BPR - WINNING EDGE
CASE STUDY OF INDIAN REFINERY

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INTRODUCTION

The case study being presented is of one the largest Oil Refineries in India. The organisation had the history of carrying huge inventories, right from project stage. Over a period of time, due to wide variety of vendors, lack of standardisation & planning and non disposal of unwanted stores, an inventory of Rs. 490 million (US $ 13.6 million) was being " maintained / managed ". Managing the stores had become a major issue. To find one item, one had to remove ten items. Nobody was accountable for inventory build up. Mismatch of computer stocks & physical stocks resulted in increased downtime, thereby leading to loss of production.

Management wanted to radically reduce the inventory.

(A) PLANNING

(A.1) Selecting the Process

Inventory, per se cannot be reduced, since it is a result (Effect) of various Cause factors. To reduce inventory we looked at the processes responsible for inventory build up. Hence the process selected for improvement was Procurement.

(A.2) Selecting the Improvement Techniques

Considering it was a chronic problem, minor improvements wouldn't have delivered the results expected by the management. In order to achieve breakthrough results technique selected was Process Reengineering. Methodology applied was Westinghouse Technology for Improvement of Processes (WesTIP). It is a five day workshop, wherein participants :

- Plan for the process to be reengineered
- Analyse the current process
- Reengineer (Redesign) the process
- Develop implementation plans

(A.3) Scoping the process

In order to ensure that improvement effort remains focussed, the procurement process was scoped. While scoping care is taken that process is neither too " long " nor too " short". If it is too long, then while mapping & analysis it remains shallow & some critical issues may left unadressed. On the other hand, if it is too short, improvement attempted may not impact the business considerably.

In the present case scope of the procurement process was as under :

Process begins with : Plan (Perceive) requirement

Process includes : Prepare indent
Raise enquiry
Evaluate offers
Place orders
Receive material
Inspect material

Process ends with : Stock charge

(A.4) Team Formation :

After scoping the process a cross functional team is formed ensuring participants are knowledgeable about the current process . Ensure " Supplier " as well as " Customer (internal) are part of the team. Some of the members can be from totally different function to bring in objectivity. Team members should be creative, bold & willing to take risks & question the fundamentals.

Usually team consists of 6-10 members from middle management & Team Leader from senior management. There have been occasions, wherein even workmen have also participated as team members. It is the responsibility of Team Leader & team to design & implement reengineered process & be accountable to " Sponsor " who authorizes the study & commits resources.

In the present case, team consisted of representatives from :

- Material Planning
- Materials Management
- Maintenance (Indentors)
- Finance
- Stores
- Information Systems

Executive Director was the sponsor.

A few other participants from above departments as Experts were also invited , for short duration to critique & validate the output.

(A.5) Sponsor's Expectations

To set stretch targets, Sponsor's expectations were defined & documented. These were :

Improve	Working capital
	Profitability & productivity
	Space in stores
	Material Planning
	Simplify process
Reduce	Inventory
	Internal & external lead times

(B) ANALYSIS OF THE CURRENT PROCESS (" If we do not know where we are, no map will help")

The current process is analysed with respect to :

- Process Cycle Time
- Process Cost
- Value delivered to customers

(B.1) Data

Labour cost figures (Employee cost)	- Rs. 60 per hour
Total number of indents (requisitions) raised	- 1800 per year
Total number of Purchase Orders issued	- 1800 per year

Current Inventory :

Item	Rs. Million	Estimated coverage per month
Chemical additives	100	4.0
Spares & materials	175	45.0
Stores (Other than spares)	151	18.0
Cold Rolled Steel coils	34	2.5
Total	460	

(B.2) Process Mapping

To understand the way current process is performed, it is mapped in micro details. Purpose of mapping is to :

- Why we do, what we do
- Why do we, the way we do
- Issues affecting tasks

For the sake of convenience a sample Flow Item is selected, which can be traced throughout the process and represents the various facets of process. In the present case flow item selected was :

An indent of value from Rs. 50,000 - Rs. 500,000 (US $ 1390 - 13,900), which gets converted into a purchase order.

After mapping the process, for each task (activity), following data was collected :

- Hands on Time (actual time taken to complete the task)
- Elapsed time (Total time elapsed including interruptions)
- Costs (material, inspection, communication etc.)
- Who performs the task
- Issues affecting the tasks

The current status of the process was :

• No. of steps in the process	51
• Elapse time	306 days
• Employee Cost	Rs. 13,121 (US $ 365)
• No. of signatures for various approvals	60
• Value delivered to customer* (Customer satisfaction index)	63 (out of 100)

* Details in B.4

(B.3) Key Issues

Issues are problems which affect processes to perform effectively. The team members post issues under each task & then using " Dot Voting " technique select key issues.

Some of the key issues affecting the process cycle time, cost & value delivered were :

- Poor requirement planning (mostly over indenting and/or stock outs)
- Excessive bureaucracy

- No compliance to order terms by vendors
- Discrepancy in physical & computer stocks
- Limited computerisation
- Incomplete indents
- Vendors offers received by fax not accepted
- Incomplete & incorrect invoices
- Poor storage facilities
- Material indented & purchased but not used for years

(B.4) Internal Customer Value Assessment (Customer Satisfaction Index)

To determine the value delivered by the process, Value analysis for few internal customers was done. One sample is given below :

Supplier : Material Planning Customer : Purchase

Factor (Customer Requirement)	**Weightage(W)** 1	**Performance(P)** 2	**Value(V = WxP)** 3 = 1x2	**Gap (W-V)** 1-3
Complete infmn. on indent	70	0.7	49	***21***
Clear approval status	10	0.8	8	2
Delivery time schedule	10	0.4	4	6
Enclosures(Drawings etc.)	10	0.2	2	8
	100		63	37

It indicates that maximum improvement opportunity is to provide complete & correct information on the indent.

(B.5) Paradigms

Paradigms are the boundaries of beliefs of the team members within which ,according to them, the organisation operates. As a result of which improved working methods appear to be impossible. For breakthrough improvements it is critical to identify & shift existing paradigms.

Some of the existing paradigms identified were :

- Too many signatures will ensure control
- Be safe - involve all
- Servants of system /rules (rules cannot be changed)
- Lowest bid is the best & safest
- Inventory management is Material Management department's responsibility

(C) DESIGNING NEW PROCESS

(C.1) Stretch Targets

In order to achieve a quantum improvement in the reengineered process & in line with sponsor's expectations, certain targets with respect to Quality, Cost & Delivery are set which are difficult & challenging to achieve.

Targets set were :

Reduce Elapse time from 306 days to 90 days
Reduce cost of indenting &procurement by 50 %
Standardisation of items (Variety reduction) 10 % every year.

(C.2) Good Ideas

After an extensive brain storming session & also during the course of workshop, good ideas generated by the team are " parked". These are then evaluated & used for designing the reengineered process.

Some of the radical good ideas generated by team were :

- Procure only what is needed
- Value engineering & standardisation
- Integrated computerisation (Indentors, Purchase, Stores, Finance)
- Payment against document, / delivery of material
- System to write offobsolete & surplus items
- Rationalise vendor base

(C.3) Reengineered Process

Based on the outputs available from analysis of current process, good ideas, key issues, etc. team designed & mapped the reengineered process. Some of the main assumptions in the reengineered process were :

- Alternate system of payment (not through bank)
- Revised payment terms for payment
- Computerisation linking Indentors, Purchase, Stores, Finance
- On line vendor rating system
- Evaluation, selection & monitoring of vendors
- Enhanced authority for Management staff to place purchase orders
- Minimum role for Finance department
- Minimum signatures

(D) CURRENT VS. REENGINEERED PROCESS

Measure	Current	Reengineered	Savings in %
Number of steps in the process	51	16	68
Hands on Time (Days)	16.5	5	71
Elapse Time (Days)	305	123	60
Process Cost in Rs.	13,121	2925	78
Signatures needed for approval	60	16	82
Customer Value	63	92	50

(E) IMPLEMENTATION

To implement , from the reengineered process map, the various recommendations were made out & Quality Improvement Teams formed, clearly defining the responsibilities, benefits, costs, expected benefits, expected difficulties, time deadlines etc.

Some of the recommendations were :

- Develop vendor rating system & building vendor database
- Develop a system of indent planning
- Design information technology solutions
- Identification & disposal of surplus materials
- Increase number of annual rate contracts
- Revision & delegation of authority of management personnel
- Develop quality system for inventory management & incorporate under existing ISO : 9000 system

(F) IMPLEMENTATION BARRIERS

The Team which redesigned the process was attempting to " sell " Change (a reengineered process) which many were not willing to " buy ". But the team " pushed " it through perseverance & support of Sponsor of the project i.e. Executive Director.

Key barrier faced during implementation :

- Resistance to introduce planning in indent requisitioning
- Elimination of " parallel " stores (reduced " comfort " level)
- Increased accountability & responsibility (lesser signatures)
- Revision of payment terms for vendors

Strategy adopted to overcome the barriers were :

- Massive communication across the organisation highlighting benefits of reengineered process & gaining buy in.
- Identified who were supporting, opposing & fence sitters in the change process. Using peer / superior pressure, cajoling, counseling etc. reduced / neutralizing restraining forces.
- Intervention by top management
- Regular monitoring of progress of Quality Improvement projects.

(G) SOME BENEFITS

- Savings of approx. Rs. 11 million (US $ 0.3 million)
- Reduced inventory with reduced inventory carrying cost
- Lesser lead times
- Process automation , fewer process errors, ease of data collection, analysis, access
- Better stores management, additional space
- Simpler & user friendly process
- Lesser inter departmental conflict
- No. of steps to complete the process down from 51 to 16
- Elapse time down from 306 days to 123 days
- Reliable vendors with minimum follow up
- Smoother plant operation

Thankyou.