BUSINESS PROCESS MANAGEMENT

PROJECT PRESENTATION

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June/2022

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GRACE HOSPITAL

PROBLEM DESCRIPTION

PATIENT DISSATISFACTION

- The process is time consuming and involves uncertainty on how long in going to take
- Clinic staff does not know how to answer time/schedule related patient's questions

LACK OF COMMUNICATION

Sometimes the patients make a mistake on the day and time of the medical appointment due to the lack of a more efficient communication service between the patient
and the hospital

FINANCIALS

Huge opportunity costs losses on unattended clients (no cash entering)

COSTS

Costs on non-essential supply equipment and idle time resources

TECHNOLOGY

Low / bad use of technological tools

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OBJECTIVES

USE BUSINESS PROCESS MANAGEMENT

Use BPM's methods, techniques and tools to discover, analyze, redesign, execute and monitor a typical medical consultation

FOCUS ON ORTHOPEDICS DEPARTMENT

Addressing the orthopedic department problems can be a way to spread thru other hospital's areas

COST SAVINGS

Reduce expenses of supplies and enable process / resources runs more efficient

CUSTOMER SATISFACTION

Improve the patient flow in the hospital and the entire patient Experience making it more enjoyable and simpler

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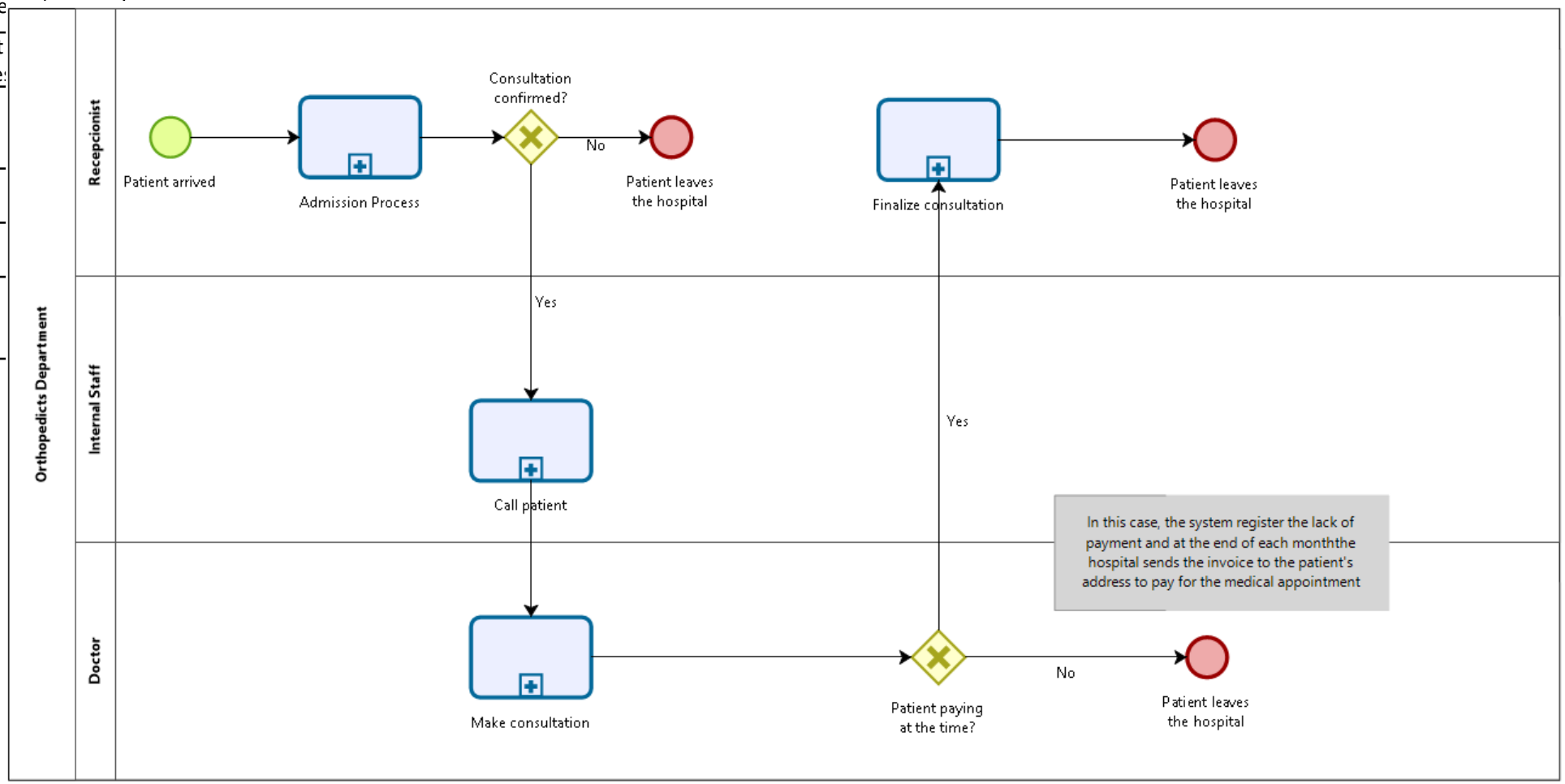
PROCESS DISCOVERY

THE AS-IS MODEL

Receptionist	Internal Staff	Doctor
Receive patient on the desk	Verify medical availability	Attend the patient
Ask for patient Citizen Card and medical consultation	Direct patient to Doctor's office	Register prescription into system
Insert patient personal data into the system		Register exams into the
Confirm consultation		Print pre
Receive the payment from patient		
Sign papers with hospital signature		
Print justification for the patient		
Deliver all necessary papers to the patient		

MAIN TASKS OF THE PROCESS

AS-IS MODEL OVERVIEW



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PROCESS ANALYSIS

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QUALITATIVE ANALYSIS

"Qualitative process analysis techniques allow us to identify, classify, and understand weaknesses and improvement opportunities in a process" (Dumas, M., La Rosa, M., Mendling, J., Reijers, H.A., 2018).

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QUALITATIVE ANALYSIS

VALUE-ADDED ANALYSIS

Activity	Steps	Classification	Justification
Call patient's ticket	a) order the system to call the next ticket	BVA	Makes the process run efficiently
Receive Patient on the Desk	a) wait for the patient to arrive; b) confirm the ticket	NVA	It does not add value to the business or the client
Ask for Patient ID	a) ask for the ID and wait b) check if the ID corresponds to the person	BVA	It is mandatory to check the identification of the patient
Ask for Medical Consultation	a) ask for which is the doctor to be consulted	NVA	The patient ID could give access to this information
Insert Patient Personal Data into the Information System	a) open Hospital's IS system; b) ask for more information	BVA	Important for the hospital management
Register Patient's Health System	a) ask for health system; b) add health system info on IS, if exists	BVA	Important for the hospital management
Confirm Consultation	a) confirm consultation and provide details	VA	Relevant to patient whether the consultation is confirmed

WASTE ANALYSIS

QUALITATIVE ANALYSIS

Activity	Situation	Category	Subtype	Justification
Admission Process	Waiting for the client / patient to come when recepcionist calls the ticket ID	Hold	Waiting	The recepcionist (resource) has to wait, on average 30s for the patient arrival to the desk.
Admission Process	Client is waiting to be called by the recepcionist	Hold	Inventory	The client has to wait to initiate the service.
Admission Process	Client goes to the recepcionist's desk	Move	Transportation	The client has to go to the desk and find the correct recepcionist's desk.
Admission Process	Waiting for the client's ID when asked to have it	Hold	Waiting	The recepcionist waits for the document.
Admission Process	The recepcionist aks for the medical consultant	Over-do	Over-processing	With the client ID, there is no need to ask for the consultation that could led to more waiting time as the patient could forget the doctors name, give a different name, etc.
Admission Process	Client responds to recepcionist's questions and waits	Hold	Iventory	Client have to wait to confirm his/her consultant and answers / provides all the informations that the recepcionist asks.
Call Patient	Internal staff checks medical's appointment list availability	Over-do	Over-processing	It could be done by the recepcionist or by IS.
Call Patient	Internal staff calls the patient	Hold	Waiting	There could be a delay between the time of the call and when the patient comes.
Call Patient	Client waits to be called to the doctor's office	Hold	Inventory	After consultant's confirmation, the client has to wait to

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QUALITATIVE ANALYSIS

ISSUE REGISTER

Activity	Issue	Data / Assumptions	Qualitative Impact	Quantitative Impact	Impact	Effort / Cost	Justification
Receive Patient on the Desk	Long time waiting for the patient to start the admission process	The recepcionist has to wait, on average 30s for the patient arrival to the desk.	Reducing impact on other patient's experience	Reducing the Circle Time Efficiency, increasing the Work in process	LOW	HARD	There is a window of time between each doctor's attendance and this time is, in general, inside it.
Receive Patient on the Desk	Long time waiting to the recepcionist to start the admission process	There is no information on how long the patient waits to be called	Patient's perception about the efficiency of the service.	Increasing the risk of reducing the Circle Time Efficiency and increasing the Work in process	MEDIUM	MEDIUM	As the main purpose is to retain more clients, improving its experience.
Ask for Medical Consultation	Repeated client info	The recepcionist is already with the client ID and can retrieve on the IS his appointment without asking	Patient's perception about the efficiency of the service.	Increase process time	MEDIUM	EASY	As the main purpose is to retain more clients, improving its experience.
Verify Medical Availability	Internal Staff appointment list verification could be done in other manner	Verifying the availiability of the doctor and the patient could be done by as IS or even the recepcionist	Making the process more efficient.	Increase process time	HIGH	EASY	There is no reason for keeping a person just to check te availiability.
Call Patient	Calling the patient could be an automated task	The doctor could trigger the "call for the patient" automatically when the current consultation has finished	Making the process more efficient.	Increasing the risk of reducing the Circle Time Efficiency and increasing the Work in process	HIGH	EASY	There are several technologies to make this work

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QUALITATIVE ANALYSIS

PICK CHART

QUANTITATIVE ANALYSIS

Techniques for analyzing business processes quantitatively in terms of process performance measures such as cycle time, waiting time, cost, and resource utilization.

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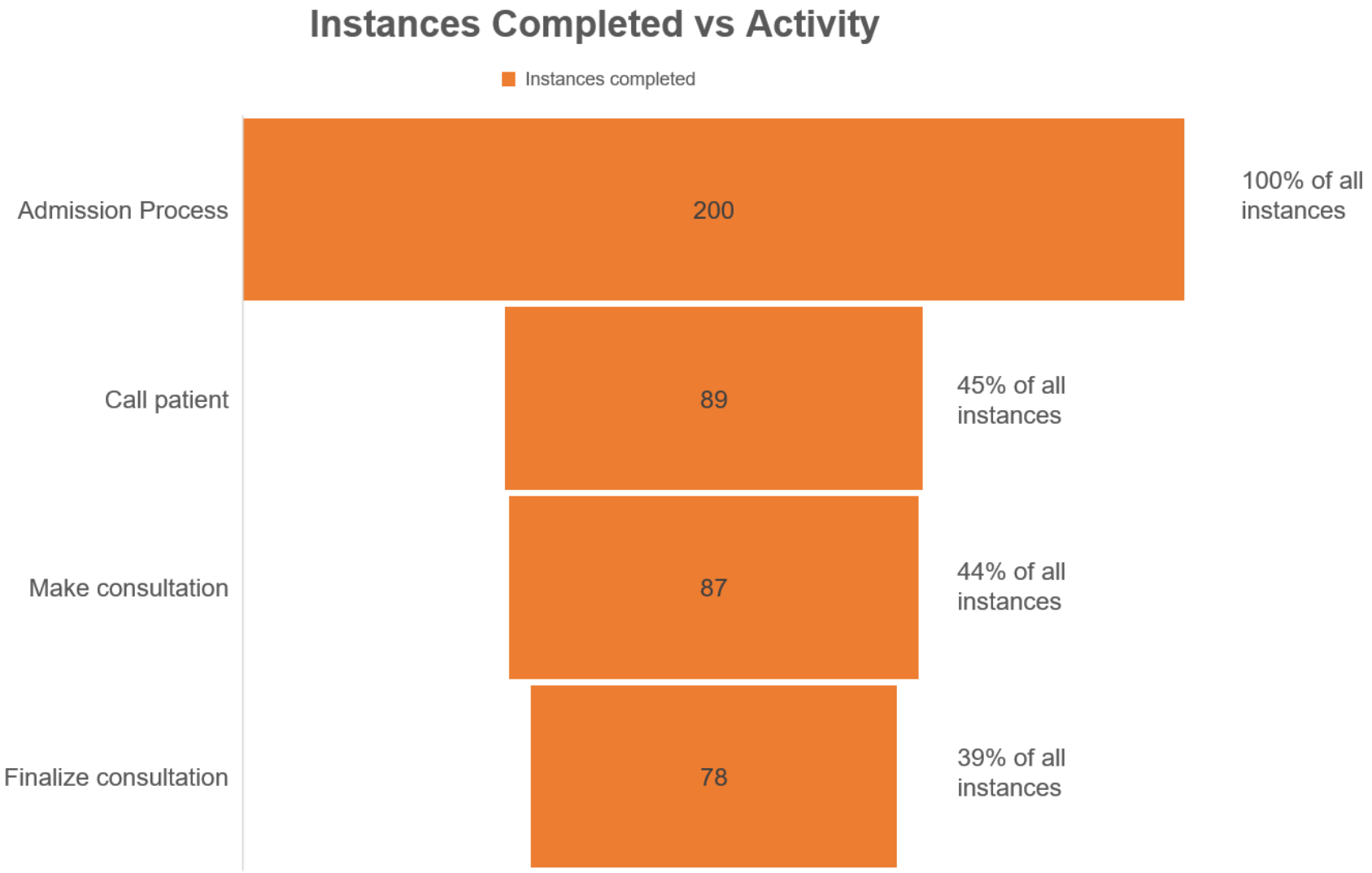
QUANTITATIVE ANALYSIS



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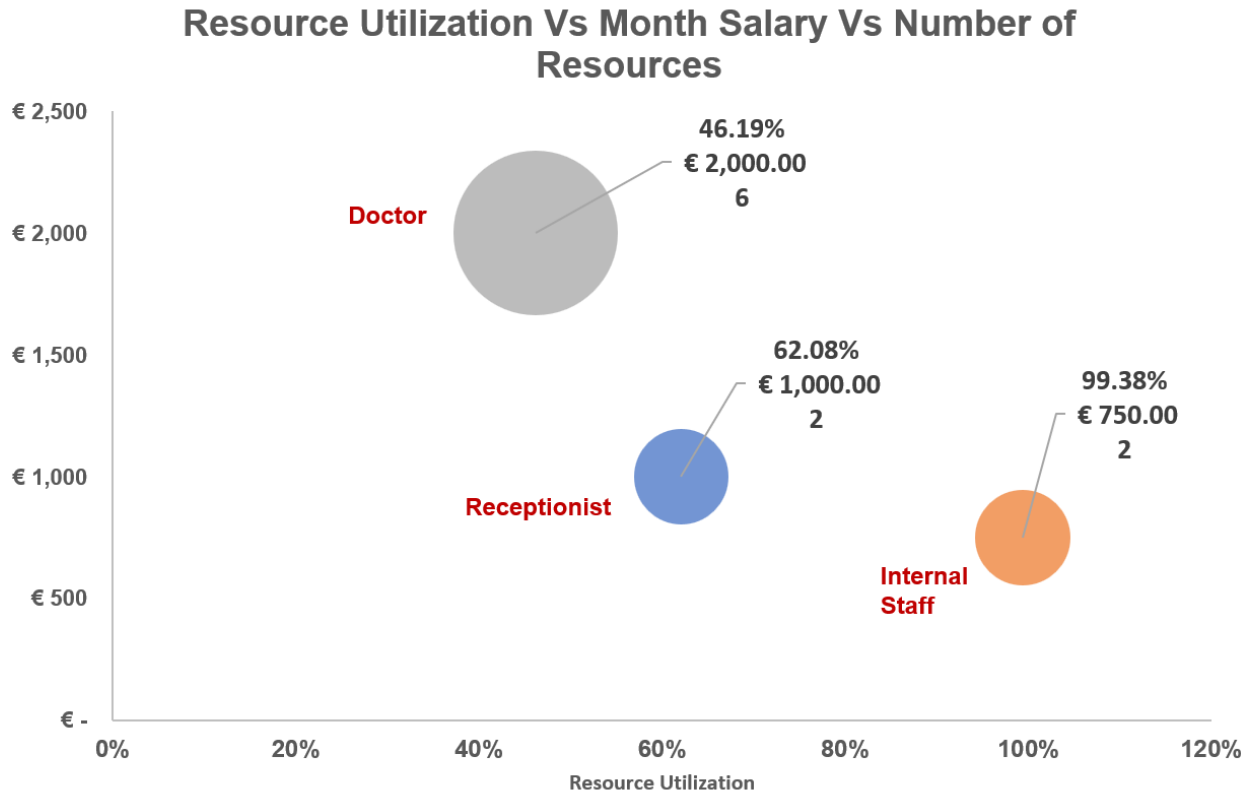
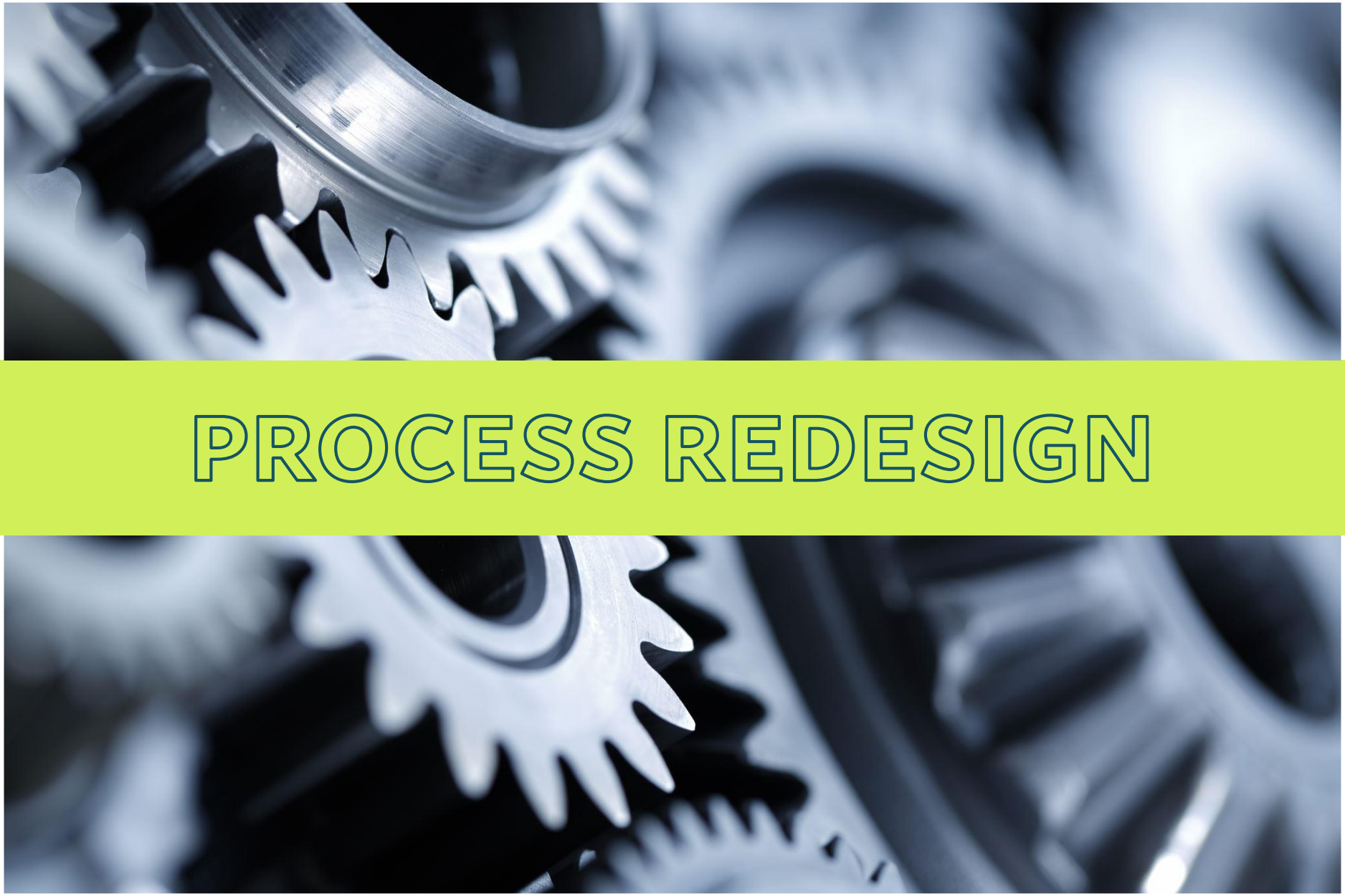
QUANTITATIVE ANALYSIS



Activity	Avg. Processing Time (min.)	Avg. Waiting Time (min.)	Cycle Time	Theoretical Cycle Time	Cycle Time Efficiency
Admission Process	2,34	0,34	2,68	2,00	75%
Call patient	133,10	125,11	258,21	10,50	4%
Make consultation	15,05	0,03	15,08	15,00	99%
Finalize consultation	2,82	0,32	3,14	2,50	80%
Orthopedicts Department	**135,17**	**143,93**	**279,11**	**30,00**	**11%**

CYCLE TIME EFFICIENCY FOR AS-IS MODEL



PROCESS REDESIGN

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EXPLOITATIVE REDESIGN APPROACH

FINALIZE CONSULTATION PROCESS - REDESIGN

Activity	Heuristics	Level	Time	Cost	Flexibility	Quality	Justification
Call the Patient Ticket	Triage	Task	Improves	No effect	Worsens	No effect	An automated system would call the patient to the correct recepcionist desk when leaving the doctor's office.
Sign Papers with Hospital Signature	Task Elimination	Task	Improves	Improves	Improves	Ambiguous	The hospital can use a eletronic signature to send the document to the costumer (by email, SMS) and he can print it by himself (not using the hospital resources).
Print Justification for the Patient	Task Elimination	Task	Improves	Improves	Improves	Ambiguous	
Take the Patient's ID card	Task Elimination	Task	Improves	No effect	Improves	Improves	The recepcionist has all the client's info on the IS and doesn't need to bother him again asking this confirmation.
Print the Information about the New Appointment	Task Elimination	Task	Improves	Improves	Improves	Ambiguous	The hospital can use a eletronic signature to send the document to the costumer (by email, SMS) and he can print it by himself (not using the hospital resources).
Deliver All Necessary Papers to the Patient	Task Elimination	Task	Improves	Improves	Improves	Ambiguous	

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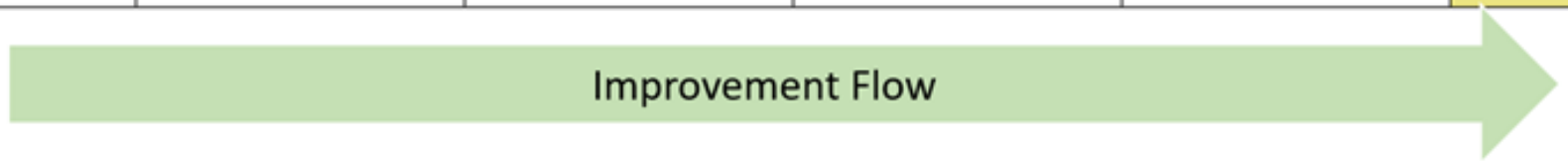
WHAT-IF ANALYSIS

Resource	As-Is	What-If 1	What-If 2	What-If 3	What-If 4
Receptionist	62%	82%	84%	43%	45%
Internal staff	99%	95%	95%	95%	36%
Doctor	46%	93%	65%	65%	67%
Recepcionist Machine				27%	28%
Internal machine					60%



- What-if 1 - based on As-Is: reducing the average time from 10.5 min to 5 min in the activity Call Patient.
- What-if 2 - based on What-if 1: reducing the average time from 15 min to 10 min in the activity Make Consultation.
- What-if 3 - based on What-if 2: adding three receptionist machines on Admission process and using a gate "OR" to parallelize the task into more resources.
- What-if 4 - based on What-if 3: adding two internal machines on the activity Call Patient and using a gate "OR" in the resource option.

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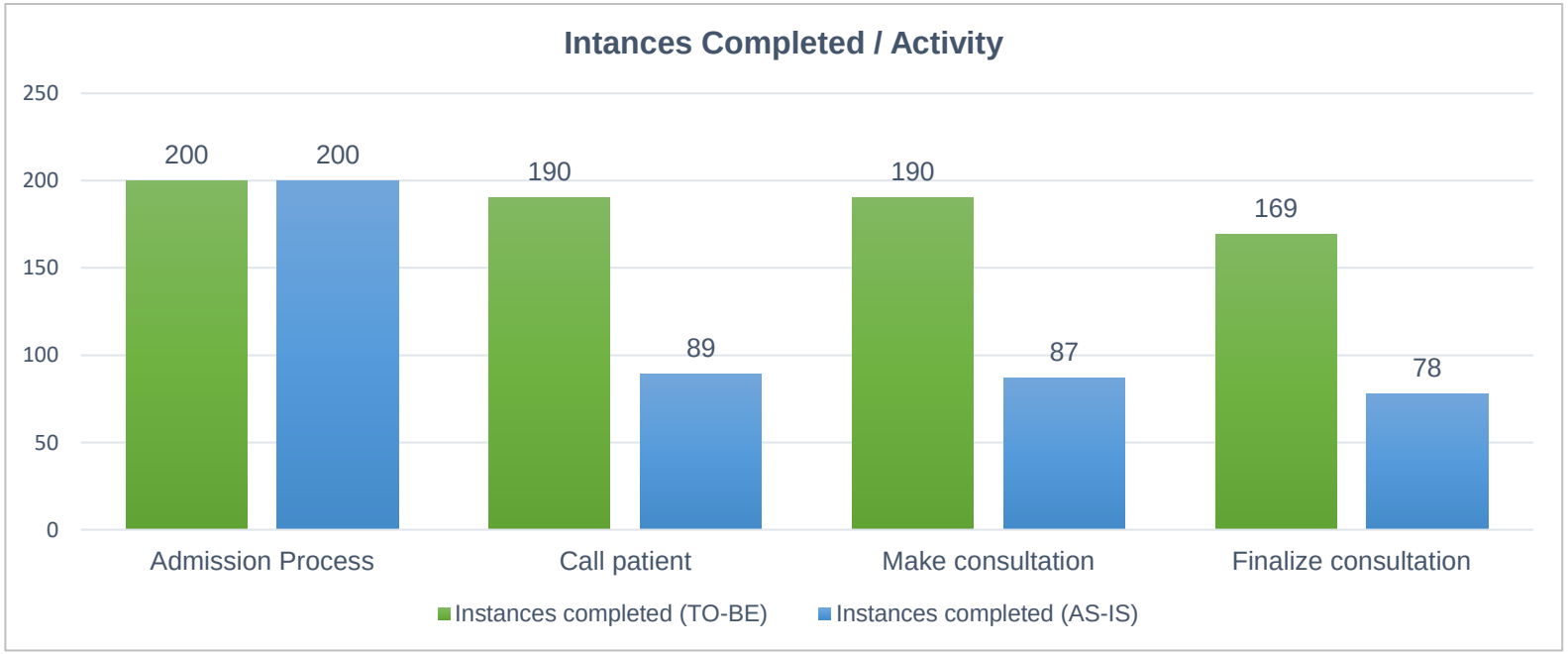
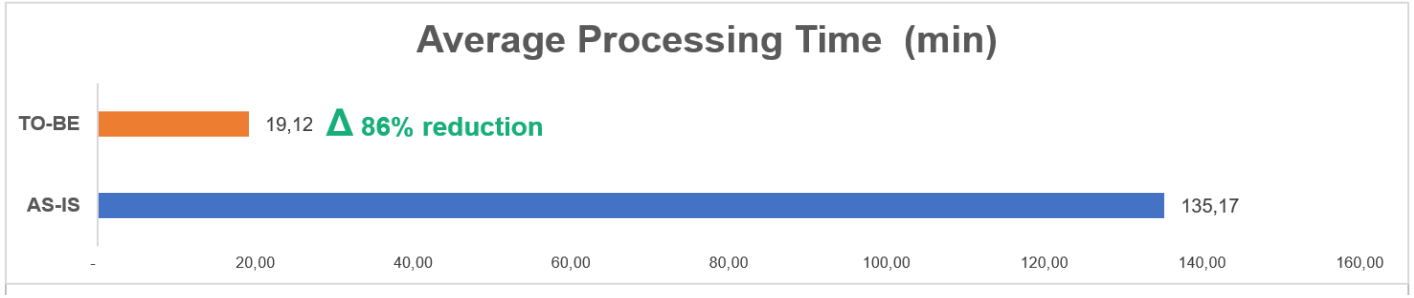
FLOW ANALYSIS

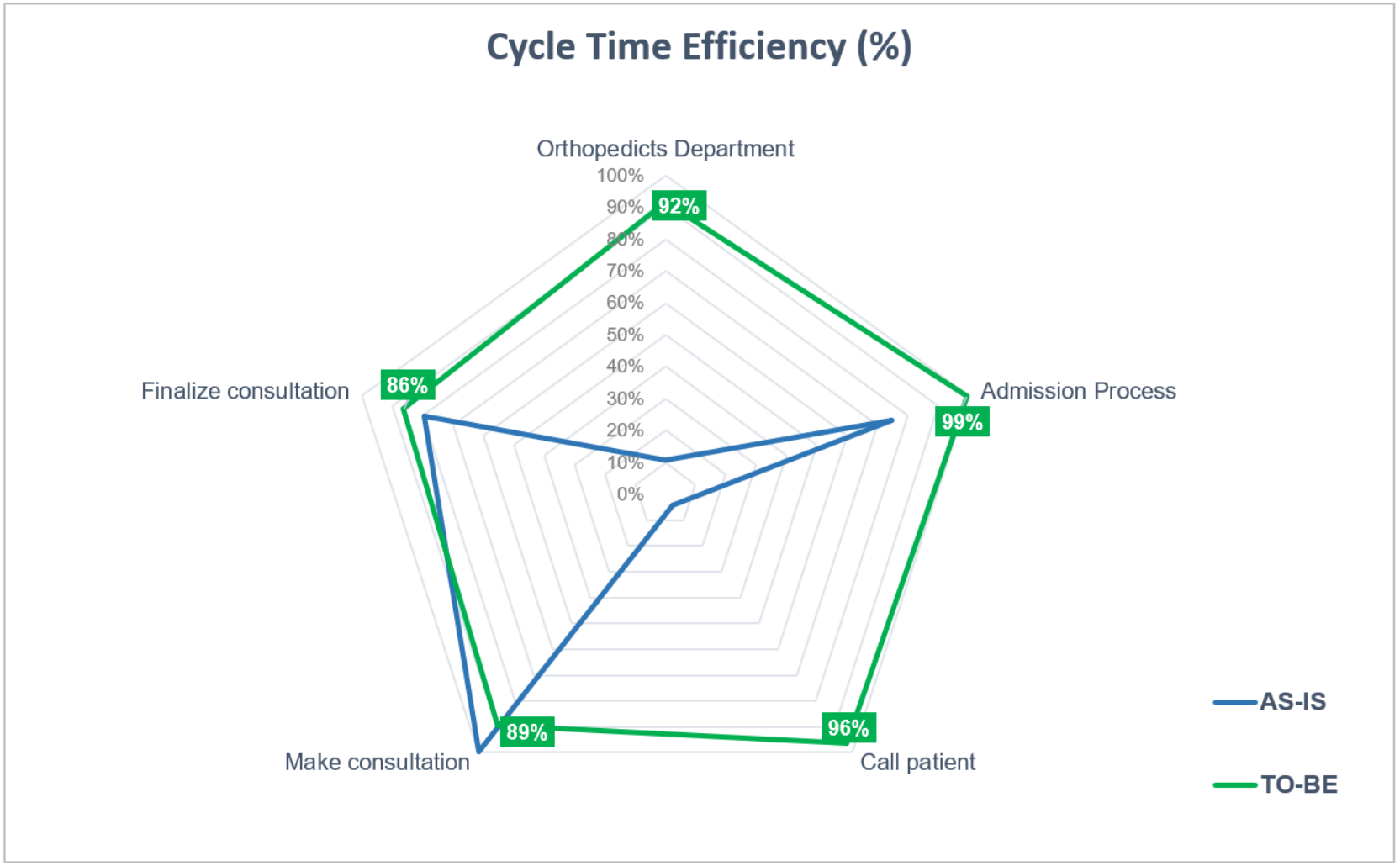
AVERAGE PROCESSING TIME TO-BE VS AS-IS





INSTANCES COMPLETED / ACTIVITY TO-BE VS AS-IS

FLOW ANALYSIS



CYCLE TIME EFFICIENCY TO-BE VS AS-IS

QUEUING ANALYSIS

	AS-IS		
Activity	**Avg. time (m)**	**Avg. time waiting for resource (min)**	**Total time waiting for resource (min)**
Orthopedicts Department	135,17		11.479,35
Admission Process	2,34	0,34	67,25
Call patient	133,10	125,11	11.385,00
Make consultation	15,05	0,03	2,31
Finalize consultation	2,82	0,32	24,79

	TO-BE		
Activity	**Avg. time (m)**	**Avg. time waiting for resource (min)**	**Total time waiting for resource (min)**
Orthopedicts Department	19,12		178,55
Admission Process	2,01	0,00	0,87
Call patient	5,00	0,18	35,07
Make consultation	10,61	0,58	109,44
Finalize consultation	2,70	0,20	33,18

	Improvement Rate %		
Activity	**Avg. time (m)**	**Avg. time waiting for resource (min)**	**Total time waiting for resource (min)**
Orthopedicts Department	-85,86%		-98,44%
Admission Process	-14,19%	-98,71%	-98,71%
Call patient	-96,24%	-99,85%	-99,69%
Make consultation	-29,51%	2118,44%	4635,99%
Finalize consultation	-4,37%	-38,24%	33,82%

QUEUE ANALYSIS IN A VIEW TO-BE VS AS-IS

RESULTS

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COST-BENEFIT ANALYSIS

AS-IS Yearly Direct and Indirect Costs						
	Resource	Number of services		Cost per Unit		Total Cost
Staff and Over Head Cost	Receptionist	2	€	1.000,00	€	28.000,00
	Internal Staff	2	€	750,00	€	21.000,00
	Doctor	6	€	2.000,00	€	168.000,00
	Total	10	€	3.750,00	€	217.000,00
Direct Cost	Printing Documents per Year per patient (Nr of Patients per day*30 *12)	6.000	€	0,13	€	9.360,00
		Instances not served		Cost per specialist consult		Total Opportunity Cost
Opportunity Cost	Lost per Year (Nr of patient not attended * price per consult * 365)	113	€	70,00	€	2.887.150,00
	TOTAL COST PER YEAR (AS-IS)				€	3.113.510,00

TO-BE Yearly Direct and Indirect Costs						
	Resource	Number of services		Cost per Unit		Total Cost
Staff and Over Head Cost	Receptionist	2	€	1.000,00	€	28.000,00
	Internal Staff	2	€	750,00	€	21.000,00
	Doctor	6	€	2.000,00	€	168.000,00
	Total	10	€	3.750,00	€	217.000,00
Technology Cost	Additional Number of Services					
	Recepcionist Machine (Acquisition)	3	€	598,60	€	1.795,80
	Internal machine (Acquisition)	2	€	278,58	€	557,16
	Equipment Assembly and Maintenance		€	400,00	€	400,00
	Total	5	€	1.277,18	€	2.752,96
		Instances not served		Cost per specialist consult		Total Opportunity Cost
Opportunity Cost	Lost per Year (Nr of patient not attended * price per consult * 365)	10	€	70,00	€	255.500,00
	TOTAL COST PER YEAR (TO-BE)				€	475.252,96

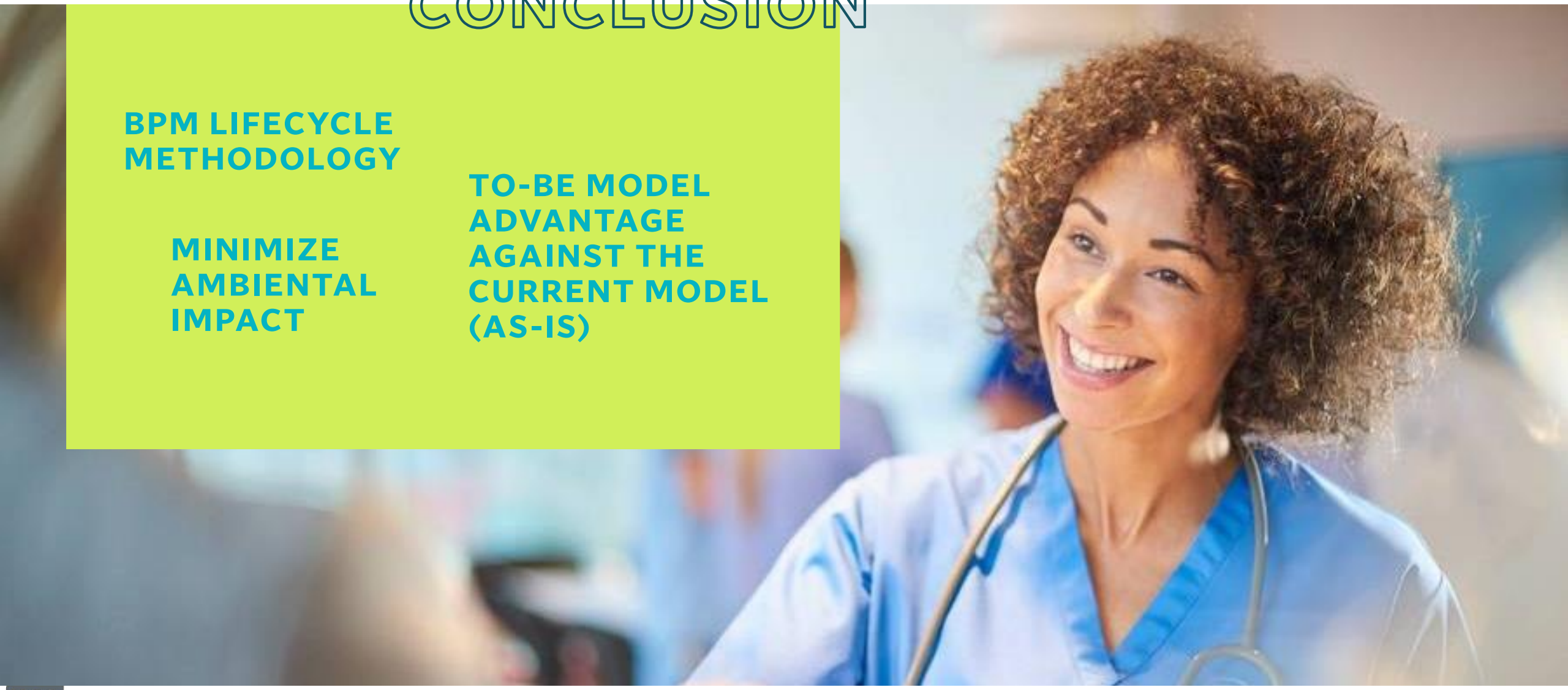
COST SAVING PER YEAR AFTER IMPLEMENTING TO-BE MODEL	€	2.638.257,04
% OF COST REDUCTION TO-BE VS AS-IS		-85%

CONCLUSION

BPM LIFECYCLE METHODOLOGY

MINIMIZE AMBIENTAL IMPACT

TO-BE MODEL ADVANTAGE AGAINST THE CURRENT MODEL (AS-IS)



THANK YOU

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