

FLOW-SIM

Market Research

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Introduction to Methodology

In this marketing research we will study the market of Computational Fluid Dynamics (CFD) and analyze its development trends in order to predict the future of this market.

The market research for a CFD product has to deal with two market aspects which are typical of any technological product. The first covers *regular* market mechanisms, and in this context we will study the following main questions: what is the annual volume of this market, what is the growth rate, how it is expected to change and why, who are the main players on the market and what percentage of the market they occupy, what are the prevailing distribution channels and business models, what is the standard services package, characteristics of consumers, markets geography, etc.

The second is a *technological* aspect connected to the specific features of the technology under consideration, and it must absolutely be taken into consideration for any technological product. In this context we will study the circumstances of the appearance of a given technology on the market. What problem does this technology solve? How important is the problem, and how it was solved before the new technology appeared. Was the technology in question aimed at improving the existing processes, or its appearance was connected with radical changes in the existing processes, and with the appearance of the new ones?

To answer this question, we will try to analyze the history of this technology and its development. We will also check whether we deal with a principally new phenomenon, or with a solution to a local problem.

If we consider a principally new phenomenon which results in a new type of solution, we must explore the spectrum of its possible applications. Here, too, the history of the technology development will allow us to inspect the applications and the corresponding industries in chronological order. We know that some industries, such as the war industry, or aircrafts industry, are normally being financed from the state budgets, and profitability is therefore somewhat less essential in these state-financed industries than in the industries financed by private capital. For the state-financed industries, it is the technological issue that is prevailing. However, although some technologies may be in demand in these budget industries, even for those of them that offer excellent technological solutions, the issue of conversion complicates the marketing. Tracing the history of the technology development will allow us to better understand the prospects of the technology we are now studying. Successful application of a technology in some state-financed industries is definitely an indication of a technological success, but this fact does not prove the technology will also be a commercial success, and we know many examples of commercial failures of first-class technologies.

If a new technology can be applied in a number of industries, we should naturally study the history of all these applications. In some cases, a novel technology that offers unquestionable advantages for a consumer could not be integrated in the

existing technological and control systems due to specific problems, such as difficulties in re-engineering, lack of properly qualified and trained personnel, lack of funds for long range investment in proper training, new problems lacking an immediate technological solution, etc. It is a fact that many existing products available on the market cost less than the introduction of these products in the existing production lines would cost. This fact is explained by difficulties in introducing totally novel products and technologies. The more radical the innovation, the more difficult is the application of the innovative product. In the last decades, due to a rapid technological progress, the market is often falling behind the technological novelties, despite a great demand for such products.

When studying an advanced technology which can be regarded as a new technological field, we need to explore the tendencies of its development. After all, any conventional industry is based on a tested technological process that can be further improved and developed. The parameters of improvement are always *price*, *quality* and *speed*. Nevertheless, the market for this conventional industry does not change, and nor does the growth rate. The growth rate depends on standard economic indices, and on these indices the market forecasts are based. If we treat a novel technology as conventional, we will be mainly interested in the direction of the improvement or advancement of this industry due to the appearance of technological novelties. In this context, such approach to an industry enables us to determine the main parameter of the improvement (*price*, *quality* or *speed*) on which the developers are focused in their competition with each other. To do it, we will attempt to analyze the technologies currently available on the market.

The improvement of an advanced technology may have another important effect. It can drastically change the existing map of applications. As we have already mentioned, a good technological solution does not necessarily result in a market success, and its profitability may be questionable. Since *speed* may also help reduce *price*, and thus allow for using the same technology in a number of industries, the growth rate of technological products may reach very high levels.

It is well known that traditional industries are often skeptical with regard to application of new technologies. Before the managers decide to introduce a new technology, they would like to see a proof of its successful application in similar businesses, and we know many examples of such conservatism.

Based on the analysis of all the above mentioned factors and their effect on the market of technological products, we have selected a certain sequence in analyzing these factors in order to paint a complete picture of a given market. While collecting information, we have encountered a number of contradictory opinions and forecasts, a lack of coherence in individual flows of information, and different opinions regarding the industry we have been analyzing. Therefore, we have attempted to systematize the collected information, with an emphasis on examples of successful applications. We have also studied new tendencies that may prove to be dominant in the future industry development.

Now we would like to return to *regular* market mechanisms which are relevant to this market study. With regard to *regular* market features, we are mainly concerned with the existing situation on the market. Thus, we estimate the prospects of the natural demand growth for this product based on the tendencies and current status of the key application fields. The geography of the main markets is studied on the basis of the concentration of these application fields. We are also carefully looking into new possible applications in order to find niches for future products based on the same technology. We are studying the characteristics of the key players on the market, their caliber, main advantages they offer, and other parameters. We analyze the activity of our main competitors and learn the rules of the game with regard to main products and consumers, and the relationship between all the characters. To do this, we have conducted a comparative analysis of the three leading companies on this market. The analysis of basic services packages offered by these companies to the potential clients allowed us to reveal the tendencies in the pricing policy of these companies, and to better understand the market prices in general. In addition, we have learned a number of features characteristic of the introduction of this kind of product.

We have spared no effort for proper selection and processing of a tremendous amount of highly diverse and heterogeneous information. We have interviewed professionals from different companies operating on the market, and used our original analysis system to improve the quality of the research. As a result, we hope to have found a correct logical scheme that will allow the reader to receive answers to the main marketing questions.