BPR - WINNING EDGE
CASE STUDY OF INDIAN REFINERY

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SYNOPSIS

In one of India's largest refinery there was a chronic problem of inventory build up and management. Total inventory - Rs. 460 million. Management was keen to radically reduce inventory. Process selected was Procurement & technique applied Business Process Reengineering.

A cross functional team of middle management officers , in a five day workshop :

* Planned for Reengineering
* Analysed the current process using mapping, key issues Root cause analysis, Paradigms etc
* Set stretch targets, generated breakthrough shifting their paradigms and designed a new process.
* Worked out Implementation plans clearly identifying tasks, responsibilities, time frames etc.
* Worked out strategy to break implementation barriers

Current Vs. Reengineered Process

Measure	Existing	Reeng.	Savings %
NO. OF STEPS	51	16	(-) 68
HANDS ON TIME (DAYS)	16.55	4.85	(-) 71
ELAPSED TIME (DAYS)	305	123	(-) 60
COST	RS. 13,121	RS. 2925	(-) 78
SIGNATURES FOR APPROVAL	60	16	(-) 73
INVESTMENT (COST OVER TIME)	15, 83, 437	2, 88, 750	(-) 81. 8
VALUE STRUCTURE			
CUSTOMER : TOP MGT.	39.5	22	(+) 44
: PURCHASE	37	8	(+) 78

Benefits :

* Savings of approx. Rs. 11 million (US $ 0.3 million)
* Number of steps to complete the process down from 51 to 16
* Elapse time down from 306 days to 123.
* Employee cost to process an indent down from Rs. 13,121 (US $ 364) to 2,925 (US $ 81).
* Less inventory & its carrying cost
* Better stores management. More working space
* Simple, user friendly process

INTRODUCTION

The case study being presented is of one of the largest Oil Refineries in India. The organisation had a history of carrying huge inventories, right from project stage. Over a period of time due to wide variety of vendors, lack of standardisation and planning, and non-disposal of unwanted materials 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 and 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 building the inventory. Hence the process selected for improvement was Procurement.

(A.2) Selecting the Improvement Techniques

Considering that it was a chronic problem minor improvement would'nt have delivered the results expected by the management. In order to achieve breakthrough results technique selected for improvement was Process Reengineering. Methodology applied was Westinghouse Technology for Improvement (WesTIP). It is a five day

workshop wherein participants :

* Plan for the process to be Reengineered
* Analyse the current process
* Reengineer 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 or too short. If it is too long then while mapping & analysis it remains shallow and some critical issues may get unaddressed. On the other hand if it is too short the impact , improvement attempted may not impact the business considerably.

In the present case scoping was done as under :

Process begins with	: Perceive / Plan requirement
Process includes	: Prepare indent Raise enquiry Evaluate offers Place orders Receive material Inspect material
Process ends with	: Stock charge (Take material in stock)

(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)" is part of the team. Some of the members can be from totally different function to bring in objectivity. Team members should be creative, bold and willing to take risks and question the fundamentals.

Usually a team consists of 6 - 10 members from middle management and a Team Leader. There have been occassions wherein we have included workmen as well as junior & senior management staff.

It is the responsibility of Team leader & team to design and implement reengineered process and be accountable to Sponsor, who authorises the study and commits resources.

In the present case team consisted representatives from :

Material Planning
Materials Mgt.,
Maintenance (Indentors)
Finance
Stores
Information systems

Executive Director (Refinery) was sponsor.

A few expert participants (colleagues) were also invited, for short durations for validation & their contribution.

(A.5) Sponsor's Expectations :

To set stretch tagets Sponsor's expectations were defined & documented as under :

Improve :
* Working capital management
* 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

* Cycle time
* Cost
* Value delivered to customers

(B.1) Data

Labour cost figures : Employee cost per hour - Rs. 60
Total no. of indents / year - 1800
Total no. of purchase orders issued / year - 1800

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
	460	

(B.2) Process Mapping

To understand the way process is performed currently it is mapped in micro details. Purpose is to highlight :

" Why we do what we do "
" Why we do the way we do "
" Issues affecting the tasks "

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

"An indent in the range of Rs. 50,000 (US $ 1390) to 500,000/- (US $ 13,900) which gets converted to a purchase order."

For each tasks (what and not how) following data was collected :

* Hands on Time (Actual time taken to complete the task)
* Elapse time (Total time elapsed including interruptions & travel)
* Costs (material, telephone, travel etc.)
* Who does the task
* Issues (complaints)

The current status was :

No. of Steps in the process	51
Elapsed Time in Days	306
Employee Cost to process one indent	Rs.13,121 (US $ 365)
No. of Signatures for various Approvals	60
Value delivered to Customer (Customer Satisfaction Index)	63 (Out of 100)

(B.3) Key Issues

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

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

* Poor requirement planning (mostly over indenting & stockouts)
* Too bureaucratic
* No compliance to order terms by vendors
* Discrepancy in physical & computer stocks
* Limited automation
* Incomplete indents
* Vendors offers/quotes received by fax not accepted
* Incomplete / incorrect invoices
* Poor storage facilities
* Material indented & purchased but not used for years.

(B.4) Intenal Customer Value Assesment (Customer Satisfaction Index):

To determine the Value delivered by the Process , Value analysis for an internal customer was done.

Supplier : Materials Planning **Customer** : Purchase

Value Factor	Value (V) 1	Performance(P) 2	VxP 3=1x2	GAP 1- 3
Complete information on indent	70	0.7	49	21
Clear approval status	10	0.8	8	2
Delivery time schedule	10	0.4	4	6
Enclosures	10	0.2	2	8
	100		63	27

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 to rule (Rules cannot be changed)
* Lowest bid is the best (safest)
* Inventory management is Material management deptt's. responsibility

(C) WHERE WE WANT TO GO ?

(C.1) Stretch targets :

In order to achieve a quantum improvement in the reengineered process and in line with Sponsor's expectation, certain targets with respect to Quality, Cost & Delivery are set by the team. These are called Stretch targets.

Targets set were :

Elapsed Time	90 days
Cost of indenting & procurement	(-) by 50 %
Standardisation of items (Variety reduction)	10 % every year

(C.2) Good Ideas :

After an extensive Brain Storming session and also during analysis of current process good ideas generated by the team are "parked" . These are evaluated and used for designing the reengineered process.

Some of the good ideas generated were :

* Procure only what is needed
* Value Engineering & Standardisation
* Integrated computerisation (Indentors,Purchase, Stores, Finance)
* Payment against document / delivery of material
* System to write off obsolete & surplus items
* Rationalise vendor base

(C.3) Reengineered Process :

Based on the inputs available from analysis of current process & good ideas the team designed & mapped the Reengineered process. Some of the main assumptions while redesigning the process were :

* Computerisation (linking Indentors, Purchase, Stores & Finance)
* Alternate system of payments (not through bank)
* Revised payment terms for vendors

* On line vendor rating system
* Evaluation, Selection & Monitoring of Vendors
* Enhanced authority for placement of purchase orders
* Minmum role for Finance department
* Minimum signatures

Some of the highlights of Reengineered process were :
:

No. of Steps in the process	16
Elapsed time in Days	123
Employee cost to process one indent	Rs. 2,925 (US $ 81)
No. of Signatures for Approval	16
Customer Satisfaction Index	92 (Out of 100)

(D) CURRENT Vs. REENGINEERED PROCESS :

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(E) IMPLEMENTATION :

For implementation, from the reengineered process map various recommendations were made out and Quality Improvement Teams formed, clearly defining the responsibilities, tasks, benefits, costs, 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 material
* Increase number of annual rate contracts
* Revision & delegation of authority
* Develop Quality systems for Inventory management & incorporate under ISO : 9000

(F) IMPLEMENTATION BARRIERS :

The WesTIP team which redesigned the process was attempting to "sell " something which many did'nt want to buy i.e. Change. But the team made it happen due to their perseverence & support of Executive Director.

Key barriers faced were :

* Resistance to introduce indent planning.
* 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 the benefits of reengineered process & gaining buy in.
* Identified who are supporting, opposing & fence sitters. Using "peer / superior's pressure", counselling, etc. reduced / neutralised restraining forces
* Intervention by top management
* Regular monitoring the progress at different levels.

BENEFITS :

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* Employee cost to process an indent down from Rs. 13,121 (US $ 364) to 2,925 (US $ 81).
* Less inventory & its carrying cost
* Less procurement lead times (internal & external)
* Reliable vendors with minimum of follow up & rework
* Smooth & uninterrupted plant operation
* Improved company image
* Process automation (fewer errors), ease of information collection, dissemination and availability to right people at right time.
* Better stores management. More working space
* Simple, user friendly process
* Lesser interdepartmental conflicts