda, The role of technology marketing micro business, small and medium enterprises (Smes) agents for repurchase intention and its impact on the community satisfaction (case in Indonesia), *International Journal of Scientific and Technology Research*, **8**, 1724-1730 (2019)  
EID: 2-s2.0-85077314760
  13. ISO 9000 : 2015, Quality management systems — Fundamentals and vocabulary [Online] <https://www.iso.org/obp/ui/#iso:std:iso:9000:ed-4:v1:en>
  14. Philip Kotler, Gary Amstrong, Principles of Marketing, 17th edition, Pearson, pages 736