

P.C.N. and Arena meet hotel

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This paper deals with the analysis of a hotel facility to determine opportunity for improvements using the Process Chain Network (P.C.N.) in combination with the Arena simulation software. The information presented is based on the authors' personal experiences as guests at hotels.

Keywords: Process Chain Network, Simulation, Improvement process

Introduction

According to Sampson (2011) Process Chain Network implies a process that links entities into a network that visualizes business processes, networks, and managerial issues. It is a flowchart that you can use in a service organization. This paper applies this tool to analyze a hotel. It can be used to any kind of hotel, and in any service company.

Whenever one starts to analyze the flowchart, one can find several opportunities for improvement. One of them it is related to waiting lines. In that case, the authors applied the simulation software Arena. According to arenasimulation.com (2015), *discrete event simulation describes a process with a set of unique, specific events in time. These flexible, activity-based models can be effectively used to simulate almost any process.*

In addition to those waiting line problems, there are some other issues encountered by the team introduce some logic improvements by eliminating some activities, by changing the flow of the process. Those changes are visualized in the graphics in the current situation and in the proposed recommendations.

Theoretical Background

The most known flowchart to be applied for services organization is the Service Blueprint (Jacobs and Chase, 2013, pp.213-216). There is the way to draw the activities involved in a service company. Sampson (2011) introduced the Process Chain Network – P.C.N. changing the

Service Blueprint by adding some other options to analyze the processes, by creating three regions of a process domain: (1) direct interaction, (2) surrogate interaction, and (3) independent processing.

Direct interaction means that people are interaction with people directly. Surrogate interaction is when an entity is performing process steps with a non-human resource of another entity such as ordering supplies via a supplier website. Independent processing is when processes take place with neither of the previous interactions such as cleaning a facility in a hospital (Sampson, 2001, 2011).

According to arenasimulation.com (2015), *business process simulation software is an effective way to evaluate the full implications of business decisions before they are put into practice*. This software was used for the solutions of waiting line problems in the analysis of the hotel, in the hospitality industry.

Current situation of the PCN scenario

Our case is to make a PCN diagram for a hotel with limited resources. The booking, check-in and checkout processes are as follows:

- The customer calls the hotel, the hotel receptionist checks for availability of room for the customers intended date of check-in and reservation is made.
- On check-in the receptionist collects some of its customer's information, gives the key of the reserved room to customer and the hotel attendant leads the customer to the room.
- On checkout, the hotel attendant inspects the room and the receptionist prepares the bill.

Assumptions

- There is only one server (receptionist) in the hotel and multiple attendants.
- It takes between 8-12mins to attend to a customer
- The customers are couples coming for honeymoon
- The time between arrival follows an exponential distribution with a mean of 10minutes
- The hotel Operates 24hrs a day and has a capacity of 200 rooms.

Method and Procedure

- We identified a business process in order to analyze two entities.
- Then we constructed some PCN Diagrams for the selected process.
- First step involved the customer need and last step had the need resolved.
Hence the resulting PCN diagrams were formulated below.

Development of the PCN

Figures 1, 2 and 3 represent the graphical analysis (PCN) of the current situation of the Hotel Booking, Arrival Check-in, and Checkout, respectively. Figures 4, 5, and 6 represent the identification of the Profits, or Losses (\$, -\$), Customer satisfaction (😊), and Opportunities for improvement- OFIs (:()

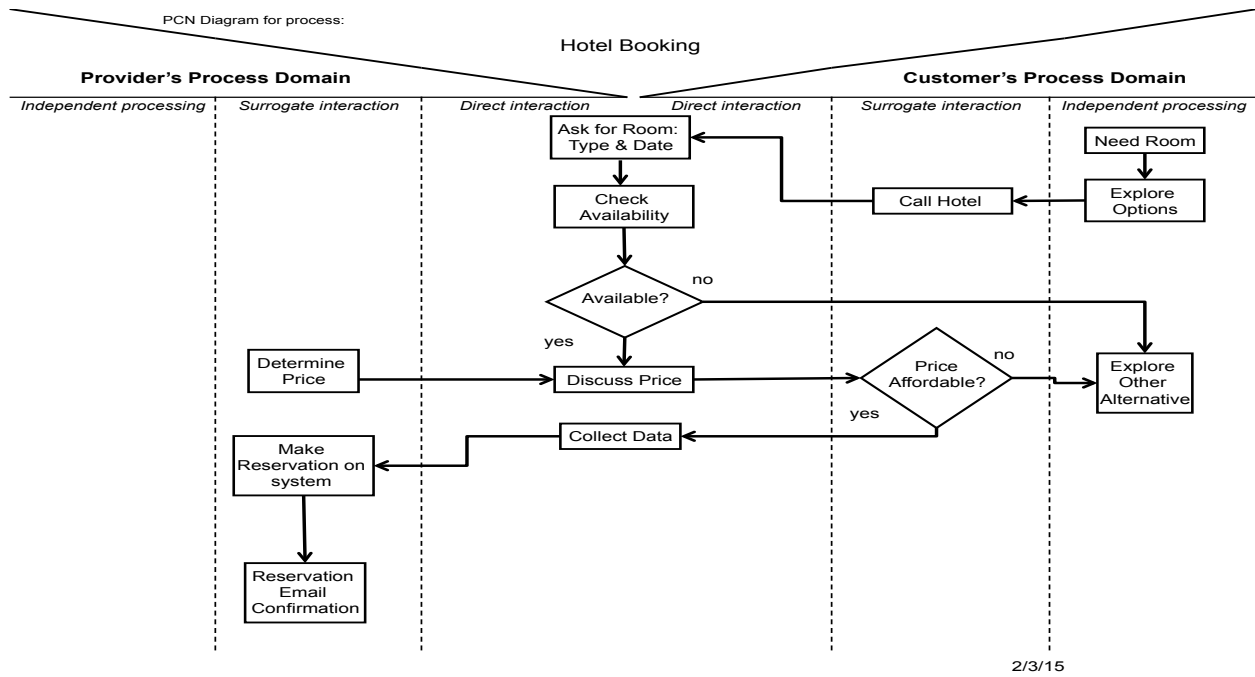


Figure 1. PCN for Hotel Booking

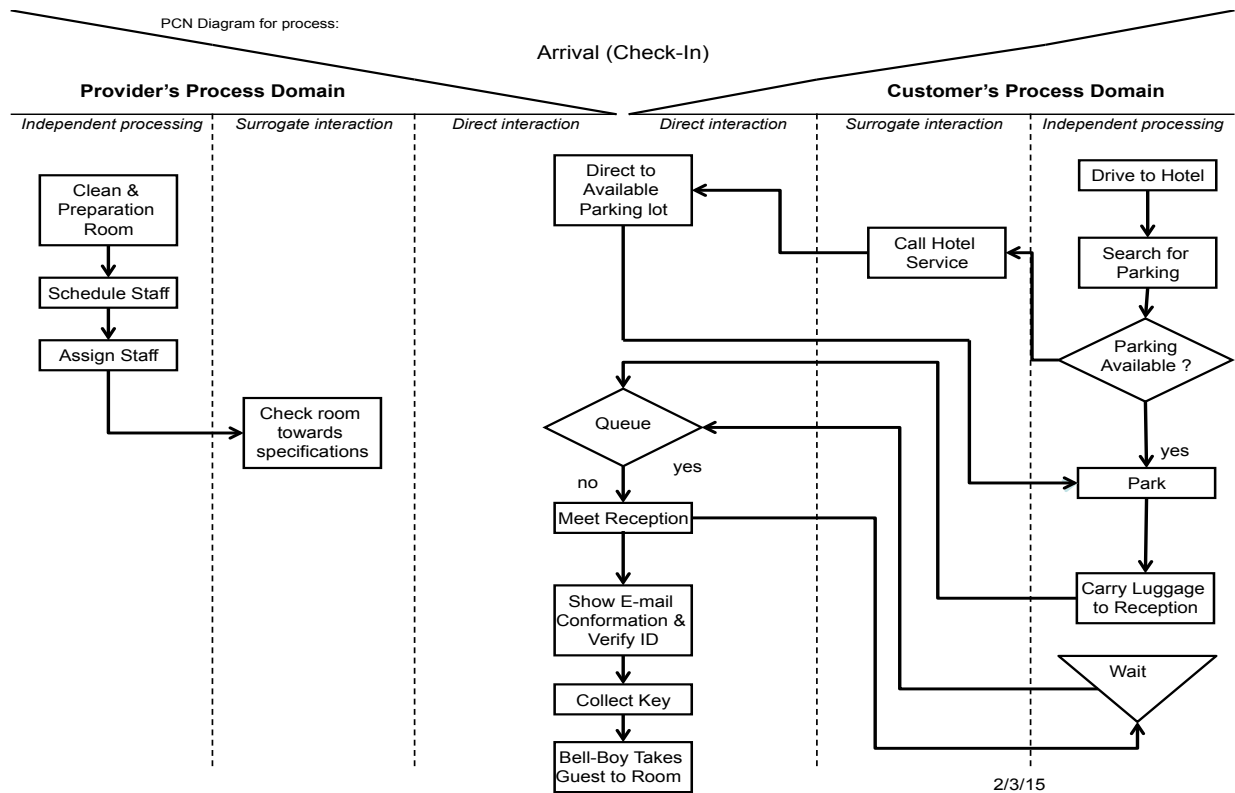


Figure 2. PCN for Arrival Check-in

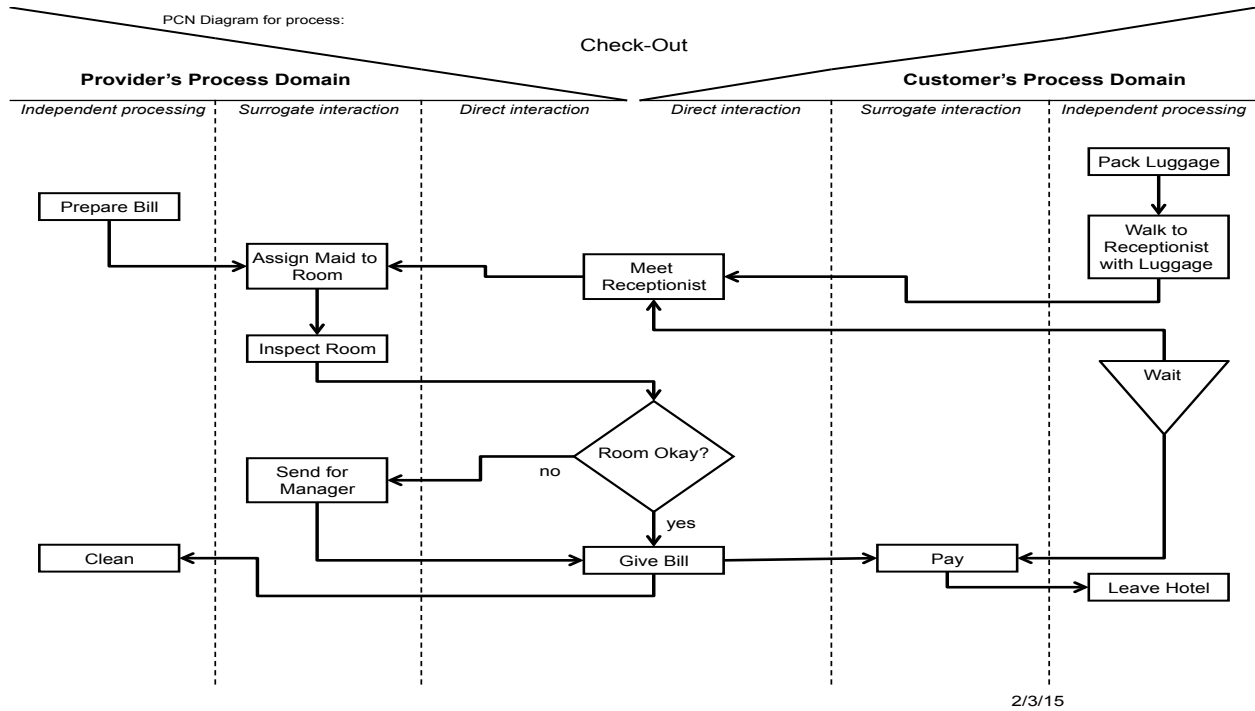


Fig. 3 – PCN Checkout

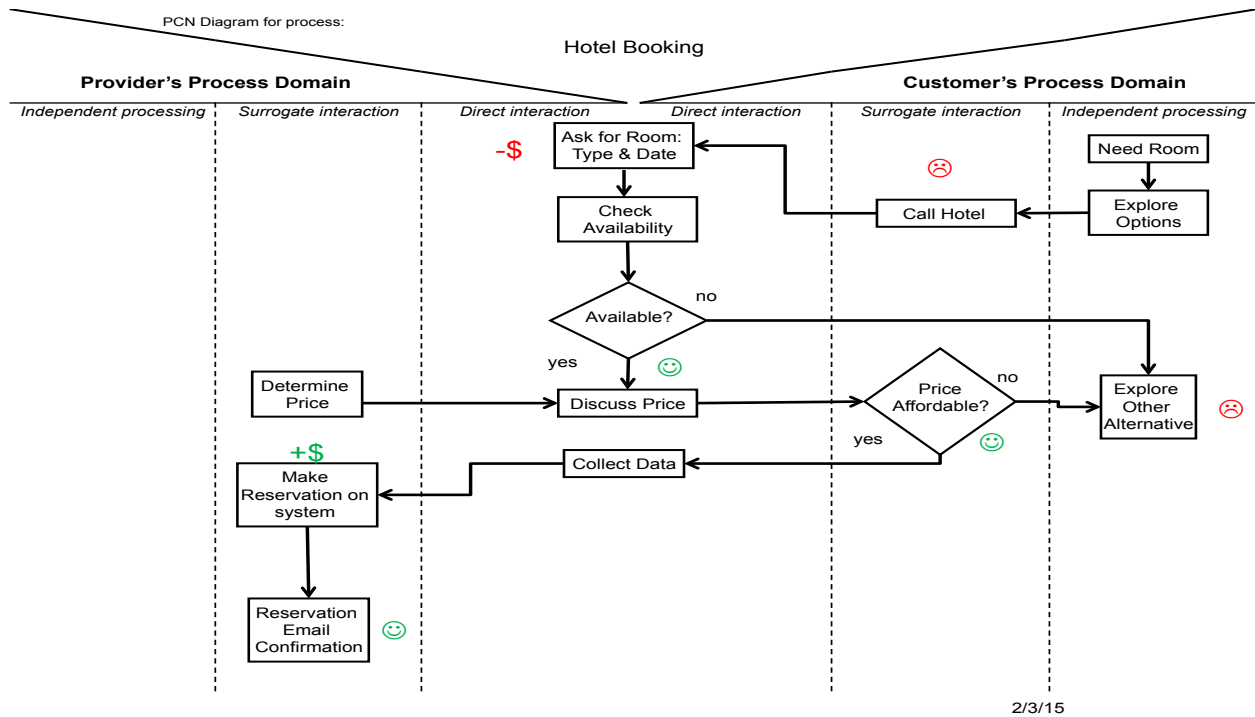


Figure 4. PCN for Hotel Booking identification of Profits, Customer satisfaction and OFIs

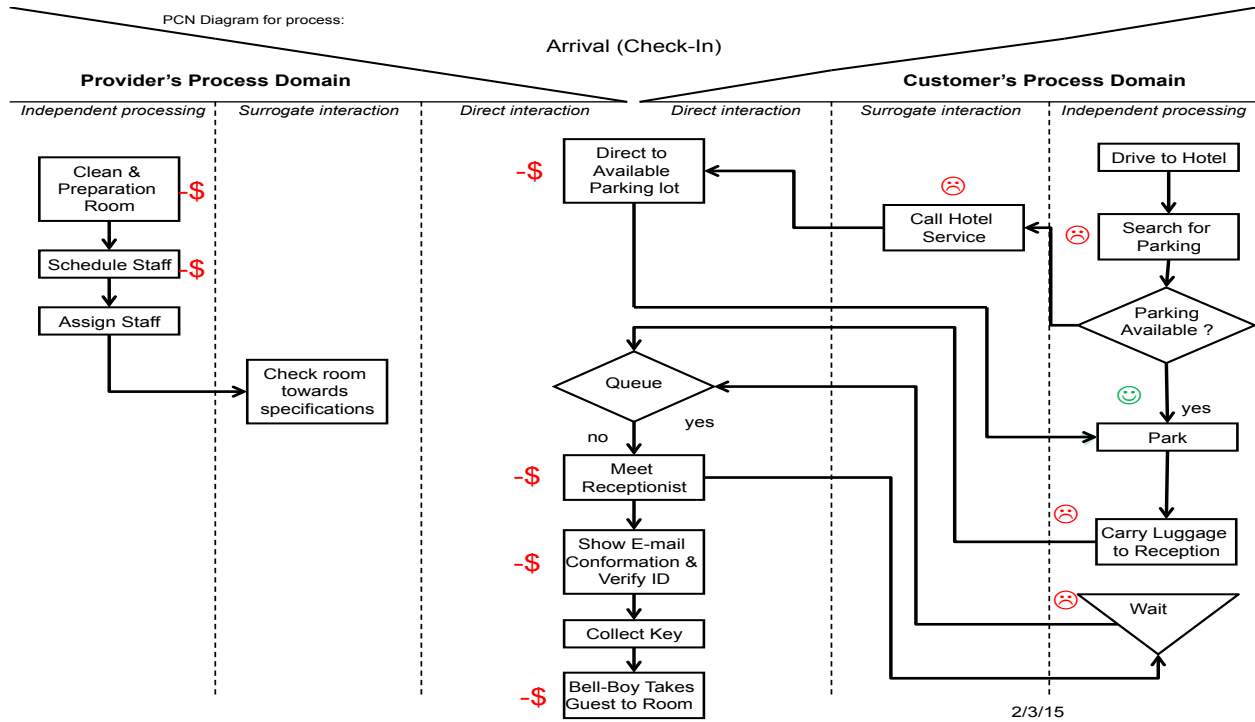


Figure 5. PCN for Arrival (Check-in) identification of Profits, Customer satisfaction and OFIs

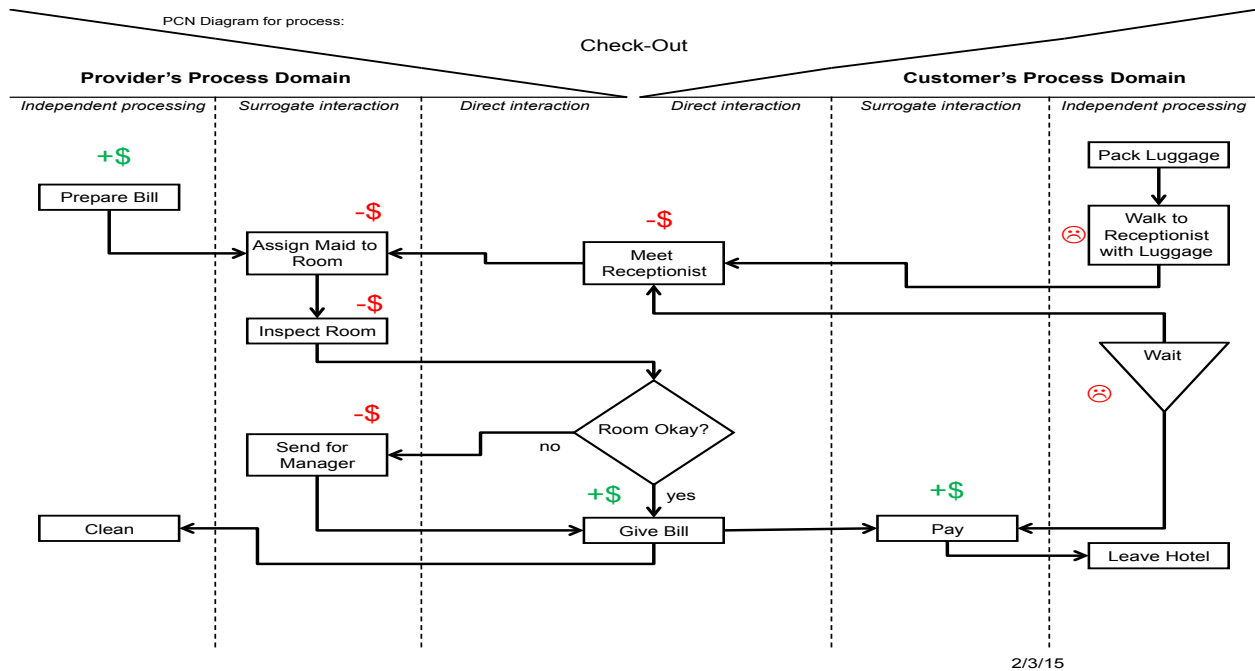


Figure 6. PCN for Checkout identification of Profits, Customer satisfaction and OFIs

Improvement

Based on the processes on the current condition of the checking-in process, the authors created a simulation model of the hotel as shown in Fig. 7 using Arena Software.

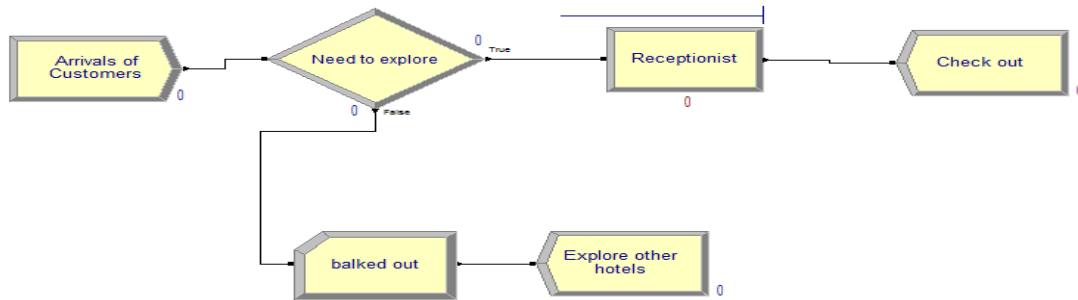


Figure 7. *Arena Model*

After running the Arena Model using the assumptions described before the Fig. 8 and 9 shows the simulation results.

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Category Overview

December 4, 2014

Values Across All Replications

MGMT 511

Replications: 30

Time Units: Minutes

Entity

Time

VA Time	Average	Half Width	Minimum Average	Maximum Average	Minimum Value	Maximum Value
Customers	4.9976	0.20	4.0255	6.1383	0.00	11.9983
NVA Time	Average	Half Width	Minimum Average	Maximum Average	Minimum Value	Maximum Value
Customers	0.00	0.00	0.00	0.00	0.00	0.00
Wait Time	Average	Half Width	Minimum Average	Maximum Average	Minimum Value	Maximum Value
Customers	12.6746	0.33	10.7459	14.1736	0.00	42.1345

Figure 8. *Simulation Results*

In order to improve on the waiting time to have a better customer service as well as reducing the utilization of the server, the authors proposed that the hotel management employ one more server. Employing one more server reduces the waiting time to 5.14 min and the utilization is shown below

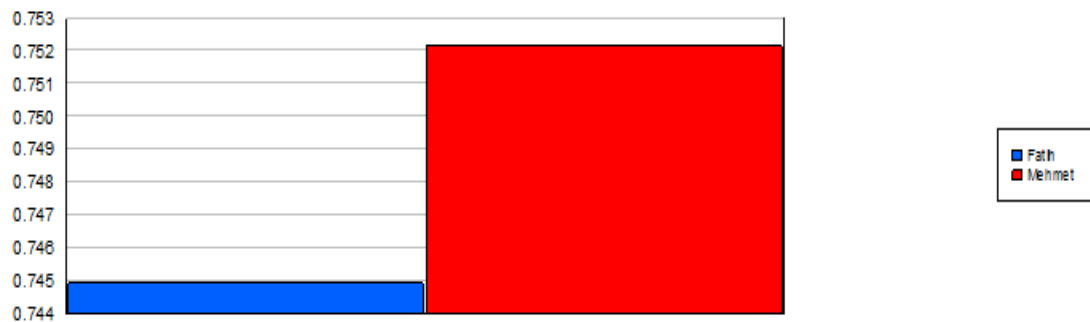


Figure 9. *Simulation Results improvement*

Process Improvements in the PCN

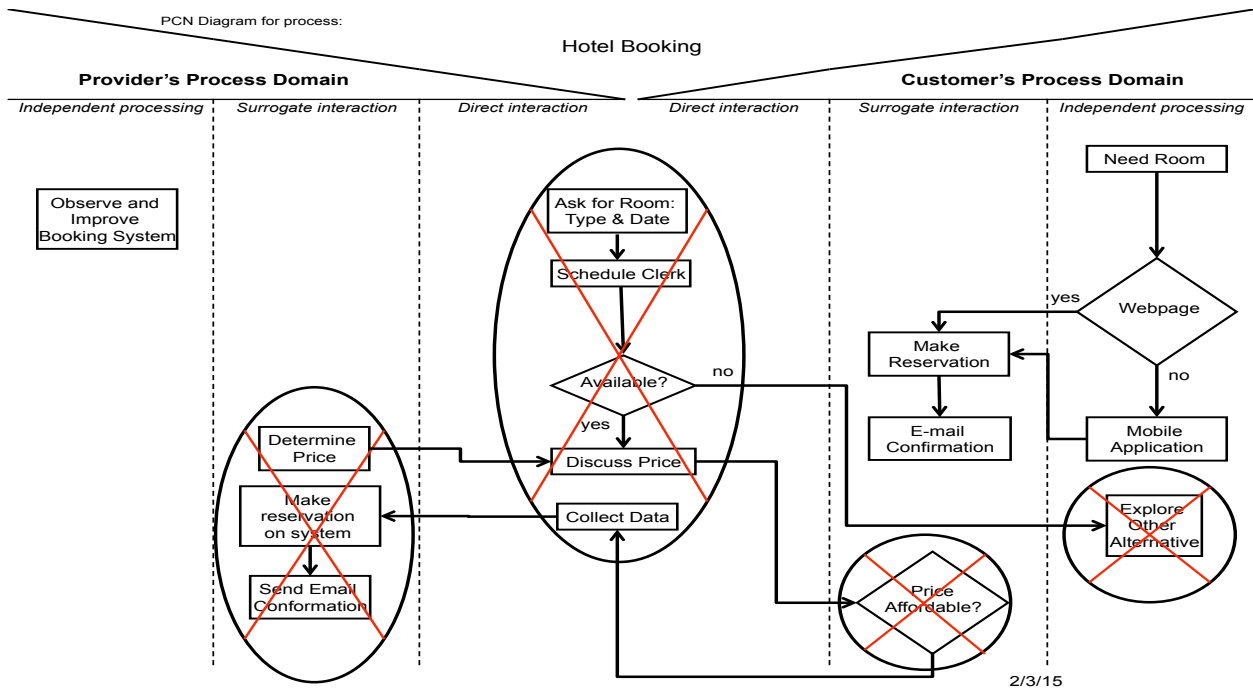


Figure 10. PCN suggestions to eliminate non valued steps in Hotel Booking

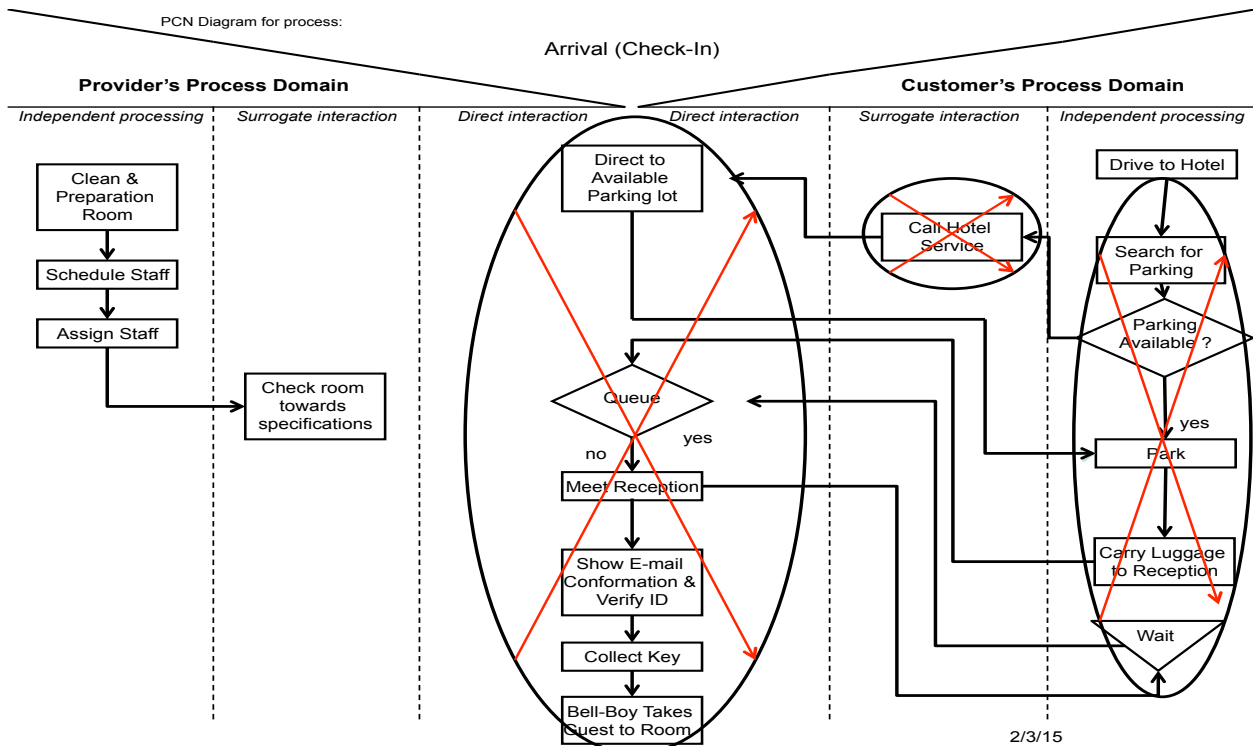


Figure 11. PCN suggestions to eliminate non valued steps in Arrival (Check-in)

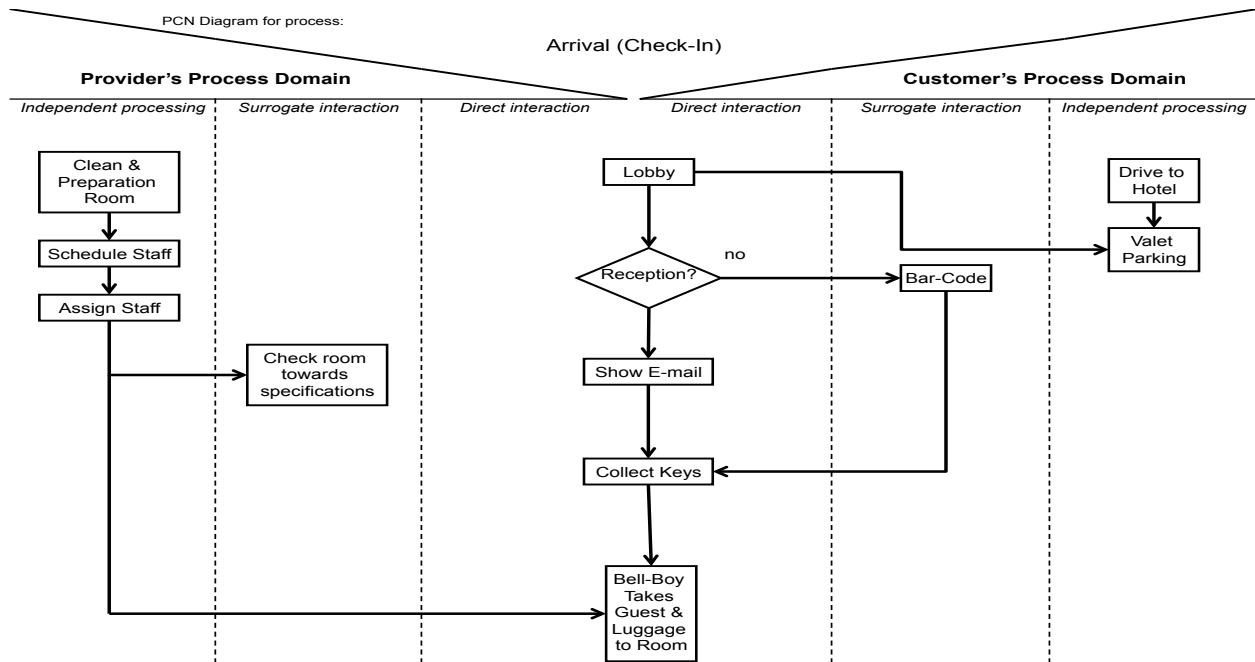


Figure 12. PCN suggestions for improvement in Arrival (Check-in)

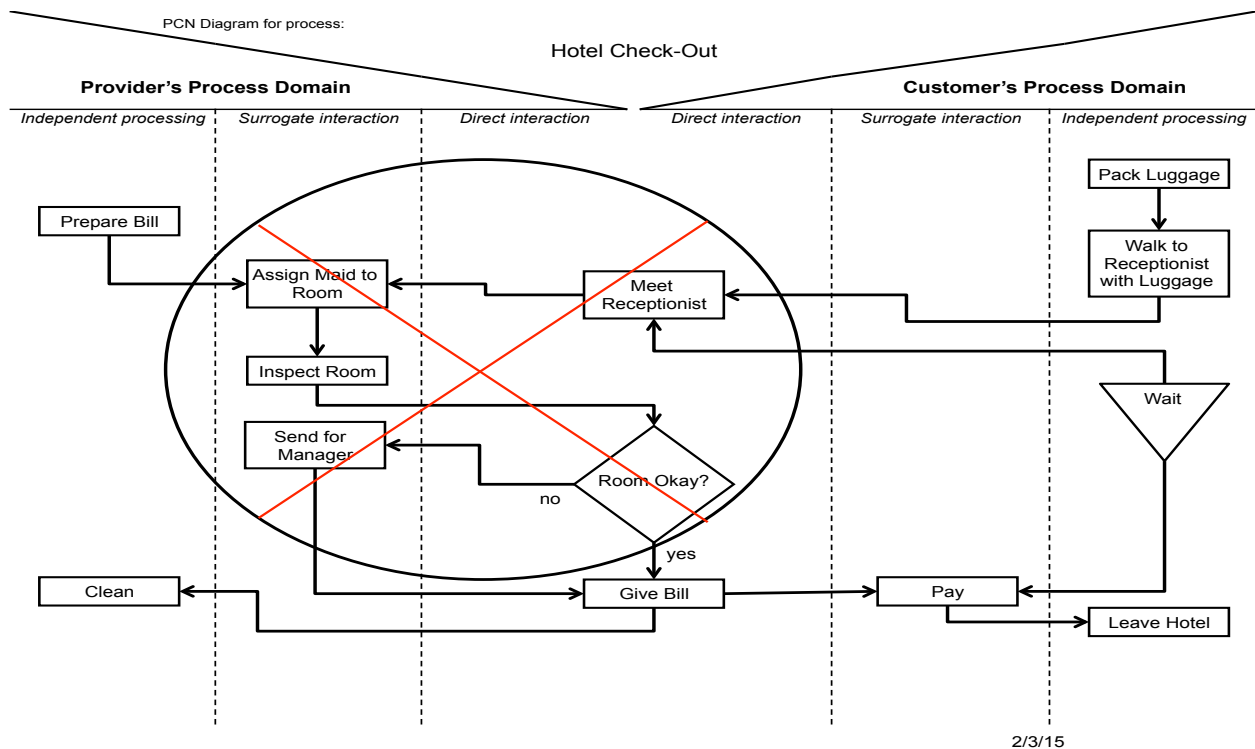


Figure 13. PCN suggestions to eliminate non valued steps in Checkout

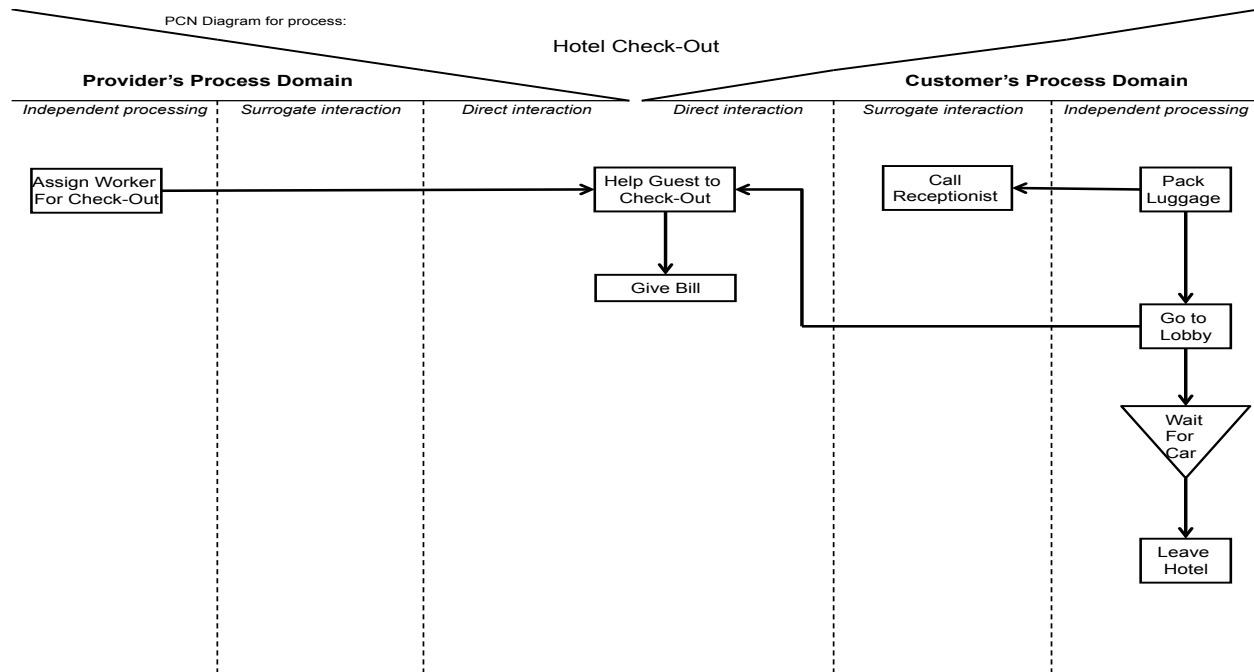


Figure 12. PCN suggestions for improvement in Checkout

Conclusions

The PCN diagram gave the professionals an insightful view to the working structure of the devised hotel service.

The points for improvement were easily noticed and tackled from both the provider and customer aspect by simply studying the PCN diagram.

Improvements in service towards process inefficiency, economies of scale, customization and surrogate positioning were easily implemented due to the structure of the PCN diagram.

Innovations were introduced into process chains by repositioning steps, or sets of steps across the regions of a process domain or across the entities of a process-chain network.

The Arena simulation was as a useful tool to analyze the waiting lines problems guests face when are doing the check-in, and checkout. However, for the checkout hotels are using an automatics checkout, just putting the receipt underneath the door, or sending it to the guest's email.

To sum up, the PCN is a very useful tool for business assessment, improvement and implementation. The PCN framework unlocked a powerful approach to service innovation based on exploring process configuration alternatives. It also showed enabling innovations to be visualized by moving process steps from the provider's process domain to the customer's process domain. Relieving innovations were visualized by moving steps the other direction (i.e. toward the hotel service).

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