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**TITLE: INNOVATIVE INVENTORY CLASSIFICATION CUBICAL MODEL  
- A TOOL FOR IMPROVING PRODUCTIVITY & PROFITABILITY**

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# **INNOVATIVE INVENTORY CLASSIFICATION CUBICAL MODEL**

- A TOOL FOR IMPROVING PRODUCTIVITY & PROFITABILITY

*INVENTORY IS A DOUBLE EDGE WEAPON. SHORTAGE OF INVENTORY LEADS TO LOSS OF PRODUCTION & PRODUCTIVITY. EXCESS OF INVENTORY LEADS TO THE LOSS OF PROFIT & ULTIMATELY RESULTS IN LOSS OF PROFITABILITY.*

*PROPOSED NEW INNOVATIVE INVENTORY CLASSIFICATION CUBICAL MODEL MAINTAINS BALANCE BETWEEN EXCESS & SHORTAGE OF INVENTORY, AND THUS AVOID ANY LOSS OF PRODUCTIVITY & PROFITABILITY.*

## **INTRODUCTION**

Globalization has already shrunken the world into an electronic village for operation with the availability of latest world - class products. Today, every consumer is looking for better than the best available anywhere in the world. Therefore, any industry is required to become internationally competitive not only in quality but also in terms of delivery time and price.

**“Necessity is the Mother of Invention”** applies in the present Business scenario, which calls for innovation. The rate of obsolescence of Technology & Products is much faster than Innovation. This scenario has compelled each and every operator, in any field, to keep its Research & Development team on toe, because only R&D team can bring Innovation. It is easily said than done, because Innovation comes across many uncertainties. Innovation is required not only in Products & Services but each & every area of operation guided by vision and will to attain excellence. **“Survival of the Fittest”** in today’s context needs more emphasis.

Any Business operation, whether Manufacturing or Services, consists of Hardware, Software and Human-ware. It goes without saying that all out efforts are to be made for optimization of resource utilization so as to minimize the following costs:

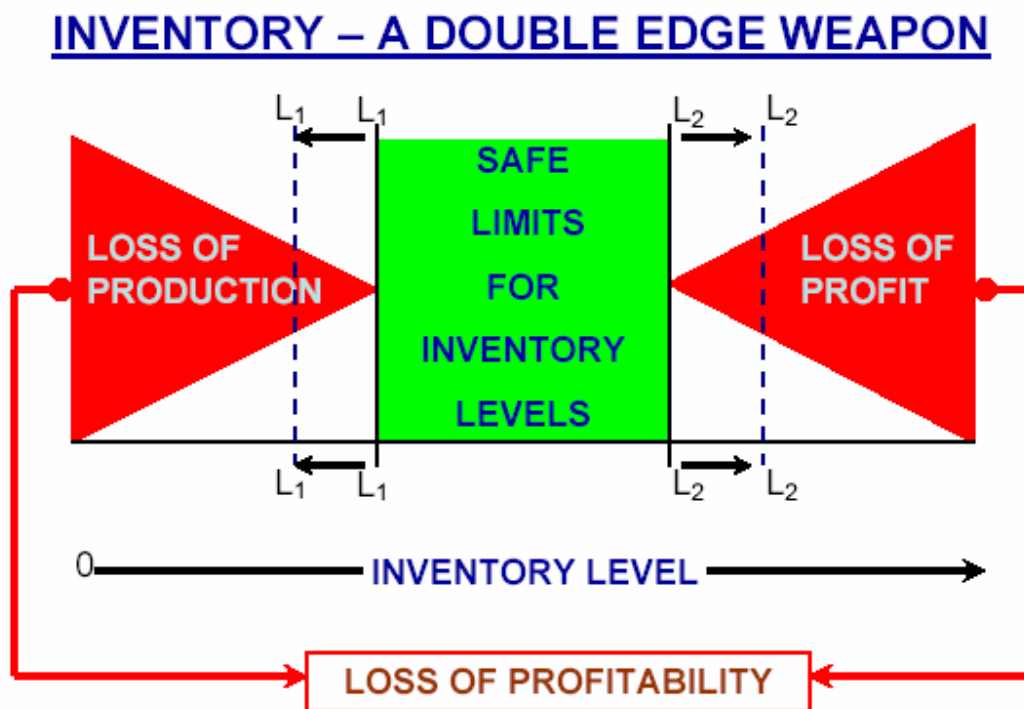
- MATERIALS (40-50 % of total cost)
- LOGISTICS (8-16 % of total cost)
- MANPOWER (10-15 % of total cost)

Inventory (materials) plays a major role in the production cost. Therefore, all out efforts are required to optimize the inventory and inventory carrying costs. Innovation in materials (using alternative better substitutes) can also reduce the material cost drastically. **Every 10 % cost reduction in materials can result in 5 % addition in net profit.**

## INVENTORY - A DOUBLE EDGE WEAPON

Inventory has been called a double edge weapon because its excess or shortage has same effect of eating away the profitability in either case, as can be seen by the following equations:

1. SHORTAGE OF INVENTORY - LEADS TO LOSS OF PRODUCTION
2. EXCESS OF INVENTORY - LEADS TO LOSS OF PROFIT



$L_1$  = LOWER LIMIT OF ACCEPTABLE INVENTORY

$L_2$  = UPPER LIMIT OF ACCEPTABLE INVENTORY

**A drift in either of the Control Limits  $L_1$  or  $L_2$  leads to**

**LOSS OF PROFITABILITY.**

$L_1$  and  $L_2$  in the above diagram represent the two acceptable safe limits of inventory level.  $L_1$  represents the lower limit and  $L_2$  represents the upper limit. Following impacts of inventory limits  $L_1$  &  $L_2$  can be ascertained very easily:

1. If the inventory starts reducing below  $L_1$  level (as shown by dotted line), it results in more and more loss of production. Loss of production below normal level will certainly affect the productivity as well as profitability as fixed overheads will have to be amortized on lower volume of production and only variable cost can be saved.
2. If the inventory starts increasing beyond  $L_2$  level (as shown by dotted line), it results in more and more reduction in profit due to increase in inventory carrying costs. Loss due to higher inventory carrying cost will also affect the profitability.

**Thus in both the situations (i.e. shortage or excess of inventory), profitability of operations goes down. This peculiar behavior of inventory levels makes the inventory a double edge weapon.**

### **ROLE OF INNOVATION IN INVENTORY MANAGEMENT**

Innovation is a creative process, which involves three steps namely Idea generation, Development & Implementation. Thus, Innovation is the process of converting new ideas into a new product or service. Innovation improves the efficiency, effectiveness and quality of product or service or life. Innovation is required not only in products and services but in each and every field of operation coupled with vision and will to attain excellence, including Inventory Management. Innovation has to be a time bound process and is required to be faster than fastest. Innovation is never ending process for achieving better than the best performance. **Innovation Needs a Planned Strategy.**

## **INNOVATIVE INVENTORY CLASSIFICATION CUBICAL MODEL**

This paper proposes a suitable model for maintaining balance between excess and shortage of inventory by using suitable combination of different existing classifications of inventory.

Following **EXISTING** Inventory classifications have been used in developing the model:

1. Based on money value (ABC analysis)

A : Costliest items – 10 % by quantity but 70 % by cost

B : Medium cost items - 20% by quantity but 20 % by cost

C : Low cost items - 70% by quantity but 10 % by cost

2. Based on criticality of application / usage (VED analysis)

V : Vital

E : Essential

D : Desirable

3. Based on availability (SAP analysis)

S : Scarce

A : Available

P : Plenty

4. Based on consumption pattern (FSN analysis)

F : Fast

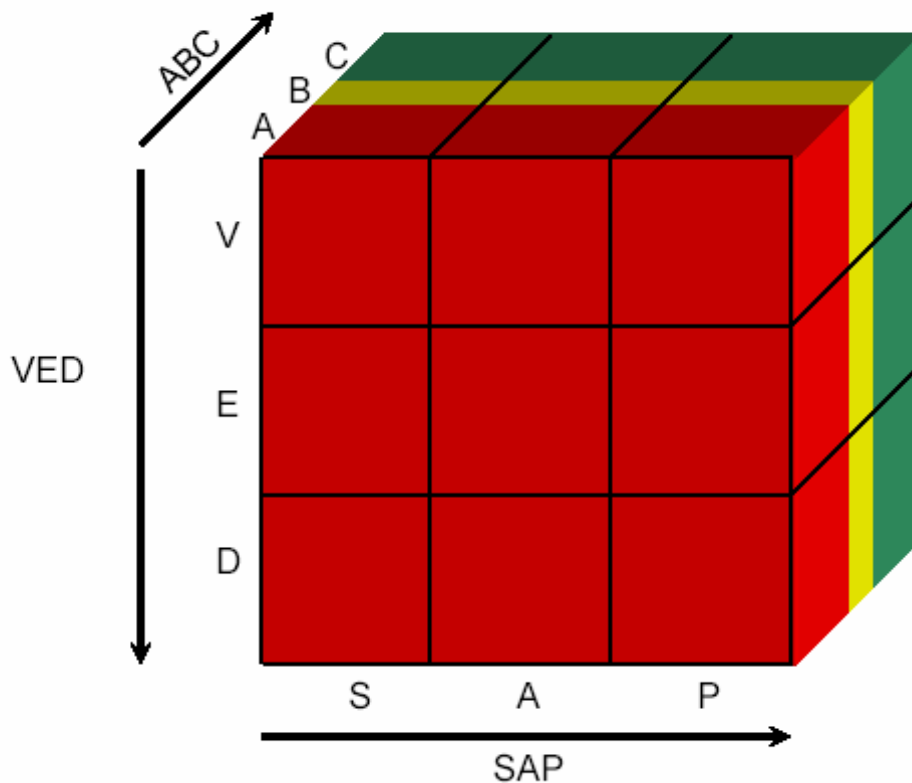
S : Slow

N : Non-moving

## PROPOSED INNOVATIVE INVENTORY CLASSIFICATION CUBICAL MODEL

Any three classifications can be selected for the development of New Cubical Model based on needs of a particular Organization. A cubical model has been developed using ABC, VED & SAP Classification as three dimensions of Cube. This has given us 27 classifications as under :

### INNOVATIVE INVENTORY CLASSIFICATION CUBICAL MODEL



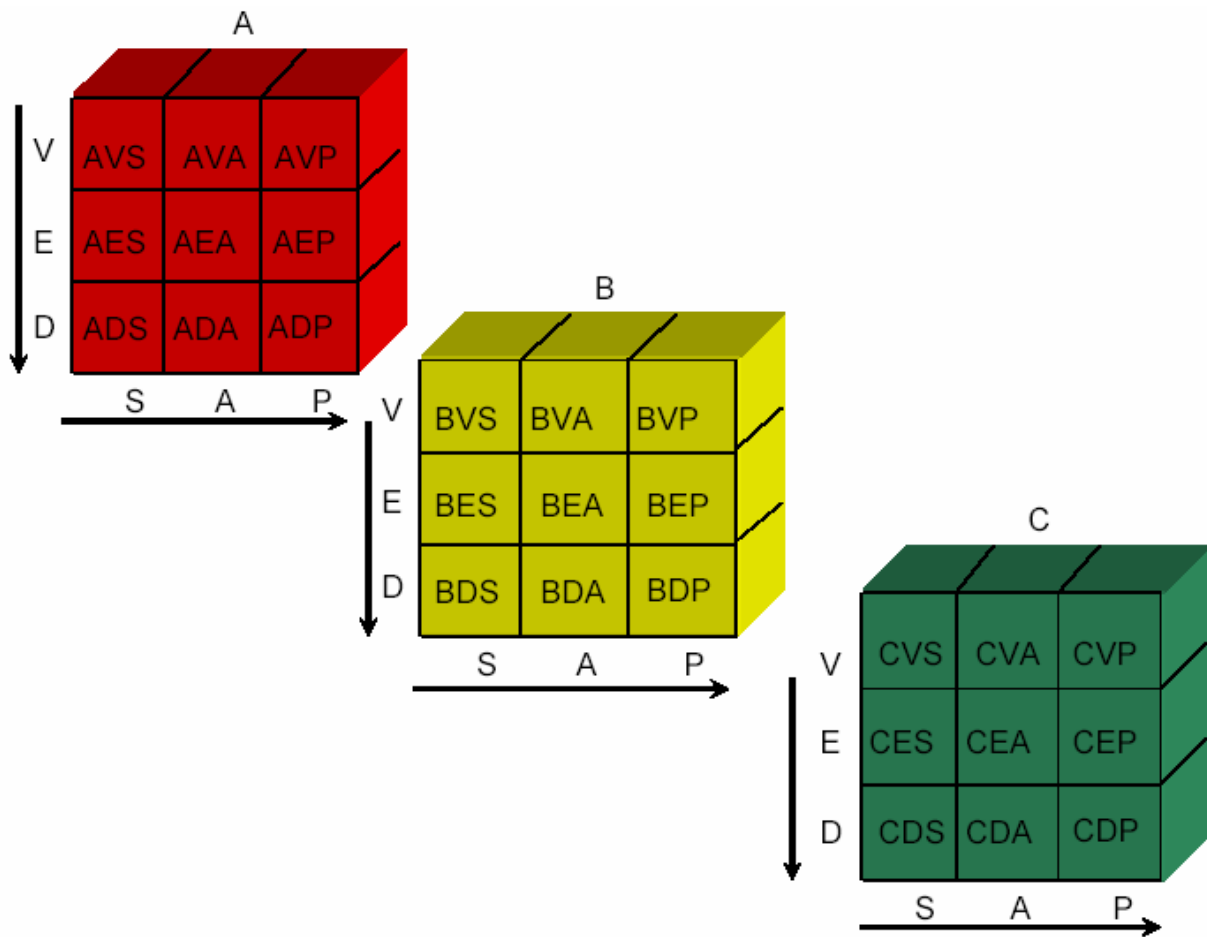
For superimposition of fourth classification, the above cube can be divided into Three Separate Slices as below:

Slice 1 - Classification A

Slice 2 - Classification B

Slice 3 - Classification C

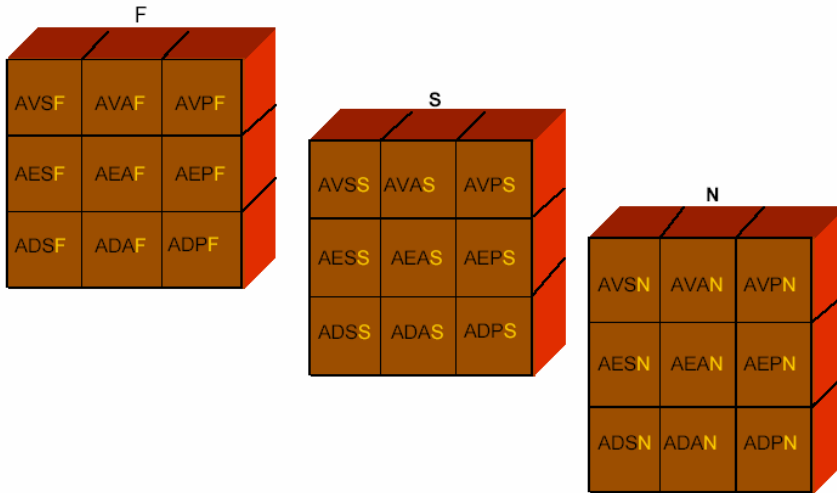
**Three slices of “ABC” Classification**



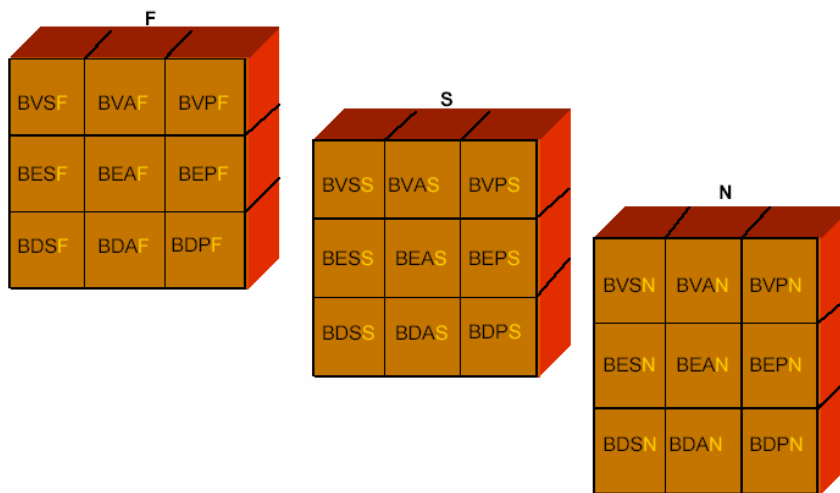


Fourth Classification (FSN) can be superimposed on the above three slices as under as under:

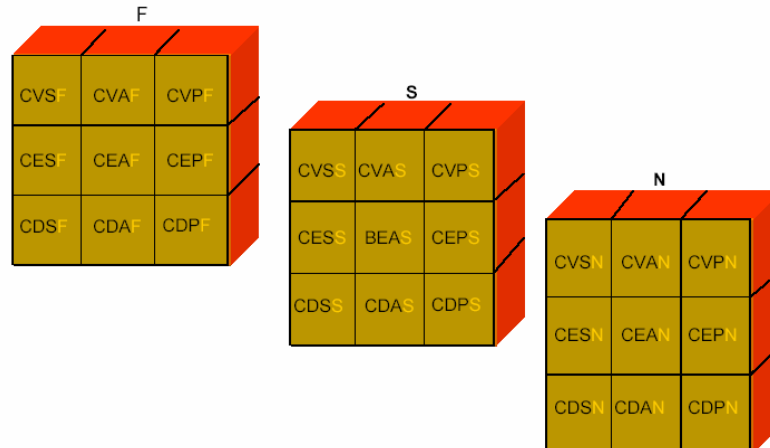
SUPER IMPOSITION OF "FSN" ON "A" INVENTORY CLASSIFICATION



SUPER IMPOSITION OF "FSN" ON "B" INVENTORY CLASSIFICATION



SUPER IMPOSITION OF "FSN" ON "C" INVENTORY CLASSIFICATION



The above “**INNOVATIVE INVENTORY CLASSIFICATION CUBICAL MODEL**” will help us in the following areas:

- Cost Reduction
- Avoid Production Loss
- Avoid Customer Loss
- Customer satisfaction through better quality and timely delivery
- Avoid inter departmental conflicts due to shortage of Inventory
- Reduction in working capital requirement resulting in increase in profitability

### **ACHIEVEMENTS**

1. We select three most important factors of Inventory Classification applicable to any particular industry and develop a new **THREE DIMENSIONAL CUBICAL INVENTORY MODEL COUPLED WITH THE POSSIBILITY OF SUPERIMPOSITION OF FOURTH PARAMETER**. This three-dimensional cubical model gives us 27 classifications of inventory. When fourth parameter is superimposed over this model, we get 81 classifications of Inventory. This will help us in most logical / judicious allocation of available funds (working capital) in Inventory.

2. Main aim has been to develop a model for achieving **NEGATIVE INVENTORY CARRYING COSTS**. The basic idea of negative inventory carrying cost has been derived from double edge nature of Inventory. While maintaining balance between shortage and excess of Inventory, new creative, innovative and cubical model has been developed for converting Inventory Carrying costs into a surplus cash flow. Most of the regular suppliers will agree for long term supply agreements with mutually agreed credit period.
  
3. Proper Material Resource Planning, Just-In-Time (JIT) concept in procurement of inventory, nimbleness in production, faster delivery to customers & faster collection of payments from customers and finally purchasing material on longer credit period and reduction in total internal lead time can convert Inventory Carrying Cost in to surplus cash flow. For achieving this concept of negative inventory carrying cost, following equations can also help is reducing Inventory Costs.

**UPSWING OF BUSINESS (GROWTH) – BUILD INVENTORY**

**DECLINING PHASE - CAREFULLY SELECT OR REDUCE INVENTORY**

4. Most of the inter-departmental conflicts arise when operations are not smooth and fault-finding or attributing the causes to others start as a self defense mechanism. Most of the operational problems can be attributed to the inventory. Through proposed model sufficient inventory level is always maintained successfully at optimum Inventory Carrying Costs.

**CONCLUSION:** Proposed Innovative Inventory Classification Cubical Model has been projected as a tool for improving Productivity & Profitability. Foregoing deliberations can be correlated to improvement in productivity & Profitability as under:

**PRODUCTIVITY:** The model is based on nimbleness in production with assured availability of requisite materials. This leaves very little scope for inter-departmental conflicts by maintaining balanced inventory. Thus ensuring improvement in productivity as there can be no loss of production due to inventory.

**PROFITABILITY:** Inventory has been optimized. Inventory cost has been eliminated or reduced drastically to the bare minimum level. This will reduce inventory carrying costs which will ultimately improve the profitability.

Thus this proposed “Innovative Inventory Classification Cubical Model” can be used to convert threats of “Double Edge Weapon” i.e. Inventory into an Opportunity for improving both Productivity as well as Profitability.