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ACHIEVING OPERATIONAL EXCELLENCE IN RETAIL BANKING WITH TAILORED INDUSTRIAL PRODUCTION METHODS

Abstract. The paper focuses on the issue of how bank's operational expenses originate and on new approaches to their reduction by using tailored methods from industrial production. Principal issues of how the banks currently manage operational expenses are raised and their relevance to challenges the banks are facing is considered in this article. The paper provides quick review of methods developed by Toyota Motor Corporation (Toyota Production System) and now used by major industrial production companies to optimize their production processes and reduce expenses and implementation of these methods for retail financial service company is researched. The author studies experience of the leading Eastern European bank in Russian Federation and Ukraine.

Keywords: Bank, Operational Excellence, Reducing Expenses, Lean Production, Lean Six Sigma, TPS, Business Model of a Retail Bank

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Introduction. Nowadays retail (and universal) banks face one of the biggest challenges in a lifetime; their income is more and more dependent on commission income instead of credits. Commission's service level and operational expenses are of vital importance as the bank should process enormous amounts of operations still keeping customers satisfied in order to collect relatively small revenues from each small operation.

Even credits largely depend on service and operational expenses. According to the Gallup survey, the average number of cards owned by all Americans - including those with no credit cards - is 2.6. Among Americans with credit cards, the average number of cards owned is 3.7 [Holmes 2014]. This means the competition is tough and banks should provide exceptional service at competitive price to receive credit income from a credit card as a most common credit product.

In this regard a study on how banks can reduce operational expenses while still keeping and even increasing service level and customer satisfaction simultaneously is of particular importance.

Literature review and the problem statement. The issue of operational excellence combined with maintaining high-quality of service and/or production received considerable attention from many authors, especially those specializing in Lean Production methods as Masaaki Imai [Imai 2012] or Jeffrey Liker [Liker 2004] and Six Sigma methodology as Michael George [George 2003]. While the mentioned authors research operational excellence at industrial production companies such as Toyota or Morotola, during recent years new researches are published by Bohdan Oppenheim [Oppenheim, Felbur 2014], Ade Asefeso [Asefeso 2014] and others, and they are focused specifically on using the mentioned tools and methods in finance organizations and particularly banks.

Such leading consulting companies as PricewaterhouseCoopers also published researches of these issues [PwC 2012] and suggest specific consulting services for the banks.

The paper aims to summarize, describe and demonstrate the real examples how Lean and Six Sigma approaches could help in establishing operational excellence in the retail bank.

Research results. The primary thing a modern bank deals with is information. Of course, banks are about money but money is the information too and the purpose of a bank is to correctly process it, connect customers and provide them with non-material information services. That's why a modern bank is a service company dealing with information. Processing information requires information technology tools and if we agree that information is the primary thing a bank deals with we would not be surprised that measured as a percentage of revenues, financial services companies spent more on IT than any other industry. According to Deutsche Bank's research, in a bank sector IT costs equal 7.3% of their revenues compared to an average of 3.7% across all other industries [Mai 2012]. IT investment stands a top priority for banks according to recent KPMG survey [Yurcan 2013]. Does it mean a bank is really some kind of IT company? Even if so banks don't produce software – they produce services. So one of the key factors in maximizing bank's profitability should be focus on operational expenses connected with providing its services to customers.

For a retail bank typical service provided for each customer is relatively cheap and revenue is generated by mass quantities as in any retail business. So banks should find how to make each of these mass operations cheaper by reducing either fixed or variable costs. The banks are trying to install a Ford's conveyor – they implement complex IT systems to make each single operation cheaper and standardized. But the problem, comparing to real production line, is that bank's conveyor is virtual and much of the waste or excess expense is hidden from management inside datacenters. Banks improve their conveyors by increasing investments to IT. According to Oliver Wyman Group Celent research IT spending across North America, Europe, and Asia-Pacific will grow to USD 196.7 billion in 2015, with an increase of approximately 4.6% over 2014 [Lodge, Zhang, Jegher 2015]. But doesn't this way of growth look extensive?

Of course, banks should invest in their main productive factor but without controlling production expenses on the other side they will one day face the necessity to share bloated costs with the customers motivating them to look for more effective providers of financial services.

Banks are constantly trying to reduce operational expenses, including such approaches as IT outsourcing. From the point of many bank's management IT is not "native business" of the bank so it should be outsourced to the appropriate IT company. The other part of their business banks are trying to outsource is business processes. According to HfS Research, the Banking Financial Services Outsourcing Market in the USA will grow approximately 5.2% annually during the period 2012 – 2017, largely driven by business processes outsourcing services estimated 7% compounded annual growth rate (CAGR) [HfS Research 2013] (fig. 1).

While outsourcing is a common practice now in this case it may result in a fundamental problem – if a bank's business model is based on information and information processing, if primary bank's customer services hardly rely on IT (banks virtual conveyor), than how the bank can control service quality and cost if it doesn't control its own conveyor. Is a bank just a reseller or a real producer

of its services? While the answer to this question could be controversial the services are still produced either inside the bank or inside a company to which they are outsourced. So, outsourcing can really clear the balance but can't really reduce expenses. To control operational expenses banks still need some additional methods and tools.

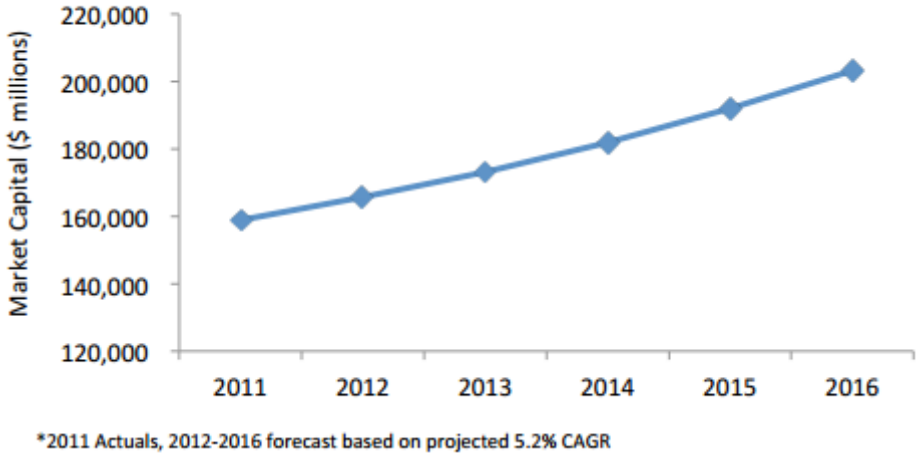

Figure 1 – BFS IT and business services outsourcing market
Source: HfS Research, 2013 market sizing data [HfS Research 2013]

As IT in banks is their conveyor some of them appealed to experience of the industrial production, the world from which the conveyor originally came from.

While conveyor was invented by Henry Ford most comprehensive set of tools on optimizing conveyor production was developed by Taiichi Ohno from Toyota, the inventor of the Toyota Production System also known as Lean Production. In his works "Toyota Production System: Beyond Large-Scale Production" and "Workplace Management" [Ohno 1988] Taiichi Ohno described main tools and principles used by Toyota Motor Company to achieve operational excellence and become leader in cost-effective production. Toyota's success was so convincing that many other leading manufacturing companies also implemented Lean Production. It was also highly popularized by such well-known industrial production experts as Dr. Jeffrey Liker, who brilliantly described Toyota experience in his book "The Toyota Way: 14 Management Principles from the World's Greatest Manufacturer" [Liker 2004].

While Lean Production started at automobile industry it than spread to other industries proving to be quite universal approach.

Main components of Lean Manufacturing and their interconnection are demonstrated on fig. 2.

The foundation of Lean Manufacturing system is the stability which lies in standardized methods and approaches. The base of the system, on which it's built, is Kaizen approach to production (continuous improvement practice) and 5S (sort, systematic arrangement, shine, standardize, sustain: organize a work space / workprocess for efficiency and effectiveness). The two pillars are JIT (just in time) and Jidoka (act on abnormality) based on Heijunka (smoothing and sequencine of production) and Standard working (reducing variability in processes and absorbing demand fluctuations). Finally, the roof consists of the

Lean Production results: reduced delivery times and costs together with improved quality.

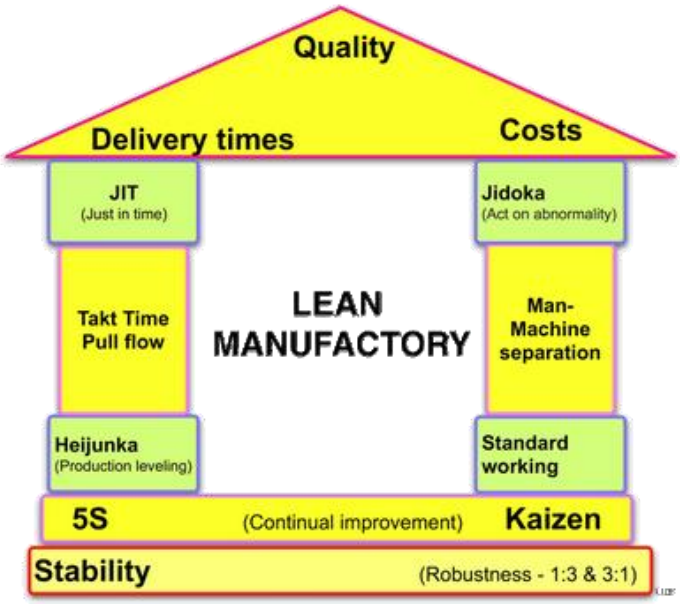

Figure 2 – Lean Manufactory House
Source: Visualization by Laurens van Lieshout [Lieshout 2006]

Just in time approach is one of the fundamentals which sets the idea that each production resource or result should arrive to the conveyor and leave it Just in time in order to eliminate possible loss connected with overproduction and storage expenses. Toyota developed a set of very simple tools that regulated production process and flow of materials/production in order to make Just in time possible. Later those tools were implemented by other industries. For example, Dell Computer eliminated warehouse delivering ordered computers to end-customers just from the assembly factory – the resulting economy allowed Dell to propose customers best prices.

The idea of Jidoka can be described with simple principle "don't hide problems, fix them as quickly as possible". Jidoka tools like poka-yoke are purposed to eliminate product defects by preventing, correcting and gaining attention to errors and defects if they occur. The main idea lies in Man-Machine separation or autonomation best described as "automation with a human touch". This is the type of automation that stops a machine if some abnormal situation occurs, it can even stop the whole production line if a small defect is detected. This approach is aimed to immediately detect abnormality and gain attention by stopping production – the result is fixing and investigating the root that caused the problem instead of hiding it and further producing defective products. What's interesting, overproduction is often also considered as defect as it finally results in losses.

Lean Production tools are targeted to fight Muda (losses) which are generally split into 7 areas:

- Muda caused by unnecessary stock
- Muda caused by defects/rejects
- Muda caused by unnecessary movement
- Muda caused by inappropriate processing
- Muda caused by waiting

- Muda caused by transport
- Muda caused by overproduction.

Lean Production pillars like JIT or Jidoka directly eliminate Muda. If materials arrive in the shortest way (no transport loss and no unnecessary movement) right when they are necessary (no waiting loss) and then delivered to the client/next stage (no stock loss) Just in Time is in action. Eliminating problems during processing (no inappropriate processing loss), reducing defects (no defects loss) and producing the exact needed amounts of the production (no overproduction loss) means Jidoka is implemented. The resulting financial gain from eliminating Muda can be overwhelming.

Lean Management is a systematic approach, to use the described tools properly generally requires management to perform value stream mapping – the process of visualizing the entire production process from the very beginner to the customer for further analysis and optimization. The idea behind value stream is that almost any production process can be considered as "value creation" and during visualization all production steps are separated and each is evaluated with the question "does it process value or is it at least mandatory due to some standards and/or regulations". Toyota calls this tool "material and information flow mapping" stressing that information flow is also part of the production process. Quite often, in large processes, no single person is in charge of all details and "has a full picture". In such case unnecessary activities resulting in substantial losses are hidden inside the process but they can be found after all process are visualized and analyzed in the whole. That's why Lean Production is Lean in the meaning of "thin" or the one that has no unnecessary unproductive fat.

Another significant step in optimizing industrial productivity was Six Sigma methodology. While Lean Production uses relatively simple "common sense" tools that fit production of almost any size, Six Sigma relies more on mathematics and statistics and is more suited for large enterprises.

Six Sigma methodology is data-driven aimed to eliminate defects in a process by achieving stable and predictable process results, in other words by reducing or even eliminating process variation. Defects originate from process variability when the process that generally produces acceptable product sometimes leaves predefined scope and the product is unacceptable. For example, if a product should pass a quality test and should be produced in 10 days than any product produced in 2, 3 or 7 days and still passing the quality test is acceptable. But variability sometimes causes products to be produced longer or fail the quality standards – that's the defect. The described defect comes from process instability. Six Sigma methodology describes how to analyze and rebuild processes in order to achieve the desired stability in the process and finally minimize defects. Six Sigma heavily relies on mathematical and statistical tools to measure the process and find causes of instability. For large processes with millions of products just our insight is definitely not enough to always correctly identify where a defect originates, why the process is unstable, what are the reasons of loss – here comes strong statistical methodology supported by modern analytical software. So processes improved with Six Sigma can be measured, analyzed and controlled.

But what quality level can be theoretically achieved with Six Sigma? The sigma rating indicates the percentage of defect-free products. Possible sigma ratings are presented in tabl. 1.

Table 1 – Sigma levels short description

Sigma level	Defects per million	Percent defective	Percentage yield
1	691 462	69%	31%
2	308 538	31%	69%
3	66 807	6.7%	93.3%
4	6 210	0.62%	99.38%
5	233	0.023%	99.977%
6	3.4	0.00034%	99.99966%
7	0.019	0.0000019%	99.9999981%

Source: compiled by the author based on own calculations

For most real-world processed high sigma ratings can't be reached and serve only as a theoretical goal, constant improvement could produce unbelievable results. For example, according to US National Transportation Safety Board [National Transportation Safety Board 2015] the number of aircraft incidents for large aircrafts (cargo and passenger with 10 or more seats) in 2014 was 28 for 17,599 million hours flown. That's 1,59 defects per million – better than Six Sigma. The same year no passenger was killed or injured when transported by a large aircraft and from 1995 the number of killed or injured passengers is 1209, which may seem quite large number, but comparing to 13 858 million total passenger enplanements for that period the number of "defects" per million is only 0,087 – still not Seven Sigma but better than Six Sigma.

Lean Production and Six Sigma are different approaches to process improvement but they do not exclude each other, each of them can be effectively used at the same enterprise for appropriate cases. It resulted in the so-called Lean Six Sigma approach combining "the best from two worlds". Lean Six Sigma is thoroughly studied and described by many authors and among them Michael George, the author of the best-selling "Lean Six Sigma for Service: How to Use Lean Speed and Six Sigma Quality to Improve Services and Transactions" [George 2003].

So, how can such approaches as Lean Six Sigma be used in a bank? Is it possible to gain positive effect from tools and methodologies originated at real production plants with metal and ore if we put them to the financial institution dealing primary with information and where primary real medium is paper or a computer infrastructure. Many authors answered "Yes" and proposed their argumentation. Among them there are Bohdan Oppenheim and Marek Felbur with their best-selling book "Lean for Banks: Improving Quality, Productivity, and Morale in Financial Offices" [Oppenheim, Felbur 2014] or Ade Asefeso who wrote "Lean Banking" [Asefeso 2014]. Some authors propose such summarization of Lean into 10 rules [TechTarget 2009]:

1. Eliminate waste
2. Minimize inventory
3. Maximize flow
4. Pull production from customer demand
5. Meet customer requirements
6. Do it right the first time
7. Empower workers
8. Design for rapid changeover
9. Partner with suppliers
10. Create a culture of continuous improvement (Kaizen).

Most or even all of the mentioned is also important for the bank and its processes:

- Bank also generates large amounts of waste and uses extra inventory if we understand unnecessary information and movements, unnecessary processing and equipment as waste as they really are
- Maximizing the flow in production means processing more products at some period of time, bank also benefits from maximizing its flow as expensive systems and personnel should not stay idle and branches/ATM's should generate as much operations (income) as possible
- Meeting customer demands and delivering the product Just in time is even more important for the bank as a service organization. Banks generate very similar services and competition between them is even higher than in other industries
- Bank needs corporate culture and inspired well-trained personnel even more than other industries as much of the service still comes from personal contact and trust between a customer and his manager
- Bank should be ready to change rapidly and continuously improve as financial markets change rapidly and new technologies make vital for the bank to adapt or die.

On the previous pages much time is devoted to production companies that may seem not very appropriate for the article about banks, but after studying how production companies improve their production processes it is clear – such tools can be used by banks as they face the same problems. Even more, information flows the banks deal with could benefit from Lean Six Sigma even more as they can be redesigned much easier than real steel conveyor, statistics can be gathered and analyzed much faster and cheaper and finally customer satisfaction often plays a greater role.

Chris Nichols, Chief Strategy Officer at CenterState Bank Central (FL, USA), wrote an excellent article about how such typical and important for any bank process as loan processing could benefit from Lean Six Sigma [Nichols 2014]. As the author notes chances are very good that after analyzing loan processing at your bank you will see a wide dispersion in the time it takes to process each loan. If so, than processing time is unpredictable and possibly below competitors. As the famous risk practitioner Gordon Graham said, "If it is predictable, it is preventable." The idea of applying Lean Six Sigma to such process is to study each delay, review all the process, find Muda's and rebuild the process. Chris Nichols notes that on average Lean Six Sigma banks have found that 30% of their collected loan information results in no actionable decisions, that is nothing but the direct loss. After eliminating Muda and rebuilding the process, restructuring how and what information is collected, analyzed and presented, rethinking the forms each customer fills, a bank can save about 35% in processing time.

GoLeanSixSigma [GoLeanSixSigma 2015] provides an impressive list of banks and other financial providers who successfully implemented Lean Six Sigma: AXA (France), Bank of America (USA), Bank of Montreal (Canada), Capital One (USA), CenterState Bank Central (USA), HSBC Holdings (USA) and others. Some banks report more than 100% result in net income after several years of continuous implementation of Lean Six Sigma.

In recent years, of particular interest is the experience of Sberbank (Savings Bank of Russian Federation). Since 2009 Sberbank implements an ambitious program called Sberbank Production System – an adapted version of

the Toyota Production System. By tailoring well-known industrial Lean and Sixth Sigma approaches to the banking sphere Sberbank has achieved really stunning results. The story of how Sberbank has done it deserves to be told.

Sberbank adapted Just in Time to its needs by implementing flexible schedules of branch personnel in order to maximize the number of cashiers and tellers during high load time, it allowed to serve more customers and almost eliminate enormous queues, notorious for Sberbank. More customers served meant more operational income. The next step was rethinking processes using value stream mapping to remove unnecessary steps and eliminate waiting, the latter allowed documents to travel faster through the bank.

Sberbank eliminated much of Muda caused by unnecessary movement of personnel and transportation with paper-docs by implementing electronic document workflow. It also allowed parallel agreement of documents and eliminated waiting Muda.

The massive branch redesign program was implemented to eliminate 3 Muda's at once:

- Rearranging client space allowed to minimize unnecessary movement of clients from one employee to another and employees from their working spaces to paper lockers and printers
- Reviewing and standardizing how much paper and stationery each branch needed for a period of time reduced unnecessary stock
- Removing tables where customers filled forms and transferring that task to bank employees dramatically reduced the number of mistakes that resulted in defects and rejects or even further inappropriate processing

While the bank generally doesn't suffer from overproduction, Sberbank considered extra personnel as some type of overproduction. After calculation of time necessary for a typical operation and multiplying on number of operations real optimization of branch and back-office personnel became possible.

After first effect gained with simple Lean Kaizen improvements more complex projects with Six Sigma arised. Centralization of support functions and standardization reduced variation, for example unification of user access rights to computer systems allowed a new employee to start working from the first day instead of waiting up to several days till all necessary access rights to various systems are granted by manual request after review by several controllers. Standard processing times for documents and operations also revealed problems and enabled solving them.

Sberbank also implemented ideology "Complaint is a gift" that encouraged customers to provide feedback. From the Lean point of view it is Jidoka that helps to reveal problems immediately, from Six Sigma point of view it is continuous flow of statistical information necessary to analyze processes and find causes of imperfection.

Sberbank reports [Sberbank 2015] that after 5 years of Sberbank Production System implementation the bank's key areas increased their productivity by 30-50%, labor productivity increased by about 50% and queues almost disappeared. To enable more than 150 000 employees to receive special training basic Lean Six Sigma elements were included to mass training programs, and initial training was provided to all new employees. From the financial point Sberbank Annual Report of 2011 [Sberbank 2015] states that economical effect from this program amounted about USD 930 million for the period 2009 – 2011.

Ukrainian subsidiary Sberbank also demonstrated astonishing results. While Sberbank of Russia already controlled largest share of the market and was

focused on income Ukrainian subsidiary started from a small bank and used Lean Six Sigma not only to increase financial output but also to grow faster than its competitors. Comparison of Ukrainian Sberbank growth with the overall Ukrainian market is shown in tabl. 2.

Table 2 – Comparison of Ukrainian Sberbank growth with the Ukrainian banking market

Year	Market share of total assets of Ukrainian banks	Assets growth: Sberbank / Average market	Rank by assets among other Ukrainian banks
2009	0,71% (+0,19%)	+28% / -6%	30
2010	1,05% (+0,34%)	+60% / +8%	23
2011	1,61% (+0,56%)	+71% / +12%	17
2012	2,40% (+0,79%)	+60% / 7%	11
2013	2,75% (+0,35%)	+30% / +13%	8
2014	3,55% (+0,80%)	+33% / +3%	8

Source: compiled by the author based on National Bank of Ukraine data [National Bank of Ukraine 2015]

Since 2009 the number of branches of Ukrainian Sberbank has increased 4,4 times from 43 to 186 when the number of customers increased 250 times from 4 thousands to about 1 million. These figures convincingly demonstrate not only how Lean Six Sigma helped the bank to grow but also how it increased its productivity allowing each branch to serve about 50 times more customers.

Conclusions. Thus, operational excellence can be achieved in retail banking by using industrial production methods. This thesis is proved by experience of many banks and their notable results. By achieving operational excellence banks not only increase profits but become capable of serving customers better, decreasing commissions while maintaining the same or even increased profit from each operation.

While this area is relatively new for banks and comparing to industrial production banks are new users of Lean Six Sigma much can be improved in the methodology and further tailoring of the industry proven tools is necessary. More banks should be involved in operational excellence programs and their management should receive more information and education on this subject.

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