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Perceive efficacy of Alteration in outsources Parts Repair System upon Performance: Case Study at powerplant maintenance center

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Abstract

This paper aimed to assess the impact of change on outsources repair parts system upon PPM in terms of operation excellence, customer intimacy, and decision making. Data required has been gathered from two sources. The first one is a questionnaire answers from the selected research sample. The other one is the quantitative data collected from information system and production planning record. SPSS program used to examine the collected information. This study revealed that the modification on outsources parts repair system has a positive effect on PPM in all study aspect: performance excellence, customer intimacy and decision-making. Moreover, the study exposed the improvement in parts turnaround time. Besides, an increase of parts repair quality has been noticed.

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Keywords: outsource parts repaire system; supply chain; operation excellence; customer intimacy; decision-making.

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1. Introduction and Background information

PPM powerplant maintenance "is a Jet Propulsion Center contains numbers of specialty shops such as NDT, Composite repair, plating, plasma spray, paint, welding, state of the art machine shop, sheet metal, thrust reverser shop, bearing, metrology and fluid analysis lab and harness shop. PPM is supported by a twin bay engine test cell and three APU test cells"[1].

Previously PPM was facing a difficulty keeping its production on track as planned to satisfy engines market demand. PPM management took the challenge mentioned by Hammer [2] "the major challenge for managers is to obliterate non-value adding work, rather than using technology for automating it". After studying the problem and reviewing the available solutions, PPM management perform its business solution based on BPR (business process reengineering), which covers the envisioning of new business strategies, the actual procedure design activities, and the accomplishment of the modification in its multipart: technological, human, and organizational dimensions [3].

PPM department signed a partnership agreement with Chromalloy; which is a "global technology company, partner with original equipment manufacturers, commercial airlines, the military and power companies to deliver innovative solutions that reduce manufacturing and operating expenses, and extend the life of gas turbine engines" [4]. This partnership agreement shaped a new process (supply chain) handling parts for repair. Moreover, this solution allows PPM as a customer to integrate Chromalloy information system to be acquainted with the status of each single part under repair at Chromalloy shops. Since the target of this research is to address the usefulness of the change occurred at outsource repair system. To achieve this target, information has been collected through two ways; first; answers of a targeted sample to a designed questionnaire. The respond percentage of distributed questionnaire was (.946). Second a quantitative operations process information system. Data has been analyzed using SPSS program. The questionnaire validity test reflected a high validity of (.955) as value of Alpha Cronbach's test. The study revealed that the majority of the sample responses agree that the new outsources repair system achieved an operations excellence, customer intimacy and Decision-making. Second; data collected from operation system data base had been analyzed, the result shows remarkable decreas in turn around time for under repair parts and zero defected or lost items.

The PPM management executed a business partnership with Chromalloy company to perform a new outsource parts repair system. Information and communication technologies, process and people were the crucial set of information systems (IS) used to conduct such a global business partnership. PPM estimated that information systems (IS) would provide solutions for the problems and challenges occurred, by mean of transferring raw data to useful information through three major steps: input, processing, and output. Moreover, (IS) represents a great combination of people, organization (process), and technology [5].

What is (IS)? Information systems are made up of five components: people, process, hardware, software, and data, the last three components are fitting under the category technology [6]. As per Kenneth& Jane Loudon: "Information systems are the foundation of fast-paced supply chains." [5] A supply chain is dynamic and involves the constant flow of information, product, and funds between different stages [7].

The new outsource parts repairer's system has a dramatically changed in three terms; first: installing and using advanced hardware, software and communication tools (suitable technology). Second: special team has been assigned to perform the required tasks. Third; modification of outsource parts repair process as follow:

a- Previous process steps illustrated in figure (a) contains:

1. Collect unserviceable parts by planner,
2. Plan and schedule repair by planner,
3. Request repair quotations by planner,
4. Handling parts by Logistic team,
5. Boxing and labeling by PPM store,
6. Send parts to the cargo store by logistic team,
7. Line up parts for shipping cargo store,
8. Send to our office abroad ,