

Crown Paints Kenya Limited: Supply Chain Value Analysis in Manufacturing Firms

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EXECUTIVE SUMMARY

The critical value chain areas addressed in this case includes: i) forecasting and planning; ii) procurement; iii) material handling; iv) production and v) warehousing distribution and customer service. The methodology used in understanding and finally analysing and providing useful recommendations for the company's supply value chain involved both qualitative and quantitative research paradigms. This included: discussions with the organisations management staff; discussions with the organisations suppliers and customers; an analysis of the organisations supply chain; and benchmarking with leading local best-practise organisations. Six years down the line after the implementation of the researcher's recommendations, the company tripled its gross earnings from Ksh. 1 billion by end of 2006 to Ksh. 3 billion by the end of 2011. The findings on forecasting and planning aspects of the supply value chain included: lack of formal supply planning process and insurance premium on excess stocks. The recommendation therefore was to formalise/ structure supply planning process. The findings on procurement were: large supplier base with no long term contracts with chosen few suppliers; high stock levels; make or buy decisions; stock outs; lack of clear specifications. The full paper presents other findings and recommendations reached on all the facets of the supply value analysis investigated.

Key words: value analysis, supply chain management, supply networks

1.0 BACKGROUND

Crown Paints Kenya Limited is a leading paint manufacturing organisation that makes and markets leading brands of decorative and industrial/ automotive paints. The organisation operates in three strategic business units namely Crown, Twiga and Berger and has trade depots in three geographical regions in Kenya, namely Nairobi, Mombasa and Kisumu. The organisation sells its products locally to dealers' mainly major hardware shops, retail outlets, and directly to both institutional and individual end users. It also sells in the regional export market. The organisation had in the first half of the year embarked on an aggressive growth strategy in an environment of rising competition in a relatively more vibrant construction industry. It is therefore a prerequisite that the organisation acquires competitive advantage in both its cost base and customer service levels to be able to achieve its corporate goals. It is against this backdrop that the organisation contracted International Supply Chain Solutions (ISCS) and the researcher from the Management University of Africa (MUA) to study its supply chain and recommend winning strategies aligned to its overall corporate growth strategy.

2.0 METHODOLOGY

The study was conducted using mainly qualitative approach by conducting focused interviews with: the organisation's management and staff; organisation's suppliers and customers. Also conducting an analysis of the organisations supply chain and benchmarking with leading local best-practice organisations.

3.0 DISCUSSION OF FINDINGS AND RESULTS

3.1 Forecasting and planning

The key finding was lack of formal supply planning process in the company. This was evidenced by: low fill rates (78%); overstocks/ stock outs; un-coordinated production; uncoordinated distribution process; and insurance premiums on excess stock. The cost to the organisation as a result of lack of formal supply planning

process was Ksh. 15,000,000.00 while the costs accruing due to insurance premiums on excess stock was 1,400,000.00. Hence, a total cost of Ksh. 16, 400,000.00 to the organisation.

3.2 Procurement

The study revealed the existence of a large supplier base with no long term contracts with chosen few suppliers. The value of raw materials was at Ksh. 22,500,000.00, packaging materials costing Ksh. 2,500,000.00 while consumables costed Ksh. 25,000,000.00 a sum total of Ksh. 50,000,000.00 Other findings on procurement revealed are summarised in the table 1.0 below:

Table 1.0: Procurement opportunities

Findings	Value (Ksh.)
1.High stock levels	15,400,000.00
2.Make or Buy (It is cheaper to buy MR142 (app. Ksh. 80 vs. Ksh. 96 per Kg.)	20,520,000.00
3.Stock outs (MP7, MC44, MW27)	600,000.00
4.Lack of clear specifications (MU4B vs MU4)	6,400, 000.00
TOTAL	42,920,000.00

3.3 Material handling

A major loss of Ksh. 16,795,016.00 occurred as a result of uncontrolled access, storage loss on bulk liquid material and packaging material. There was also evidence of lack of clear storage plan and no regard to manufacturers storage instructions. Other findings on material handling revealed are summarised in the table 2.0 below:

Table 2.0: Material handling opportunities

Findings	Value (Ksh.)
1. Receiving	
i)Quality checks – M021 (Overuse of MC34, MC17)	254,280.00
ii)Quantity verification (All bulk liquid materials)	4,227,094.00
2. Storage	
i)Spillage / damages – No records (MW24 Case)	
ii)Storage of base strainers	322,560.00
iii)Large amount of obsolete materials	349,994.00
3. Issues	
i) Stock rotation	2,057,400.00
ii) Lack of accountability	
iii) Poor documentation, no stores requisition	
iv) Precision on weights scales	
v) Damages by forklifts driven by unskilled people	
vi) Issues of intermediates lack controls/ documentation	3,789,896.00
vii) No guidelines for materials issues for non- production purposes (MS 27)	
viii) No documentation in pack material issues	
i) Stores administration and organisation	
No clear structure and roles	142,560.00
TOTAL	11,143,784

3.4 Production

The process loss was found to be 3% which entailed loss of FG; spillage; leakages/ evaporation; under weight materials and low staff morale. This was a total sum of Ksh. 25,000,000.00.

3.5 Warehousing, Distribution and Customer Service

The findings on warehousing, distribution and customer service focussed on the following aspects: variance levels; management and staffing; non-care activities; operational practices; assembly and dispatch; supply planning; documentation and customer service. This findings are summarised in table 3.0 below:

Table 3.0: Warehousing, distribution and customer service opportunities

Findings	Value (Ksh.)
1. Variance Levels Inadequate operational processes 2. Management and staffing i) Lack of a national stock management structure. ii) Evaluation and grading of non-management staff. 3. Non-care activities i) Supermarket right inside warehouse ii) Packing of 4L paints inside warehouse 4. Operational practices Lack of basic operational practices 5. Assembly and dispatch i) Multiple dispatches through a single exit door. ii) Unserviceable / hand pallets trucks 6. Supply planning Lack of structured finished goods supply planning and control process. 7. Documentation Lack of responsibility for record keeping and archiving. 8. Customer service Inadequate customer service policy	8,400,000.00
TOTAL	8,400,000.00
GRAND TOTAL	170,658,800.00
TOTAL SUPPLY CHAIN VALUE OPPORTUNITIES	171,000,000.00

4.0 CONCLUSION AND RECOMMENDATIONS

4.1 Conclusion

The analysis of findings reveal that there is gross under utilisation of factory production capacity, material stock outs and overstock, and under utilisation of delivery vehicle capacities. It was also observed that there is no clear contractual process for suppliers and the organisation therefore fails to leverage with structured supplier relationships in terms of price paid and service.

It was also observed that obsolete material has built up over the years due to: lack of material phase out planning, with the resultant effect that products are phased out abruptly without due consideration to the relevant material still held in stock; purchase of large amounts of “trial material”, which become obsolete when, initial trials fail. These are costly to Crown Paints as they persistently pick up costs, thus: handling costs; insurance costs; finance costs; and space costs.

From the analysis of production process losses for the month of August 2005, a process loss of 3% was observed. Relative to local manufacturing benchmarks (not necessarily in the paint industry), this can be regarded as quite high and represents a production waste valued at Ksh. 25,000,000.00 annually for Crown Paints (K) Ltd., at a product throughput of approximately Ksh. 1,200,000,000.00.

The variance between physical and book stocks on finished goods is high although the net variance of Ksh. 16M at the end of June 2005 as an improvement on April 2005 (Ksh. 28M). There has been a further improvement in the September 2005 stock take. There is potential risk to stocks from non-core activities being conducted inside the warehouse. These include: retail operations at the “supermarket “inside the warehouse through which the public have some access to the stock room; heavy and continuous repackaging of 4-litre paint at the despatch area causing congestion and confusion.

4.2 Recommendations

To improve supply reliability and responsiveness to customer demands to achieve a 98% customer fill rate, from current average of 78%. Given that 50% of the orders not delivered within a two week period are delivered and accepted by the customers later, improvement in customer service levels would attract net in an additional Ksh. 150,000,000.00 in sales and additional (approximately) Ksh. 15,000,000.00 in profits. The strategies to adopt would include: sales forecasting and planning; material availability; factory throughput; distribution planning; communication and performance monitoring.

In order for the company to realise a financial savings of up to Ksh. 90,000,000.00 there is need to establish professional practices in the procurement process. Some of the strategies that would help achieve this includes: rationalise supplier base; minimise material stock levels; establish and implement a clear decision rules for make or buy consideration; establish clear material specifications.

To eliminate Ksh. 28,000,000.00 waste pertaining to handling of materials from the supply chain the following strategies could be adopted: quality and quantity checks during receiving. All materials must be kept in designated areas under lock and key, with specific stores officers controlling access to various areas. On the other hand, to eliminate Ksh. 25,000,000.00 process waste it is vital to reduce the process loss of 3% to 1%.

The strategy to adopt is the Kaizen waste management methodology. Kaizen is one of the most effective global methodologies for supply chain waste management. The following steps were identified: decongest the filling stations by wheeling away product in pallet loads as soon as they are filled; identify and rectify all materials/product leakage points in the plant; control handling of moving equipment by ensuring that only authorised and skilled persons handle moving equipment like forklifts and hand-pallet trucks; and, increase weighing precision of material by use of higher precision electronic weighing scales in the stores.

Without central co-ordination there is a likelihood of under or over-stocking at the depot leading to lost sales. In order to determine the adequacy of storage space, it is necessary to have a stock holding policy that guides the business on the quantity of each stock – keeping – unit (SKU) to hold. One of the key reasons for holding stock is to meet customer demand. The weekly stock level required to meet customer demand is the sum of average demand (based on historical sales), 3 standard deviations and safety stock (half average demand). The required stock level works out to about 2.0 weeks cover of sales on average although it varies from one SKU to another. The stock holding policy determines the warehousing capacity and ultimately the level of customer service.

5.0 EXHIBITS

Exhibit 1.0

Recommended material stock levels

Material Category	Av. Monthly Consumption, Ksh.	Std. deviation K.sh.	Av. Lead-Time.	Lead time Stock, Ksh.	Safety Stock, Ksh.	Max Stock, Ksh.	Expected Stock on Hand, Ksh.
Imported Raw material	32,000,000.00	46,000.00	1.9	60,800,000.00	30,400,000.00	91,200,000.00	60,800,000.00
Local raw material	26,756,487.79	92,154.46	0.125	3,344,560.97	1,672,280.00	5,016,841.46	3,344,560.97
Packaging material	11,069,946.68	8,564,159.70	0.125	1,383,743.33	691,871.67	2,075,615.00	1,383,743.33
Total max. stock (First 85% of material)						98,292,456.46	65,528,304.31
Total max. stock (All of materials)						115,638,184.07	77,092,122.72

Exhibit 2.0

Supply side price-based savings realisable

Category of spend	Annual spend	% savings realisable	Actual savings realisable (Ksh.)	Remark
Raw materials	750,000,000	3	22,500,000.00	Held discussions with selected local and overseas suppliers
Packaging materials	120,000,000	3	2,500,000.00	Savings realisable from plastic packaging
Non-production items	108,000,000	23	25,000,000.00	Market survey (see exhibit 3)
Total			50,000,000.00	

Exhibit 3.0
Procurement market survey (Non-production input items)

Spend category	4 months spend (analysed)	Annual spend	% savings realisable per market survey	Annual savings realisable (KSh.)
Safety items	47,727.56	143,182.68	33.16	47,479.38
Resale items	1,234,425.60	3,703,276.80	20.00	740,655.36
Lab equipments	67,744.00	203,232.00	72.56	147,465.14
Disposables	384,346.00	1,156,038.00	10.59	122,424.42
Repair and maintenance	10,076,421.08	30,229,263.24	27.92	8,440,010.30
Stationery and printing	6,650,408.26	19,951,224.78	23.36	4,660,606.11
computer	2,957,281.08	8,871,843.24	12.11	1,074,380.22
T- shirts	678,020.00	2,034,060.00	22.57	459,087.34
Total (Ksh.)	22,097,373.58	66,292,120.74	22.92	15,233,020.92

Exhibit 4.0
Obsolete stock handling cost computation

Stock take days	Number of workers	Hours worked	Overtime factor	Total hours	Rate per hour (Ksh.)	Total wages paid (Ksh)
Friday	5	8	1	40	100.00	4,000.00
Saturday morning	5	4	1	20	100.00	2,000.00
Saturday afternoon	5	4	1.5	30	100.00	3,000.00
Sunday	5	8	2	80	100.00	8,000.00
TOTALS						17,000.00
Labour cost per stock take, Ksh.				17,000.00		
Number of stock takes per year				4.00		
Annual labour cost, Ksh.				68,000.00		

Exhibit 5.0
Obsolete material insurance cost computation

	KShs.
Total premium paid, 2004	4,517,557.00
Total value insured, 2004	735,003,000.00
Total value of stock	
Insured (FG, RM, PM), 2004	350,000,000.00
Proportion of premium relating	
To total stocks	2,151,208.84
Value of total stocks 2004, RM/PM	266,395,000.00
Value of FG stocks 2004	117,042,000.00
Total stock value, 2004	383,437,000.00
Proportion of premium relating	
To RM and PM	1,494,564.37
Value of obsolete RM	17,662,498.41
Insurance cost on obsolete materials, Ksh.	76,651.15

Exhibit 6.0
Obsolete material financing cost computation

	Kshs.
Value of obsolete stock	13,662,498.41
Finance cost @ 14%	1,912,749.78

Total cost of holding obsolete material = Ksh. 2,057, 400.93

Exhibit 7.0
Finished goods variance items – April and June 2005

Code	Description	April – 05		June -05	
		Lt/kg	Val (Ksh.)	Lt/kg	Val (Ksh.)
CM	ACID CATALYSED LACQUERS	5	5,406,806		
QA	BASES	45,937	3,885,209	18,636	1,497,055
AC	SILK VINYL / WALLSHEEN	22,192	1,870,810	13,337	1,356,381
AQ	SOLO PURE SATIN EMULSION	26,088	1,848,882	937	81,122
AD	ECONOMY VESTA PLASTIC	63,215	1,685,697	18,413	526,358
BA	SUPER GLOSS	15,936	1,634,041	11,074	1,016,569
AC	STAINERS FOR EMULSION	9,860	1,173,137	1,365	56,998
AN	INTERMEDIATES	8,740	968,412	9,768	1,360,716
BI	SOLO ULTRA GLOSS	8,998	789,459	168	16,971
BC	ECONOMY VESTA GLOSS	10,656	736,508	27,278	2,097,923
QD	STAINERS FOR OIL PAINTS	4,696	586,013	2,911	463,866
FC	FAST DRY AUTO	4,938	516,751	42	824
GC	STOVING ENAMEL	3,431	511,889	2,672	487,941
AE	PERMPLAST	5,394	451,590	629	59,820
CA	WOOD FINISHES	4,625	447,390		
JM	URETHANE MODIFIED OIL	4,192	439,046	5,931	653,117
JA	L.OA	4,866	363,384	11,636	832,038
GJ	EXPOXY PHENOLIC LINNING L	1,076	335,293	1,026	319,595
FK	SPOT PUTTY	2,283	317,132	194	17,044
QF	STAINRES FOR STOVING E	1,893	307,810	856	165,317
AT	CROWN COVENANT + 2 EMUL	6,105	307,512	1,183	65,872
FD	PRIMER SURFACER GREY	3,134	289,320	1,600	167
FB	CELLULOSE AUTO	1,974	252,452	507	57,289
CC	MULTIPURPOSE VARNISH	2,738	243,507		
DJ	2 PACK EPOXY FLOOR PAINT	2,368	236,606	335	39,873
AX	PERMACOTE EXTERIOR EMUL	2,434	232,581	1,328	61,818
GA	ROLLER COATING	1,164	225,598	133	25,564
QE	STAINERS FOR QAD ENAMELS	880	193,424	308	67,974
FA	2K ACRYLIC AUTO	1,153	184,300	22	6,582
DV	SILICONE WATER PROOFING S	880	180,546		
EX	ECON/ BUDGET UNDERCOAT	4,728	179,116	7	312
DB	2PACK/ EPILUX EPOXY E	939	177,541	499	97,477
FH	2K ACRYLIC HARDENER	373	165,208	261	87,443
JC	S.O.A	874	161,970	6,406	671,204
FE	2-PACK SELF ETCH PRIMER	621	160,106	510	48,589
JB	M.O.A	2,045	151,096	5,111	425,408
FJ	2K ACRYLIC CLEANER	451	150,544	173	56,340
FM	DOUBLE STRENGTH PAINT	1,500	147,243		
FZ	APS VEHICLE REFINISHES	1,227	143,329	415	54,829

AI	SOLO HI-MATT EMULSION	1,985	143,258	1,027	81,806
QG	STAINERS FOR ROLLER COAT	556	123,744	680	93,435
SA	BITUMEN/PITCHES	1,856	114,261	231	9,193
CE	VARNISH STAINS	1,066	104,054	256	22,640
DQ	FLOOR PAINTS	1,167	96,128	94	7,996
KA	2502	1,039	81,228	154	15,011
AZ	APS – EMULSIONS	2,336	77,311	2,750	199,661
HD	ROADLINE/ CHLO RUBBER	681	75,699	18	2,231
QJ	STAINERS FOR 2PACK PROXY	406	73,780	991	215,471
DP	ROOFING PAINT	851	71,261	2,697	213,781
HC	THINNER FOR 2PACK POLYTH	622	69,748	510	57,900
GD	Q.A.D	92	69,327	187	55,233
FN	HIGH GLOSS THINNER	553	61,890	86	9,753
FG	2K ACRYLIC PRIMER	445	58,885		
BZ	APS- GLOSSER AND UC	952	57,804		
CL	TIMBERGUARD	398	54,064	19	3,404
KC	2530	737	53,631	52	4,624
EL	ZINC PHOSPHATE PRIMER	253	48,791		
DC	DUOTONE	998	41,506	251	63,103
AG	ROCKFAST/ TARTARUGA	659,695	38,241	1,455	76,085
GZ	APS-INDUSRIAL PAINTS	206	37,573	609	110,643
DA	CHLORINATED RUBBERS	203	36,286	208	37,396
CF	2 PACK POLYURETHANE	164	34,338	3,419	877,318
BB	VESTA GLOSS/ STAR HI-GLOSS	349	31,879	5,806	523,703
QH	STAINERS FOR CHLO R PAINTS	37	31,255	83	11,073
LA	METAL PUTTY	713	28,785	167	737,821
CH	RONSEAL HARDGLAZE	250	25,349		
ED	ALKALI RESISTING	253	23,644	133	19,170
QB	ADDITIVES	1,744	21,916	1,181	22,183
DZ	APS – SPECIALISED	142	21,204	498	86,157
KL	2546	151	17,093		
DT	DECK PAINTS	142	16,916	148	14,487
DF	ALLUMINIUM PAINTS	223	16,099	23	1,984
LL	POLYFILLA	323	15,434	636	
EA	WHITE WOOD PRIMER	253	15,403	786	50,493
CN	PRECATALYSED LAQUERS	100	15,105	755	111,493
AV	SOLO SILK SHEEN EMULSION	152	14,408	11,855	990,177
DE	ALUMINIUM PAINT	78	12,273	651	122,732
ES	2PACK EPOXY ZINC P.PRIMER	78	11,745		
KB	2507	157	9,100	1,182	69,390
KF	WS003	160	8,714	150	1,178,250
KK	SOLFIX	51	8,387	186	31,986
AA	MATT/ NU-PLASTIK EMULSION	261	8,365	34,308	1,787,197
JF	PVA POLYMER	66	5,403	15,168	1,252,066
DG	BLACK BITUMINOUS	130	5,219		
EP	STANDARD THINNER	45	4,734	9	875
BD	EGGSHELL	122	4,347	1,149	60,159
DN	ROOFSHIELD/ ROOFMASTER	31	3,924	14	1,719
FS	2K ACRYLIC THINNERS	40	3,888		
JN	STY AECALATE FOR SB RESIN	9	2,993	66	19,114

GP	OVERPRINT VANISH	13	2,076	21	3,366
HA	WHITE SPIRIT	21	1,688		
BF	SCHOOL BOARD PAINT	18	1,622	7	631
EO	CATALYST	7	1,550	5	1,107
DU	SUPER TROPICAL ANTI-F.	7,301	1,274		
AL	STRONGHOLDTEXTURED P.	17	992	12	696
CB	POLUYURETHANE VARNISH	5	786		
EY	APSU/ DUAL COATE	10	756	208	11,346
DM	ROAD MARKING PAINT	5	578	5	483
AB	COVERMATT/ STARMATT	0	568	801	46,226
EW	CROWN/ UNIVERSAL UNDERC.	8	404	3	124
GE	HMEG VARNISH AD 12	2	398	2	422
EC	PENETRATING PRIMER	4	358		
EE	RED OXIDE PREFAB P.M.	6	311		
CD	ALKYD/ EXTERIOR C-G V	3	189		
PA	PA SMALL ORDER PRODN	1	1		
CJ	BUDGET VANISH STAIN				
CT	HARDENER 2-PACK P.V.				
CK	BUDGET VANISH				
	TOTAL	936,914	27,888,744	184,677	15,928,483
	BOOK STOCK VALUE		166,727,717		140,073,318
	LEVEL OF VARIANCE		17%		11%

Exhibit 8.0
Order assembly and dispatch cycle time

Date	Route	Customer	Assy, Inv Ready	Dispatch	Time take (hrs)
15-Jul-05	South B	South B General store	10.52	14.45	3.93
		Moka hardware	10.50	14.45	3.95
		Electron hardware	10.50	14.45	3.95
		Kenon hardware agencies	13.44	14.45	1.01
		Kenon hardware agencies	11,17	14.45	3.28
		Tip Top	11.48	14.45	2.97
		Prime Time Hardware	11.11	14.45	3.34
		Cementers hardware	8.30	14.45	6.15
		City mattresses Ltd.	11.50	14.45	2.95
					3.50
15-Jul-05	Westlands	Ali Glaziers	10.59	14.53	3.94
		Ali Glaziers	11.47	14.53	3.06
		Ali Glaziers	11.16	14.53	3.37
		Ali Glaziers	13.47	14.53	1.06
		Ali Glaziers	9.15	14.53	5.38
		Ali Glaziers	11.57	14.53	2.96
		Viking Hse	8.52	14.53	6.01
14-Jul-05		Nafis Glass Hardware	16.16	14.53	23.26
		Laxcon Hardware	14.09	14.53	0.44
		Laxcon Hardware	14.13	14.53	0.40
					4.99
15-Jul- 05	Gikomba	Mt. Kenya Timber Hardware	11.10	15.01	3.91
		Mutundu Hardware	14.01	15.01	1.00
		Global Hardware	11.38	15.01	3.63
		Rayat Hardware	10.59	15.01	4.42
		Rayat Hardware	12.06	15.01	2.95
		Amratlal Hardware	11.16	15.01	3.85
		Amratlal Hardware	14.46	15.01	0.55
				2.90	
Average assembly and dispatch time, hours				3.80	

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