

A review of scientific approaches to building a digital functional model of quality management

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Abstract

In the context of the establishment of the global digital economy, one area where effective information technology (IT) solutions can provide significant benefits is quality management. Turning to the current market situation for IT solutions in this area, it became clear that, in order to expand the activities of quality management in business areas, there is a need to build models with applied content, consisting of the sum of very important economic, management and digital criteria. However, these needs cannot be met objectively. As one of the reasons for the emergence of such a technological situation, it can be shown that the institutions producing technologies do not fully consider the work processes, regimes, essence of production, management, economic, financial, and commercial differences in industries. An effective solution in such a situation – at the level of a certain enterprise (organization), it is the establishment of management models that describe the full range of its production, financial-economic, cooperation mode and relations. After the example-model is established, it is possible to build individual management models and apply them in real sectors of the economy by covering the areas of activity and regimes of business units, their scale, positions in the macroeconomics and other specific aspects. Most of the developed countries have national strategies and programs for the digitization of the processes surrounding the life-activity of the economy and society. The studied problem is the question of increasing the efficiency of work in a specific field of activity and solving this issue can provide a special economic effect for business units operating in a specific market.

Keywords: Business Areas, Digital Technologies, Quality Management, Management, Small And Medium Enterprise.

"Quality" is one of the main categories in economic management. This category is used in marketing and statistics. It should be taken into account that today the list of subjects or content areas to which the concept of quality is applied is quite extensive, and in addition to "product quality", "process quality" and "management quality" indicators have also been added to this list. In addition, there are special objects to which the concept of quality is applied, for example: the quality of the work process. [3]

From the point of view of the standard management procedure, the concept of quality means compliance with the requirements set at all stages, levels and links of management, and for quality management to be effective, these requirements must be expressed by special parameters (a system of indicators). Quantitative assessment of quality is one of the methodological foundations of management. The statement of value allows to establish mutual relations with other aspects of functioning of the business unit (organization) as a complex system. This requires a clear understanding of quality. [2]

In fact, quality means compliance with the requirements for a strictly defined list of parameters that must be observed in relation to a specific control object. In production practice, these are regulatory and consumer requirements that describe a set of parameters.

The quality object acts as a certain field of reality, it is relatively concretized. The achievement of the main goal of the business unit is determined in each case by the profitability indicator: for the long-term perspective, this indicator expresses the efficiency of the activity. However, product quality is not directly related to profit, and yet this relationship can be explained by the added benefits of higher quality products in terms of customer satisfaction and regulation – in terms of obtaining optimal quality costs. At the same time, regulatory requirements limit this aspect only to interactions with consumers and stakeholders. Quality should maximize satisfaction for consumers and not create negative impacts for stakeholders. [10] Since the result-goal of quality management is determined by the profit of the enterprise (organization), it is clear that there is no single solution to the problem of quality management, since it depends on the characteristics of activities to achieve this goal. It is only possible to formulate a model for any industry

based on the original quality management model. In countries that are leaders in the field of digital technologies, the state acts as a driver (initiator) of relevant activities. Without the active participation of the state, it is impossible to imagine the successful development of the technological offer in leading countries, as well as the commercialization of technologies, including the creation of leading corporations that form the "digital image" of the modern economy.

The goals and objectives of the countries are generally similar, but the approaches to policy implementation are somewhat different. Some initiatives are embedded in the broader international scientific, technological and innovation agenda. "digital" initiatives in action are generally characterized by a clear sequence and build on the results of previous strategic and program documents in the field of information communication technologies (ict). In most countries, the first strategies in this area were developed in the late 1990s and early 2000s. Thus, the European Union's initiative to transition to the "electronic Europe" (e-Europe) information society was adopted in 1999.[6] During the 2000s, the main tasks of the digitization policy were related to both the establishment of information infrastructure and the stimulation of the gradual introduction of ict into various fields of activity. Within the implementation of the national broadband strategy (2010), the goal of providing the population in Great Britain, mainly in rural areas, with fast broadband internet (upload speed 24 mb/s) has been achieved. The next stage of the state policy - the launch of pilot programs for the application of digital technologies in the industry - is related to the search for new sources of growth as a result of the global financial and economic crisis that occurred in 2008-2009. The "industry 4.0" trend, launched in 2011 within the framework of the "fourth industrial revolution", combined complex projects on the creation, implementation and use of digital solutions in processing enterprises. In the national programs of this period, it was accepted as a goal to apply effective intellectual solutions for enterprises.[7]

Currently, the transition to a complex digital agenda is observed in the politics of the world's leading countries. The main goal is digital transformation of public administration, development of information and communication infrastructure based on new technologies, provision of information security, development of digital skills and habits. Construction and use of infrastructure of broadband networks, access to radio frequency spectrums, regulation of markets, etc. Special attention is paid to the regulatory aspects related to in addition, strategies for applying digital technologies with high potential effects in various areas of the economy are being developed. The transition to digital technologies helps to develop the competitiveness of national economies. Taking into account the spread of digital platforms at the international level, special attention is paid to the norms and rules that ensure the diversity of technological solutions and equal conditions of the competitive environment. The digital agenda, measures and policy implications of the digital economy are the subject of active debate in leading places around the world.[5] The main reason for the success of digitalization policy can be coordination of activities of authorities, business, science, education and expert communities and establishment of permanent communications. Special attention should be paid to the effectiveness of monitoring and policy measures and the evaluation of this effectiveness. In addition, despite the high importance of digitization issues as a whole, there is also an imbalance between the goals of the programs: a little more attention is paid to the digitization of public administration, little space is given to stimulating the population's use of digital technological achievements, and business digitization support measures occupy an intermediate position. To achieve the goals of general digitization, both traditional financial and non-financial support measures, as well as newer mechanisms that take into account the characteristics of digital technologies, are applied. The portfolio of measures of the governments of most countries is dominated by financial instruments. A significant part of the national programs is aimed at supporting small and medium enterprises (smes) and start-ups. Public-private co-financing of programs becomes the main principle of innovation policy and serves to stimulate the commercialization of new solutions based on competitive selection.[9] Research and development support is based on traditional grants and subsidies. At the same time, new means are being developed to

ensure a synergetic effect and attract maximum competence centers. Among them, digital research platforms occupy a central place. In particular, special platforms for joint research and testing of solutions in the field of wireless communications (platforms for advanced wireless communications research) have been established in the united states.[1] The mechanisms of application of digital technologies are characterized by considerable differences: test polygons, test sites, etc. Most of the initiatives are aimed at stimulating the technological development of small and medium-sized enterprises, transfer of technologies, assisting in the search for counterparties, obtaining financial support. To ensure the mass diffusion of digital technologies among enterprises, flexible mechanisms, primarily tax incentives, are applied. They allow covering a wide contingent Of "Economic Agents" (for example, rapid depreciation or tax credit for information technology investments in japan).[4] In addition to preferential loans for the purchase of digital products and services within the framework of supporting small and medium-sized business units, various types of vouchers, including for connecting to innovative high-speed communication networks (1 gb fiber optic for households and small and medium-sized business units grants to ensure access to broadband) are actively used. Taking into account the role of the state as the largest consumer, measures are being taken to simplify the mechanism of public procurement of digital solutions for small and medium-sized business units.

For this purpose, the duration of tender procedures is reduced, limits are set on the duration and value of contracts, companies with less than two years of work experience in the market are allowed to tender, etc. With the aim of implementing long-term initiatives, special funds for the digitalization of economic sectors, including the public administration sector, are being formed. [8]

Conclusion

Normative-regulatory measures of quality management occupy an important place in measures related to the stimulation of the application of digital technologies. Normative-regulatory measures of quality management include standardization at the level of international organizations and industry consortia, normative strengthening of various aspects of application and use of digital technologies, creation of "regulatory sandboxes" (electronic coordination points), management of radio frequency spectrum for commercial use. Most of the initiatives are implemented on the basis of pilot projects. In the scope of quality management, the set of management tools related to the creation of more flexible mechanisms of interaction with sales, the development of long-term public-private partnerships (for example, the mechanism of sectoral agreements in great britain) is of particular interest.

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