

## SERVICE ORIENTED CUSTOMS ADMINISTRATION BASED ON THE PRINCIPLES OF LEAN MANUFACTURING

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**Abstract:** *Problems of choosing methods of management in the customs management system has been the subject of scientific research for several years. This problem becomes more urgent within the tendency of the Customs to reconfigure its performance according to the needs of business. Customs plays a strategic role in economic development of the country. It takes part in the regulation of international trade exchange between the participants of foreign economic activity, and carries out the fiscal function at the borders of the country. The customs service effectively replenishes the federal budget and thereby contributes to national economy. Customs needs to be brought to the business way of functioning in order to boost international trade and economy. Within the trend of running business and manufacturing using tools of digital economy, such as E-commerce and Single Window, the need to get value for money from governments at all levels is under the spotlight as never before. However, cost-cutting programs that seek savings of 1 to 3 percent a year will not be enough and in some cases may even weaken the quality of service. Many countries have achieved practically significant results in the study and application of management technologies, such as Japan, the USA and the UK. Their experience in the implementation of the Lean production principles in the management structure of the system allows analyzing preconditions of implementation, the possibility of practical application of Lean production and achievement of target results in governmental structures. Lean aims to optimize costs, quality, and customer service constantly. It does so by engaging and equipping employees to focus on creating and delivering value in the eyes of the customer and eliminating whatever does not contribute to this goal. Evaluation of this method of the customs services improvement by using management tools allows to highlight the importance of conceptual provisions. In the Russian Federation the fundamental conceptual documents of the Federal customs service are the development Strategy of the customs service of the Russian Federation until 2020 and the Comprehensive program of the development of customs authorities up to 2020. The target directions of the development of the Customs service are formulated in these documents, as well as the tasks to achieve them. The concept of Lean production taken from the business sphere is designed to reduce the 7 types of production costs of customs services through the use of specific tools. The authors come to the conclusion that it is possible with the use of analytical ways of information processing: the system of indicators that meet the requirements of the state policy and the WCO's recommendations in the field of Customs.*

**Keywords:** *lean-indicators, lean-manufacturing, Strategy of development of customs service of the Russian Federation till 2020, the Concept of service-oriented administration, government administration, government services*

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The strategy of developing the RF customs service until 2020 involves implementing the service-oriented customs administration [1] Concept, this determines eight key areas for developing the customs service content under modern conditions, including also improving customs regulation, implementation of the fiscal function, developing law enforcement, integration processes and international cooperation, improving the system of public services and control, and supervisory functions, improvement of customs infrastructure in compliance with transportation and logistics policy and law enforcement risks. The concept assumes an integrated approach to the incessant improvement of the entire managerial system in the EAEU structures, which is sufficiently in line with the concept of lean production [8], applicable to governmental bodies.

The lean state is associated not only with optimizing the processes of governmental and municipal authorities, but also with the increase of efficiency and crisis resistance of non-profit institutions in the areas of health, education, culture, as well as governmental enterprises. Lean manufacturing allows one to do more work without attracting additional labor, reduces the cost of public services, increases customer satisfaction (taxpayer), significantly reduces the time spent on rendering services. It is important that lean manufacturing requires less money for implementation and further use than the other approaches does not depend on expensive IT solutions. The relevance of this topic is to improve the activities of customs authorities in order to improve the quality and efficiency of their work, which can be achieved through the use of Lean production tools (lean manufacturing, lean production).

In 2001, initiatives using lean technologies in public administration first appeared in the UK. In 2006, on the initiative of the UK, the first EU conference on the introducing lean in the health sector was held.

In the UK, lean programs have been consistently implemented since 2006 in the National Health Service (NHS), the Department of income and fees, the court service, the Ministry of labor and pensions of the UK, the National Audit Office (NAO) — an organization close to the RF Accounting chamber. It should be noted that NAO and NHS have developed know-how that can become a basis for adapting the best practices of thrift in Russian governmental agencies.

Program UK Lean Aerospace Initiative (Lean Aerospace initiative Industry UK) is a national scientific research program, which includes the consortium of universities of Bath, Cranfield, Nottingham, Warwick and which works in close cooperation with the LAI at MTU, USA. This unique and broad program is funded by the EPSRC (Engineering and Physical Research Council) the Governmental Agency for Research and Education in the area of Engineering and Physical Sciences and 45 member companies of SBAC-Society of British Aerospace Companies - the Society of British Aerospace Companies (which comprises 2,600 member companies). For example, at the Bath University, the research program focuses on improving lean processes in the aerospace industry and deals, in particular, with such issues as:

1. Coordinating common indices and measurement parameters.
2. Developing requirements for lean-accounting and measurement of operational parameters.
3. New topic – "the practice of lean in the supply chain in the aerospace industry" and "value during the life cycle of the product".

To date, the Lean Enterprise Academy (LEA) operates in the UK – a company that has embarked on the path of building up efficient production systems aimed at developing the companies' ability to increase productivity, reduce production costs, TOD, costs and production losses.

LEA company has grown from a research group of MIT (Massachusetts Institute of Technology), which was responsible for studying and implementing lean manufacturing in a revolutionary system of manufacturing and management. Now the LEA objectives are developing and disseminating knowledge in lean-thinking and lean-practice.

The company cooperates with organizations to help them understand and apply lean manufacturing principles. They identify and eliminate "gaps" in the manufacturing system, improve productivity, develop the company's ability to optimize production to meet customer needs and maximize profits.

The lean manufacturing concept in US governmental agencies. Lean Government approach is distinguished by the following recommendation principles:

- 1) reviewing the existing system of public services, the cost whereof should be optimized, society as a whole and stakeholders;
- 2) motivate employees and external stakeholders to continuously improve and find solutions to problems;
- 3) implement the concept of incessant improvement of processes and organization of their activities;
- 4) strive to reduce process complexity and variability;
- 5) use performance metrics and visual control to provide quick feedback and improve real-time decision making;
- 6) carrying out activities involving systemic thinking.

One of the main goals in lean manufacturing offers reducing waste, and under public administration, waste is as follows:

- 1) material and technical resources: backlog (permits, approval of plans), redundant materials and information, outdated databases;
- 2) defects: data errors, missing information, errors in documents, confusing instructions or requirements, typos;
- 3) overproduction: unnecessary reports and copies, excessive E-mails, doing unrequested work;
- 4) complexity: unnecessary steps under way, too many levels of signing, unclear job descriptions (difficult to understand formal style);
- 5) waiting: time for approval, waiting for information or decisions, waiting for people in meetings;
- 6) excessive movement: poor printer and copier availability, unnecessary movement to find files or supplies, moving for meetings (meetings, staff conferences);
- 7) moving elements: routing reports, moving documents, and their storing.

Numerous governmental agencies, such as the U.S. environmental protection Agency and the States of Iowa, Minnesota, and Washington, use the lean concept to improve the quality, transparency, and speed of governmental processes. As in the industrial and service sectors, some governmental agencies are implementing lean practices together with Six Sigma process improvement approaches.

Six Sigma stands for a managerial approach that seeks to systematically apply statistical techniques to reduce variability and eliminate defects in service delivery.

The source monitoring all current government activities on the Federal, governmental, and city levels is the Lean Government Center.

List of structures that use this concept:

- U. S. Environmental Protection Agency,
- U.S. Department of Defence,
- U.S. Army,
- U.S. Department of Agriculture.
- U.S. Department of Housing and Urban Development.
- U. S. Nuclear Regulatory Commission.
- U.S: Department of state.

Examples of governmental organizations that actively use the Lean Government concept:

- Colorado Department of Transportation (CDOT),
- Connecticut Department of Environmental Protection,
- The Ministry of labor Connecticut,
- Iowa Office of Lean Enterprise,
- Minnesota Enterprise Lean,
- State of Ohio Lean,
- Washington State's Results,
- New Hampshire Department of Environmental Services,
- Wisconsin Department of Transportation (Wis DOT).

Examples of municipalities that implement the lean concept:

- Denver, Colorado (City and County of Denver, Colorado),
- Cape coral, Florida (City of Cape Coral, Florida),
- Cincinnati, Ohio (City of Cincinnati, Ohio),
- Fort Wayne, Indiana (City of Ft. Wayne, Indiana),
- Grand rapids, Michigan (City of Grand Rapids, Michigan),
- Irving, Texas (City of Irving, Texas),
- Jacksonville, Florida (Jacksonville, Florida).

International Association for managing cities and counties (International City/County Management Association (ICMA)) supports the program, in order to help authority to improve managerial processes using the concept of lean production.

It is interesting to refer to the evaluation of the existing experience, given by Western scientists. Thus, Z. Radnor and S. P. Osborne note that there are two main approaches to introducing lean technologies in public administrations. This is, first, the use of individual seminars or events held "concentrated" in a certain period of time. These activities are often referred to as quick improvement activities. In addition, secondly, the introduction of a comprehensive, programmatic approaches (a set of interrelated projects, to cover in the future all sectors of activities). Both approaches use the same tools, but the difference is in the depth, breadth and regularity of the tools. Kaizen: are short-and medium-term activities, and the program approach involves an appeal to incessant improvement.

With regard to the reform CO activities, advantage should be given to incessant improvement and systematic change in the practice of customs services, which implies the participation of all four parts of the customs system in implementing lean domestic policy.

The practice of introducing lean production technologies in the governmental structures in foreign countries allows adapting them to be used in EAEU. The Ural regional customs administration has been implementing the principles of lean production for several years. In 2015 the managing staff (Deputy Heads, heads of services, heads of customs) was trained in the basic principles of lean production on the basis of the Ural state University of Economics.

The concept of implementing lean production provides for a constant increase in satisfying traders (it correlates with the concept of "customs services"), improving the efficiency of working processes, easing organizational structure and providing rapid response to changes in the environment.

In this regard, we recommend the following sequence of steps to create lean production in the customs authorities:

1. To define a vision, that is, to shape what the customs authorities should look like, so that their employees are satisfied with the work, and their activities would be effective, customer - oriented.
2. All staff from managerial and up to junior positions should be committed into the process. Management should be prepared to provide the necessary resources for the project.
3. Measuring value and loss. Setting standards and monitoring the results.
4. Identifying the steps to achieve the desired results. Describing the current and future situations.
5. Encouraging changes, both within organizations and within individuals.
6. Constantly support changes in each unit, department and working process (it is lack of common efforts that is the major obstacle for implementing lean principles in public institutions, which is usually due to short periods of top managers staying in their positions). To adhere to a holistic vision of the process of providing customs services, to show determination.

These changes are characterized by the set of indicators presented in Table 1.

Table 3. LEAN-indicators taken into account in the of customs

<b>Indicators of success in implementing lean measures into CO.</b>		
<b>Implementation of lean manufacturing.</b>	<b>Moral climate indicators.</b>	
<ul style="list-style-type: none"> <li>• Number of the held events.</li> <li>• Number of participants in the events.</li> <li>• Number of trainings.</li> </ul>	<ul style="list-style-type: none"> <li>• Employees' satisfaction.</li> <li>• Employees' turnover rates.</li> </ul>	
<b>Indicators of efficiency and effectiveness of processes in CO.</b>		
<b>Time wise indicators.</b>	<b>Cost wise indicators.</b>	<b>Quality indicators.</b>
<ul style="list-style-type: none"> <li>• Full time of registering movement of goods (according to customs procedures).</li> <li>• Time spent on value-creating activities.</li> <li>• Time spent on activities that do not create value.</li> <li>• Time spent on activities that do not create value BUT are NECESSARY.</li> </ul>	<ul style="list-style-type: none"> <li>• Saving employees' labor.</li> <li>• Cost savings.</li> <li>• Cost per unit of customs services.</li> </ul>	<ul style="list-style-type: none"> <li>• The number of processed data (by regions) + priority AREAS of economic activities.</li> <li>• Number of arbitration cases won by traders.</li> <li>• Review of posts with full or partial duplication of functions.</li> </ul>

<ul style="list-style-type: none"> <li>• Time spent on value-creating activities in the full time of customs service delivery.</li> </ul>		
<b>Indicators of results.</b>		<b>Indicators of the processes complexity.</b>
<ul style="list-style-type: none"> <li>• Scope of work (monthly usage of data (diesel fuel) by region).</li> <li>• Accumulated and waiting for transfer to the next stage of work.</li> <li>• Work in progress.</li> </ul>	<ul style="list-style-type: none"> <li>• Number of stages of customs clearance which create value.</li> <li>• The number of decisions made for the release of goods.</li> <li>• "Number of work transfers" (documents).</li> <li>• "Loops" - the number of times to repeat the work.</li> <li>• "Black holes" - sources for constant problems.</li> </ul>	
<b>Indicators of success in implementing lean measures in CO.</b>		
<b>Implementation of lean manufacturing.</b>		<b>Moral climate indicators.</b>
<ul style="list-style-type: none"> <li>• Number of the held events.</li> <li>• Number of participants in the events.</li> <li>• Number of trainings.</li> </ul>		<ul style="list-style-type: none"> <li>• Employees' satisfaction.</li> <li>• Employees' turnover rates.</li> </ul>

According to the Complex program for developing the FCS of Russia, the Customs Code of the EAEU will create a basis for simplifying customs procedures, will introduce the priority of automated electronic technologies over hard copy documents circulation, stimulate the use of "one step office" mechanisms, fundamentally change the approaches to the institution of the authorized economic operator, as well as allow the possibility of transferring the payment of customs remunerations to the stage after release of goods and instalments/deferral of payments.

The impact of the technological factor (namely, complex automation and informatization of all areas) has a positive effect on the activities of customs authorities, expressed in enhancing the efficiency and efficiency of all types of control.

The Program defines, as one of the main directions for developing - the "implementation of the best world practices of customs administration ("electronic customs", "one step office", etc.), tools and recommendations of the WCO in the area of risk management, organizing customs control after releasing goods, ensuring full, timely and lawful collection of customs payments" and "development of human resources and material and technical base of the FCS of Russia". The concept of Lean production allows implementing these areas, taking into account the goals and objectives set by the Program.

A set of measures aimed at improving customs administration has been carried out recently:

1. Mandatory preliminary informing of customs authorities on goods imported into the customs territory of the EAEU by road and rail has been introduced.
2. Conditions have been created for introducing mandatory preliminary information on goods transported by sea (pilot projects are being carried out).
3. Taking into account the positive experience in introducing preliminary informing in the automotive and railway crossings it is important to have it compulsory in respect of goods transported via sea and air checkpoints across the state border of the Russian Federation.
4. Mandatory electronic customs declaring of goods has been introduced. The requirement to submit more than 20 documents submitted during the customs Declaration of goods has been abolished.
5. The possibility of remote releasing the goods has been provided.

6. The know-how of automatic registration of the customs declaration filed in the form of an electronic document and automatic release of goods have been introduced.
7. The technology for simplifying customs operations with goods that are exported to international post offices has been developed.
8. The system of applied technologies of control of calculation, payment and transfer of customs payments was modernized, allowing reducing the time for releasing goods. The possibility for paying customs duties in real time regime has been granted.

The comprehensive program for developing the FCS of Russia until 2020 has developed a system of indicators characterizing the implementation of the goals and objectives. These indicators can be compared with the efficiency indicators of the Lean production concept (see table. 2).

Table 4. Comparison of the efficiency indicators system for implementing goals and objectives of the FCS of Russia and indicators of efficiency of the concept of Lean production.

<b>Efficiency and effectiveness indicators of processes in CO.</b>		
<b>Time wise indicators.</b>	<b>Cost wise indicators.</b>	<b>Quality indicators.</b>
Modernization and the content of the service "Hard currency exchange control" "Private office of the participant of foreign economic activity" based on the needs of the business community: 2016-> 70% 2017-80% 2018-90% 2019-95% <b>2020-100%.</b>	The share of electronic declarations for goods registered in the centers of electronic declaring,%: 2016-16% 2017-20% 2018-30% 2019-60% <b>2020-90% .</b>	The level of satisfaction of citizens with the quality of public information and consulting services: 2016 — 2017- not less than 80% 2018- not less than 85% 2019- not less than 90% <b>2020- not less than 95%.</b>
	Share of automatically registered electronic declarations for exported goods: 2016-35,7% 2017-50% 2018-60% 2019-70% <b>2020-99%.</b>	The share of FEA participants who satisfactorily assess the quality of public services provided by customs authorities in the total number of FEA participants using public services: 2016- 60% 2017- 65% 2018- 70% 2019- 75% <b>2020- 80%</b>
	Maintaining the personnel potential and ensuring the staffing of customs authorities with sufficient personnel to fulfil the tasks assigned to them: 2016- 91.6% <b>2017-2020 - 92%</b>	

To achieve these goals, an action plan for implementing the Program has also been developed. Such measures can be effectively implemented by lean production tools. The most significant activities to which Lean production tools are applicable are presented in Table 3.

Table 5. Lean production tools applicable for implementing the program.

<b>Programs.</b>	<b>Lean production tools.</b>
Automatic registration of declarations for goods submitted in the form of an electronic document (2017).	Flow alignment (Continuous Flow) - building production flows without stops and buffer accumulation.
The concentration of declaring goods at customs (e-Declaration) (2017-2020).	Time tact (Takt time) - answers the question of what performance should each cell or each section of the target services work to meet customer demand.
Implementing measures to create a system of traceability of the movement of goods of the EAEU goods movement traceability in terms of implementing the tasks set at the national level (2017-2019).	Heijunka (heijunka) - a tool for levelling the actions performed; the movement of goods is divided into small segments, arranged in a special order, allowing to reduce risks and to carry out various operations with the goods within a short period.
Automating customs control processes after releasing the goods (2017-2020).	VSM: value stream Mapping (Value Stream Mapping) - helps to see valuable operations and those that do not add value.
Improving mechanisms of crime prevention in the customs area (2017-2020).	Incessant improving (Kaizen) - the overall synergistic effect, the joint efforts of all employees help to quickly and thoroughly identify violations.
Ensuring automation of risk identification processes at the level of at least 90% (2020).	Poka-Yoke, (error protection) - developing methods to prevent errors directly under way. The ideal goal is defect-free; it is cheaper than inspection, inspection and verification.
Implementing and using the software products risk management process with the possibility of data mining (2017-2020).	KPI, Key indicators (system of metrics for reviewing the governmental bodies critical activities).
Providing public services in electronic form (2020; tool).	"Quick changeover "(SMED — Single-Minute Exchange of Die): the breakdown of the performed operations, the implementation of operations "one-touch" + Bottle neck analysis (in the search of the bottle neck) the Definition of the " bottleneck " in the chain, which does not allow to work more efficiently.
Shifting to electronic document management in the customs administration and other payments, the collection whereof is the responsibility of the customs authorities (until 2020).	"Quick changeover "(SMED — Single-Minute Exchange of Die): the breakdown of the performed operations, the implementation of operations "one-touch" + Bottle neck analysis.
Increase of the areas relating to Federal property for placing RF customs authorities officials and ensuring legal activities of customs authorities at the expense of new construction (acquisition) (according to the allocated budgetary appropriations).	Gemba ("place of battle") – this approach reveals that the most important things do not take place in the main offices, but also on the spots; involving management, reducing the feedback time to problems solving, strengthening discipline, obtaining "first hand" information without distortion.



Updating the list of positions of the Federal state civil service for which the rotation of Federal governmental civil servants of the RF customs authorities is provided by amending the order of the Federal customs service of November 14, 2012 № 2315.	Bottleneck analysis (bottle neck search). The definition of the "bottleneck" in the chain, which does not allow working more efficiently. Improving this weak link brings about improved staff productivity and service rendering.
Improving the efficiency of divisions activities on counteraction to corruption for the identifying, preventing and suppressing corruption crimes committed by customs authorities officials.	Kaizen, comprising moral improvement, personal discipline and initiative.

The main directions of development specified in the Program are also closely correlated with the main ideas of the production concept, namely:

- 1) incessant satisfying participants of foreign economic activities;
- 2) improving the efficiency of work processes;
- 3) the simplicity of the organizational structure and rapid response to changes in the environment.

Thus, it can be concluded that implementing Comprehensive development program can be effectively put into life based on methods and principles of lean production. We have developed an appropriate program of action, presented in Table. 4.

The comprehensive development program clearly defines what the customs authority should be like, and lists all the tasks that need to be solved to implement this program. In addition, the program clearly identifies all indicators to which the CO activities should aim.

In order to implement the Lean production concept in the activities of the FCS of Russia, it is necessary first to implement a comprehensive development program, what will result in availability of a ready base for using Lean production.

Table 6. The program of implementing the concept of the Federal customs service developing based on introducing the Lean production.

<b>Status.</b>	<b>Features.</b>	<b>The body responsible for the implementation.</b>
1. Management.	Reducing the number of customs administrations to the optimum minimum for implementing customs formalities. Delegating one-time authority, in order to avoid "loops" in implementing customs operations, formalities and checks of documents accompanying the movement of goods.	RF FCS
2. Foreign policy.	Support at the governmental level in the area of international scientific cooperation and international standardization. Entering into strategically important contracts and implementing activities on their basis (for example, within the SNP framework).	ECE, FCS, MINISTRY OF FOREIGN AFFAIRS OF THE RUSSIAN FEDERATION.
3. Innovations.	Shift to providing public services in electronic form, applying the one-step office system. Applying mathematical and statistical methods in assessing the success of the implementation and	RF FCS, RF Administration

	operation of the BP in the customs authorities at all 4 levels.	
4. Integration.	To create the EEC goods flow movement traceability system. Unification of tax policies in the EEC countries (in particular, achieving mutual understanding with Kazakhstan).	ECE, tax administrations of the EEC member States.
5. Economics.	Identification of goods flows directions priority within the framework of: - sanctions policy; -import substitution; -SNP; -digital economy; -developing domestic market.	RF FCS, Ministry of Finance, RF Administration
6. Social parameters.	Formation of public servants' personal responsibility for performing their duties, the vision of the business process as a whole.	RF FCS, RCD, customs sites
7. Infrastructure.	Expanding territories related to Federal property to accommodate officials, as well as to ensure customs authorities' law enforcement activities through new construction or acquisition of new areas.	RF FCS
8. Human resources.	Update the list of positions of the Federal public civil service whereon the customs authorities' rotation of employees is provided. Make changes to the order of FCS of Russia of November 14, 2012 № 2315. To increase the efficiency of anti-corruption units, detection and suppression of corruption-related crimes on the customs officials.	RF FCS
9. Info.	Implement data mining software products into the risk management process. UAIS Between/among employees.	RF FCS
10. Know-how.	Implement automatic registration of E-declarations for goods. Shift goods declaring to the centers of E-Declaration at customs sites. Automate the process of customs control after the release of goods. To ensure automation of risk identification processes at the level of at least 90%, to improve the RMS work. Shift to E- document management in the administration of customs and other payments.	RF FCS, Technical support services on 4 levels of customs authorities

In conclusion, this is to note that the developing the RF Strategy of the customs service until 2020 includes the following target areas for the implementation of the service-oriented administration Concept: improvement of customs regulation, improvement of the system of public services, improvement of customs infrastructure, improvement of information and technical support, strengthening human resources and strengthening anti-corruption activities and improvement of organizational and management activities. In this article, the following stages of improving the customs system in the framework of lean production were considered: forming a holistic view of the optimized system of customs authorities, establishing

standardized indicators and achievement thereof, promoting changes on all levels of the customs system, the incessant work to achieve a previously defined result. Carrying out these activities will make it possible to reduce the cost and time costs of customs services, improve the information automation of the system and improve customs administration by optimizing the administrative procedures and management structure of customs authorities.

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