

LEAN IN HEALTHCARE

Management concept for the
transformation of health systems in
conditions of crisis

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Foreword

During more than ten years, I had the opportunity to face healthcare processes. In 2003, in cooperation with the Ministry of Science and Technology and the Medical Faculty in Niš, I organized and recorded process at the Clinical Center in Niš using the SIPOC diagram without compensation. At that time, we formed teams of professors and doctors improve the process at the General Surgery Clinic, the Neurosurgery Clinic, the Orthopedic Clinic and the Urology Clinic. At these clinics, process maps processed and procedures described in Process Manuals. Over 50 professors, doctors, and nurses have been trained at the Medical Faculty in Niš to use computers.

By the recorded processes and the observed scattering, the teams made suggestions for improving the process. Improved process have documented. This information has become the basis for information support for these process to reduce the work-in-process and the time it takes for the administrative processing of the patient. In the considered case, this achieved by the fact that, based on the map of the service delivery process. The OPISys™ software was developed - which enabled a significant reduction in the time required, as well as preventing the possibility of occurrence of an error in the entry of patient data, diagnosis, therapy, and other.

The new opportunity emerged ten years after the first attempt by the author to initiate changes to improve the process at the Clinical Center Nis. In early 2012. At that time, Prof. Dr. Borislav Kamenov, a person who understood more than the fact that the processes of providing nursing care were outdated and that they were the main reason for offering insufficiently excellent health services, was appointed as Acting Director General of the Clinical Center Niš.

In agreement and with the approval of Prof. Dr. Borislav Kamenova at the beginning of January 2012, the implementation of the Lean project 01-2012 on the topic: "Improving process of care of newborn babies" care at the Clinical Center Nis" started. The project was implemented without compensation and included three clinics: the Clinic for Gynecology and Obstetrics - where babies are born, the Clinic for Children's Internal Diseases and the Clinic for Children's Surgery and Orthopedics - where newborn babies treated if this cannot achieve at the Clinic for gynecology and obstetrics.

Presentation of results on Lean project 01-2012 was done on 12 May 2012 Year for directors and deputy directors of all clinics at the Clinical Center Nis. After this presentation, several other directors came forward who expressed their wish to start implementing their project improvement process in their clinics using Lean's management concept. In agreement with prof.Dr. Borislav Kamenov and prof.Dr. Vidosav Djordjevic in June 2012, the implementation of Lean project 02-2012 titled: "Improving the process of clinical-biochemical laboratory diagnostics" started.

In addition to the two Lean projects in the book, the realization of the project "Lean Six Sigma Sample Analysis Process in a Microbiology Laboratory" is also briefly presented. This project implemented at KBC Dragiša Mišević in Belgrade. The obtained results showed that there are significant opportunities for improvement when applying the Lean and Six Sigma concept.

Acknowledgments

I owe great gratitude to professors, doctors and medical staff who, with total enthusiasm, took part in the realization of the mentioned Lean project. I mainly want to thank Prof. Dr. Boris Kamenov, Director General of the Clinical Center Nis at the time of project realization, on understanding, dedication, and support during the achievement of the projects.

Prof.dr Ljiljana Šarenac, a renowned scientist in international pediatric circles, was the leader of the Lean project team "Improving the process of care of newborn babies" care at the Clinical Center Nis." By understanding her importance of applying the Lean concept, as well as unselfish engagement, contributed Teams accept and actively participate in the realization of the project.

I thank Prof. Dr. Anđelka Slavković, a renowned scientist in international circles in the field of children's surgery and orthopedics. She was one of the leaders in the Lean project implementation team, and which made an unremitting contribution to the recording of the condition and in support of the application of Lean tools to improve the process. I also thank the members of the team at the Lean project that, through their engagement and dedication, helped to implement the Lean project successfully, but also to expand the idea of applying Lean in health to other clinics.

I also thank the doctors from the Clinic for Gynecology and Obstetrics, led by Dr. Ivan Stojkovic Eferica, who contributed to the identification of wastes in the process and in proposing and applying the Lean tool to reduce or eliminate these wastes.

On this occasion, I would like to thank the team members at the Lean project that, with their engagement and dedication, made a significant contribution to successfully implementing the Lean project, but also to expand the idea of applying Lean in health to other clinics.

In addition to the team for the implementation of the Lean project, 3 teams from each clinic for the realization of the 5S Kaizen event. On this occasion, I express my gratitude to the doctors and nurses who participated in these teams and who contributed to the implementation of 5S and to expand the Kaizen approach at the Clinical Center Niš.

Prof. Dr. Vidosava Djordjevic deserves the enormous credit for the realization of the project "Improving the process of clinical-biochemical laboratory diagnostics." She understood the importance of applying the Lean concept and encouraged her associates to contribute to their maximum contribution through their active involvement in the project implementation.

I take the opportunity to thank all the members of the team who worked on the realization of this Lean project and who made an unremitting contribution to achieve visible results. In particular, I would like to emphasize the engagement of Dr. Vladimir Ćosić, Deputy Prof. Dr. Vidosava Đorđević.

I thank my associate Srđan Mladenović for collecting data from the process and recording all the spaghetti diagrams that helped me to suggest solutions that contributed to reducing wastage and improving the process.

1. Introduction

On November 14, 2000, I held a two-day seminar at the then Chamber of Commerce of Yugoslavia on Six Sigma quality in production organizations - the first day and Six Sigma quality in service organizations - on the second day. The hall on the second floor of the Chamber of Commerce in Terazije was full - over 130 listeners.

Participants of the seminars were with incredible attention following the presentation of the Six Sigma management concept - a concept that has been applied globally since 1987 when it was invented and brought into use by Motorola experts. The topic was fascinated by the participants, who until then only listened to ISO 9001: 1994, or ISO 14001: 1996, which was a hit in the former Yugoslavia. Unlike the ISO 9001 standard, experts were able to see that there are new concepts that are not much burdensome with documentation; instead, they turn to applying methods and quality tools to reduce variations in processes and to achieve a level of quality of 6σ , or 3.4 errors on million chance of failure. While ISO 9001 focuses on the formal fulfillment of standard requirements, the Six Sigma concept has taken care of how the company can become more competitive, reduce or eliminate the occurrence of errors, as well as variations in processes that "negatively" affect the quality of the product or service.

I was pleased to hold two-day seminars in 2011 for the top managers of STADA Hemofarm on the subject: Lean Six Sigma - a review for senior managers. The managers of this company from the territory of the former Yugoslavia were very active during the seminar and were followed closely by the exhibitions. One of the reasons why the management of Stada Hemofarm has decided that more than 40 managers are listening to two-day seminars (twice as many as 20 participants) is that Stada at the level of the central office has decided to introduce the Lean Six Sigma concept.

The main obstacle to the implementation of Lean and Six Sigma concepts in production and service organizations in Serbia was, and I think that today, there is insufficient information from top managers on new management concepts, such as Lean and Six Sigma. Deming has long ago said: "You cannot use old methods to solve new problems." New approaches and the use of quality tools

are needed to solve problems in times of economic crisis and exposure to a wiped out competition.

Leading hospitals and healthcare institutions in the world have realized that the concept used by Toyota, known as the Toyota Production System - TPS, can also be applied in healthcare processes. Since the mid-1990s, some hospitals have begun implementing the Lean concept to reduce waste and simplify their process. Lean gave excellent results, and the story quickly spread to all parts of the world. Today, almost all well-known healthcare institutions in the world have some of the Lean concept elements or are preparing to begin implementing this concept.

1.1 Why apply Lean to the Ministry of Health?

The focus of the Ministry of Health should be to provide value for the patient and society. The improvement achieve if health institutions:

- Support their primary goal to create and maintain an unwavering focus on the patient,
- Improve the quality of healthcare and the safety of patients and staff,
- Increase the efficiency of their processes,
- Increase patient satisfaction by providing better care, no mistakes, every time,
- Raise the morale of employees and
- Increase productivity while reducing costs.

Looking for a way to "make a visible" idea about the introduction of the Lean concept in healthcare institutions in Serbia, I proposed at the beginning of January 2012 to prof. Dr. Borislav Kamenov, the director of the Clinical Center Nis, to take, without compensation, the Lean project to improve some of the process providing nursing care at the Clinical Center Nis. He immediately understood my suggestion and suggested that it be a Lean project "Improving the Process of Nursing Baby Care." This process has been selected, among other things, because 2012 was declared a year of the baby, and the mortality of newborn babies also determines the quality level of a clinical center.

Three clinics selected for the implementation of the Lean Project: 1. Clinic for gynecology and obstetrics (KGA) - where babies are born; 1. Clinic for Children's Internal Diseases (KDIB); (where newborn babies treated if no further treatment is possible on KGA) and 3. Clinic for children's surgery and

orthopedics (KGHO); (where the infant babies also treated if no further treatment is possible on KGA). The clinics mentioned above were named team members. , so a multidisciplinary team was created that knows all the processes and activities from the birth of a newborn baby to the exit from the hospital. What treated me, in particular, was that the team included KDIB and KDHO clinics, doctors with all three clinics, as well as nurses from these clinics. Thus, a multidisciplinary team created that knows all the processes and activities from the birth of a newborn baby to the exit from the hospital. What treated me, in particular, was that the team included KDIB and KDHO clinics, doctors with all three clinics, as well as nurses from these clinics (Stoiljković, 2013).

The team recorded the processes in all three clinics using the SIPOC diagram and linked all the flows that the newborn babies move and information through these three clinics. After the process recorded, team members who passed "just in time" training on Lean concepts identified eight major wastes in their processes. For the first time they "saw" that there are tremendous opportunities for improvement. Two Lean tools were first used to reduce the identified wastes: 5S and Standard Work. For the application of these tools, the core team has appointed each of the three clinics team members for 5S Kaizen event and Standard work Kaizen event. Thus, the number of people who took part in improving the process increased from the initial team of 12 members, with six other teams with 5 to 7 members. At the Lean project, there were about 50 doctors and nurses.

Team members accepted participation and work in teams with satisfaction, which exceeded all my expectations. The 5S Kaizen event held from 25-27. April 2012. This event gave visible results so that even those employed, who were not members of the team, who provided passive resistance, saw that it was useful for them, but also for the patients, and asked them to go through the training. That's how it did. At the beginning of May 2012, one-day training organized for three clinics that were not members of the team or were from other departments in those clinics where the Lean project not implemented. In this lecture, they introduced to the basic principles of Lean in healthcare, as well as with the results achieved during the project implementation. Lean contributed to the idea of applying the Lean concept to expanding to other clinics in KCN. In mid-May 2012, a lecture held for directors and their deputies of all KCN clinics.

Following is the text of the lecture call held in May 2012.

Administration of the Clinical Center Niš

Subject: Call for lectures You are invited to attend a conference on the topic:

Realization of Lean project 01/2012 at the Clinical Center Niš

Date: Tuesday 15.05.2012.

Time: 10:00 - 11:30

Venue: Amphitheater of internal clinics

Lecturer: Prof. Dr. Vojislav Stoiljković and Team Members for Process Improvement

Who takes up the lecture: Leadership of the Clinical Center Niš, clinic directors and their deputies, Team members for improving the process of nursing babies' care in KCN, Sponsors and Team Leaders for 5S Kaizen event and Standard work Kaizen event.

12.01.2012. Prof. Dr. Vojislav Stoiljkovic gave a lecture for the management of the Clinical Center Nis, directors and deputy director of the clinic on the topic: Lean Six Sigma in Serbian Health. After the lecture KDIB, KDHO and KGA expressed their wish to implement one Lean project. The director of the Clinical Center Nis decided to implement the Lean project 01/2012 titled: Improving process of care of newborn babies in the Clinical Center Nis.

For the implementation of the Lean project 01/2012, the director of the Clinical Center Niš formed a multidisciplinary team with KDIB, KDHO, and KGA. Prof. Dr. Ljiljana Šaranac appointed as the team leader. Results of this team and six new teams formed for: a) 5S Kaizen event and Standard work Kaizen event will be presented at the lecture.

Topics:

1. Charter at Lean project 01/2012 - Improving process of care of newborn babies in the Clinical Center Niš
2. Recording of the process of care for newborn babies at the Clinical Center Nis and preparation of the Manual on the process
3. Eight biggest wastes identified by team members in the process of nursing babies at the Clinical Center Nis
4. Lean tools to reduce and eliminate identified wastes
5. Implementation of the 5S Kaizen Event at KDIB, KDHO, and KGA

6. Realization Standard work Kaizen event at KDIB, KDHO, and KGA
7. Presentation of results achieved by leaders and Team members for 5S Kaizen event with KDIB, KDHO, and KGA
8. Lessons learned on the implementation of the Lean project 01/2012
9. Gratitude to the people who took part in the 5S Kaizen event and to everyone who contributed to its realization
10. Discussion

In Niš, April 30, 2012

*Director of the Clinical Center Niš
Prof. Dr. Borislav Kamenov*

Managers from all KCN clinics will receive the lecture. Immediately after the conference, the directors of some clinics contacted and asked if a similar project could implement at their clinics. One of the first was Prof.dr Vidosava Djordjevic, head of the Center for Medical Biochemistry. In the framework of the healthcare act, the Center performs clinical-biochemical laboratory diagnostics, both routinely and highly specialized, in all available biological fluids, for the needs of all areas of medicine. The Center analyzes several hundred biochemical markers and annually performs about 2,000,000 different biochemical analyzes.

2.000.000 different biochemical analyzes per year, similar to the production of 2.000.000 cars in a company such as Toyota or some other. It was an ideal opportunity to apply Toyota Production System. There are already a lot of examples of laboratories in the world that successfully used the Lean concept in the biochemical analysis processes and achieved great success in shortening the process time, increasing quality, reducing errors, freeing up space, reducing inventory and generating enormous cash savings.

The decision made. We decided to implement the second Lean 02/2012 project: "Improving the process of clinical-biochemical laboratory diagnostics." Prof. Dr. Borislav Kamenov agreed, and Prof. Dr. Vidosava Djordjevic appointed a multidisciplinary team of staff at the Center for Medical Biochemistry and with clinics using the services of the Center so that the project could start with the realization.

It said beforehand that the reader would have prepared what he could expect from this book, for example:

- Why Lean needs health facilities
- Health on a burning platform
- Explanation fundamental principles of the Lean concept
- Application Lean concept in health care
- Guide to the implementation of the Lean project in health care
- Mapping process flow using the SIPOC diagram
- Mapping the flow of values through the process
- Kaizen event
- Forms and standard documents used for the introduction of Lean Concept

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