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Process Reengineering in an Online Gambling Organization: An action research application in a Portuguese company

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BUSINESS SCHOOL

Department of Marketing, Strategy and Operations

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Resumo

A indústria de apostas online tem assistido a um crescimento exponencial nesta última década, o que tem suscitado um aumento de conteúdo académico sobre as temáticas desta indústria. Este desenvolvimento é explicado devido ao crescimento contínuo das tecnologias de informação que têm drasticamente modificado os hábitos comportamentais, promovendo o acesso às redes sociais, jogos e apostas online. Esta nova tendência tem impulsionado mudanças contínuas nos regulamentos legais que envolvem esta indústria, o que requer agilidade das empresas em se adaptarem a constantes mudanças na sua realidade e ainda assim se manterem competitivas.

A reengenharia de processos compreende as principais metodologias e ferramentas para sustentar esta capacidade de adaptação das empresas no longo prazo, promovendo uma cultura de melhoria contínua. *Lean* desempenha um papel principal, suportando a implementação de melhores práticas nos processos, capacitando as empresas de agilidade na adaptação à mudança.

O objetivo deste caso de estudo passa por ligar estes dois universos e assim perceber como uma empresa de apostas online pode redesenhar os seus processos com o objetivo de atingir a excelência operacional e melhoria contínua. Para atingir esse objetivo, este trabalho contém um suporte científico nos temas de reengenharia de processos, *lean* e melhoria contínua a serem considerados nas fases da metodologia que vão conduzir o caso de estudo.

Este caso de estudo permite um conhecimento extensivo nas metodologias anteriormente mencionadas e como podem impactar positivamente uma indústria com características singulares como a indústria de apostas online.

Palavras-chave: Apostas online; Reengenharia de processos; *Lean*; Melhoria contínua.

Sistema de Classificação JEL: Organizações Industriais: Estudos na Indústria: Apostas (L83); Mudança Tecnológica: Inovação: Mudança Tecnológica (O33)

Abstract

Online Gambling industry is exponentially growing in this decade and it is facing a significant attention in the literature. This development can be explained by the continuous Information Technologies progress that has been changing people behaviors, promoting new access to social media, gaming and also online gambling. This new trend has been facing constant changes in legal regulations that require an unique agility from organizations to adapt to these new requirements and still remain competitive.

Process reengineering unveils the main methodologies and tools to sustain this tenacity to adapt in long-term perspective, by promoting a continuous improvement culture. Lean, as a major player in these methodologies, supports this agility, by implementing processes best practices to thrive this change and achieve competitive advantage.

This research objective is to comprehend how these two universes can be connected to reveal how an online gambling organization can redefine its processes to achieve operational excellence and continuous improvement.

This research provides a deep understanding how these methodologies previously mentioned can impact positively distinctive industries as online gambling.

Keywords: Online gambling; Process reengineering; Lean, Continuous improvement.

JEL Classification System: Industrial Organization: Services: Gambling (L83); Technological change: Innovation: Technological Change

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List of Abbreviations

BPR – Business Process Reengineering

VSM – Value Stream Mapping

KPI – Key Performance Indicator

SLA – Service Level Agreement

PDCA – Plan Do Check Act

SRIJ – *Serviço de Regulação de Jogo Online*

1. Introduction

1.1. Introduction

In this first chapter, the theme presents the main challenges that organizations are currently facing in order to align and redefine business processes to pursuit their strategic objectives. That resumes the main reason to work on this action research. The combination of each identified objective translates into the answer to the defined research question. Additionally, the methodology and scope clarify how and what this action research has been approaching. The structure aims to guide the readers through the research.

1.2. Theme

Increasing globalization has triggered supply chains to become larger, more complex, and consequently, more susceptible to disruptions (Shashi *et al*., 2019).

One of the major challenges that organizations are facing today is to ensure alignment of their architecture and governance model in the pursuit of the strategic plan and objectives, in order to achieve the business and organizational development (Ojha *et al*., 2019).

Without the holistic and integrative vision of the business, organizations operate casuistically on their challenges, being managed by chaos. However, the definition of architecture and governance models, as well as their standardization, allows organizations, through performance indicators, to align their actions with their vision, objectives and strategy (Scott *et al*., 2019).

The definition of business processes are an essential insight to understand how the various components are interconnected and which components and capabilities are critical to the business (Brinch, 2018).

The initial literature on business processes describes it as a succession of interconnected activities crossing functional margins with inputs and outputs (Armistead & Machin, 1997) . In fact, the meaning reflects the basic idea behind a business process, still there could be added that business process management studies, designs, develops and performs business processes in order to achieve the daily operation routine while also ensures control and continuous improvement to achieve optimal results and operational excellence (Morais *et al*., 2014). Continuous improvement or the Japanese concept *Kaizen* is a process-oriented approach that aims to apply improvements on the existing processes, focusing on *quick-wins*, short-term waste reductions (Singh & Singh, 2015).

Process Reengineering implements these improvements by exploring the customer value perspective, industry legal requirements and internal success factors to redesign processes in order to gain significant improvements in cost, quality, and service. (Pattanayak & Roy, 2015).

The online gambling industry is growing on a daily basis, justified in the Marketline Industry Profile (2019, p.2) report by the "*increased availability of online gambling due to internet access, the growing affordability of apps and smartphones, and online gambling's legalization in some regions have all helped contribute to the industry's growth in recent years*".

This action research provides the main methodologies and concepts of Process Reengineering, Lean and Continuous Improvement in this distinctive risen industry that is heavily conditioned by law and compliance processes that require a continuous adaptation to the internet technology that is moving faster than the regulating laws, protecting consumers data, compulsive gambling exacerbated and securities issues such as money laundering. (Laffey *et al*., 2016).

The action research presents an opportunity to explore how process reengineering can be adopted into this industry, along with the main impacts and benefits, since the literature is missing the additional value these subjects carry.

1.3. Research Question

Considering the theme presented, the research question that suits to this case is: "*How can an online gambling organization redefine its processes aligned with the industry restrictions and compliance requirements to achieve operational excellence and continuous improvement?*"

1.4. Objectives

The main reason that led to this project origin was the Apostar&Ganhar organization intention to increase efficiency, reduce costs and ensure compliance that could allow to offer a faster, safer and more efficient service to customers. Therefore, to pursuit the main objective previously mentioned, the following specific objectives were acknowledged:

- Map four core processes selected in project committee according to Apostar&Ganhar organization strategic objectives;
- Address the To Be process sustained by Lean and Continuous Improvement methodologies;
- Create work instructions to standardize procedures, so the organization can reach an optimal level of flexibility;

- Introduce KPIs to every single process identified in order to measure the TO BE impacts in the process, these KPIs also allow to keep pursuing the best outcomes of the process;
- Quick-Wins and tools to be implemented on a short-term period, so the KPIs can be followed on a period basis.

1.5. Methodology

This work is considered an action research since the emphasis is on what have been done in this work, the output and results presented to a real organization facing currently globally challenges (Avison et al., 1999).

To best match the main objective proposed, the current project could be conducted in five consecutive steps:

- Map As Is processes: Explores how the process has been executed;
- Gap Analysis: Identifies where are the main *pain points* and bottlenecks;
- To Be Model definition: Presents improvements to the process;
- Process Implementation: Introduces the previous improvements and the respective KPIs to measure benefits;
- Continuous Improvement & Lessons Learn: Examine the primary outcomes and purpose roadmap initiatives to sustain the continuous improvement culture.

1.6. Scope

The project will take place in Apostar&Ganhar organization headquarters, on a daily basis. Considering what has been said, the main objective is to build a strong, solid and sustainable house so Apostar&Ganhar can have all the tools to thrive in a medium-long term. According to this objective, the scope has been decided in a project committee and was divided in four central processes:

- Deposits Incident Management;
- Cash Withdrawal;
- Self-Exclusion Revoke report elaboration;
- Report of the accounts that have been suspended, cancelled or inactive elaboration.

1.7. Structure

The project is divided into five different chapters, related to each project stage:

Chapter 1: Project introduction, followed by the overall approach about the thematic involved, the research question and its specific objectives. It ends with scope and methodology explanation.

Chapter 2: Scientific Chapter, which is where the literature review sustains the subjects involved in this project.

Chapter 3: Provides an insight visualization of the project methodology, to conduct and guide through the project documentation.

Chapter 4: Apostar&Ganhar characterization and project presentation. It ends with the recommendations.

Chapter 5: Discussion, considering the main action research outputs related to what have been proposed in the chapter 1 as objective and connect to the previous researches in these subjects' fields.

Chapter 6: Formal conclusion that presents future initiatives recommendations and highlights the main benefits of process reengineering in startup organizations.

2. Literature Review

A chapter that provides a collection of theoretical methodologies, frameworks and philosophies to further sustain and develop the project subjects. Process reengineering topic is highlighted, since it is the main scope underlying this project and which has been challenged by the Apostar&Ganhar. It will be followed by the two main concepts that together can provide the optimal outcomes to a successful process reengineering. It closes with an industry explanation in order to understand the main constraints and complexity that entail these subject's implementation in this distinctive industry.

2.1. Business Process Reengineering

This subchapter presents the literature references to detail the process reengineering meaning and what are the main tools and methodologies that can be applied in daily operations.

2.1.1. Concept

In this new scenario where organizations have to suit their value proposition to a uncertainty environmental change, where the procurement is forcing new products and new services, the agile concept is acknowledged as a cross-functional skill inherent in the organizations that will thrive through success by continuously adapting their business systems across the years (Lichtenthaler, 2020).

Business systems are sustained by processes. Processes are the interactions of activities to achieve an output. That said, processes can be seemed as a path to reach a certain destiny, the path should be clear and adapted to business objectives or should be replaced or redesigned to fulfill its purpose (Bhaskar, 2018). According to (Eze et al., 2019) Business Processes Reengineering is an experienced and incremental process resulting in new forms of performing business that provides ground for a firm to succeed.

Process Reengineering is a growing management tool (Goksoy *et al*., 2012) that wishes to optimize the value output by redesigning processes in a cost-benefit perspective. The new technology adoption is vital to ensure efficiency and effectiveness by automating and eliminating wastes and creating *new ways* of doing things through competitive performance (Roest, 2014).

There are some dissonant discussions regarding business processes reengineering. According to Boje *et al*. (2017, p. 98), the BPR approach "*completely lost*" the objective scientific method that was the main purpose to eradicate obsolete and non-value-added

activities in the Information Technology engineering area, instead migrated to management layer solution based to investigate and eliminate defects, becoming "*another solution in search of a problem with its lack of data-driven process*".

There are several studies considering BPR using data to achieve success in its implementation (Park *et al*., 2017). The most common data driven tool is the KPIs which translates the targets and goals concept for business processes performances. It uses internal and historic information to compare results in BPR implementation projects (Alegre *et al*., 2017).

Omidi & Khoshtinat (2016) also argues that the literature misses a clear and scientific model to implement process reengineering projects in order to achieve the desired solutions proposed to it translating to seventy percent of those projects failing in action.

In this action research it will be tested the BPR methodologies impact in the KPIs available to provide a defensible argument to Sungau & Ndunguru (2015, p.162) that affirmed in his article that "*BPR has no significant direct effect on Operational Cost*".

2.1.2. Methodologies & tools

Considering the action research subjects, it is important to explore the primary tools and methodologies to effectively introduce BPR and to accomplish the positive results expected. According to (Tatic et al., 2018) companies do not have enough knowledge considering the primary methodologies and tools that should devote attention to successfully implement BPR.

AbdEllatif *et al*. (2017) also defend that one of the mains reasons that BPR implementation has a high failure rate is the lack of tools and methodologies to focus not only in the process itself but also in the surrounding environment, and the organization knowledge.

That said, it has been searched successful methodologies, philosophies and tools that can support the action research implementation:

Business Process Modelling Notification

"*In order to manage business processes, they have to be described and documented*" Allweyer (2016, p. 13). In order to create a standard and uniform method to descript and document processes, Business Process Modelling Notification has been created so everyone can understand the concepts, nomenclature and graphics represented.

Business Process Modelling Notification has been created by the Business Process Management Initiative which was represented by software companies. The first version was

published by Stephen A. White from IBM and it has been updated through the years until the second version has been released by Object Management Group in 2011(Allweyer, 2016).

Business Process Modelling Notification can be used to translate an organization business models in terms of actors, activities, and workflows and represent a source of knowledge transfer, quality measures, rules, communication, and documentation in general (Moreno-Montes De Oca *et al*., 2014).

Researchers have been arguing about using dynamic process interpretations to add flexibility in their nomenclature, however, Business process Modelling Notification is placed as the principal nomenclature to be used since facilitates the readings and clarifications between the Information technology and business areas (Röder *et al*., 2015).

Lean

Lean management was born in 1950s in Japan and since then companies started to implement this philosophy in their business models (Rosin *et al*., 2019). Lean, in its early days, could be simply described as "*do more with less*" providing more benefits and gains to a society, individual or organization while eliminating waste (Nikiforova & Bicevska, 2018).

The primary Lean principles objective it is to eliminate non-value-added activities in order to optimize processes in the customer perspective (Alrashed & Kang, 2017). It groups several tools to enable and indorse behavioral and cultural changes in an organization.

Lean usage has progressed from its natural industry environment and nowadays has several applications, particularly in services providing tools to continuously improve daily operations (Nikiforova & Bicevska, 2018).

Continuous Improvement

Continuous improvement or Kaizen derives from Lean management introduced in the Just-in-Time production system to complement waste reduction, however, it has an extensive cultural impact. It is described as a *way of life* a new culture for the organization (Singh & Singh, 2012).

The primary accomplishments of Continuous Improvement in a medium term could be stated as lower operational cost, longer equipment lifecycles, and improve workplace commitment. According to Singh & Singh (2012) it has a large scale of adoption, and the main purposes are:

- Necessity to change and persist competitive;
- To expand organization's work values and mind-set;
- To labor "*smarter and not harder*".

2.2. Lean & Continuous Improvement

It is focused on two important concepts that are drivers to implement a Process Reengineering project. It highlights the lean-thinking, exploring its nature and origins, the strategic and operational applicability, its principles, and the frameworks that support it. To end, an holistic approach, centered on continuous improvement on a long-term ends this subchapter.

2.2.1. Concept Evolution

Lean has seen different definitions during the years and it has been detailed in the literature study done by Pettersen (2009, p.137). He concluded that "*there is no agreed upon definition of lean that could be found in the reviewed literature, and the formulations of the overall purpose of the concept are divergent*" lean in its basics statement could represent "*do more with less*" (Nikiforova & Bicevska, 2018).

As for continuous improvement it has started as a complement for Lean philosophy, aiming to support workforce, providing lifetime employment and benefits according to the organization results. It was cultural improvement, dealing with motivation, empowerment and employee participation in organization goals and benefits, decentralizing the mission across the company (Singh & Singh, 2015).

Continuous improvement is represented in eight principles, already implicit in its meaning where leadership and people are the pillars, as leaders provide purpose, meaning and direction to every worker. Customer-driven organization sustained by design improvement and prevention are also the most notorious ones (Singh & Singh, 2015). The literature also adds that continuous improvement as started surrounded by Total Quality Management (TQM), that usually is responsible for endorsing in incremental changes (McLean *et al*., 2015).

The Lean concept provides a "*way to do more and more with less and less*, *less human effort, less equipment, less time, and less space, while coming closer and closer to providing customers with exactly what they want*" Womack & Jones (2003, p.15).

Lean can be applied on an operational, strategic and tactical level. On a strategic perspective there is the lean-thinking that aligns organizations and its respective objectives goals and culture behavior, in order to maximize the value-added for the customer and enhancing continuous improvement. The operational level focus more on daily basis analysis, to optimize procedures in order to reduce wastes. Tactical by ensuring quality and conservation, address customers opinions as source of value co-creation to outline objectives and requirements according to their vision and promote processes to support it (Nikiforova & Bicevska, 2018).

There are five primary principles that have been highlighted as methodology phases to adopt lean for every project or organization (Nikiforova & Bicevska, 2018):

- Identify value: Examine and identify what could be value-added in the customer perspective;
- Map value stream: as the principle states, the process or activities has to be documented in order to create transparency and space to be optimized;
- Identify Wastes: Categorize all possible inefficiencies that has a negative impact in the process;
- Eliminate Waste: Eliminate the previously identified wastes that are not contributing to value-added processes;
- Pursue Perfection: Promote initiatives to sustain continuous improvement organization behaviors.

2.2.2. Wastes

Lean process improvement, as have been said, focuses on eliminating wastes that have no value-added to customers. That said, it important to understand the *muda* concept, the Japanese word for waste. Womack & Jones (2003, p.15) defined *muda* as "*mistakes which require rectification, production of items no one wants so that inventories and remaindered goods pile up, processing steps which aren't actually needed and services which don't meet the needs of the customer*".

The first seven wastes to be recognized in the Toyota Production System by Ohno (1988) were:

- Overproduction – producing more than necessary;
- Defects;
- Unnecessary inventory – excessive storage;
- Inappropriate processing – use of inadequate procedures;
- Excessive transportation;
- Waiting – inactive production periods;
- Unnecessary motion –workplace disorganization.

There have been some few changes to this concept and the seven wastes still remain with the same meaning however with different names, shortly now referred to as *TIMWOOD*: transportation, inventory, motion, waiting, over processing, over producing, defects. Diversified studies have been mentioning and categorizing waste in lean principles, however,

it is still complex to identify them and respond with the right methodologies and tools (Gnanavelbabu & Arunagiri, 2017).

2.2.3. Methodologies & Tools

Lean management embraces a considerable number of tools which have to be tailored to positively impact organizations and allow them to obtain considerable gains when implementing these mechanisms correctly. "*The use of lean tools is a simple way and low cost solution to achieve productivity and profitability, using a continuous focus on the elimination of waste through all the organization*" stated by Oliveira *et al*. (2017, p.1088).

VSM

VSM, considered the first toolkit to be used in the production system, consists in mapping all the value-added and non-value-added actions required to bring a product across the main flow to every product (Rother & Shook, 2003). "*VSM is a pencil and a paper tool that helps you to see and understand the flow of material and information as a product makes its way through the value stream*" detailed by Rother & Shook (2003, p.4).

The literature has witness a considerable change in the fields adopted by VSM. Fukuzawa (2020) led an extensive study of publications, concluding that VSM has been used and it is effective outside of manufacturing industries, adding this versatile approach to this solution.

Service VSM, the new face of VSM as adoption to services, has different subjects and graphics usage, however, it has the same purpose. Service VSM focus on describing a process considering the lean principles of identifying wastes and eliminating them, not only in the organization perspective but also considering customer feedback and value co-creation. It contains also quantitative indicators to measure process performance. The process should have inbound and outbound perspectives, bearing in mind suppliers and clients as part of the process that have to be attainable to measure performance or value provided (Morlock & Meier, 2015)

Problem Solving

Problem Solving is a fundamental skill that is present in most decision-making we do on our daily habits. In this research it was an essential skill to thrive through the action research exploration in order to address the process stakeholders *pain points* and figure solutions that could solve them (van Aken & Berends, 2018). This solution is nothing less than a schematic approach to a problem, represented by the capacity to identify problem and its respective causes

and impacts, regroup information to sustain analysis, clarify applicable information towards discovery a solution, introduce strategies to sustain solution implementation, apply them and measure the benefits (Harlim & Belski, 2015).

Problem solving is heavily data dependent, to reach the pretended outputs. Data translated into information is key to sustain decision-making and define the right strategies to impact the right problems (van Aken & Berends, 2018).

Visual Management

Visual Management has been a pillar of lean principles that groups all other tools. It can be easily explain in two functions: the transmitter who makes the visual information to be followed and the worker that receives and follow it (Murata, 2019).

In order to sustain lean best practices, visual management has been highly used as an information tool, in order to be intuitive and easily represent the message to be shared (Murata, 2019).

5S

5S is a Lean tool mainly used in industry shop floor, to optimize space and improve working systems. It focuses on organizing and cleaning the work space in order to eliminate unnecessary time consuming activities and potential production mistakes (Huarhua-Machuca *et al*., 2019).

The name translates the necessary phases to adjust, organize and clean the workplace, each "S" has a specific point to the final goal. Sort (*Seiri* in Japanese) means that everything that is not being used should be removed. Set in order (*Seiton*), refers to set everything in the right place to be correctly performed. Shine (*Seiso*) completes the two previously phases by completely clean the workspace. Standardize (*Seiketsu*) and sustain (*shitsuke*) act as continuous improvement of the primary phases, in order to standardize those practices and train workers to perform them in a daily basis (Pinto *et al*., 2019) (Huarhua-Machuca *et al*., 2019).

5S has been successfully implemented in several literature examples, mostly in manufacturing industries. However, the literature is scarce regarding the 5S application in service organizations as support for visual management and continuous improvement methodologies (Beynon-Davies & Lederman, 2016).

PDCA Cycle

The PDCA cycle is more than a methodology. It is seen as a philosophy to sustain continuous improvement practices. It is represented by four phases (Silva *et al*., 2017):

- Plan: In this phase it is described the initiatives for improvement sustained by current data, relating the main causes and impacts of *as is* performances;
- Do: States the action plan execution event, who and how the event has been performed;
- Check: Compare what have been achieved with the initiative in place to the old situation, in order to clarify the main outcomes;
- Act: At this stage, it is developed best practices to sustain and standardize this new situation in daily operations to continuously improve and adopt this new reality.

Standard Work

Standard Work normalizes best practices procedures in a specific workplace. It promotes flexibility between teams by documenting the principal activities in each workplace (Boettcher *et al*., 2019).

As previously mentioned, Standard Work aims to document the work sequence of an employee so the knowledge-based-activities can be taught and can be performed according to its standards. It encourages best practices adoption and movements whiting a team (Lu & Yang, 2015).

2.3. Online Gambling Industry

2.3.1. Concept and evolution

Gambling is used to be defined as a game practice chances for money. Currently it has a broad definition and it has advanced in quantity and quality due to exponential internet growth (Effertz *et al*., 2018).

Technologies today have a significant impact in people's daily habits, which has translated to an easy access for playing games, surfing on social media and also gambling online. That said, the total availability of this new trend, as online gambling is concerned, has facilitated use and daily habits of continuous online gambling behaviors which has been a primary target in this industry researches literatures (Hou *et al*., 2019).

On the other hand, a misconception of Online Gaming, Online Gambling and Social Gambling has been growing. These industries have took advantage of exploiting each industry limitation in the regulations systems, since mainly social gambling industries do not face the same restrictions (Ozuem *et al*., 2018). Some authors defend that social gambling and online gambling should not be considered in the same industry, because social gambling users are unwilling to spend money according to iGaming Business 2013, and online gambling considers

mostly playing games online. The study provided by Ozuem *et al*. (2018) concludes that in a marketing and behavior perspective the two industries, online gambling and social gambling, can be merged because of the influence they have in each other and the fact that consumer patterns are identic.

Gambling actions have been around for centuries and its practices have been linked to illegal behaviors and non-regulated economies. However, to respond to this reality, governments have created conditions to support this practice in order to provide transparency and revenue stream to states (Laffey *et al*., 2016). Regulated market choices are very challenging considering the unique development and new entrants in this market. According to Laffey *et al*. (2016, p.6) "*Regulators were faced with the problem of Internet technology moving faster than the law, raising a series of questions including that of the issue of conflict of laws, given that every nation can unilaterally regulate every Internet transaction*".

Gambling has progressed from an illegal market to a regulated one. It is a source of jobs, revenue and represents a considerable portion that is continuously growing. Online gambling uses this regulation policies to provide more safety to its users and to protect its business from foreign and non-regulated markets. However, the legalization suffers local customization according to its market territory, to benefit native economies and interests. Online gambling as an industry is still growing and faces considerable restrictions and policies to protect their consumers and detect some inadequate gambling behaviors related to money laundering and addictive practices. This attitudes have to be taken in to account in order to develop a sustainable business model that can fulfill market legalizations and still provide the best offers and gambling experience to its customers (Laffey *et al*., 2016).

2.3.2. Process reengineering in an Online Gambling organization

The two main topics of this research will be crossed to understand how these two themes have been correlated in past studies and how process reengineering can suit this distinct industry.

First, let's examine the literature research that comprehends lean philosophy, consider the main subtopic in the process reengineering theme. The following table, according to Jastia & Kodali (2015) study, illustrates the literature reviews and trends distribution considering Lean Management, Lean Supply chain, Lean product development and Lean Enterprise.

Industry	LM	LSC	LPD	LE	Number of articles	%
Manufacturing sector	337	58	3	3	401	73,44
Aerospace	6	2	0	0	8	1,46
Auto components	25	6	0	0	31	5,67
Automobile	120	17	2	2	141	25,82
Chemical	6	3	0	0	9	1,64
Information communication technology and electronics	18	10	0	0	28	5,13
Others	10	3	0	0	13	2,38
Multiples	152	17	1	1	171	31,32
Service	17	38	0	0	55	10,07
Health care	8	12	0	0	20	3,67
ICT	7	12	0	0	19	3,48
Tourism and hospitality	1	10	0	0	11	2
Public service	1	4	0	0	5	0,92
Infrastructure	15	4	0	0	19	3,48
Infrastructure	14	2	0	0	16	2,93
Oil and gas	1	2	0	0	3	0,55
Agriculture	4	3	0	0	7	1,1
Food processing	2	4	0	0	7	1,28
None	45	11	1	1	58	10,62
Grand total					546	100

Table 1- Frequency distribution of type of sectors covered by researchers Jastia & Kodali (2015)

It can be seen that literature regarding lean principles studies still have a major incidence on manufacturing sectors, resulting from the fact that Lean was born in that environment and it has expressive good results in its implementation. However some industries have gain a significant increase lately, such as service and healthcare, although their business model and characteristics are far distant from manufacturing, which represents a different approach from the traditional philosophy introduced by Taiichi Ohno in the Japan Toyota Production System. Jastia & Kodali (2015, p.16) finishes their literature research concluding that "*It clearly*

indicates that lean principles can be implemented in any kind of industry to improve the customer satisfaction as well as the productivity of the organization".

To finish this subchapter, there is not yet a direct correlation between lean principles approach in online gambling. The literature is scarce in mixture, which is an ideal opportunity to confirm that Lean principles can be adopted in every industry in order to optimize processes and improve value in customer perspective.

2.4. Summary

This chapter highlights the primary subject that will be focused throughout this research, which is Process reengineering and its respective methodologies and tools to be used in these types of examples. The literature review started by explaining the main concepts surrounding process reengineering, converging in lean and continuous improvement themes that will be fundamental to conduct the action research.

It also includes an industry concept and evolution for the reason that it is a distinctive and recent one, that has few dissonant arguments related to scope restrictions and what is considered online gambling. It was also considered important to highlight the industry regulations and legal restrictions in order to understand how these constraints have impacted the action research scope and its approach.

It finishes by examining the related works in the fields of Lean and Continuous improvement, as the literature did not deliver a single study correlating these themes with Online Gambling as an industry.

3. Research Methodology

This chapter presents the methodology embraced to explore and solve the research question and the action research specific objectives. It starts by presenting the research methodology that sustains the action research, followed by each investigation phase and its data collection methods. Additionally, it is presented the tools that have been used to achieve it.

3.1. Action research Methodology

This action research is considered a project for the reason that studies Lean and continuous improvement methodologies implementation in an enterprise environment, in this case, the Apostar&Ganhar organization, fulfilling its proposed objectives and challenges.

This work is an action research which according to Avison *et al*. (1999) "*combines theory and practice through change and reflection in an immediate problematic situation within a mutually acceptable ethical framework*". It resumes as a research that focus on change and reflection through iterative and incremental implementations sustained by the literature (Avison et al., 1999).

As identified from the previous chapter, the literature is still missing contents and studies concerning the application of Process Reengineering methodologies in an online gambling industry, which classifies this research type as exploratory in its nature. It is one from three possible motives to conduct an action research, the remaining are explicative and descriptive.(Yin, 2018).

To successfully conduct this action research, the figure 1 illustrates the five methodology phases to approach each scope process agreed in project committee. This sub sequential set of phases have been previously adopted in Nikiforova & Bicevska (2018) study as they mentioned that "*are key principles in every implementation*".

Figure 1 – Research Investigation Phases | Source: Author's elaboration based on Nikiforova & Bicevska (2018) study

3.2. Research Investigation Phases

The Research Investigation presents each of the five investigation phases in detail to give more consistent information related to what has been done in each phase, answering what were the primary tasks that were normally performed.

These phases were the base model to conduct the action research. It goes back to the beginning of 2018 when this project has started, and for the duration of three months, it has been performed this sub sequential model to act in each Apostar&Ganhar scope process.

Additionally, it is important to mention that Apostar&Ganhar had a noteworthy consultant organization helping them at that moment in developing and growing from those early maturity stages. This consultancy company was crucial in some project validation and Apostar&Ganhar decision-making regarding this action research conduction, since it had a significant experience in similar projects with competitors.

Table 2 describes the investigation phases sequence and its respective data collection method and process reengineering tool to provide more transparency in tools and data collection methods used by phase. The strategy decided was to work individually, following the five phases according to each process.

Investigation Phase	Data Collection Methods	Process Reengineering Tools
Map As Is Processes	Interviews, direct observation	BPMN
Gap Analysis	Interviews, Benchmark, Focus Group	Problem Solving, 5S
To Be Model Definition	Interviews, Benchmark, Focus Group	BPMN, VSM, PDCA
Process Implementation	Direct observation, interviews	VSM, 5S, Standard Work, Visual Management
Continuous Improvement & Lessons Learn	Benchmark, direct observation, Focus group, Formation	PDCA, Visual Management

Table 2 - Research Investigation Phases, Respective Data Collection Methods and Process Reengineering Tools | Source: author's elaboration based on Literature Review

3.2.1. Map As Is Processes

The main output in this phase it was the process x, documented as an old version or before process reengineering action. As stated, all the scope processes were mapped. This phase reflects the Apostar&Ganhar business processes "state of art" at that moment and its current practices. As the previous table reflects, the data collection used in this phase was mainly the stakeholders' interviews that aimed to reach the ones involved in a specific process, following a previously worked interview template, illustrated in the Annexe A. Typically, there were 3-7 stakeholders involved per process to validate overall process tasks. Direct observation provided an holistic understanding of the process interactions. Looking at the process reengineering tools used in this phase, considering that the focus was to simply map the As Is process, the only tool that has been used was the Business Process Modelling Notification, supported by the *Bizagi Modeler software*, so the process could be illustrated and documented.

3.2.2. Gap Analysis & Problem Solving Identification

Following the process mapping, it was time to critically analyze the workers feedback about the process in study. The main input in this phase was the interviews performed in the last phase, where it could be diagnosed the main defects, waste and time-consuming activities. That said, the primary tool used was the problem-solving concept by listening what the stakeholders

consider as quick-wins, small improvements that could reduce costs, improve efficiency and increase the client's quality perspective. It was used benchmark data collection, mainly sustained by best practices adoption from the consultant organization that was supporting Apostar&Ganhar decision-making. To add some value to the process reengineering, the lean methodology, particularly the 5S philosophy, has been centered as starting point to act in the daily operations.

3.2.3. To Be Model definition

Succeeding the Gap Analysis, this investigation phase scope relies on "*assembling*" an optimal process, eliminating the main defects and failures and introducing the quick-wins that have been identified previously. Primarily it was used the data inputs received from the interviews and also supported by the benchmark mentioned in the prior phase. The formal approval for each To Be process had to be in a steering acting as a focus group with the main process stakeholders involved. The Process Reengineering tools that supported this phase were mainly the BPMN, mapping and documented the To Be process using Bizagi Modeler, the VSM in order to eliminate the process inefficiencies and the Deming Cycle, PDCA, introducing KPI to track the numerical impacts and incentivize continuous improvement procedures.

3.2.4. Process Implementation

This phase groups the work that has been approved and applies it in practice. It is time to introduce all the improvements mentioned in the previous phases and record the main impacts that those improvements had in the studied process. To receive this information, it is essential to interview the process stakeholders again to perceive their opinion about the main benefits and progresses that they can identify. To scientifically justify this information, it is also important to measure these benefits in a quantitative perspective. In order to accomplish that, it was necessary to witness "on job" the process and identify the main impacts on the KPIs suggested in the To Be Model Definition phase. The tools used in this phase were the standard work, was created work instructions in each process (Annexe B) to disseminate process knowledge and promote flexibility. In this way, everyone could perform the to be process. 5S sustained by visual management in order to alert stakeholders of not conforming actions.

3.2.5. Continuous Improvement & Lessons Learn

The last phase summarizes what have been achieved and promotes continuously best practices adoption, defined in the previous phases. It is really important to adapt the organization's culture to these principles, in order for it to thrive to the changes and improvements in a sustainable path. To implement and instruct this culture, it was necessary to benchmark the best practices in this field and understand the best way to apply them to this organization's reality. To accomplish that, the primary tool used was the visual management to impact positively the changes and to easily identify non-conforming procedures. The PDCA cycle was essential to audit and introduce continuous improvement initiatives.

4. Action research

This chapter presents the action research conduction designed in the previous chapter. It starts with an industry overview, highlights the market evolution and legal context that involve an online gambling industry. This is followed by the scope description and the process reengineering tools used to analyze the processes discussed. To end this chapter, it will be presented the general recommendations and medium/long-term developments to complement the benefits gain.

4.1. Action research Characterization

In this subchapter it will be presented the industry development according to market growth and legal requirements to address the complexity, the risks and constraints to study it, that had a relevant impact in the action research conduction.

4.1.1. Industry Overview

Online Gambling industry has seen a tremendously evolution over the years due to improved internet access and download speeds, mainly in the sports betting category supported by live streams and video contents. It is now a trend in online market segments and has a significant impact in overall gambling category. The legal requirements have been evolving and organizations have faced this issue by adapting their value chains around these constraints, which led to new businesses models and different processes as result.

The market growth has been increasing year by year with an incredible 16,2% in 2018, in which sports betting represents the majority segment in this industry, as is illustrated in the table 3.

Year	$ Million	€Million	% Growth
2014	39,500.0	33,445.9	-
2015	41,400.0	35,054.7	4.8%
2016	44,929.9	38,043.6	8.5%
2017	49,242.3	41,695.1	9.6%
2018	57,207.4	48,439	16.2%

Table 3 - Industry Market Growth | Source: Market Line 2019

4.1.2. Portugal Industry Overview

The growth that has been registered worldwide is also visible in Portugal. According to SRIJ (2019) there was a significant increase in Gross Revenue to 65,4 million euros in 2019, more 52,1 % than the previous year. The number of new players also reveals this new market trend, that marks a 58,4% increase in 2019, declaring 163,900 new players in 2019 which is really impressive considering Portugal total population. Considering this response from the market procurement, there were also new players trying to enter this market, with 3 new players ending 2019, counting now 12 exploring entities.

In the legal field, the Portuguese government has approved the last *Regime Jurídico dos Jogos e Apostas Online* (RJO) defining the terms and conditions to this industry be exploited. The main subjects centering these legal requirements are:

- Protect under 18 years old and addicted persons to play, inhibiting excessive and non-regulated behaviors;
- Avoid fraud and money laundering practices;
- Mitigate criminal behaviors in online gambling;
- Promote transparency and integrity, in the contest for sports manipulation results.

4.1.3. Apostar&Ganhar

For not exposing an authentic reality, using real data regarding the organization in study, this action research is not allowed to use the organization's real name, so the fictitious name used in this work has been created by the author to comply with the non-divulgation-agreement deal when the project started.

As previously mentioned, this project started in January 2018, when was first decided to work on Apostar&Ganhar value chain in order to create a sustainable environment for a continuous growth in results.

Apostar&Ganhar was, at that moment, a grow up, six years old completed in November 2017, lacking maturity in their processes, although offering a recognized customer experience and best gambling offers in the market.

That said Apostar&Ganhar has conquered a solid position as major player in Portugal. It was one of the first regulated organizations in Portugal to protect their consumers in their privacy, safety and personal data.

It differentiates from other players by having a strong focus in customer satisfaction provided by an optimal customer experience and assistance. It aims to provide the best competitive offers and a diversified offer to sustain its position.

To accomplish that, Apostar&Ganhar strategic objectives were divided in:

- Increase sales volume by 20%
- Mitigate non-compliance cases, reaching the targets imposed by SRIJ
- Optimize efficiency in 15%
- Reduce Complaints in 60%

4.2. Action research Conduction

To prepare the following work to be developed with Apostar&Ganhar and their partners was created a steering meeting to regroup all project involved stakeholders and discuss the project kick-off data and the specific scope to be considered.

As previously mentioned the necessities were vast, considering their processes maturity level. However, considering the project requirements and the stakeholders involved, it could not be possible to fulfill all the Apostar&Ganhar necessities to optimize the organization holistically. Instead, it was defined to work in four processes that were clearly considered as core and were suffering insufficient outcomes.

The table 4 shows the real necessity that was transmitted by Apostar&Ganhar, core processes from each department area that were representative and solid to be studied in this project.

Department	Core Processes
Finance	Deposits Incident Management Cash Withdrawal
Customer Support	Segmented Offers Management Complaints Management
Product Management	Payout Matrix Management
Compliance	Self-Exclusion Revoke report elaboration Report of the accounts that have been suspended, cancelled or inactive elaboration
Marketing	Potential Target Segmentation
IT	Change management Service Management

Table 4 - Apostar&Ganhar value chain | Source: author's elaboration based on project committee

To decide which processes were going to be considered, it was voted in the kick-off meeting four primary processes according to its respective impacts in the strategic objectives. It was also decided the weight of each strategic objective, previously mentioned, to sustain the decision-making. The weight is represented in the table 5.

Strategic Objective	Weight %
Increase sales volume	30%
Mitigate non-compliance cases, reaching the targets imposed by SRIJ	40%
Optimize efficiency	10%
Reduce Complaints	20%

Table 5 - Weight of Apostar&Ganhar Strategic Objectives

According to these weights, the focus group decided to promote four processes, divided by two central departments, finance and compliance to be consider in this exploratory action research:

a. Deposits Incident Management
b. Cash Withdrawal
c. Self-Exclusion Revoke report elaboration

d. Report of the accounts that have been suspended, cancelled or inactive elaboration

It was now time to proceed to the action research conduction, starting in the Finance department considering both a) and b) processes. As mentioned in **Chapter 3**, each process was studied individually and went through each investigation phase.

Compliance department was next in line, although the processes were not considered as separable because both reports were complementary procedures that had to be delivered to the same entity.

4.2.1. Finance Department

The Finance department was highlighted as focus point, the processes approached translated the business core for the organization, processing the inbound and outbound cash flows. It was identified the two scope processes:

- Deposits Incident Management: Daily process responsible to identify and solve the main issues related to the cash flow into the player account. It occurs twice a day.
- Cash Withdrawal: Daily process that considers all the activities related with the cash flow transactions from Apostar&Ganhar to the player ownership. It occurs twice a day.

4.2.1.1. Deposits Incident Management

The process was studied by investigating the interactions between two teams, the Customer Support team and the Finance team.

4.2.1.1.1. Map process As Is

The interviews conducted with process stakeholders, from Finance team, occurred in one day and it was followed by direct observation in the next day. To perform this first phase, the Customer support team was also involved in interviews since they had an important role as trigger to start this process. It was possible to understand and map the process as the figure 1 illustrates.

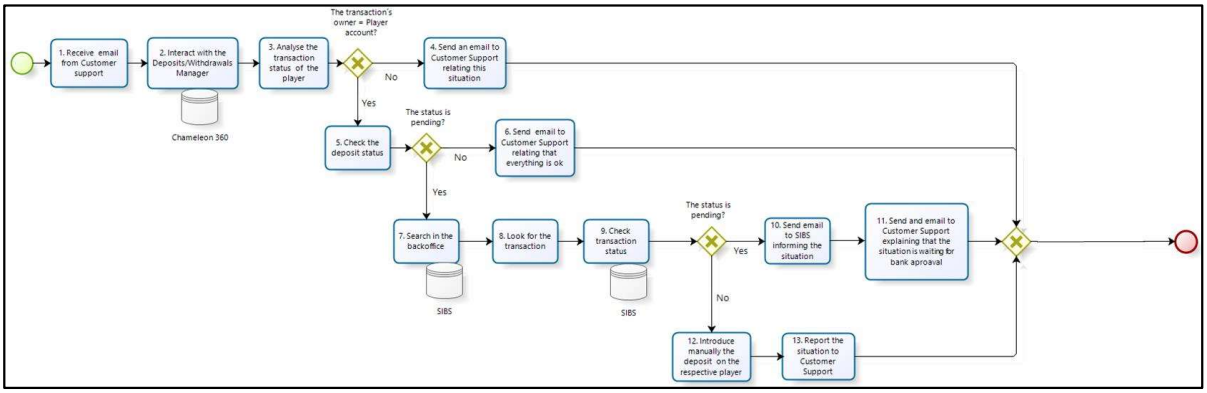

Figure 2 - Deposits Incident Management As Is | Source: author's elaboration based on interviews

The process starts by receiving an input message from Customer Support department, stating some incident that is concerning a specific client, then the first action to be performed by the finance department is to confirm if that specific client is the transaction owner, then validates the deposit status to confirm if there was an error in the automatic deposit procedure. In the positive cases the process requires a manually procedure to solve the client issue. In both cases the process ends with a feedback message to the customer support relating the process closure.

4.2.1.1.2. Gap Analysis

Next it was time to identify possible improvements in order to reduce waste and add value in the customer perspective. In this phase it was noted that the Apostar&Ganhar was lacking KPIs to objectively and quantitatively diagnose the negative process bottleneck impacts. Therefore, the first impression was to work on KPIs that could measure and monitor the process development. The second step was to regroup with the process stakeholders and identify, in their perspective, the main “pain points” in this process. To summarize, the information used focus group data collection method in this process, to save time and group everyone’s feedback. The bottleneck was mainly in the input and output communication between departments. To confirm it, it was used the direct observation data collection method to record the process delivery time, which is the time to internally solve the client incident. According to VSM and Lean methodologies, this task had to be improved in order to facilitate the Finance department and efficiently solve the client’s issue in a quick response tactic. Benchmark was also used to identify possible automated solutions for this case.

4.2.1.1.3. To Be Model definition

It was identified in the previous moment the necessities recognized both by the process stakeholders and by direct observation as mentioned. Sustained by lean best practices, it was proposed and mapped the main improvements that required less investment and were easy to implement, and therefore could impact positively in a short-term period. The following image clarifies the quick-wins presented.

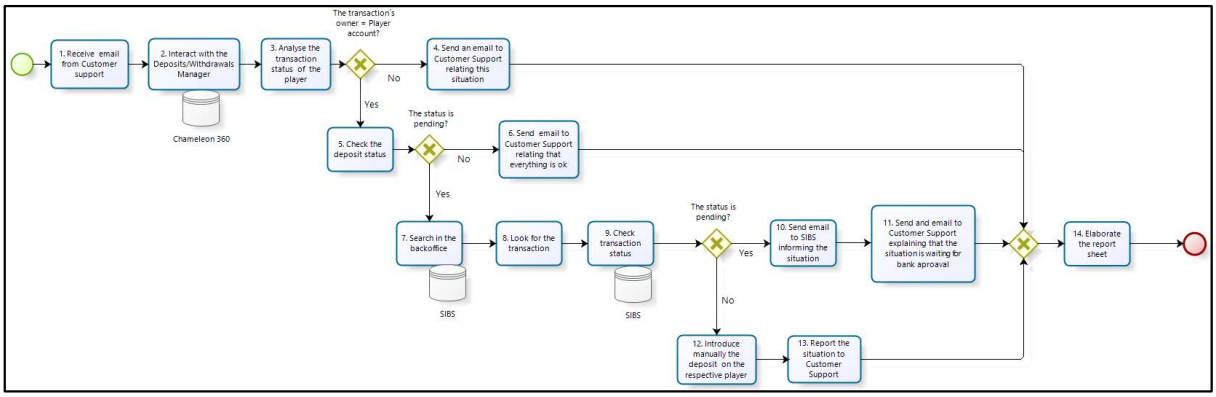

Figure 3 - Deposits Incident Management To Be process | Source: author's elaboration based on interviews and direct observation

The quick-win proposed impacts mainly the first activity, identified as the process bottleneck. The solution suggested is to create a standard email template so the Customer Team and the Finance department can efficiently communicate in order to optimize the delivery time. In this scenario, the customer support team could send all the relevant information in a clear procedure to reduce the finance department following process activities. The To Be process also received a new activity, at the end of the process, to document process times, occurrences and main reasons that triggers this process, so the Apostar&Ganhar could work on mitigating the SLA related with the deposit process, reducing the incidents numbers and also tracking the KPIs performance in a weekly basis.

4.2.1.1.4. Process Implementation

Following the To Be process proposed and validated, it was time to implement it in a daily routine. As said, it was created an email template as the Figure 4 illustrates.

Figure 4 - Deposits Incident Management Email Template, Quick-Win | Source: author's elaboration

Therefore, to improve this process, the implementation was made in the Customer Support department, although the positive impacts would be generated in the Finance department team. The idea behind that was to holistically understand the benefits of analyzing processes as an interconnected value chain and act accordingly in the improvements proposed. It was also implemented the following KPIs:

- Number of cases: The non-quality incidents, on a weekly basis, identified by the client
- Recurrence rate: The number of clients that have experienced more than one incident on a weekly basis
- Number of Batch Cases: The number of incidents that happen simultaneously to more than one client
- Lead Time: The time since the issue have been reported by the client and it have been solved
- Productivity: The time spent to execute process tasks

The table 6 complements these previous implemented indicators followed and acknowledged by the process stakeholders as solid KPIs objectives targets to be defined.

KPIs Type	KPIs Description	Target	Frequency
Quality	Nº of cases	<10	Week
	Recurrence rate	2	Week
	Nº of Batch cases	0	Week
Delivery	Lead Time SLA	60 Minutes	Week
Cost	Productivity	10 Minutes	Week

Table 6 - Deposits Incident Management KPIs Implemented | Source author's elaboration based in interviews and direct observation

The final improvement implemented aligned with the Process To Be Mapped focuses the last process activity. According to what have been said, this activity promotes continuously KPIs tracking. It is a manual task, which impacts negatively the process productivity, but the trade-off is beneficial to process transparency and process results, in order to minimize the most important KPI: number of cases. That said, it was created an excel template to keep introducing the process results.

4.2.1.1.5. Continuous Improvement & Lessons Learn

In this phase it was time to measure the KPIs impacts and implement the best practices to promote continuous improvements in this process. The KPIs impacts were measured one month later after the process To Be implementation, reflected on the template provided as quick-win. The results were clear, and most important, the Apostar&Ganhar had relevant data to sustain its next moves in order to act on the incidents root causes and that had an important effect on the KPIS “Number of incident cases”, through working on the main incident root causes the KPIS registered a decrease by 57% in a monthly analysis, reaching below the target objective of minus 10 cases for week, averaging an 7.5 cases week in that month. To introduce flexibility in the Finance team, it was also created Kanban cards with work instructions to be followed, also available in the dynamic governance model (Annexe B) To end this process it was proposed to the process team periodically, two in two week, create a PDCA meeting supported by a visual board to work on KPISS variation and define actions to be applied in the process.

4.2.1.2. Cash Withdrawal

This process, as previously mentioned, represents all the necessary activities to perform the cash withdrawal in the Apostar&Ganhar perspective. It aims to deposit the respective player's amounts in their bank accounts.

4.2.1.2.1. Map As Is process

The identified process occurs two times per day, to perform multiple cash withdrawal to the players instead of one by one. That said, this process was studied by order and not by player, so the object and output of this process is the release order. The following image reveals the process at that time, according to the interviews executed to the process stakeholders, followed by a focus group to conclude the as is definition.

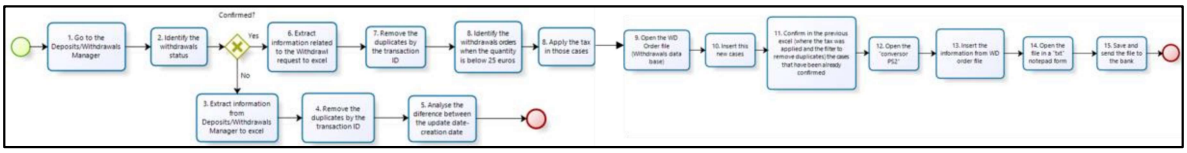

Figure 5 - Cash Withdrawal Process As Is author's elaboration based on interviews and direct observation

The process takes place periodically and happens normally one time between 9:00 am and 9:30 am so it can group all the cash withdrawals requested in the previous day and another between 14:00 and 14:30 to perform the requested process before the bank's closing hour. It is supported by a website that identifies the withdrawal status and then the remaining process is performed manually. The process ends when the process stakeholder sends the Withdrawal order (WO) to the respective bank so the Withdrawal order can be processed after an executive approval from the Apostar&Ganhar.

4.2.1.2.2. Gap Analysis

The process faced several deficiencies, identified by the stakeholder involved. Those deficits were mainly due to the fact that, this important and core process studied was relaying on manually tasks. As said in the As Is phase, this process executes high cash flows transactions, since we consider the main object, the Withdrawal Order, as output that groups several players' transactions, which should not be performed manually supported by excel and notepad solutions. The second inefficiency noted in the interviews and by direct observation was the delivery time to perform those transactions. The bottleneck was clearly recognized and was the

last process activity, considering the Apostar&Ganhar Board's time to approve the withdrawal order release in the bank, once again, there was a communication problem. The board commission was not focusing its attention to this matter, since it was involved in several strategic concerns and it was missing a quick alert so its members could easily approve the Withdrawal Order.

4.2.1.2.3. To Be process definition

According to the known defects previously mentioned, the primary objective in this phase was to propose a software base solution to support this process. The idea was well received, however did not had the majority support to be implemented and considered in that time scale, so it was not considered in the To Be process definition. Therefore, the process reengineering in this case was not entirely complete. Nevertheless, it was achieved a reduce time in that last approval activity so we could reduce the process delivery time. The To Be process presented is similar to the As Is. In fact, there are the same activities to be performed, although the solution was not to eliminate and reduce activities because according Womack & Jones (2003), there is none value-added activities that still has to be executed, and the process approval activity is one of them. Thus, the problem-solving solution was centering an important question, "how can this activity be performed in the less time possible?". Consequently, to have been mentioned in the Gap Analysis phase, the idea was to implement some responsive and agile alert message in order to remember the board commission to approve the withdrawal order. The solution suggested was to create a skype group and a WhatsApp group to simply send and receive messages.

4.2.1.2.4. Process Implementation

In this case, the implementation procedures were easier than the previous process, since there were not major restructuring changes in the process. To implement this "solution" it was just necessary to group all the process stakeholders and brief them the benefits to introduce this routine in their daily operations. Similar to the preceding process there was no KPIs already implemented to monitor the process outputs and impacts, so in this phase it was created three KPIs:

- Number of complaints, process non-compliance rate in customer perspective, counting the interactions between the client and the Customer Support team, considering this subject

- Lead Time, time since the client request the withdrawal until it have been processed in the bank
- Productivity, time spent to execute the process activities
- The table number 7 resumes the previous KPIs mentioned and its respective targets and frequencies to be continuously monitor.

KPIS Type	KPIs Description	Target	Frequency
Quality	Nº of Complaints	0	Monthly
Delivery	Lead Time	60 minutes	week
Cost	Productivity	10 minutes	week

Table 7 - Cash Withdrawal KPIs Implemented | Source: author's elaboration based in interviews and focus group

4.2.1.2.5. Continuous Improvement & Lessons Learn

Following this, it was implemented a daily routine to introduce manually the KPIS of this process. Two weeks after the process implementation with the previous quick-win presented it was measured the main effects in the KPIs in order to understand the results. The following table clarifies the process lead time deviation from the target defined.

Order	Creation Date	Autorization Date	Status	Notes	SLA	Lead Time	% Deviation	Indicator
WD ORDER000561	2/11/17 12:20	2/11/17 16:19	Processed		24:00:00	3:59:12	-83,39%	●
WD ORDER000563	3/11/17 11:06	3/11/17 12:04	Processed		24:00:00	0:57:41	-95,99%	●
WD ORDER000562	2/11/17 16:29	3/11/17 12:04	Processed		24:00:00	19:35:29	-18,37%	●
WD ORDER000565	6/11/17 11:26	6/11/17 11:45	Processed		24:00:00	0:19:33	-98,64%	●
WD ORDER000564	3/11/17 15:46	6/11/17 11:37	Processed	Weekend	24:00:00	67:51:06		
WD ORDER000567	7/11/17 11:24	7/11/17 11:39	Processed		24:00:00	0:14:39	-98,98%	●
WD ORDER000576	14/11/17 11:11	14/11/17 17:11	Processed		24:00:00	6:00:12	-74,99%	●
WD ORDER000575	13/11/17 15:35	14/11/17 17:11	Processed		24:00:00	25:35:59	6,67%	●
WD ORDER000581	16/11/17 12:15	16/11/17 18:11	Processed		24:00:00	5:55:33	-75,31%	●
WD ORDER000582	16/11/17 16:04	17/11/17 12:25	Processed		24:00:00	20:21:43	-15,16%	●
WD ORDER000583	17/11/17 11:35	17/11/17 12:43	Processed		24:00:00	1:07:27	-95,32%	●
WD ORDER000580	15/11/17 15:33	16/11/17 18:11	Processed		24:00:00	26:37:25	10,93%	●

Figure 6 - Cash Withdrawal SLA Success Rate | Source author's elaboration based in interviews and direct observation

It could be said that, this quick-win implemented solution had an immediate impact in the process KPIs specially the lead time and SLA to deliver the cash withdrawal to the clients. According to this two weeks sample, in approximately 80% of the cases, the bottleneck activity

considering the confirmation and authorization task could be fulfilled in less than 24 hours, SLA targeted by the Apostar&Ganhar.

4.2.2. Compliance Department

The Compliance Department was underlined as the key department to be restructured. It comprehends the principles legal restrictions and translates that obligations to the organization. Apostar&Ganhar's value chain can be seen as compliance department centricity, since the organization can only operate if this department is well coordinated and aligned with the legal requirements. Resuming, the compliance department is a bidirectional link between the departments and the legal requirements and has the mission to identify possible nonconformities and define mechanisms to control and fulfill them.

It is composed by two central processes:

- Self-Exclusion Revoke report is a report that had a legal obligation to be sent in a weekly basis to the *Serviço de Regulação e Inspeção de Jogos* SRIJ, so they could consider the players that are no longer able to play
- Elaborate the report of the accounts that have been suspended, cancelled or inactive, same as the previous process, it is a report that is required by SRIJ in a weekly basis

These two primary reports were the principal output produced by the compliance department in order to continuously update the Apostar&Ganhar's client base and certify that there is no non-conformity.

4.2.2.1. Map As Is Process

These two complementary processes as said had a weekly basis periodicity. To identify the processes activities it was created a focus group with several intervenient teams to specify each task that led to this reports output.

The Self Exclusion Revoke report is mainly elaborated by the compliance team and can be represented by the figure 7:

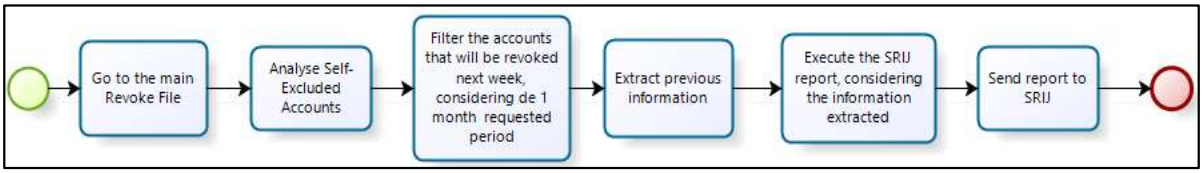

Figure 7 - Compliance Department As Is Self-Exclusion Revoke report | Source: author's elaboration based in interviews and direct observation

The report that considers the accounts that have been suspended, cancelled or inactive was more complex, since groups multiple tasks from three different departments. It starts in the compliance team, where they extracted from the system the information to be reported, then this information had to be validated in the B.I team so there is no "false positive" cases that could mislead the information in analysis. Following these steps it was time to confirm if the player had still funds in his account, if the answer was negative, there were no actions to be made, otherwise it would be forward to the Finance department to execute the withdrawal process. The following image illustrates both situations.

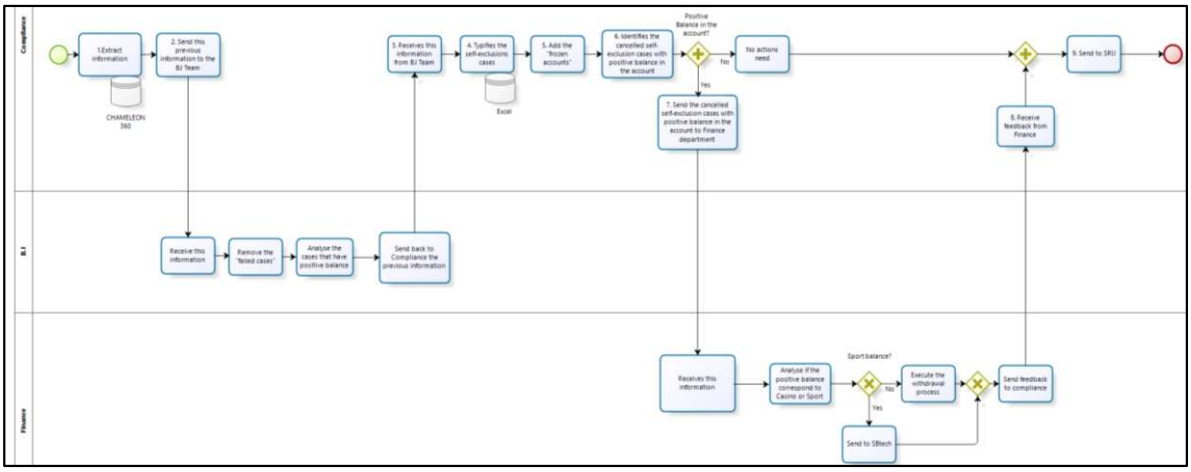

Figure 8 - Compliance Department As Is suspended, cancelled or inactive accounts report | Source: author's elaboration based in interviews and direct observation

4.2.2.2. Gap Analysis

Similar to the other processes approached in this chapter, following the As Is it was time to group once again with the process stakeholders and identify the main "pain points". According to the interviews and direct observation of the process it was recognized that the information between departments was inefficient and did not consider all the important requirements that would lead to a simple and direct approach to the revoked accounts. It was identified the

necessity to decentralize the quality controls for all the departments. The idea was to promote awareness for these legal requirements not only in one department but also as a main topic for daily operation. Thus, it was necessary to add transparency and visibility across the organization, considering these legal aspects to be performed.

4.2.2.3. To Be process definition

Capitalizing the principal pain points and necessities pointed in the previous moment it was introduced an email template to optimize information between departments. It was a quick-win already implemented in the previous process in study and had significant positive impacts considering the small effort to accomplish this improvement. To face the quality control decentralization requirement, it was created a framework tool to be implemented in different departments. The idea was to create awareness for the quality control mechanisms that had to be implemented in order to fulfill the legal requirements imposed by SRIJ. Therefore, the approach in this case was different, instead of acting in these two processes it was prioritized the quality control as an organization necessity and was studied the best way to implement this quick-win across all Apostar&Ganhar.

4.2.2.4. Process Implementation

In this moment, related to what have been identified by the main process stakeholders across the previous methodology phases, it was implemented a framework tool to transfer the quality control mechanisms across the organization. The following image translates an example of the non-conformities requirements that had to be controlled, the respective KPIS imposed by the SRIJ, the control mechanism that had to be implemented, the department that had to implement this control in their operation, and the time based proposed.

Critical Success Factor	Non-Conformaty	Indicators	Target	Control Mechanism	Department	Status	Frequency
Self-Exlusions	Allow Sel-excluded accounts to play	Nº of Cases Lead Time	0 1 Hour	Self-Excluded automatic alert	I.T.		Daily
	Do not ativate the self-exlusion	Nº of Cases Lead Time	0 1 Hour	No activation ativity alert	I.T.		Daily
	Do not execute the revogue process when requested	Nº of Cases Lead Time	0 1 Month	Daily reactivation of the considered cases	Compliance		Weekly
	Do not report to SRIJ self-excluded accounts	Nº of Cases Lead Time	0 1 week	Self-Exclusion Revoke report	I.T.		Weekly
	Delay in cancelled accounts transfer	Nº of Cases Lead Time	0 1 week	Report of the accounts that have been cancelled	Compliance		Weekly

Figure 9 - Compliance Department Legal Non-conformaties controls | Source: author's elaboration based in interviews and direct observation

In this example, it shows the primary critical success factor, the self-revoke players and the five legal non-conformities to be controlled, each non-conformity had a target related to two different KPIS, Lead Time and Number of cases. To every single non-conformity it was created a control mechanism, in this case to be implemented in the I.T. department with different period analysis, weekly and daily.

In this scenario as example, the compliance department could have had visibility related to the non-conformities' cases in the self-revoke critical success factor and could have monitored their status in order to accomplish the imposed regulations from SRIJ.

4.2.2.5. Continuous Improvement & Lessons Learn

In this phase, it was implemented the work instructions to create standard procedures in this new quality control methodology across the organization. The impacts were positive and after one month of analysis there were no non-conformities performed by Apostar&Ganhar imposed by SRIJ. The controls were performed correctly and was supported by a technological solution to aggregate all KPISSS in order to be monitored and managed visually.

4.3. Recommendations

In this subchapter it is proposed future initiatives in a medium, long-term that were not targeted in this study. As said, the exploratory action research was focused in four primary processes due to the man-power and time restrictions to perform this project. Apostar&Ganhar were challenging a broad approach to their value chain, requiring a complete study through their processes and business model.

Thus, to face short-term goals the project general idea was to introduce quick-wins that could be easily implemented and could impact positively the value in the customer perspective, mitigating the non-conformities and optimizing efficiency.

To complement the work that has been done, it was time to suggest future initiatives so the Apostar&Ganhar could sustain its position as market leader. The complexity and impact matrix (where we pinpoint across the axes the connection between these two factors) was used to prioritize the initiatives according to its respective time to be implemented and impact in the strategic objectives previously defined. In the first wave, three initiatives have been proposed since they had less than three months of implementation and high impact on the strategic objectives, they were:

- *Performance Evaluation*: Model based in a quantitative analysis, through the top-down organization objectives division for the respective team and also a qualitative approach, through the connection of functional and behavioral capabilities with the respective employee role;
- *Ticketing Tool*: Solution that could, on-time monitored open tickets and solved tickets, creating dashboards bringing more transparency, more efficiency since these activities could be performed automatically and increase customer satisfaction by working in a continuously root-cause of the problem that led to the incidents monitored;
- *Knowledge Management*: In order to promote continuous improvement practices, it was suggested a dynamic editing space to aggregate the processes mapped, act as governance model, with new To Be solutions implemented in order to share the process knowledge-based and provide flexibility between departments.

5. Discussion

The case conduction has shown how a singular industry as Online Gambling can also be positively impacted by processes reengineering. It faces unique risks and constraints that can overcome the positive results if continuous improvement culture is not inherent in their daily operations and culture. Once again Jastia & Kodali (2015, p.16) argument was proved right, defending that every industry can be positively impacted by Lean Methodologies in customer satisfaction and particularly in product optimization. In this study, the greatest impacts were in process efficiency due to lack of Best Practices and standard procedures. Consequently, this process efficiency has resulted in less delivery time, culminating in an improved online gambling experience to players.

The approach to this action research, considering the previously mentioned restrictions, was based in Eze *et al*. (2019) testimonial of process reengineering that mentions it as an essential behavior to implement innovative and incremental quick-wins to processes in order to achieve success. An immediate requirement to fruitfully measure the project results and positive impacts from it according to Park *et al*. (2017) was missing, and were the absence of KPIs and their respective record. Boje *et al*. (2017, p. 98) stated in their article that BPR has become "*another solution in search of a problem with its lack of data-driven process*" and in January 2018, project kick-off he was right, Apostar&Ganhar was missing historical data in its core processes. The focus was business results and market share, compromising the structure that could leverage those results to an increased position. Bearing in mind Boje *et al*. (2017) knowledge and experience, it was intuitive to understand the data-driven requirements and act accordingly. The implemention of the above moentioned KPIs in the process arised as a core objetive of this action research.

The Process reengineering tools presented in the literature review played a major part in this action research conduction, predominantly BPMN, which sustained and documented the principal work performed to be controlled and measured, (Allweyer, 2016) and also VSM to express the value and non-value-added activities. However, the Service Value Stream Map graphics and specific nomenclature were not entirely used, the concept was key to identify pain points and propose alternatives. Problem solving skill was mainly used in the Gap Analysis phase to identify, in the interviews and focus groups, the primary "pain points" and possible improvements. Visual Management tools, such as 5S, were used to create the work instructions and standard work procedures towards Lu & Yang (2015) statement that promotes best

practices adoption through the new To Be processes. PDCA was used in the last methodology phase to create and stimulate continuous improvement initiatives.

To resume this chapter, the action research research question is once again highlighted to understand the journey and to deliver an adequate response to this action research value proposition. The research question is:

- "*How can an online gambling organization redefine its processes aligned with the industry restrictions and compliance requirements to achieve operational excellence and continuous improvement?*"

This action research provided a deep understanding of how BPR with its respective tools can impact the processes in study, delivering also a step-by-step methodology to approach similar processes in comparable industries. The objectives were clearly attained in the table 8 and according to the analyzed, produced and validated data by Apostar&Ganhar organization it was proved that the current action research answers the previous research question.

Action research Objective	**Deliverable**	**Chapters & Sections**
Map four core processes	As Is Mapped for the four processes in study, stating their old procedures. Figure 2, 5, 7, 8	4.2.1.1.1; 4.2.1.2.1; 4.2.2.1
Address the To Be process	To Be process documented and implemented in the Figure 3	4.2.1.1.3; 4.2.1.2.3; 4.2.2.3
Create Work Instructions	Created Work Instructions to the four mapped processes	Example in Annexe B
Introduce KPIs	Table 6, 7 and Figure 9	4.2.1.1.4; 4.2.1.2.4; 4.2.2.4
Quick-wins and tools	Created Quick-wins and frameworks to best practices adoption in the four processes studied. Figure 4, 6, 9,	4.2.1.1.4; 4.2.1.2.5; 4.2.2.4;

Table 8 – Action research objectives' deliverables

To end the discussion and to sustain the positive output outlined in the previous paragraph the final results obtained at the end of this project, after three months of analysis, were substantially positive although there was not significant historical data to effectively and narrowly compare the quantitative impacts. Nevertheless, at the end of those three months the results were:

- Process Deposits Incident Management registered a 57% reduction in the number of cases (monthly analysis), overcoming expectations. It reached a result below the target expectation of 10 cases per week, staying on average at the 7.5 cases per week;
- Cash Withdrawal process recorded an 80% SLA success rate in the bottleneck activity time (Bank Work Order approval from the Administration), targeted as 24 hours to be confirmed;
- No non-conformities performed by Apostar&Ganhar imposed by SRIJ in one-month analysis.

6. Conclusions

6.1. Final Conclusions

Process Reengineering, as methodology based on Lean and Continuous Improvement philosophies, has been studied from late 90s with several research papers and studies performed in multidiscipline industries as presented in the final Literature Review subchapter. The main purpose of this investigation was to introduce these themes in this new and trending industry that is facing a continuous growth during this decade.

It was visible in the last chapter that process reengineering in online gambling has positive impacts when it's considered the regulation and legal requirements as central part to create a business model proposition acting as bidirectional information flow from regulators as SRIJ, other entities and Apostar&Ganhar. Apostar&Ganhar has to recreate itself constantly to promote best practices and KPIs and to monitor processes outputs in order to act in non-value-added activities that can be the root-causes of negative performances.

The project was highly appreciated by Apostar&Ganhar and at the end of 2018, in a two-day visit to its headquarters, the recommendation explicit in the subchapter 4.3 was successfully implemented. Specifically, the Ticketing solution, to automatically receive and distribute tickets to be performed. This was a massive implementation because it could allow Apostar&Ganhar organization to automatically monitor KPIs such as delivery time to respond a ticket, satisfaction rate, number of tickets per area, and numerous others to provide precious information, which was the main challenge and opportunity to improve in the beginning of 2018. In this visit, the Apostar&Ganhar also created a Quality area, responding to the compliance department that centered all the continuous improvement initiatives, which had the responsibility to auditing and promoting process best practices adoption. The written work instruction created in this action research was taken into account for the definition of those best practices, which consequently led Apostar&Ganhar to the achievement of optimal medium-term results.

At the end of this work it can be stated that after the action research conduction and its success illustrated in the previous chapter can be concluded that online gambling industries can explore similar projects in order to adapt to current legal and technological constraints that they are facing to be more prepared to the future.

6.2. Limits to the Findings

There were some specific conditions that could mislead the results and the approach in another similar organization. This action research relies on Apostar&Ganhar's reality that was facing an early maturity stage as organization, it could almost be said that it was a startup or "grow up" as have been calling lately. Its governance model and its processes were not solid, it was missing KPIss as mentioned, it also had several projects running at the same time impacting processes output and continuous adapting procedures to new realities externally and internally, with new areas, new regulations and new technologies have been created, explained by industry and organization short age. Nevertheless, it can be useful to other investigations concerning online gambling as industry focus, to understand the legal and regulation impacts in value chain, acting as important link between processes.

The results achieved were highly conditioned by Apostar&Ganhar stakeholder's feedback from interviews and focus group in VSM construction and BPMN practices, and since there was no previously data recording those processes, it was considered their input and direct observation the main source of information to conduct this action research. The consultant partner had also an effective contribution to this action research, mainly in the benchmark input information, acting as a validation entity, due to its experience in similar projects stated in the Chapter 3.

There was missing an important pre-requisite to validate the To Be Model definition, generally used in Lean methodologies based, which is the simulation phase. Apostar&Ganhar consciously ignored this phase in order to maximize agility to their other projects in pipeline and also for the reason that they were comfortable with the consultant validation step.

6.3. Future research alternatives

Considering what have been examined in previous chapters, this industry is recent and it is growing exponentially in this decade. Thus, it has vast opportunities to be explored. The literature in this industry focuses mainly in gambling behaviors and regulation and legalization requirements. There are no studies correlating value chain strategies, information technologies and globalization strategies, which could lead to the pursuit of a new examination considering the industry growth, new entrants and the exponential potential of new players. A possible research question for future research studies could be:

- “How can an organization sustain their competitive advantage in online gambling industry, which has been targeted by new entrants, disruptive technologies and continuous regulations restrictions?

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Annexe A – Interview Template (Portuguese)

O Objetivo do trabalho é realizar um projeto de Reengenharia de Processos, numa perspetiva de crescimento de negócio e identificação de oportunidades de melhoria.

Dados Principais	
Hora:	Nome da Pessoa:
Função:	Departamento: I.T
Email:	Nº Telefone:

Processo X

1 Quais são as principais tarefas executadas dentro do processo?

Tarefa A:

1.1.1 Quais são os inputs (por exemplo, informações de outra área, sistemas, tecnologias, matéria prima, materiais) e qual a origem de cada um deles.

1.1.2 Quais são os outputs deste processo e quem são os clientes? Com que frequência fala com eles?

1.1.4 Quantas funções intervêm no processo e quem são os colaboradores que as executam?

1.1.5 Que documentos e sistemas são usados neste processo?

Annexe B – Work Instruction Example

1

Receive email from Customer Support in the Finance Mail box:

2

Go to Chameleon 360 and click the interface banking, then Deposits/Withdrawals Manager:

3

In the Deposits/Withdrawals Manager, search the respective customer ID, received from Customer Support. If the Customer ID has transactions related with the respective deposit, then we have to check the transaction status:

4

Send an email relating the situation to Customer Support, when the client does not have any transaction related with the payment proof:

5

When the client has transactions that may match the payment proof, verify if the player has pending or declined transactions status, search in the status column:

6

Send and email to Customer Support reporting that everything is ok:

7

Go to Backoffice SIBS click in the transactions interface:

8

In the Menu, select the date of the event (within an accurate range) and also the Merchant transaction ID that match the EPS Transaction of the pending/declined transaction from Chameleon360:

9

Search for the respective transaction ID and check status: