

# The application of the "two-way broom theory" to solve Huasheng's apple single product supply chain management "pain point"

Yangbin Ou<sup>1</sup>

<sup>1</sup>Department of Management Technology, Xijing University, China

**Keywords:** Husheng's fruit industry, Broom Theory, Supply Chain Management, pain point.

**Abstract.** This article through the application of innovation "broom theory" to solve Huasheng's fruit industry supply chain management "pain points", and through empirical research and put forward the solution to the problem; for enterprise decision-making. How enterprises implement supply chain management to solve the "pain points" -- standardization of fresh electricity supplier in the cold chain project, the problem of customer experience, and so on.

## Current situation of supply chain management and operation of Huasheng's fruit

Huasheng's fruit industry after many years of hard work has been completed in the high quality of apple fruit area of purchasing for network system, similar to Huangmajia's distribution network model, in Northern Shaanxi Five County District built a village level service team (2000 people scale), mainly engaged in orchard technical guidance, information service, apple futures direct purchasing, agricultural sales etc. business. Huasheng's fruit built Apple CA cold storage 40 thousand tons in the marsh, through the "futures purchase" mode, pre-stored fruit 6000 tons / year; through the "apple sisters" in the production and processing center of the automatic sorting line of apple in cleaning and sorting packaging processing; as a domestic, international order center, administrative center of management function of Huasheng's fruit set up its own domestic and international marketing network, expand the international market business, to carry out foreign fruit procurement operations. In 8 the city established a branch, pre-warehouse, established a chain of Direct stores - Guoleshi Apple Store. In the Jingdong platform, Ali Tmall opened stores of Huasheng fruit to develop electronic commerce. Huasheng's fruit industry has successfully entered the WAL-MART, Huarun, Carrefour, Metro, etc...

## The main problems of China's fruit industry supply chain management:

Huasheng's fruit didn't node departments or enterprises as a whole, did not realize the whole process of strategic management. Due to the nature of the enterprises and between the Huasheng internal departments of the different objectives, resulting in contradictions and conflicts of interest, among the supply chain enterprises and Huasheng's internal departments can not play its function of efficiency, it is difficult to achieve the overall objective of supply chain. The supply chain management emphasizes the integrated management mode, which is a kind of Huasheng's fruit raised extensive management, supply chain management of each node is a random entity heavily built, more and more complex and difficult to control. Huasheng's fruit that inventory is a necessary measure to maintain production and sales, is a necessary the cost, inconsistent with the modern inventory management concept. Huasheng's fruit does not attach importance to the informatization construction, resulting in supply chain management of "bullwhip effect" is amplified, supply chain management of the benefits of efficiency, unable to play, capital turnover rate, the rate of return on investment is very low, a large contingent of personnel disorder. The development of electronic commerce is not ideal, the Jingdong, Ali electricity supplier platform can expand the network marketing channels, the Internet can not establish its own brand. In short, Huasheng's fruit brand advantage, industry advantage, physical advantage, financial advantage can not play there, the personnel structure aging, enterprise informatization construction is not enough, not thinking of the Internet, etc...

## **Huasheng's Apple single product supply chain management solutions**

The "two-way broom theory" is a metaphor according to a theory of two-way "hoop" way to sort out the broom or supply chain. The supply chain upstream- procurement, production, transportation and other aspects of efficiency, large scale, standardization, to maximize the benefits; downstream-warehouse, distribution & customer service department with elasticity, rapidly, small scale service, to meet customer demand.[1]

Both supply chain's ends meet two "hoop", to coordinate the balance of supply chain, so as to play its effectiveness, less effective. The supply chain collar is a "buffer", a multi the "program", a "focal point" of Huasheng fruit is a buyer, a base, an inventory, a production process and a period of time, a O2O store, a front warehouse or a website. The supply chain operation, play The scale effect of the low cost, the upstream and downstream supply chain planning flexibility and diversification, to meet customer requirements. The implementation strategy: delay (Postpone), figuring out how to supply what fruit's products before, don't rush out fruit's products come out, to achieve "order driven" supply chain management module (Modulate). The process of fruit supply chain upstream and downstream of the same module, change the switch to reduce more varieties of small quantities of the change cost. The synchronization (Synchronize), with many customers of polymerization factors of time or space, achieve economies of scale, efficiency and lower operation cost.[2]

Huasheng fruit supply chain upstream from the apple planting base procurement needs a supply chain in the upstream end of the "hoop" - "upgrade" agriculture company, through the introduction of self built base, "Buyer" Just in Time purchasing. Caotan distribution center of fruit production, storage and transportation, regional pre-warehouse & distribution according to the radius to O2O stores, through the scale operation, quality control and lower cost in the downstream have completed the orders after a delay. Each Guoleshi fruit stores or pre-warehouse, is another "hoop" supply chain. Another function, the use of fruit mix to reach module the function of logistics. In the allocation, the small fruit concentrated in one area of pre- warehouse, supply chain sale is mastered, and then sent to the customer distance closer to the point of sale distribution. By focusing on the adjustment of the order of the time, so that every small demand, Integrated with a large scale economy order; to a global perspective to the deployment of supply plan, so that each region can't independent supply of small products, are concentrated in the grass production and processing center to handle.[3]

Two "hoop" supply chain collaborative planning, through production, through this mechanism of play the overall strategy the biggest benefit. Agile supply. Including distributors, retailers and the speed of delivery to the customer's delivery speed. As demand changes, and timely adjust the supply volume, events and form. Production elasticity. The rapid increase of new sales channels, accept new business marketing model, to meet customer demand for the purpose of not simply reduce costs. Information transparent. Really grasp the real needs of customers, welcome cooperation and corresponding decision. Through meticulous management process reengineering, and The "two-way broom theory", becoming lean Supply chain management model.[4]

## **Empirical analysis of China's fruit industry supply chain management**

Heyman and Soblec to determine the order of the Order-up-to level (according to the level of the order) of the period “  $S_t$  ”, through the demonstration of the function “  $S_t$  ”to meet

$\min E[g(S_t, \sum_{i=1}^{l+1} D_{t+i})]$ , the same time to meet the  $\max E[w(S_t, \sum_{i=1}^{l+1} D_{t+i})]$ . Conclusion: the chain of logistics cost minimization is the maximum profit.

The total supply chain inventory minimum refers to a single enterprise inventory minimum, but each node of the total inventory to a minimum. To achieve the optimal depends on the entire supply chain inventory level and change the control of the target, and is not a simple lower inventory to the upstream and downstream enterprises.

In practice, supply cycle level and service level is not very good and effective accumulated clearly quantified, so enterprises use more fulfillment rate to achieve quantitative or qualitative, supply chain enterprises to meet customer demand for the service level.

Charles Farnt: the enterprise core competitiveness lies in the supply chain management, supply chain management is the core and key winning speed, speed the winner is to shorten the response period. With the manufacturer as the core of the three order response cycle structure model:

$$T_{RT} = \sum_{i=1}^3 RT_i = RT_1 + RT_2 + RT_3$$

inside:

$$RT_1 = T_S + T_{S-M}^{tr}$$

$T_S$ : Buyer internal response cycle  $T_{S-M}^{tr}$ : Buyer - manufacturer transit time

$$RT_2 = T_M + T_{M-R}^{tr}$$

$T_M$ : Internal response cycle  $T_{M-R}^{tr}$ : Manufacturer - distributor transit time

$$RT_3 = T_R + T_{R-C}^{tr}$$

$T_R$ : Distributor internal response cycle  $T_{R-C}^{tr}$ : Distributor - end customer transit time

$$T_{RT} = T_S + T_{S-M}^{tr} + T_M + T_{M-R}^{tr} + T_R + T_{R-C}^{tr}$$

See from the three order response cycle structure model, response period covering all nodes of the chain, namely, buyers, manufacturers, distributors and end customers. One small part of the problem will have a Domino effect, affecting the entire supply chain. [5]

## Conclusion

Huasheng fruit supply chain "pain points" lies in the cultivation and management of backward technology, limited storage conditions, classification processing is not up to the requirements of the market, sales channels, brand production is unable to play, to balance and to sell to a reasonable price; and the other end market retailers suffer from P2B2B... ..2B2C long supply chain, and fruit gross profit reduction and rising cost pressures, and service awareness, brand awareness and marketing strategy of the lack of reason, cause of Huasheng fruit supply chain is difficult to really profitable.

The fragmentation of fruit producers, retailers and consumers in the market need the Internet to build a bridge to the Huasheng fruit. P2B (producer to business) model for deep integration of supply chain, and promote China's fruit industry supply chain upgrade, create and share the entire supply chain value. Countermeasures: rebuild and optimize the industrial structure.

In the past mainly rely on the line from the origin to the effective circulation, through the supply chain management, can effectively reduce the circulation center necessary, to promote the flat channels and to the middle of the process, to improve the overall supply chain and improve circulation efficiency.

Supply chain enterprise scale Efficiency through the supply chain management, enterprises can effectively coordinate and supply chain business in the fruit production, processing, forming an organic whole circulation enterprises, build a strategic partnership, to reduce unnecessary communication cost, reduce the cost and increase the middleman amortization, improve the whole chain of the total dividend and every enterprise share dividend. Supply chain management can guarantee the quality of the products.

The fruit for the circulation of more stringent requirements, the introduction of fruit traceability and quality control technology, the storage and temperature control throughout the cold chain transportation can ensure the quality of fruit. So the supply chain of the biggest "pain points", the problems of standardization of agricultural products.

## References

- [1] Jun Yonghong, Xi Yuqin. Risk investment risk fuzzy comprehensive evaluation model [J]. *Statistics and Decision*, , 2008, 7:26-29
- [2] Zhang Yanfeng, Si Chunlin. Based on the graphical evaluation and review technique risk portfolio model [J]. *Journal of Systems Management*, 2007(16), 3: 298-301
- [3] Xu Song. Models of game theory in venture capital [D]. Tianjin University, Doctoral Dissertation, 2007,1: 7-8
- [4] Shen Feng, Liu Yong. The Black-Scholes option pricing model in venture capital enterprise application [J]. *Modern Management Science*, 2005, 2: 34-52
- [5] Liu Chenghua, Huang Xiaoben, Li Mei. Risk investment decision in the binary tree option pricing model [J]. *Scientific Management Research*, 2005, 10:161-163
- [6] Zhou Liangfeng. Real options theory and model application in risk investment research [D]. Tianjin University, Master Degree Thesis, 2007,4: 16-17
- [7] Yu Bo, Chen Xizhen, Hua Dong. Marco chain in the prediction of crops year application [J]. *Statistics and Decision*, 2007, 21:77-78
- [8] Chen Baolin. The theory and algorithms of optimization [M]. Beijing: Tsinghua University Press, 2005: 8-13