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PROCESS IMPROVEMENT IN HOTEL BUSINESS

Thesis
CENTRIA UNIVERSITY OF APPLIED SCIENCES
Industrial management
May 2016

ABSTRACT

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Degree programme		
Industrial Management		
Name of thesis		
PROCESS IMPROVEMENT IN HOTEL BUSINESS		
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This thesis works with a famous Hotel business in Helsinki. Hotel business profitability getting more tough, for that hotel management team need to always adjust their process to get more efficiency and possibly increase their sales. The main purpose of this thesis was to find the way where to start process improvement, mostly concern with revenue and occupancy variation. This thesis helps to understand situational overview and create path for next research by narrowing the development focus.

The Six Sigma methodology was used in this report to understand one-year possible variation over sales and revenue. This thesis included the method, which are used over the practical implementation of the project. Detailed studies and results are classified as confidential; therefore those are not presented in this thesis. Mostly data collect from the official archive of the hotel for that it was also hidden in this project.

This project findings gives the view of the root cause of defects in the revenue, which could led them to find improvement aims in the process. Variation over month revenue and occupancy shows the way, where to improve. Most of the time was spent analysing the key indicator that could led the project to defect. Later this project could continue by searching to prevent the problem and end up with possibly adjustment of process including development suggestion.

CONCEPT DEFINITIONS

BPI   Business Process Improvement

DMAIC   Define, Measure, Analyze, Improve and Control

DOE   Design of Experiments

EU   European Union

IHG   Inter Continental Hotels Group

LCL   Lower Control Limit

OD   Organizational Development

OSF   Official Statistic of Finland

SIPOC   Supplier, Input, Process, Output and Control

StDev   Standard Deviation

UCL   Upper Control Limit

VOC   Voice of Customer

ABSTRACT
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1 INTRODUCTION

Crowne Plaza Helsinki owned by Restel Hotelli Oy under the supervision of InterContinental Hotels Group. I have worked in Crowne Plaza Helsinki for three summers, so I have some idea about the process how they work. That's how I got interested to work with this project. The Hotel business is so competitive for that it is very important to make the process more time and cost efficiency way.

The management of Crowne Plaza says there is always some place to improve and they believe in continuous development, which could give them a competitive advantage in the market. My aim of thesis work is to find the way I could improve the process that could be efficient enough to save time and money. Also, it is hard to say total process improvement, so here my work is to divide all their process into small parts and try to analysis and find the possible solution & suggestion by using lean thinking and six-sigma methodology.

My method will be flowing way. Graph 1 shows my working process in this research.

Theory	→	Analysis Situation	→	Research & Indentify	→	Suggestion & Soluation	→	Conclusion

GRAPH 1. Thesis working method overview

To Research I am going to use data from:
- Available statistic (Finland statistic/ Hotel business statistic across Europe/ research book to find business trend)
- Analysis customer feedback (Customer satisfaction feedback from the web)
- Interviewing (To get possible suggestion and their thinking about hotel process)

Also, I use actual data from Crowne Plaza Helsinki and some part of my thesis is confidential. For that, I am not uploading those for the public reader.

2 BUSINESS SITUATION

2.1 Business situation in Europe

The hospitality industry in the EU currently employs some 9.5 million workers, spread out across 1.7 million enterprises. This represents, respectively, 4, 4% of total employment in Europe and 8% of all enterprises in the market-oriented economy. (Hotrec 2016.)

Occupancy rate of the hotel industry worldwide 2008-2015, by region

	2008	2009	2010	2011	2012	2013	2014	2015
Asia pacific	65.10%	60.60%	66.70%	67.90%	68%	68.30%	68.20%	68.20%
USA	60.60%	54.70%	57.80%	60.10%	61.40%	62.20%	64.30%	65.30%
Europe	65.10%	60.50%	64.30%	66.10%	65.80%	67.40%	68.60%	70.10%
Middle East & Africa	69.60%	61.30%	61.30%	56.80%	60.30%	61%	63.40%	62.90%
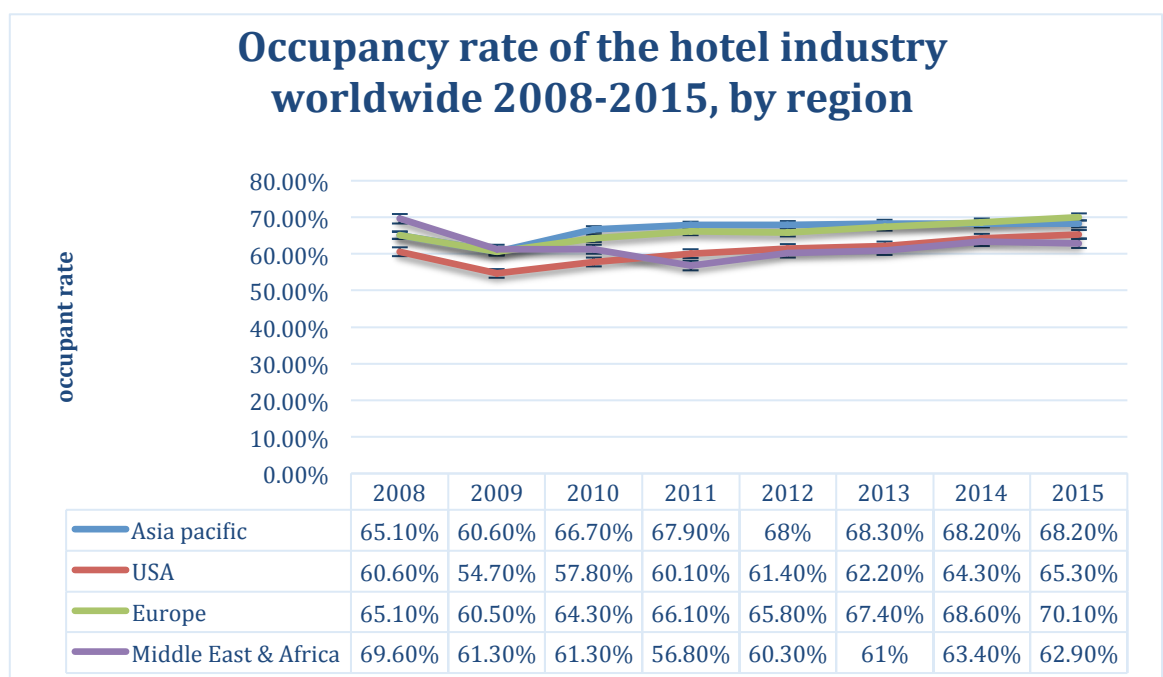
GRAPH 2. Occupancy rate in hotel industry worldwide (Hotel news 2016.)(Modified)

Hotels and restaurants are obviously an important component of the tourism industry, although it should be noted that restaurants serve locals as well as tourists. Europe is the largest tourism destination in the world with a market share of around 50%, representing some 475 million international arrivals. People are spending over 1.5 billion nights in hotels and similar establishments in the EU28. (Hotrec 2016.)

TABLE 1. Net occupancy rates of bed-places in hotels and similar establishments in 2014 and 2015 compared with the same periods (Eurostat 2016) (Modified)

Occupancy Rate/Time period	January to September		July to September	
EU countries	2014 %	2015 %	2014 %	2015 %
Belgium	43,2	43,1	49,3	48,6
Germany	42,5	43,7	50,6	51,9
Spain	58,4	60,8	70,8	73,9
France	48,3	49,4	56,7	58,4
Italy	42,9	44,6	56,7	58,0
Switzerland	43,7	43,2	49,4	48,7
Finland	39,0	39,6	43,9	45,3
Sweden	40,9	44,3	50,3	55,6
Norway	37,5	39,2	44,6	47,8
EU (28) Total	46,6	48,2	57,5	59,0

Also from table 1 we could see that among those EU countries only Switzerland loses the occupancy rate but other country from that list has been grown their occupancy rate of bed-places in hotels and similar establishment in 2014 and 2015 in the period of January to September and July to September.

2.2 Business situation in Finland and Helsinki

Overnight stays by foreign tourists increased by 14.6 percent at Finnish accommodation establishments from last year and nearly 453,000 nights were recorded for them in February 2016. In contrast, the number of nights spent by resident tourists decreased by 3.4 per cent and they spent well one million nights at accommodation establishments. A total of nearly 1.5 million overnight stays were recorded at Finnish accommodation establishments in February 2016, which was 1.5 percent more than in February 2015.

Nights spent at Finnish accommodation establishments by visitors from all the most important countries of inbound tourism to Finland increased in January to February 2016, with the exception of Russia. Overnight stays by Russian visitors decreased strongly throughout 2015, but the decrease appears to have halted in the early part of 2016. (OSF 2016.)

Between January and February, the number of nights spent by Russian visitors at accommodation establishments in Finland totaled good 180,000, which were 14.6 per cent down on the respective time period of last year. They were, however, by far, the largest group of foreign visitors in January to February, as British visitors came next with 93,500 overnight stays. Overnight stays by British tourists went up by 8.2 percent. German visitors made up the third largest group with close on 81,000 overnight stays. The number of nights recorded for them was 8.6 percent higher than in the respective period one year earlier. (OSF 2016.)

Graph 3 shows the Change of overnight stays in January/February 2016/2015 by the foreign visitor in Finland.

GRAPH 3. Over night's stay in Finland 2016/2015 (OFC 2016) (Modified)

3 CROWNE PLAZA WORKING PROCESS AND SITUATION

3.1 Crowne Plaza brand overview

Crowne Plaza Helsinki is a luxury hotel situated in the heart of Helsinki. Its global know brand for the hotel business. It's a part of Inter Continental Hotels Group of brands include InterContinental Hotels & Resorts and Holiday in Hotels & Resorts, Which operates in 52 countries with more than 400 hotels, usually located in city centers, resorts or major airports. Crowne Plaza first originally branded as "Holiday Inn Crowne Plaza", the first United States Holiday Inn Crowne Plaza was opened in 1983. After a couple of years, the brand became an independent chain owned by Holiday Inn group. The first Crowne Plaza Resort was opened in Madeira, Portugal in 1999. Still today they are expanding more Hotels and Resorts over the globe. In 1990, Inter-Continental Hotels group purchased the Holiday Inn group, which includes Crowne Plaza also. (Crowne Plaza 2012.)

3.2 Capacity for Crowne Plaza, Helsinki

The Crowne Plaza Helsinki is a top-class hotel that offers the attentive quality service of an upscale hotel chain with a global reputation. Well-appointed, comfortable rooms come with sleep advantage amenities and service. Excellent restaurants, professional conference service and functional technology reinforce the city's leading conference center, The Royal at Crowne Plaza. The Forever Health Club & Day spa at that is an ideal place for guests to relax. (Crowne Plaza Helsinki broacher 2015)

Here is some information of capacity in Crowne Plaza.

- Rooms   349
- Club rooms   33
- Junior Suites   42
- Suites   4
- Club lounge
- Restaurants   3

- Day Spa/ Health Club
- Sauna / Indoor swimming pool
- Conference room's   12
  Person max.   500
- Winter garden   220 Persons
  Banquet restaurant   600 Persons

3.3 Work process by department

The Sales & Marketing department works individually for all the Restel group Hotels. Crowne plaza Helsinki has basically three-department working. The entire departments are work under the supervision of Restel Hotelli Oy, not any of the department is outsourced. Which have an advantage and also a disadvantage.

Graph 4 shows the departments and working responsibility of Crowne Plaza, Helsinki

- Find out possible solution for problem and adjust to work all department together
- Check Booking order & send it to the housekeeping Department.
- Check feedback from coustomer & give answer (Phone calls/emails/ coustomer service/offer sale)

Mangarial work

Reception Depertment

Marketing & sales

Housekepping and maintanence

- Increase slaes and give offer to the touriest group and travel company
- Get order from Repection make room ready according to the order and other maintanence

GRAPH 4.Working responsibility and structure in Crowne Plaza Helsinki.

3.4 Working process

Here I am defining the Crowne Plaza Helsinki process start from the customer order and end with customer feedback.

```
┌──────────────────┐           ┌──────────────┐           ┌──────────────────┐
│ Booking          │           │              │           │ Sales and        │
│ request done     │           │ Customer     │           │ marketing give   │
│ by, Phone call,  │  ───────▶  │ Order        │  ◀──────  │ offer to Group   │
│ website (IHG,    │           │              │           │ or individuals   │
│ BOOKING.COM,     │           └──────────────┘           └──────────────────┘
│ Holidex etc.)    │                  │
└──────────────────┘          ┌───────────────┐
                              │ Request for   │
                              │ booking       │
                              └───────────────┘
                          ┌──────────────┐   ┌──────────────────────┐
                          │ External     │   │ Conformation by      │
                          │ Reservation  │   │ Email or massage     │
                          │ system       │   │ to customer          │
                          └──────────────┘   └──────────────────────┘

┌──────────────────┐           ┌──────────────┐           ┌──────────────────┐
│ Describe         │           │ Reception    │           │ Check            │
│ offers and       │           │ checks order │           │ Occupancy        │
│ service and      │  ───────▶  │ & Book Room  │  ◀──────  │ rate and adjust  │
│ sale Pings       │           │              │           │ order            │
│ card/ k –Plus    │           └──────────────┘           └──────────────────┘
│ card.            │
└──────────────────┘

┌──────────────────┐           ┌──────────────┐           ┌──────────────────┐
│ Sometimes        │           │ Housekeeping │           │ Give             │
│ makes rooms      │           │ Make room    │           │ conformation to  │
│ by estimation    │  ───────▶  │ ready accord-│  ◀──────  │ reception when   │
│ of Demand        │           │ ing to order │           │ room is ready    │
│ estimate         │           └──────────────┘           └──────────────────┘
└──────────────────┘

┌──────────────────┐           ┌──────────────┐           ┌──────────────────┐
│ Restaurant       │           │ Stayover     │           │ Service quality  │
│ service          │  ───────▶  │ Service      │  ◀──────  │ for Housekeeping │
│ quality          │           │              │           │ & Reception      │
└──────────────────┘           └──────────────┘           └──────────────────┘

┌──────────────────┐           ┌──────────────┐           ┌──────────────────┐
│ Write feedback   │           │ Check out &  │           │ Pay Bills By     │
│ about staying    │  ───────▶  │ Feedback     │  ◀──────  │ cash/Card/       │
│ Hotel Service    │           │              │           │ invoice          │
└──────────────────┘           └──────────────┘           └──────────────────┘
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GRAPH 5. Working process (Customer point of view)

Graph 5 shows the working process thinking about customer point of view in Crowne Plaza hotel. Its starts with the customer order in a different way, it could do by Internet or tourist agency. Sales and marketing work together to find out the potential customer and give them different offer. Individual offer mostly gives to the IHG or other members. This customer order goes to the Internal Reservation System and this system send conformation massage to the customer. Reception department check all the order in the night for next day and make forward the massage to the Housekeeping department about how many room need to be ready and which time customer are coming. Housekeeping department makes rooms ready according to the reception order lists and sometime more by estimation. In next stage when customer comes for check in Reception check the order and give selected room key for the customer. Also reception tries to sales some offer (Ping or k card) to the customer on spot, also they provide other necessary information while giving the room key. While staying in the hotel customer observe the service for Reception, Housekeeping and Restaurant. In the end they check out, pay all bills and give feedback about the service.

3.5 Problems and challenges

Restel Oy already got offer from some outsourcing company to give their Housekeeping and Reception department to outsourcing company. Restel Hotelli Oy management who are the responsible for taking this kind of decision? They give some of their hotels like Holiday Inn (City center Helsinki) and Seurahuone (Helsinki) Housekeeping department to the outsourcing company. But still they did not give those departments to the outsourcing company for Crowne Plaza hotels. Crowne Plaza Helsinki was well known for "Leading Business Hotel", so there is always a quality issue when that goes to outsourcing company. Restel Hotelli Oy want to carry on with reputation and quality service, also they are concern about the waste management and saving money for Crowne Plaza to stay in competitive in market which is the biggest challenge.

Here is some the biggest challenge they are facing recently.

- o High rent for the building. Dividum Oy owned the Crowne Plaza hotel building and Restel Oy rents it.
- o Winter occupancy rate is so low than compared to the summer occupancy rate. Some months of winter (November to February) occupancy rate are so low.
- o Feedback from customer and quality issue.

4 METHODS OF IMPROVEMENT

4.1 Business process improvement

Business process Improvement (BPI) is a systematic approach to help an organization optimize its underlying processes to achieve more efficient results. The methodology was first documented in H. James Harrington's 1991 book Business Process Improvement. It is the methodology that both Process Redesign and Business Process Re-engineering are based upon. BPI has allegedly been responsible for reducing cost and cycle time by as much as 90% while improving quality by over 60%. (Business process improvement 2012)

BPI focuses on "doing things right" more than it does on "doing the right thing". In essence, BPI attempts to reduce variation or waste in processes, so that the desired outcome can be achieved with better utilization of resource.

BPI works by

- o Defining the organization's strategic goals and purposes
- o Determining the organization's customers or stakeholders
- o Aligning the business processes to realize the organization's goals

4.2 Organizational development

Process improvement is an aspect of organizational development (OD) in which a series of actions are taken by a process owner to identify, analyze and improve existing business processes within an organization to meet new goals and objectives, such as increasing profits and performance, reducing costs and accelerating schedules. These actions often follow a specific methodology or strategy to increase the likelihood of successful results. Process improvement may include the restructuring of company training programs to increase their effectiveness. Process improvement is also a method to introduce process changes to improve the quality of a product or service, to better match customer and consumer needs. (Organizational development 2012)

4.3 DMAIC methodology

In this thesis work I am using DMAIC method to reach my improvement suggestion or solution. Figure 6 shows the general methodology about DMAIC method.
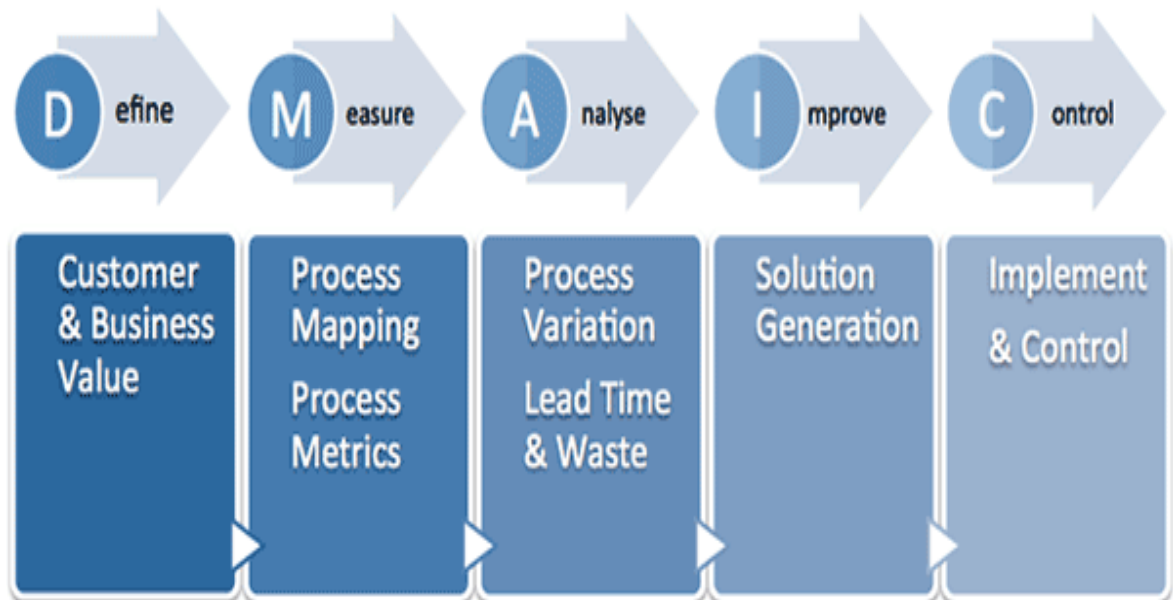
GRAPH 6. DMAIC Method Overview (McGraw Hill 2003.) (Modified)

The DMAIC stands for Define, Measure, Analyze, Improve, and Control. The purpose of the methodology is to assess a problem logically, develop a baseline understanding of the existing process and what affects the outcomes from it, and then develop and implement sound solutions to close performance gaps.

a. Define: The Define phase of a Six Sigma project is very important, as having a clear definition of the issues that must be solved is absolutely critical to the success of the project. It is important to not rush during this phase. If the issues are defined incorrectly, the entire work will end up attempting to solve the wrong problems, which will ultimately waste valuable time, effort, and resources. During my Define phase, I will do the following for this thesis.

- o Find the subject of matter where to work.

- o Create a work charter, which will define and guide the project.

- o Identify the customers of the process.

- o Clearly define the opportunities for improvement in the process, and describe them from the customer's point of view.

- o Collect feedback of customer data and analyze it in order to identify customers' needs and expectations of the process.

- o Process map and value stream map the current process.

- o Analyze the inputs that go into the process and the services or products, which come out. (Clayton Taylor 2015.)

b. Measure: When the Define phase complete, it is time to create a baseline of the existing process. During the Measure phase, I will collect data about the process, how well it is performing, and develops a picture of the outputs using that data. While the team is measuring, I will pay close attention to how well the process addresses the customer expectations identified in the Define phase. During the Measure phase, I will do the following for this thesis.

- o Use the customer's feedback to define what is critical to quality from their point of view.
- o Select the metrics, which best describe the critical to quality factors.

- o Conduct a measurement systems analysis to ensure that the collection of the information needed, so the results of the measurements will be accurate

- o Create a data-gathering plan for collecting information about each critical to quality factor.

- o Execute the data-gathering plan.

- o Use descriptive statistics and charts to describe the current process and resulting service or product.

- o Identify defects created by the process, and determine what percentage of the services or products created are defect free. (Clayton Taylor 2015.)

c. Analyze: In the Analyze phase, I will focus on using the data I collected to identify the size of the gap between the current process and the desired performance level. The focus at this point is on determining how the process must be adjusted in order

to reduce variation and center the process on a specific performance target. I will also work to identify and isolate the critical factors, which ultimately impact the results that the customers experience. During my Analyze phase. I will do the following for this thesis.

- o Conduct a detailed process assessment to identify where value is added in the process, and examine the flow of work and information through the process.
- o Conduct a root cause analysis to identify the drivers, which impact and control the critical to quality factors.
- o Use statistical analysis and designed experiments to identify the specific factors that have the greatest control over the critical to quality factors, and determine how to achieve the optimal performance for customers. (Clayton Taylor 2015.)

d. Improve: To the Improve phase I will mostly focuses on streamlining and standardizing the process as much as possible, using Lean tools. From that I could work to develop solutions, which will improve the process, and close performance gaps that are preventing it from meeting the customers' needs. Then I will model and test the most promising solutions to see the possible results, and identify the best option. Then conduct a cost / benefit analysis describing the results and recommend a solution to Crowne Plaza management. During the Improve phase, I will do the following.

- o Streamline and standardize the process
- o Generate and select solutions for improving the process and addressing root causes of problem.
- o Model and pilot solutions to see how they will affect the process, and verify that solutions will achieve expected results
- o Complete a cost / benefit analysis based on the results of the modeling and testing, and recommend the best solutions to the management. (Clayton Taylor 2015.)

e. Control: The control phase is arguably the most important part of the DMAIC method. This is where improvements are made and steps are taken to make the changes permanent. The selected solution are implemented, the changes

documented, the new process is incorporated into desk manuals, and staff are provided with any needed training. At this point, monitoring methods are put into place to ensure that the process functions correctly and alerts the appropriate staff if things start to go out of control. During the Control phase, I will do the following.

- o Implement the selected solutions.
- o Document the new / revised process.
- o Create control plans to keep the process from backsliding to the old process.
- o Train staff.
- o Implement monitoring of critical process steps and inputs to guard against the process going out of control and producing defects.
- o Hand the process over to the operations staffs.
- o Close the project. (Clayton Taylor 2015.)

In my research I am going to follow the DMAIC steps to find possible solutions and give a report to the Crowne plaza management to see how it works and what they think about this. While implementing DMAIC, I will follow all the different stage in every phase of DMAIC methodology. Also while implement DMAIC methodology I am going to use some tools like SIPOC in Define stage, Cause-Effect matrix for making suggestion and finding root cause.

5 IMPLEMENT DMAIC FOR CROWNE PLAZA

To implement DMAIC method I will think about total process, internal and external in force and customer service. Crowne plaza goals are to gives quality customer service by giving the best quality they have while staying in the hotel. Also the aim of implement DMAIC in Crowne plaza is to find out sells problems or occupancy rate (what to do to increase occupancy rate in winter?)

5.1 Define

It's the start up for phase for the DMAIC methodology. In this I am giving the overview of the business problem and surrounding where I am going to work with, also aim, goal and working teams for the research.

5.1.1 Business background

Crowne Plaza Helsinki is all well known as Leading Business in Finland, located in Mannerheimintie 50, Helsinki. The Crowne Plaza Helsinki is an awarded top-class hotel that offers the attentive quality service of an upscale hotel chain with a global reputation. Well-appointed, comfortable rooms come with Sleep Advantage amenities and services. Excellent restaurants, professional conference services and functional technology reinforce the city's leading conference center, the Royal at Crowne Plaza.

5.1.2 Problem or challenge

Crowne plaza, Helsinki provide quality service to the customer, they keep working on it by finding reason and solve it daily but the biggest challenge they are facing is the occupancy rate. Difference between winter and summer occupancy was so high, where winter occupancy is so low. Also other challenge is the building was ranted which has high rent, so in the wintertime it is hard to make profit.

5.1.3 Theory-based search

In this research I am studying similar case to get some idea. I am studying data from Official statistic Finland website to see occupancy rate, economic situation and domestic travel interest. Also, I search some data about the traveler interest towards Finland.

5.1.4 Customer feedback (VOC)

To understand the Crowne Plaza, Helsinki popularity we check the customer feedback overview. Here in table 2 shows the overview of customer feedback.

TABLE 2. Customer feedback overview (Crowne plaza Helsinki website)

From 343 customers reviews 87% recommend this property.	**Review grade (343 customers)**
Overall experience	*4,3/5 stars*
Staff and service	4,3/5
Room and comfort	4,3/5
Value	4,0/5
Room cleanliness	4,6/5
Atmosphere and Ambiance	4,1/5
Helped me Achieve my Goals	4,1/5

5.1.5 Research goal

My research goal is to find out the average occupancy rate in Crowne Plaza Helsinki in the year of 2015 and find the break-even point. Also difference of wintertime and summer time occupancy rate with the highest and lowest number. The low occupancy rate in some months or days has some reason. In this research I will find the cause and effect of low occupancy, also what does it effect to the revenue.

5.1.6 Research team

I am working the guideline of my teacher Tapio Malinen. Also I got help of Liia Krasman from Hotel Crowne Plaza Helsinki, who is give me all the data I need for the research.

5.2 Measure

In Measure phase I am going to maps out the current process. Also show the measurements that will later valuated in analysis phase. Which helps later for decision-making phase.

5.2.1 SIPOC

To understand the process and find out the scope of improvement I use SIPOC. It helps me to visualize more about the process from supplier to customer. Graph 7 describe SIPOC diagram for Crowne Plaza, Helsinki.

SIPOC Diagram

Crowne Plaza Helsinki

Suppliers	Input	Process	Output	Customers
Hotel Crowne Plaza	Restaurant Food	Coustomer Order	Revenue	Location
Restel Oy	Opera Sys.	Reservation Sys.	Occupancy	Connection
Reception Dpt.	Product Comple.	Check&Book	Coustomer Satisfaction	Quality
Housekeeping Dpt.	Worker service	Ready Rooms		Timming
Sales Dpt.		Stayover Service		Price
Marketing Dpt.		Check Out		
Outsourcing Com.		Feedback		
Royal Ravintola				

GRAPH 7.SIPOC diagram for Crowne Plaza Helsinki

5.2.2 Data collection

In Crowne Plaza Helsinki they are using Opera system for booking, information for order and sales. Also in this system they could easily see their day, month and year data. They could see whole year room revenue; total occupancy and how many people visit there. By Opera system they could find their key indicator, which helps them to make sales estimation, demand forecast and select working hours for the worker.

In my thesis I am taking whole year data for 2015. Also I select total occupancy, revenue and average rate of occupancy as indicator. I divided whole year by date, day and month. Which will helps me to find out different stage of analysis in next phase of DMAIC method. Also I use Minitab software to analysis by graphical way. Also while I analysis I take total occupancy and revenue as key indicator in this thesis.

5.3 Analyze

To analysis the situation I take year 2015 data and I use total occupancy and room revenue as indicator. I compared with the target sales with individual control chart (I-chart with UCL and LCL). Also I take worst months of the year and best month of the year to find out the cause why those months become bad or good. To analysis more deeply I narrow the target into daily based so it could give me the narrow target for sales and revenue.

5.3.1 Sales target

To find out the difference between target and what actual, first I am analyzing the target sales for whole year by month. Table 3 shows the target sales in the month and average daily target of the month.

TABLE 3. Target sales in 2015.

Months 2015	Sales target (Nights)	Average daily target /Nights (Divided by month days)
January	5685	183
February	5887	210
March	7036	227
April	6514	217
May	7131	238
June	8018	267
July	7241	234
August	7483	241
September	7834	261
October	7666	247
November	7654	255
December	5900	190

5.3.2 Revenue and occupancy in 2015

To understand whole year situation, I draw whole year revenue Boxplot by month and whole year occupancy I-Chart by using Minitab software. Graph 8 shows the I-Chart of occupancy situation of 2015. In the chart X-axis shows observation value and Y-axis shows the individual value for every month. The green line in the middle shows the average value and red line in the up and down shows the standard deviation lines UCL and LCL. The UCL is 294 room, Average 176 room and LCL 58 room for whole year. January, February, April and December are the worst month of the year 2015, where the

average is so low and fluctuation of curves is high. So that means those months have the worst month in terms of sealing rooms. In January there is some days occupancy is so high that even goes over the upper control of that month. It could some festival or concert happen in Helsinki, which create such large occupancy. Also in June there are some days are below the lower limit, which could be effect of holiday in Finland.
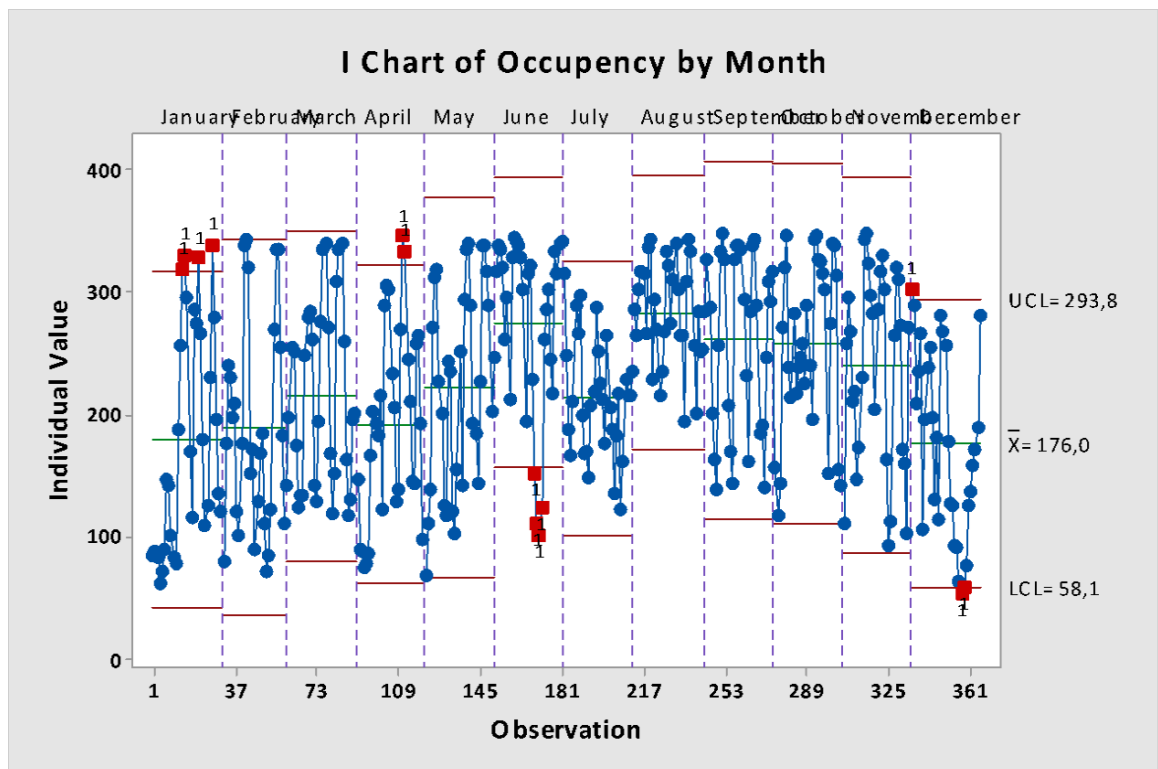
GRAPH 8. I-chart of occupancy by month

Graph 9 shows the Boxplot for room revenue for whole year by month. The line into the box shows the median of the total range. The both side tail in box shows the range of variation in the month. The star shows the exceptional days where the room revenue is higher then the range of that month. Here I take April as sample month, where the lower tail indicate the lower range 5000 and the upper tail indicate 35000. Also the median is 16000. The revenue range of April is 30000 (Upper range - Lower range). We can say from graph more than half of April revenue is over the median. Also there is four quarter of Boxplot. First quarter is from lower tail to end of lower side of the box, Second quarter is from the lower side of the box to total median, third quarter is from the total median to the end of upper side of the box and fourth quarter is from end of upper side of the box to the upper tail.
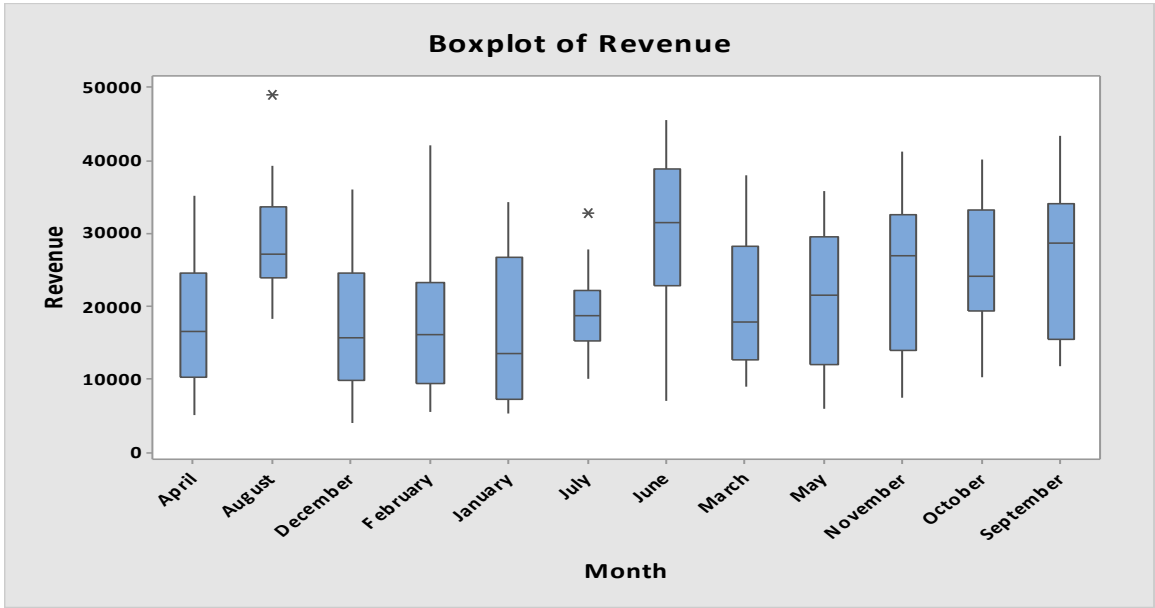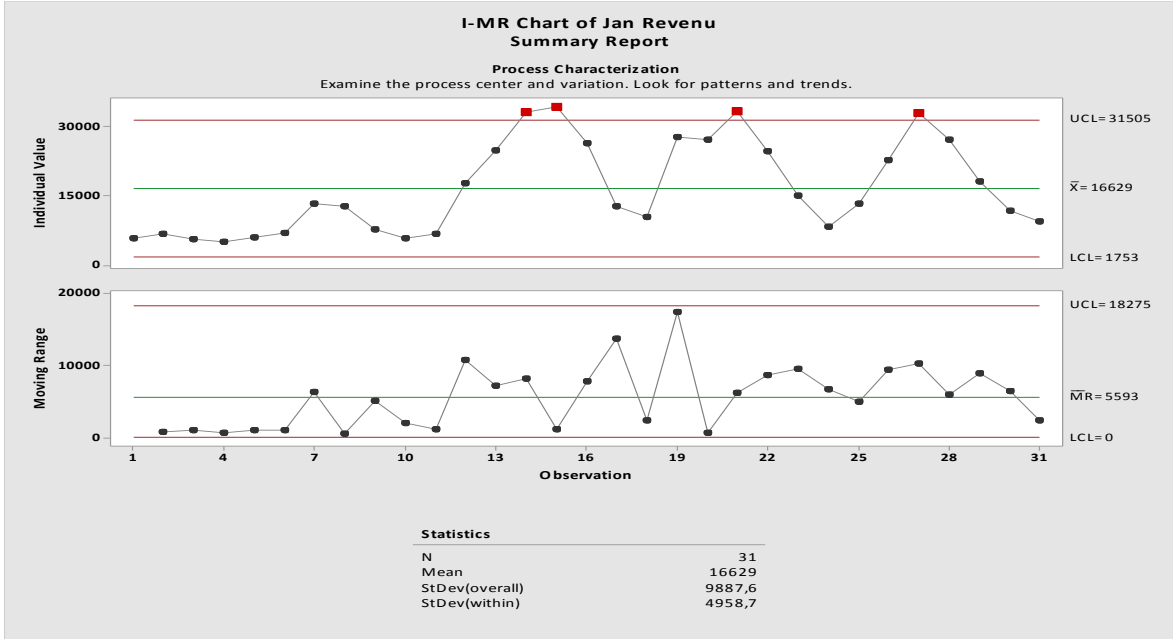
GRAPH 9. Boxplot of revenue by month

5.3.3 Worst and best month scenario

From twelve months I select the worst months and best months among them. I select January and December as worst months in term of revenue. Also I select August is the best month by revenue.


GRAPH 10. I-MR chart of January revenue

I use I-MR chart to check the stability in month. I-MR chat shows the variation of process. I know even the perfect process has some variation; always there is some chance to fix some minor problem. If I fix some minor problem in process, I-MR shows stability and gives signal about possible problem coming. In this research I use I-MR as the indicator for variation in month revenue.

Graph 10 shows the I-MR chart summary report for January revenue. From the graph I can see the Mean was 16629, LCL was 1753 and UCL was 31505 in individual value chat for January month room revenue. In moving range chart LCL was 0, UCL was 18275 and the moving range was 5593, where the sample number 31(day). From the individual value chart, I can see that starting of month eleven days revenue was below the Mean that is the worst situation in this month. Four days of this month revenue goes higher then UCL, some festival in Helsinki creates over flow of customer. Also seven more days of the month in different times has lower revenue then mean value line.
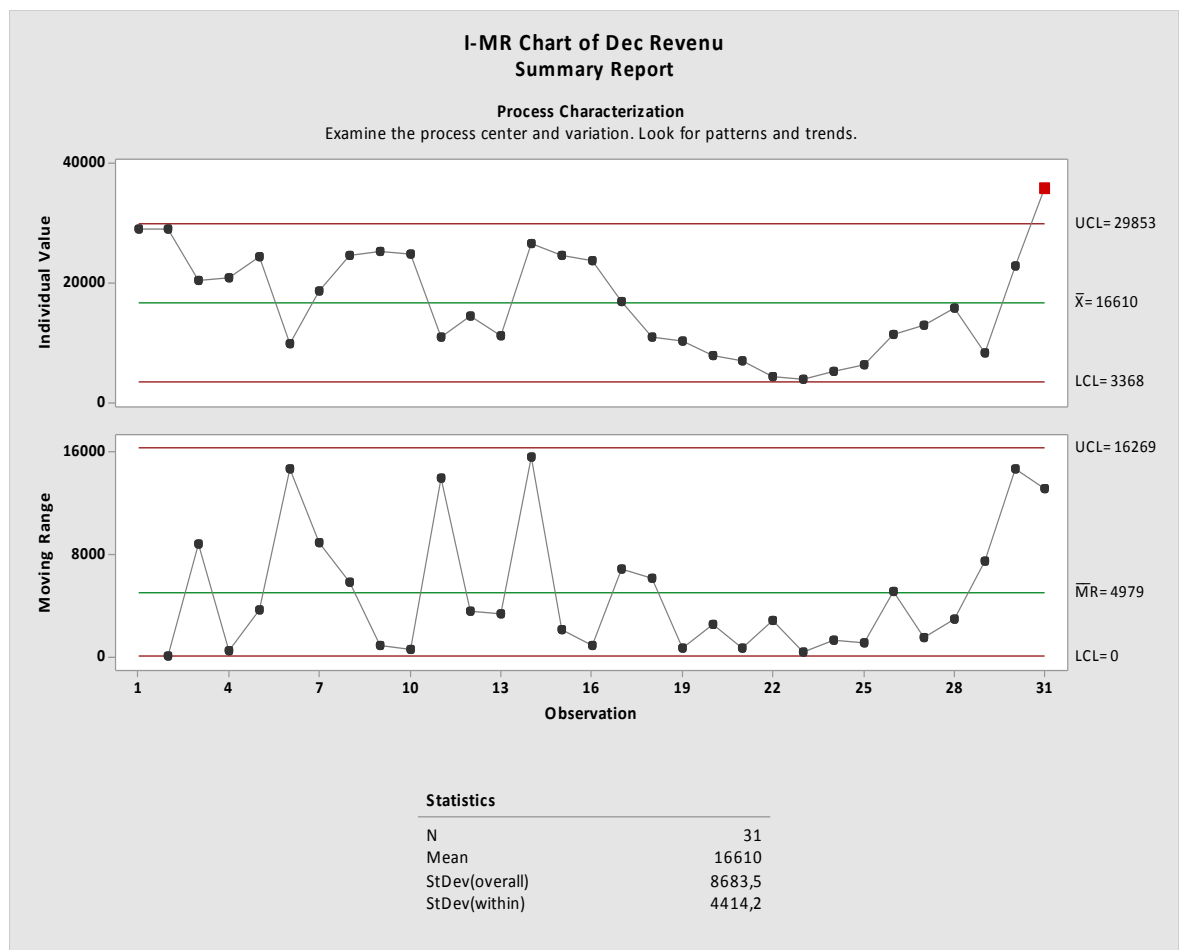
GRAPH 11. I-MR chart of December revenue

Graph 11 shows the summery report of December revenue I-MR chart. In individual value chart UCL was 29853, LCL was 3368 and Mean was 16610, where the sample size was 31(day). In the second half of the month, there is continuously twelve days down fall of revenue and it is below the Mean value. The last day of the month is exceptionally good and revenue goes over the UCL. In moving range chart the moving range was 4979, LCL was 0 and UCL was 16269.
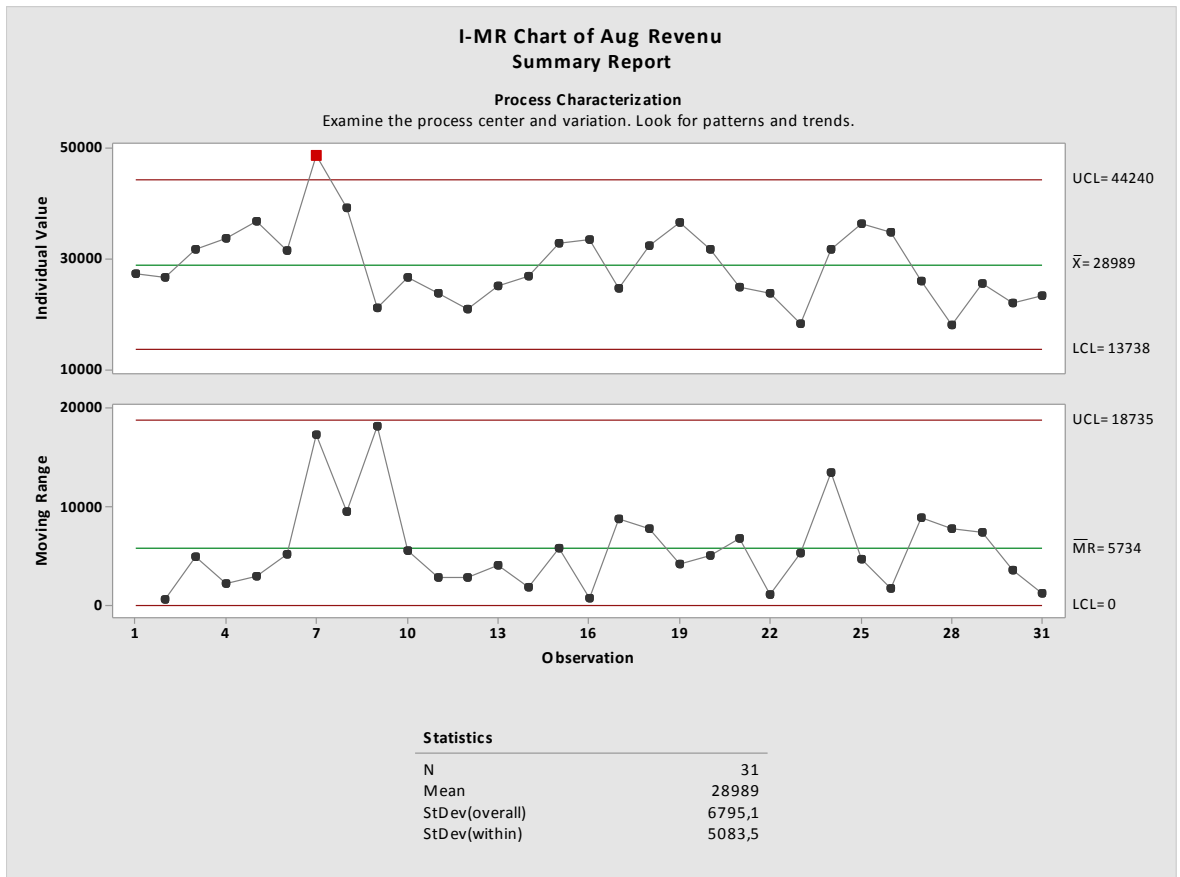
GRAPH 12. I-MR chart of August revenue

Graph 12 shows the best month in 2015, August revenue I-MR chart with summary report. In individual value chart the Mean was 28989, LCL was 13738 and UCL was 44240. Even Fifteen days are below the Mean value; still it was highest earned month in 2015.Because it is more fluctuating near the Mean value. In Moving range chart LCL was 0, UCL was 18735 and moving range was 5734. Also in that chart this month revenue mostly fluctuating near the moving range and not fluctuating so much.

5.4 Improve

In this thesis I am mostly concern about the variation of revenue and occupancy. I find out that there are some days is continuous bad and some days are continuously good. But before giving suggestion or any process change I need to find out why variation is happing and what is the cause for that. That is the next stage, which is excluded in this research.

5.5 Control

After the second stage of my research if there is some change made, that should define carefully and it should standardize with the new and old process. Also it should define the benefits, cost savings and profit growth for the new change.

6. CONCLUSION

From my prelimilanery research, it is difficult to give some suggestion or propose change in process. However I can only visualize the last year 2015 and can compare with the past. This part of thesis result it could help for the next part of research to find the cause for those variation and finding the possible solution or suggestion to fix the problem. Finding from this research also makes the focus narrow for detect the root cause of the problem. By analyzing occupancy and total revenue for 2015, later it could compare with 2016 with same indicator. That will give the more understanding of the situation.

In the next stage research I could target to find why the variation is happening. By collecting worker view concerning quality and service improvement could give possible overview of the defect. Also there could be possibility make test by using DOE method. DOE is generally associated with true experiments where the design introduces the conditions that directly affect the variation. Also it helps to understand the factors that affect a process and then create a meaningful and effective test to verify possible improvement.

After the second stage in future further research could do using same indicator with worker idea and customer feedback. Also it is possible to do another research concerning utilization of possible sales.

Altogether this project was successful. But in the starting point of this thesis I face difficulties to find the right indicator for process improvement. Process consists with lots of indicator, which could lead to the defects, and later those indicators visualize the improvement path. In this thesis, I spent much time to find the right indicator that could helps to understand the defects. It is needed to understand the major and minor problem while thinking about business improvement to see the real necessity of improvement in that time. This project work could helps to other hotel business in similar situation.

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Nothing to show (Appendices data classified as confidential)