

## **A Complete Model of the *Multi-Channel Supermarket Business***

**May 06, 2014**

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### **Introduction**

This Article provides a complete picture of the underlying skeletal structure that holds every multi-channel supermarket business together while achieving its goals. The multi-channel supermarket model introduces a comprehensive framework for managing the complexity of a multi-channel supermarket structure and a reusable blueprint for visualizing how a multi-channel supermarket company actually does business.

The model's clearly-defined core-processes and their functions provide a powerful baseline for improving business performance. By viewing a multi-channel supermarket business as a single functional system, the nature of its underlying core processes becomes clear. Then by managing and improving them as parts of a single system, substantial improvements can be made on critical success factors, such as lead-time requirements and the precise availability of stock when needed, throughout the supply chain.

This Multi-Channel Supermarket Model is a collaborative adaptation of an earlier model, called the "Supermarket Model". The Supermarket Model was published in an Article named "A Complete Model of the Supermarket Business" (Steeneken and Ackley, BPTrends.com, January 2012).

Both models are developed with a technique called "Integrated Modeling Method." That method showed how every business enterprise has the same inherent system structure.

### **Scope and Focus of the Multi-Channel Supermarket Model**

A multi-channel supermarket business enterprise is a large, complex structure, involving many component entities:

- An array of repeat customers grouped in various local areas.
- A chain of pick-up points.
- A chain of retail stores.
- A chain of fulfillment stores.
- A set of fulfillment centers.
- Various transportation systems.
- A set of warehouse distribution centers.
- An array of product suppliers under contract.

A multi-channel supermarket exists in a competitive environment, where it acts as a value-added intermediary between geographically dispersed supplier companies and the scattered individual customers who eventually buy their products.

In carrying out its function, a multi-channel supermarket business acquires and assembles a wide assortment of goods from individual suppliers, then organizes and distributes them as-needed to a chain of retail stores, fulfillment stores and fulfillment centers for sale to customers.

The multi-channel supermarket model focuses on the work that is involved in physically handling stock as it makes the journey from supplier to customer. Although it references the business entities that are involved, the model does not include the life cycle development of the physical housing structures of warehouses, stores, fulfillment stores, fulfillment centers and trucks, or the equipment they employ.

The model identifies key parameters that are involved, but this version does not include specifics, such as the actual number of product types that a store carries, number of stores and warehouses, their sizes, etc. These are determined when the model is applied to a specific multi-channel supermarket business.

## What is a Business Enterprise?

As shown in Figure 1, a typical business enterprise exists in a competitive marketplace, where it acquires resources from its supplier market, adds value by transforming them into products or services and sells the results to its customer market.

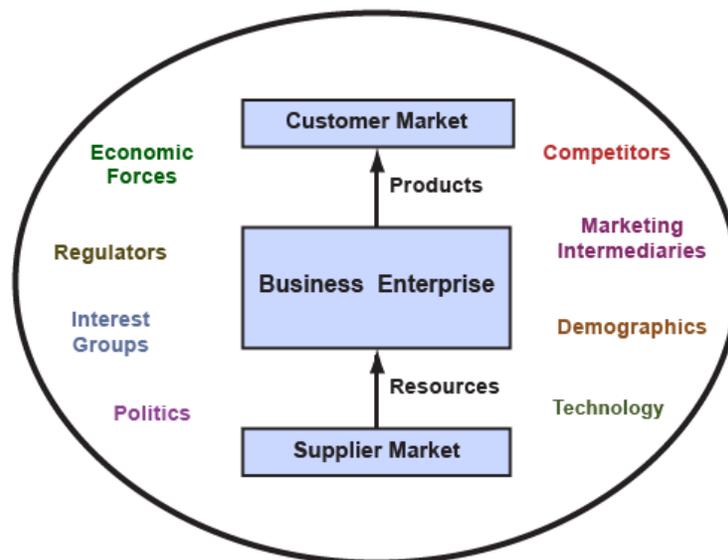


Figure 1: Business Enterprise

## What is a Multi-Channel Supermarket?

A multi-channel supermarket offers its customers traditional (offline) shopping in local retail stores, as well as online shopping via a website, shopping walls with QR codes or other resources that modern information and communication technology may offer.

A multi-channel supermarket is a business enterprise that provides a *service*. It does not produce a physical product of its own in the usual sense. Instead, it adds value by acquiring existing products from remotely-located suppliers, assembling them in regional warehouses, distributing them to local stores, local fulfillment stores and regional fulfillment centers for selling the supplier's products to customers. Groceries that are sold online are home delivered or picked up by customers.

Figure 2 shows the general flow of stock from suppliers, through the multi-channel supermarket business to local customers.

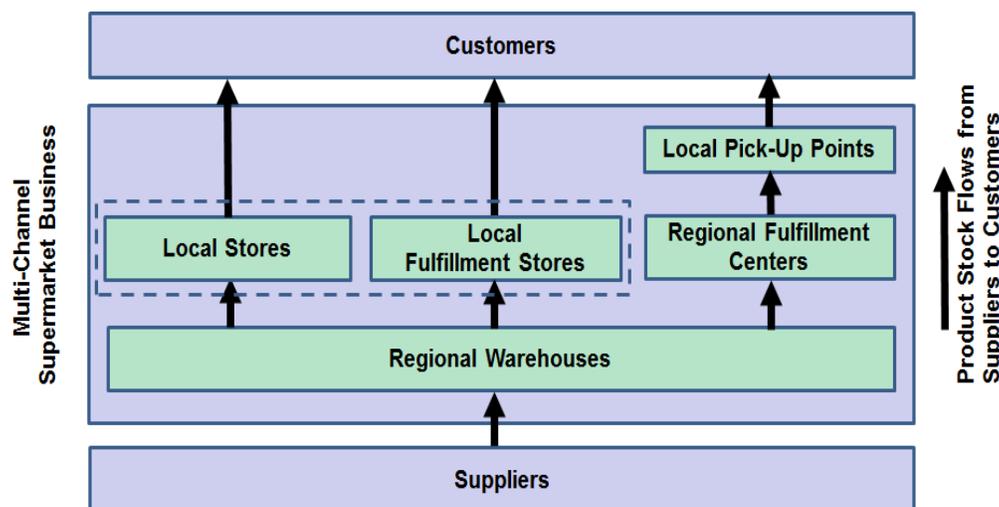


Figure 2: Multi-Channel Supermarket Business

Warehouse distribution centers assemble and distribute orders in pallets and cases. Fulfillment centers on the other hand assemble and distribute small orders of items and packages for individual customers. Fulfillment centers are specialized warehouse distribution centers for online customer orders. Pick-up points are service locations where consumers can pick up their shopping at a convenient location and moment in time.

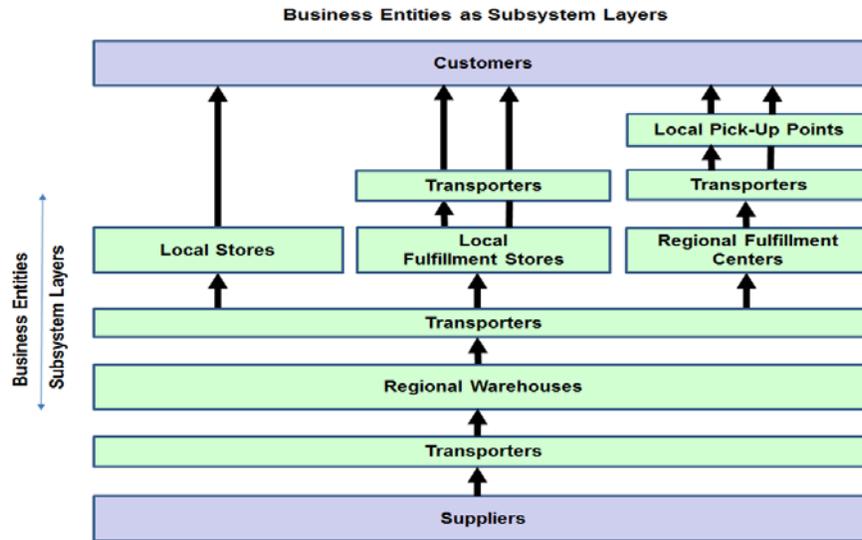
Fulfillment stores are specialized in fulfillment of online customer orders too. The scale on which orders are assembled and distributed is much smaller compared to fulfillment centers.

A multi-channel supermarket's *customers* are primarily local residents and small businesses that periodically need to replenish their stock of household products. A multi-channel supermarket's *suppliers* are primarily producers of household products that are established far from the locations of their final customers. In effect, the multi-channel supermarket provides virtual marketplaces that brings remote

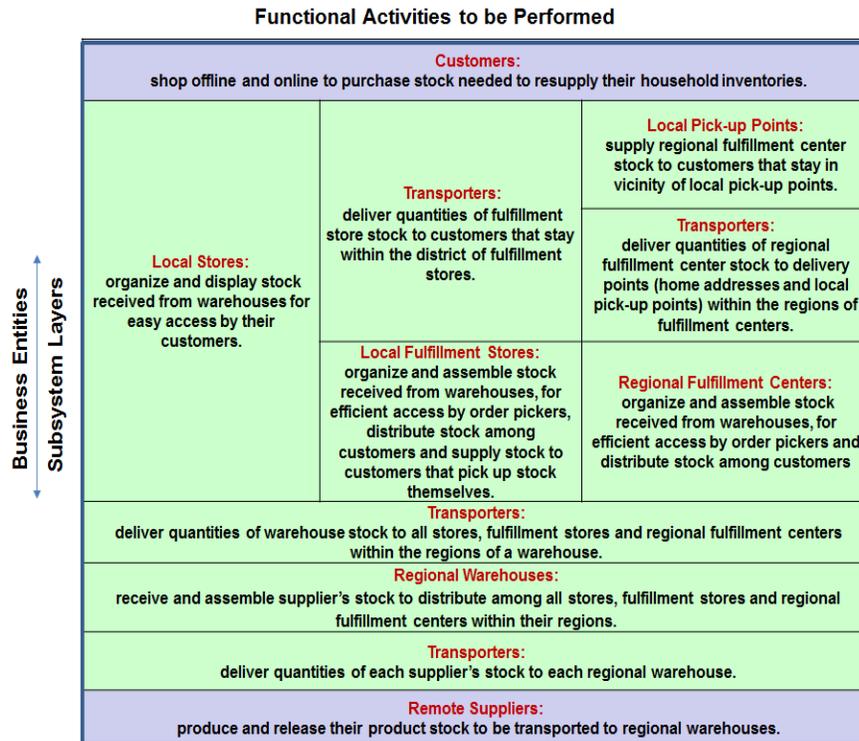
suppliers together with local customers. Given this arrangement, the multi-channel supermarket “product” is its supply-chain.

## How is the Multi-Channel Supermarket Model Structured?

The model portrays a multi-channel supermarket as a *functional system* for doing business. As a system, the sequence of work performed in bringing products from remote suppliers to local customers involves certain discrete business entities. Each of these entities provides a critical link in the multi-channel supermarket supply chain. Figure 3 identifies these business entities as subsystem layers of the model.



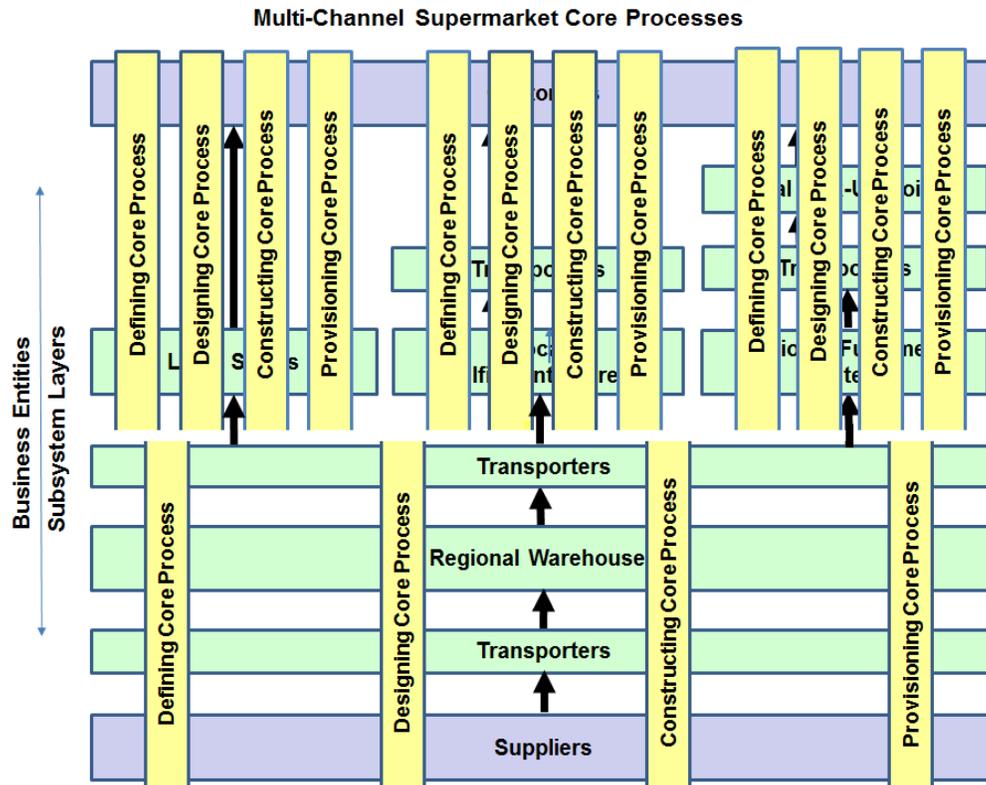
The functional activities to be performed by the subsystems are defined in Figure 4.



**Figure 4: Functional Activities**

This sequence of business entities provides an initial breakdown to define the structure of the multi-channel supermarket subsystem layers. To complete the overall structure of the multi-channel supermarket model, the structure of subsystem layers is overlaid with a sequence of four core processes, which represent the *life-cycle* of a multi-channel supermarket business.

Figure 5 shows the four core processes in a time sequence, overlaid on the previously-described subsystem layers.



**Figure 5: Core Processes**

The core process sequence begins by *defining* the business concept in terms of a detailed set of (sub)system requirements. This definition of requirements is then transformed into a tangible *design*, followed by *constructing* of the structures, procedures and contractual agreements that make up the business. The final core process shows how the resulting structures are employed to *provision* the actual multi-channel supermarket service.

To fulfill the original business concept, the four core processes are implemented over time. This four-stage development sequence comprises the life-cycle of the multi-channel supermarket's business enterprise product.

## Developing Details of the Multi-Channel Supermarket Model Structure

A more detailed subsystem structure is required as a basis for defining the core process structures. The first task is to translate the *Functional Activities to be Performed* (from Figure 4) into the sequence of Basic Functional Steps that bring product stock from remote suppliers to local customers. As shown in Figure 6, these steps describe the essential supply-chain of the multi-channel supermarket business.

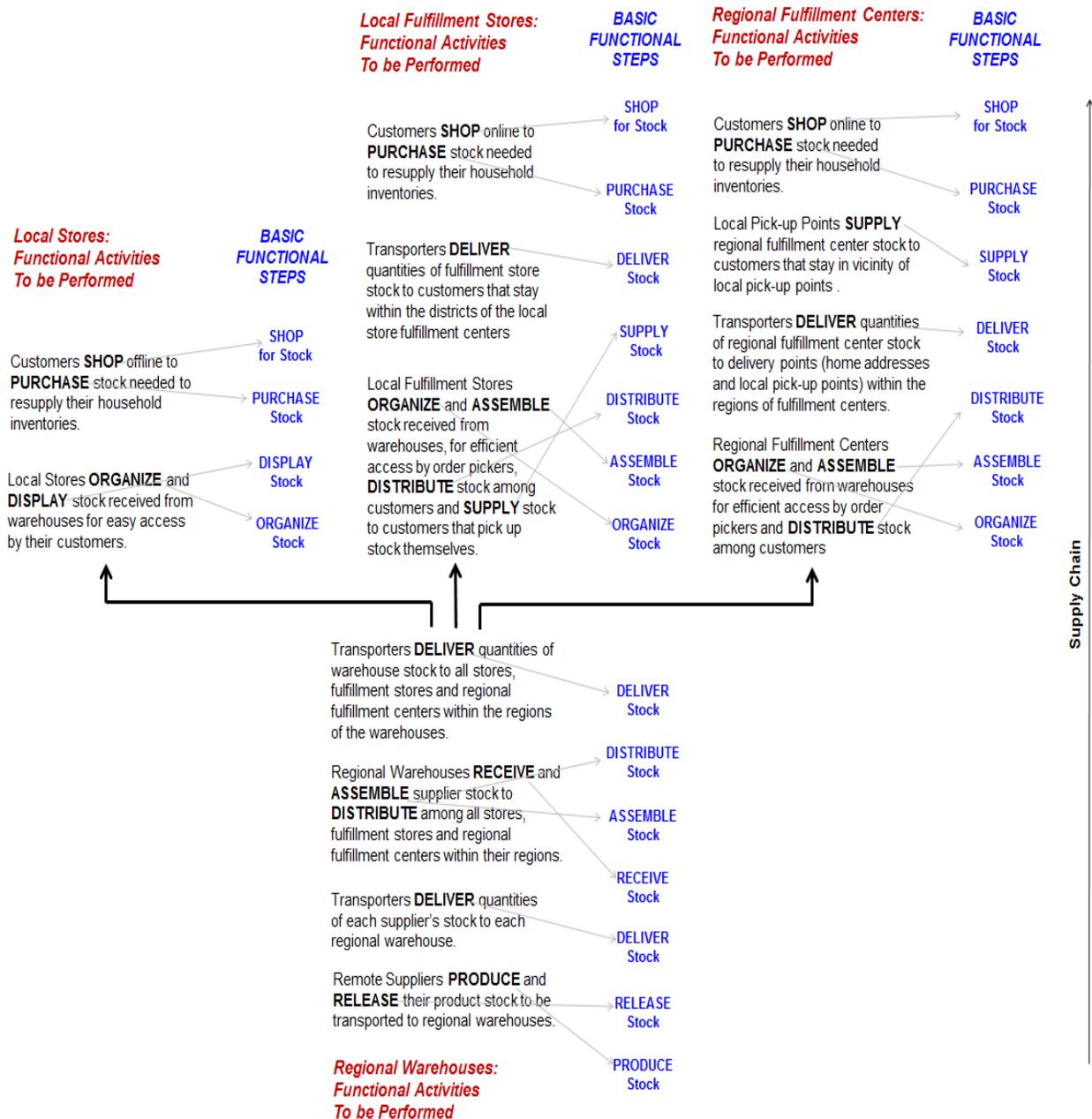


Figure 6: Supply Chain

As the blue Basic Functional Steps column shows, the physical properties of the supplier Stock remain unchanged throughout the sequence of sub-process steps. The

Stock goes through a sequence of actions that affect only its *assigned* properties, such as its location, accessibility, visibility and purchase price. The next task is to interpret the Basic Functional Steps as business subsystems, which portray the supply-chain in terms of business structural requirements. In Figure 7 the terminology shifts from *process steps* to the *state of supplier stock* at each subsystem level. For each step in the supply chain, this indicates which business entity owns or is responsible for the stock, its physical location how it is being accessed.

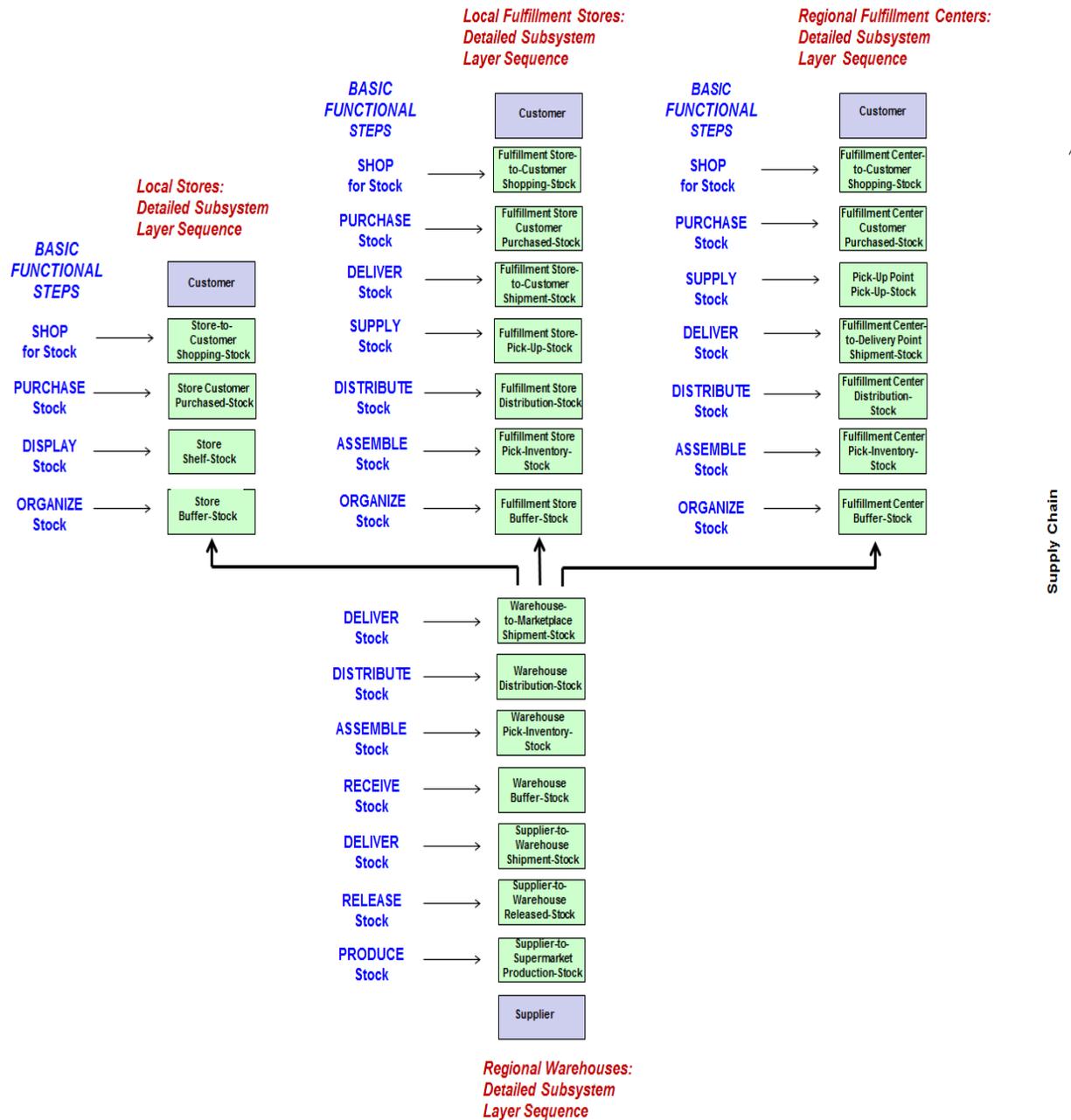


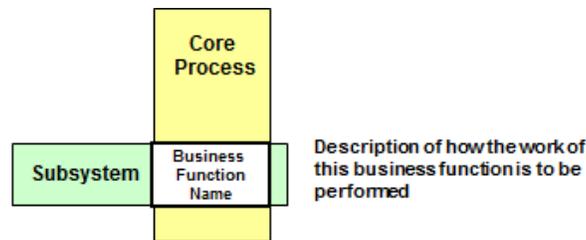
Figure 7: Subsystems

The more detailed subsystem structure of Figure 7 provides the foundation needed to identify details of the four core processes and how they are to be performed. By

directly connecting the Basic Functional Steps to the structure of subsystem layers, it forces the breakdown of core process work to coincide with the basic functional steps of the supply-chain.

When the detailed subsystems and core processes are combined, they produce a grid-like framework. Within this framework, each subsystem/core process intersection is interpreted as a Business Function to be managed and performed. In terms of physical work to be performed, the resulting array of subsystem/core process intersections displays the entire set of business functions of the multi-channel supermarket business enterprise.

Using this subsystem structure, each of the four core processes will be added sequentially to the subsystem structure to create an overview of the multi-channel supermarket model. As each core process is added, a description is provided to show how each of the new business functions is to be performed. Figure 8 illustrates how the business functions are to be identified and described:



**Figure 8: Business Function**

In the Multi-Channel Supermarket Model diagrams that follow, the first three core processes (Defining, Designing and Constructing) show downward arrows between their functions. This is to indicate that work to develop the multi-channel supermarket business concept is essentially customer-market driven. The fourth core process (Provisioning) shows upward arrows to portray the flow of stock from supplier to customer.

The arrows or sequence flows indicate the sequence of the functions within a core process. The flat end of a sequence flow is connected to a completed business function and the arrowhead is connected to the business function which is subsequently executed.

Figure 9 illustrates a parallel path of sequence flows that appears in several of the following diagrams.

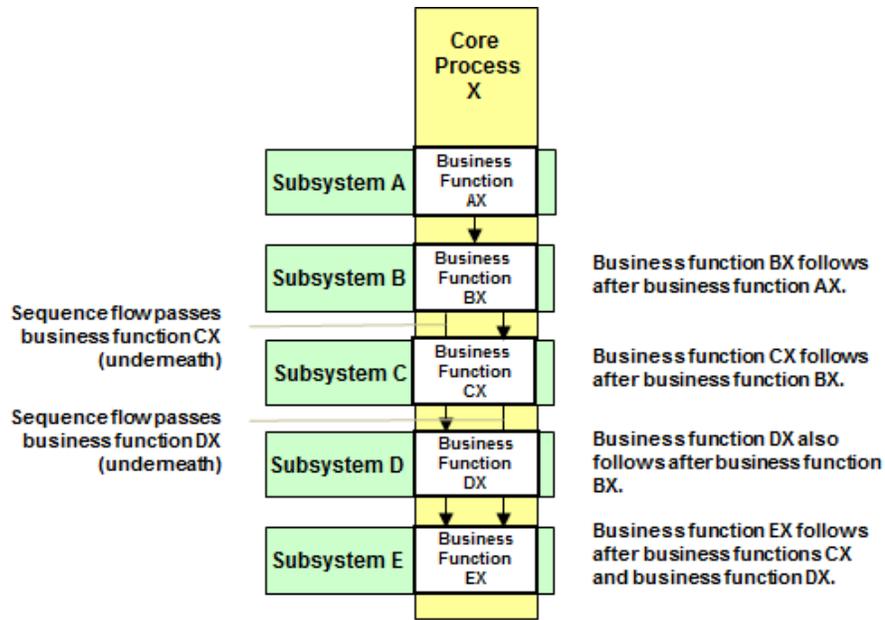


Figure 9: Sequence flows

## Implementing the Defining Core Process

Figures 10, 11, 12 and 13 provide a breakdown of the Defining Core Process into business functions that match the supply-chain sequence of functional steps and subsystems from Figure 7. Each business function is defined in terms of its *requirements*. Collectively, this column of descriptions *defines* the original business concept as a requirements specification for what is to be designed, constructed and provisioned.

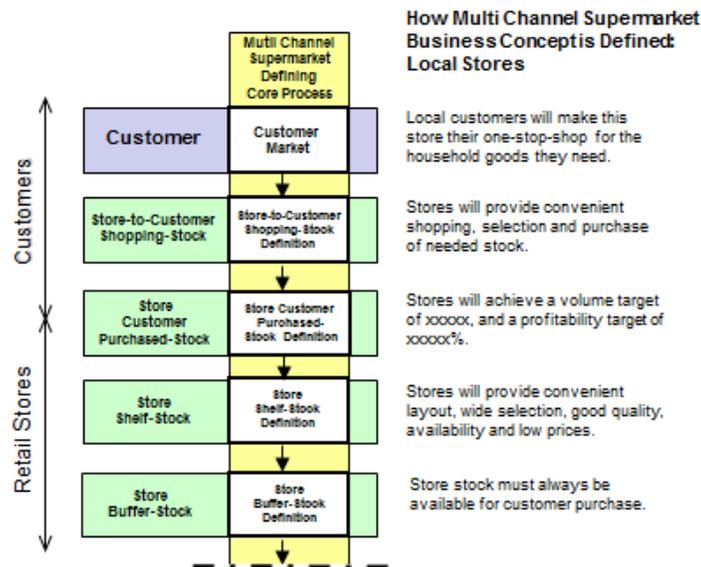


Figure 10: Defining Core Process – Local Stores

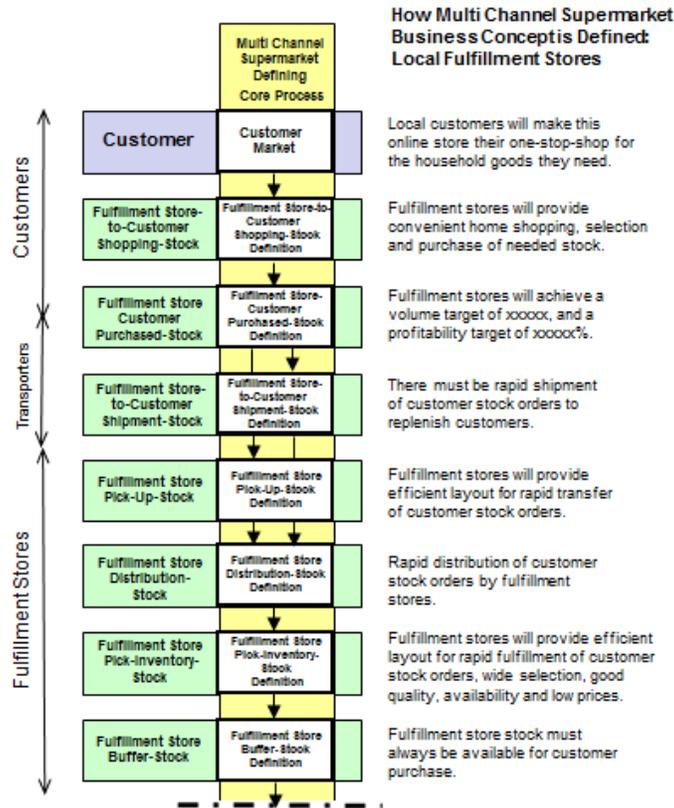


Figure 11: Defining Core Process – Local Fulfillment Stores

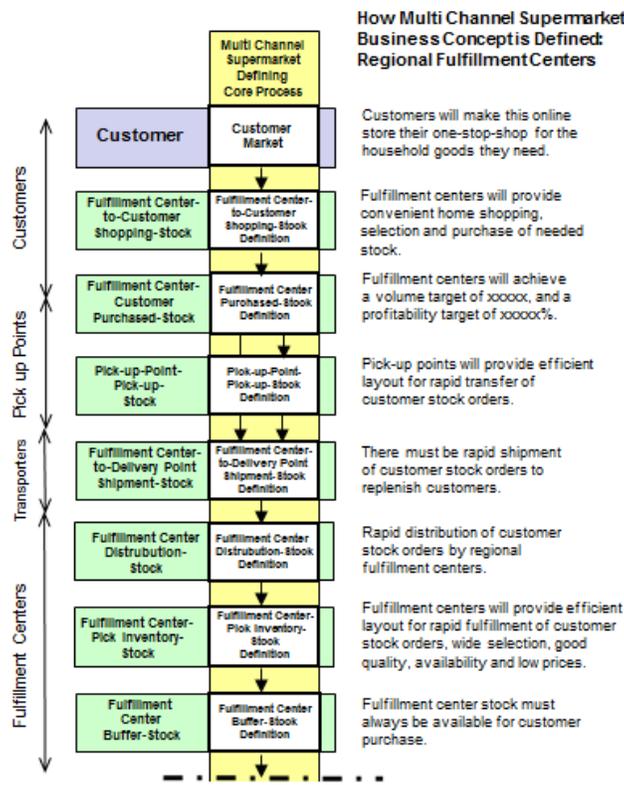


Figure 12: Defining Core Process – Regional Fulfillment Centers

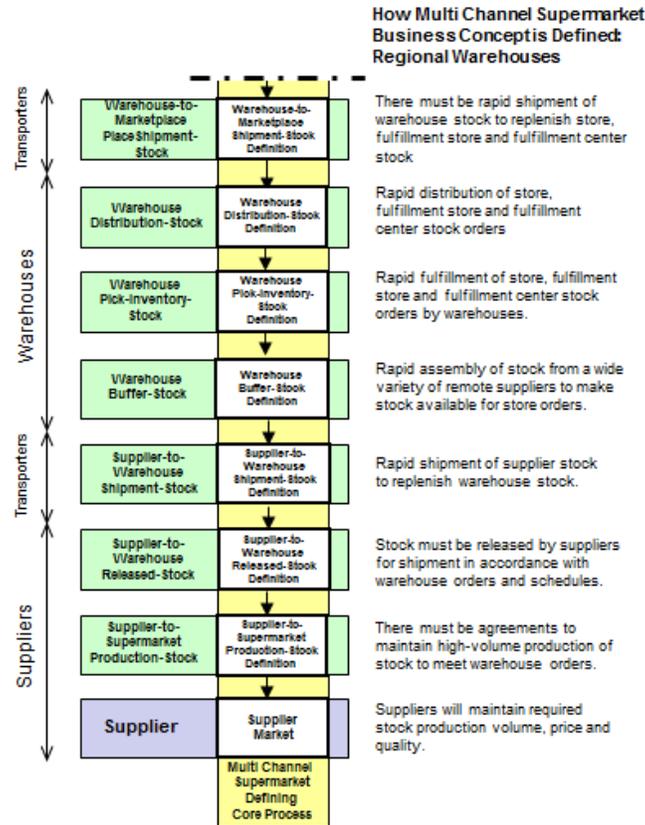


Figure 13: Defining Core Process – Regional Warehouses

## Implementing the Designing Core Process

In Figures 14, 15, 16, 16 the previously-defined requirements specifications are translated into a comprehensive structural *design* framework that can be constructed and provisioned. The horizontal arrows between subsystem functions indicate their sequence in time.

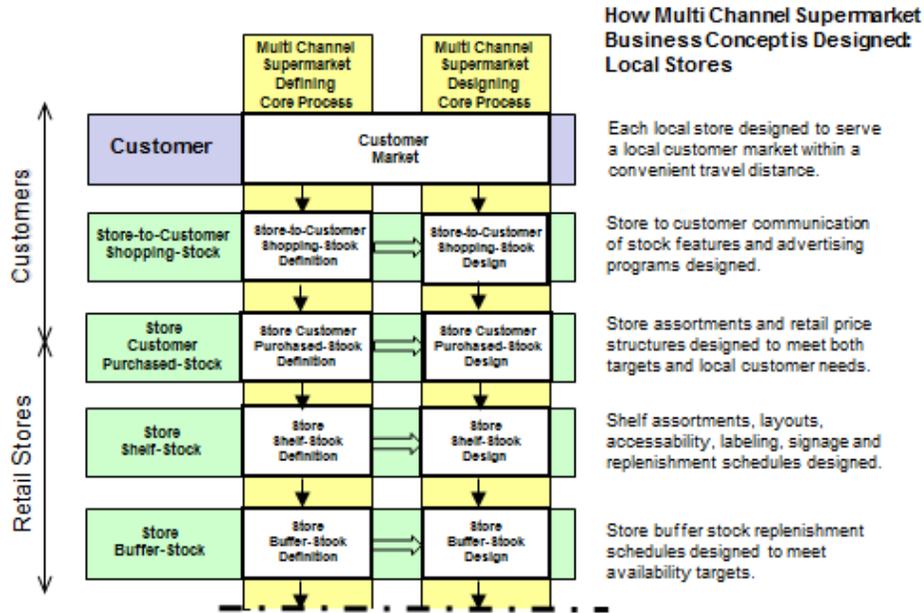


Figure 14: Designing Core Process – Local Stores

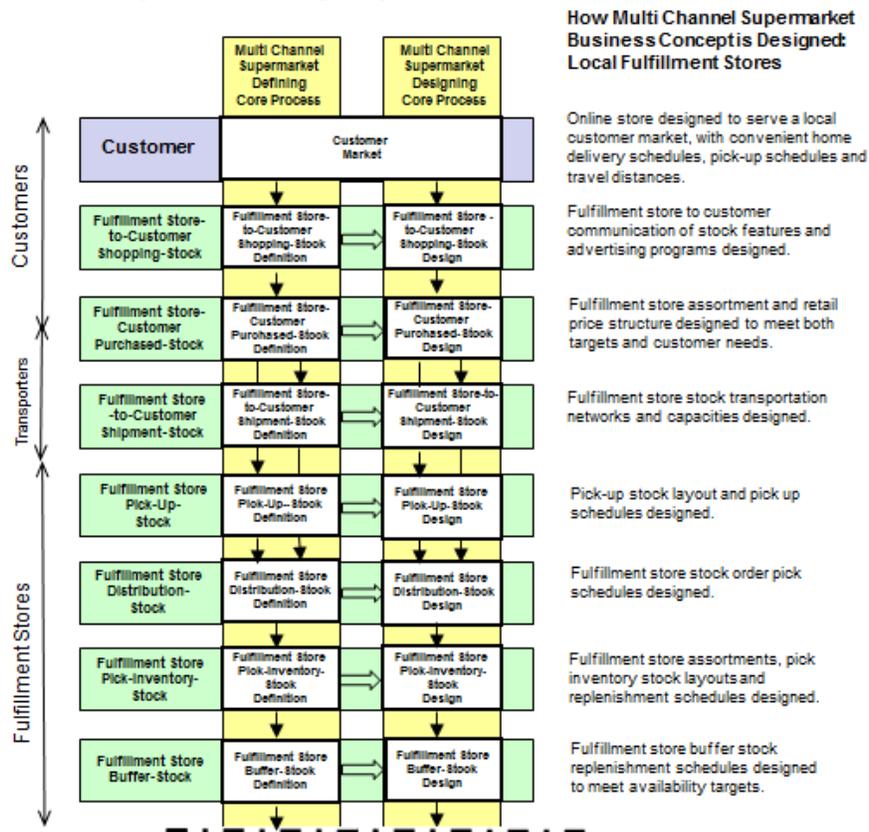


Figure 15: Designing Core Process – Local Fulfillment Stores

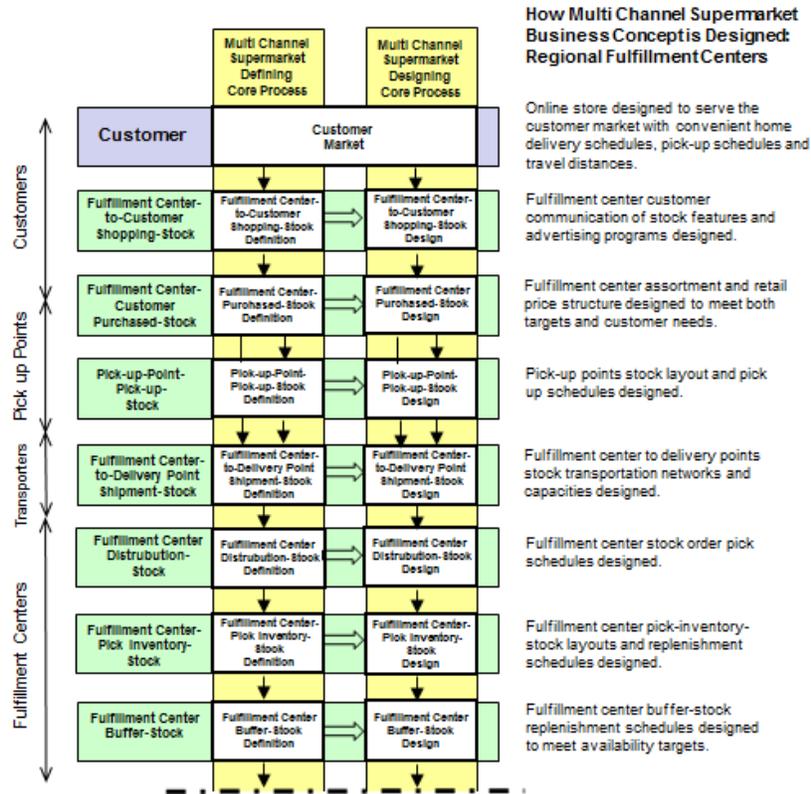


Figure 16: Designing Core Process – Regional Fulfillment Centers

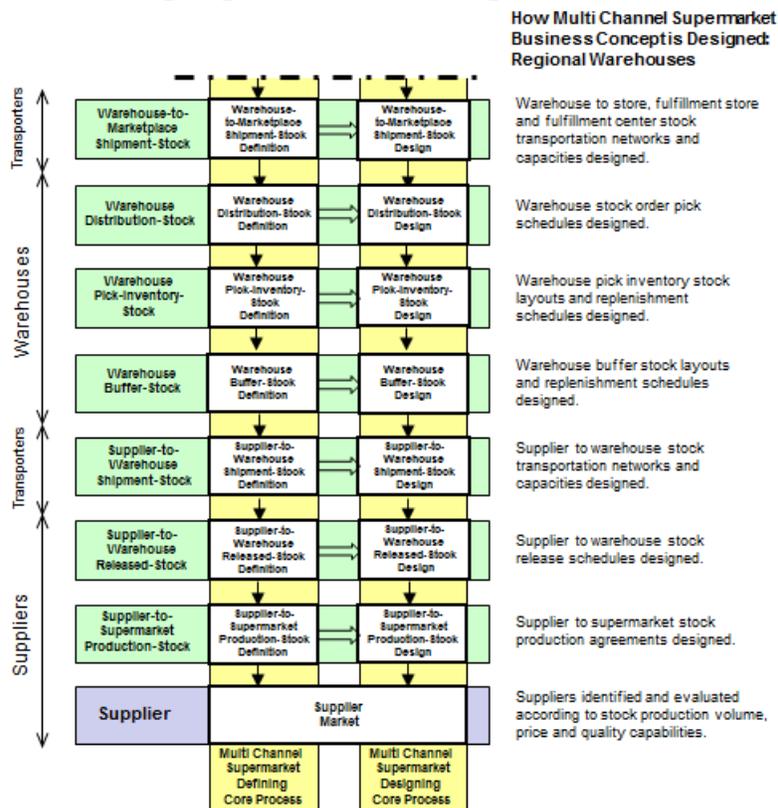


Figure 17: Designing Core Process – Regional Warehouses

## Implementing the Constructing Core Process

Based on the previous Figures 14, 15, 16 and 17 comprehensive structural design framework, Figure 18, 19, 20 en 21 show how the individual subsystem units are *constructed* to carry out their role within the integrated supplier-to-customer work-flow sequence.

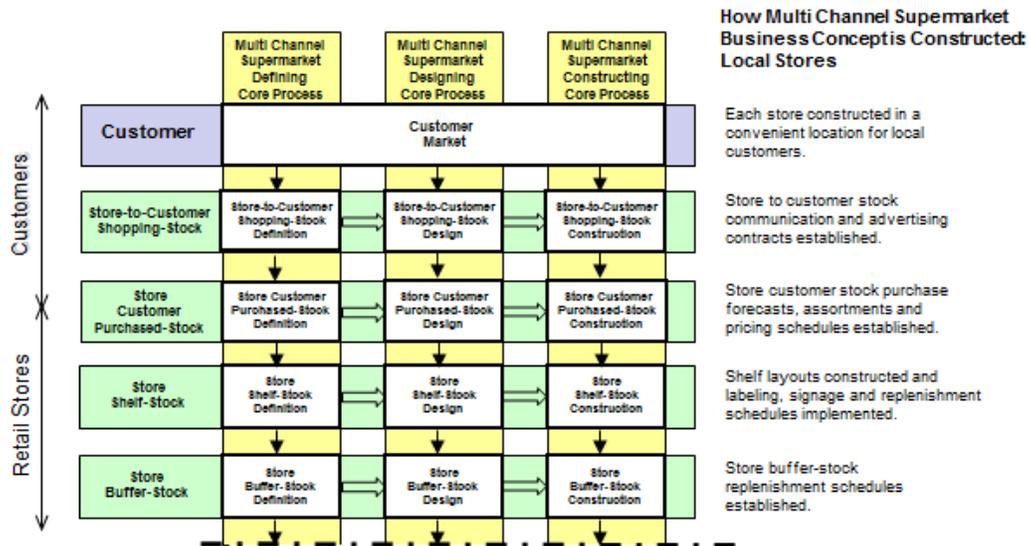


Figure 18: Constructing Core Process – Local Stores

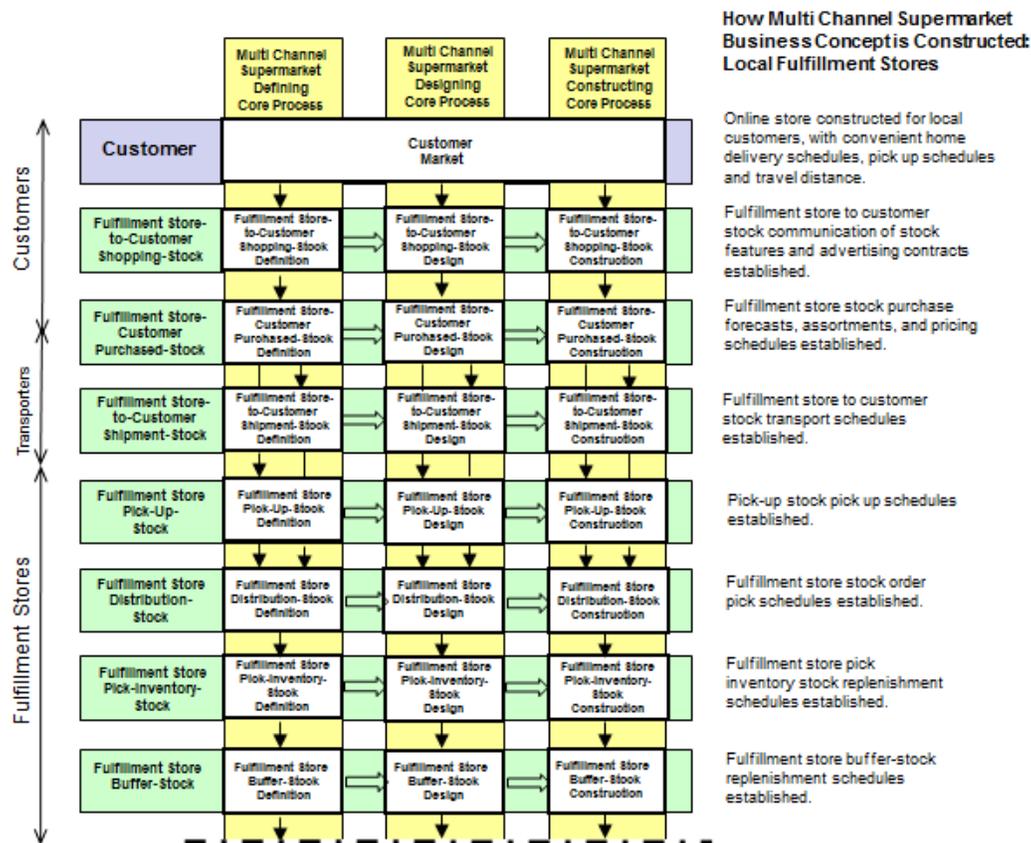


Figure 19: Constructing Core Process – Local Fulfillment Stores

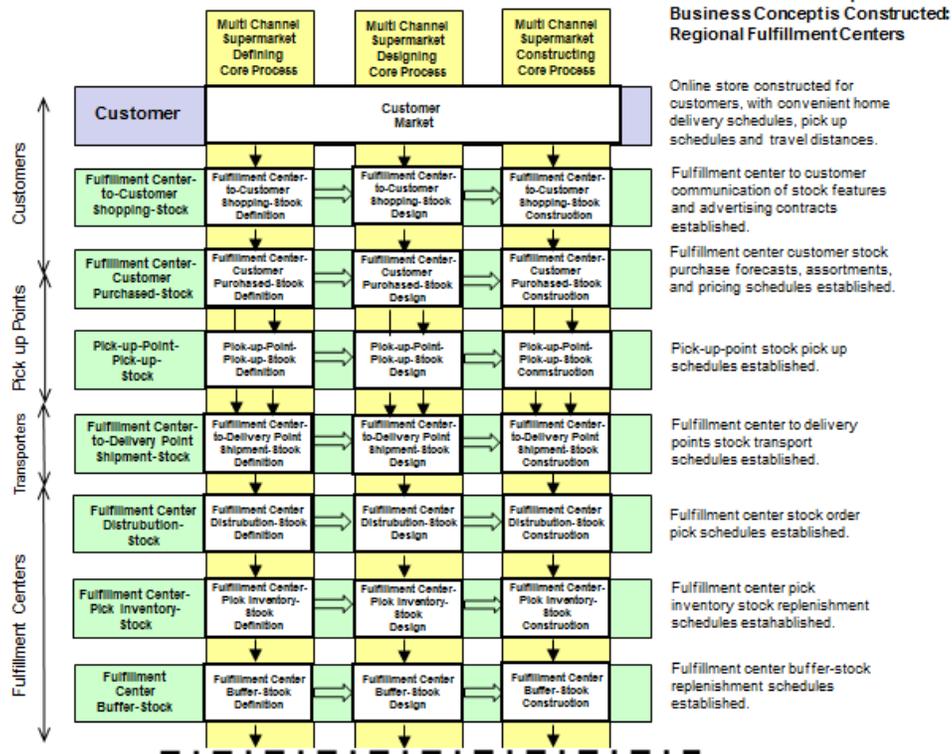


Figure 20: Constructing Core Process – Regional Fulfillment Centers

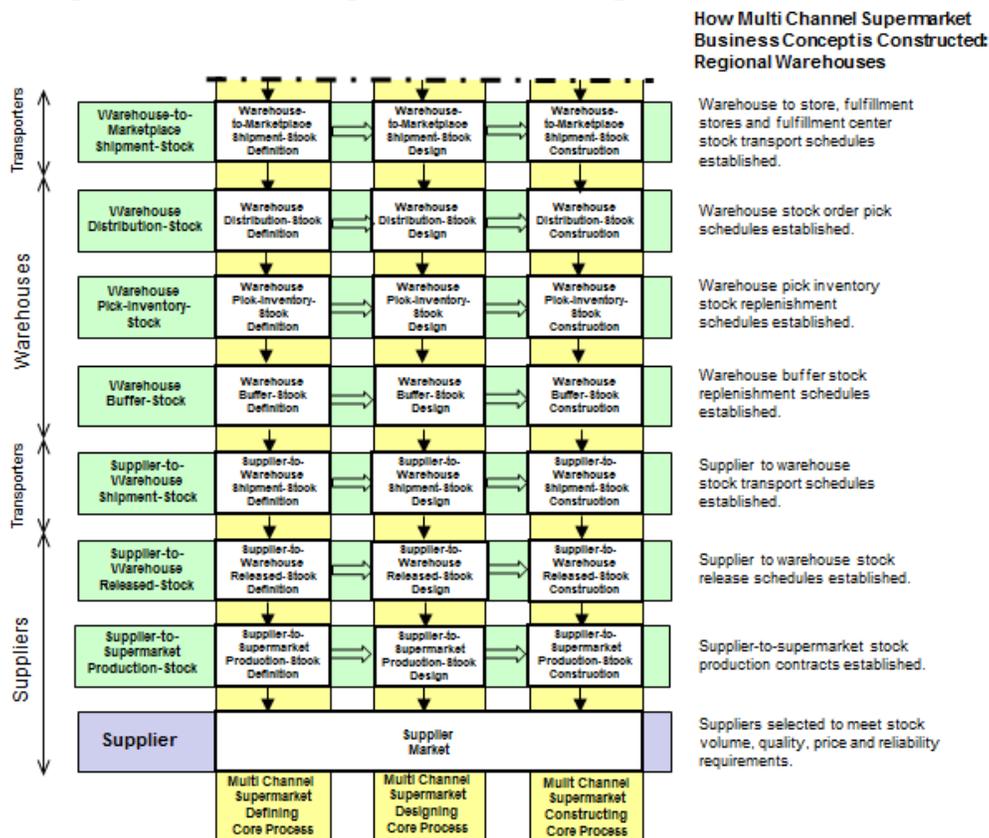


Figure 21: Constructing Core Process – Regional Warehouses

## Implementing the Provisioning Core Process

Once constructed, the original Business Concept can be put into action by *provisioning* the supplier stock as needed to fulfill the customer-driven store shelf-stock, fulfillment store picking-stock and fulfillment center picking-stock requirements. Note that In Figures 22, 23, 24 and 25 the arrows between the provisioning business functions proceed upward. This is because the *provisioning* core process column(s) portrays the physical flow of stock, from suppliers to customers.

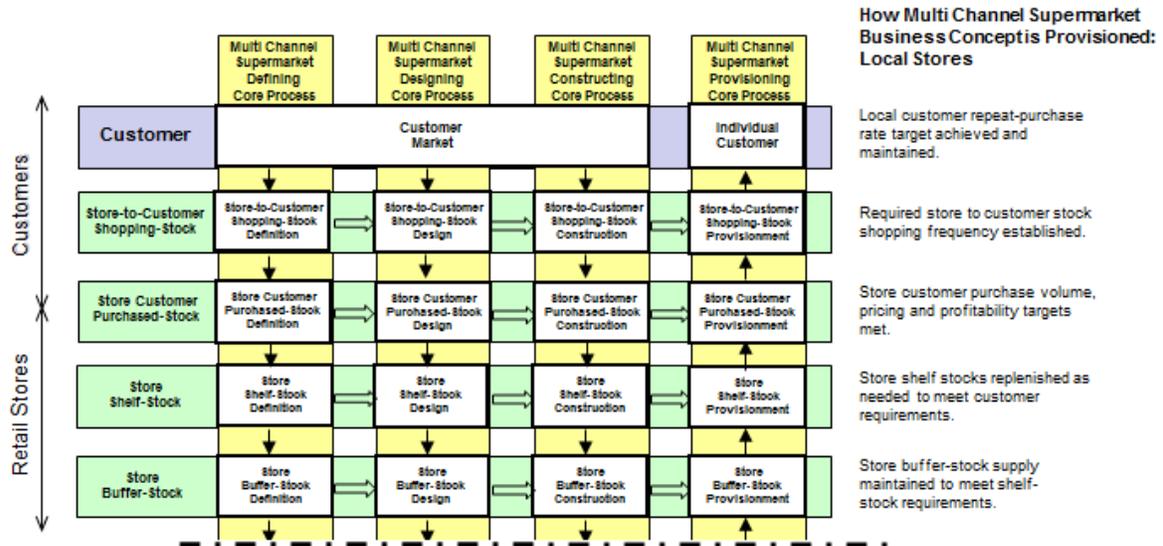


Figure 22: Provisioning Core Process – Local Stores

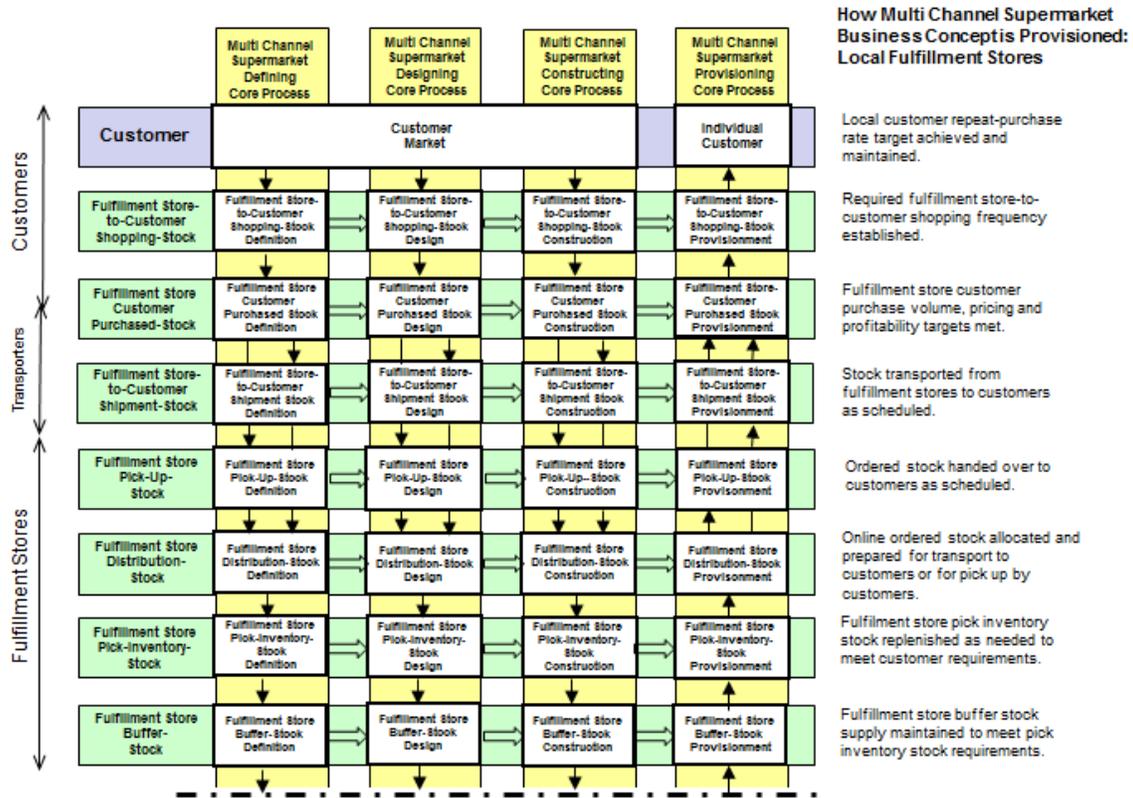


Figure 23: Provisioning Core Process – Local Fulfillment Stores

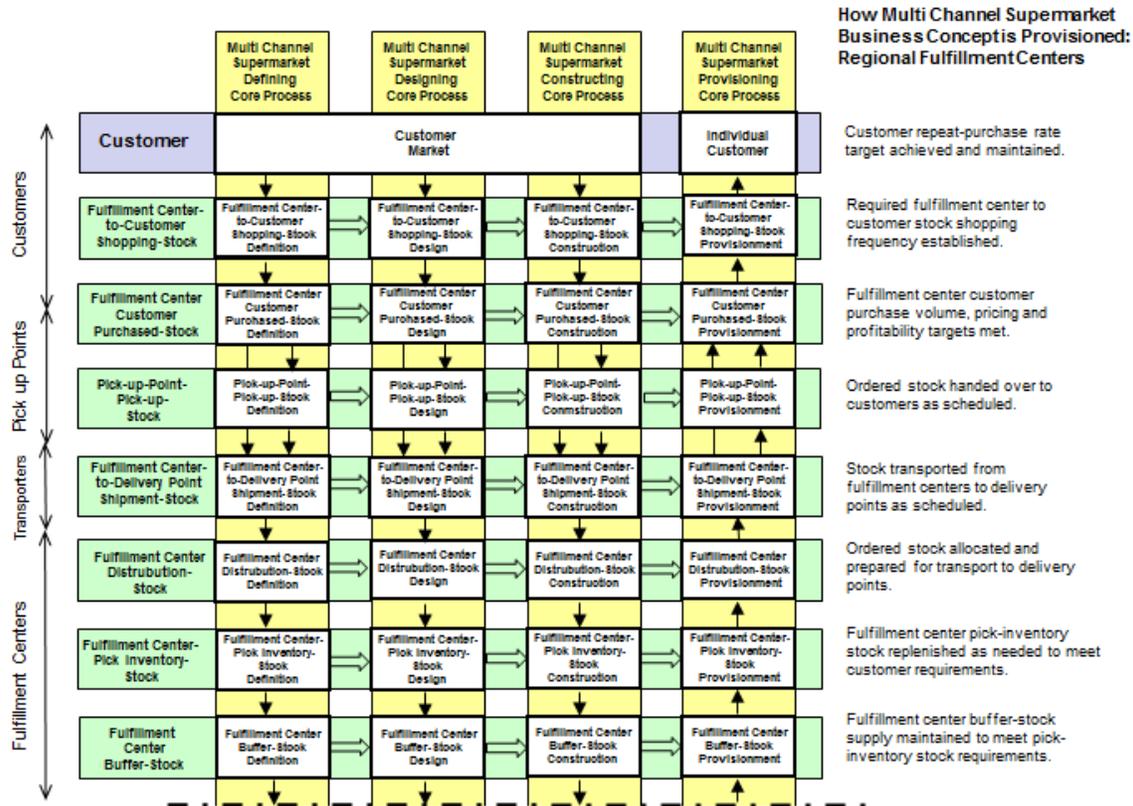


Figure 24: Provisioning Core Process – Regional Fulfillment Centers

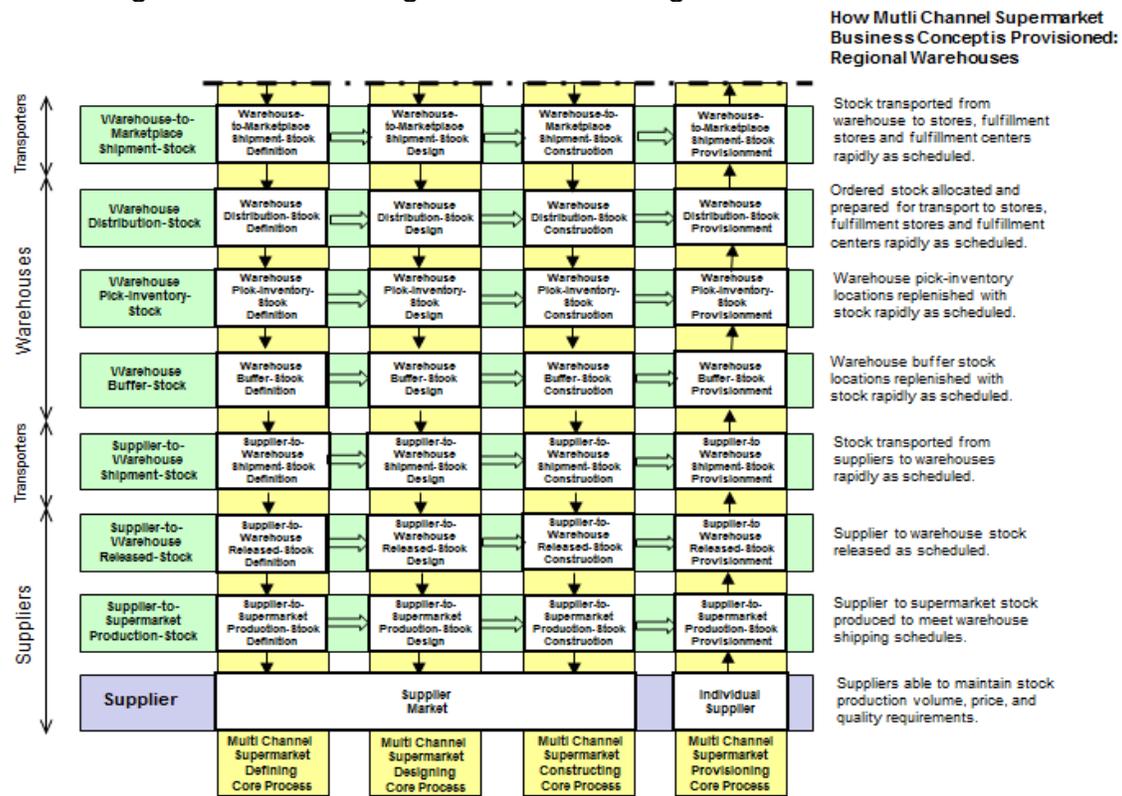


Figure 25: Provisioning Core Process – Regional Warehouses

The four core processes (defining, designing, constructing and provisioning) embody the basic product life-cycle of a multi-channel supermarket business. The defining, designing and constructing core processes have produced the provisioning core process.

Once produced, the provisioning core process is expected to “run” by itself as an ongoing system without further interaction with the earlier core processes, unless there is a problem that it cannot fix within its own framework. Multi-channel supermarkets frequently change their assortments thereby forcing a reincarnation of their product life-cycle.

### The Addition of a Supporting Core Process

Figures 26, 27 and 28 show how a partial fifth core process is added to portray how each store, fulfillment store and fulfillment center fulfills its purchase-warranty obligations to its customers.

Most customer returns of purchased stock are accommodated at the store by replacing the returned stock with a new item from existing store stock. In practice, stores, fulfillment stores and fulfillment centers often order a small quantity of additional store-stock to cover stock returns and stock-theft. In rare cases, where extra store stock is not available (e.g., shortages or very large stock items), the supporting transaction will be delayed until the new stock-item arrives.

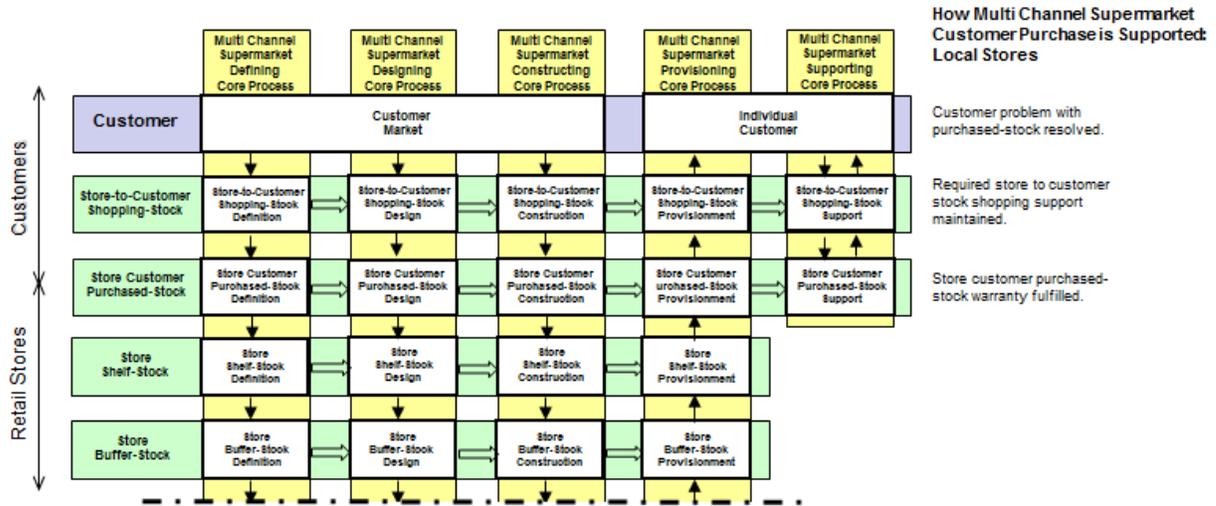


Figure 26: Supporting Core Process – Local Stores

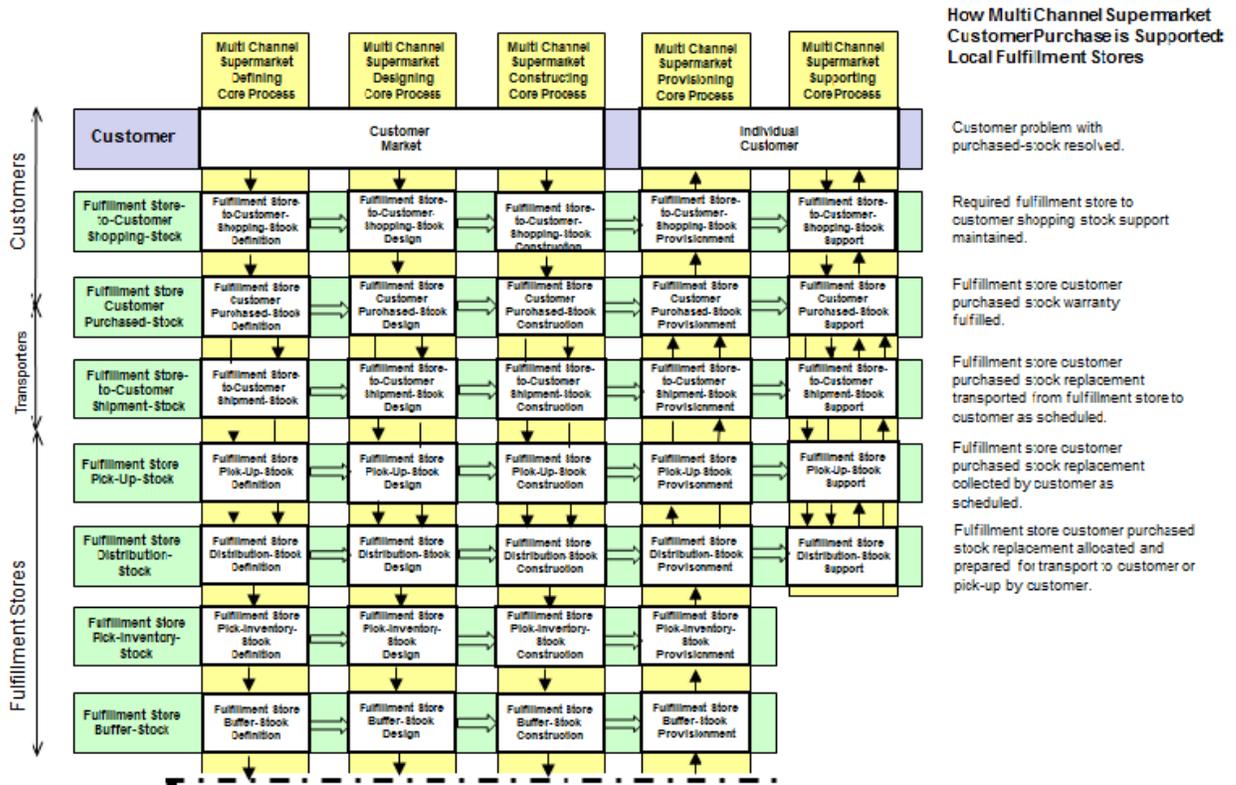


Figure 27: Supporting Core Process – Local Fulfillment Stores

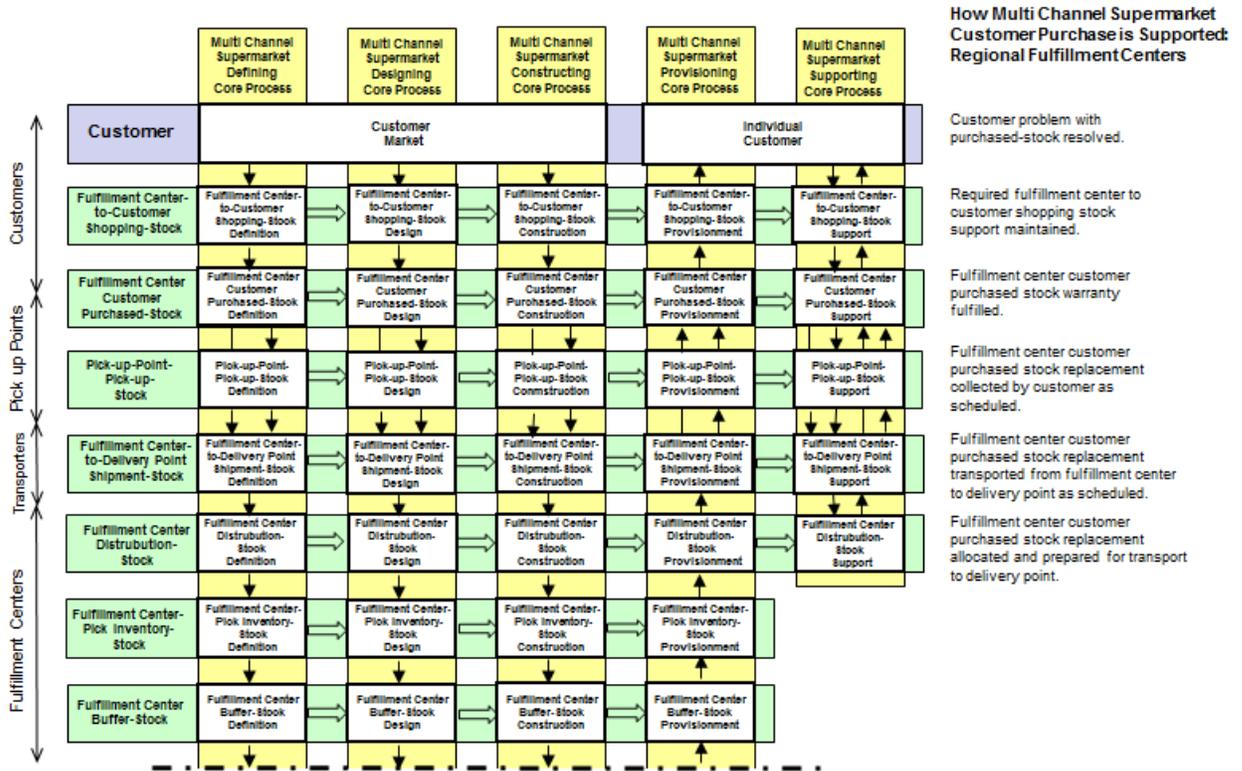


Figure 28: Supporting Core Process – Regional Fulfillment Centers

## Application of the Multi-Channel Supermarket Model

The multi-channel supermarket model can be applied to all types and sizes of multi-channel supermarket businesses. The model is intended to be used as a standardized template from which the unique characteristics of a specific multi-channel supermarket business can be clearly identified.

The unique features of different types of multi-channel supermarkets may vary, depending on strategic decisions such as to serve offline and online markets integrally or independently, size, location and stock assortment. Further, differences in core process structure may vary with a given multi-channel supermarket, depending on product size, whether perishable and supplier location.

All of these differences can be viewed as variations on the common underlying theme presented in the multi-channel supermarket model. This allows the standardized multi-channel supermarket model to be employed as a baseline template for understanding and defining all multi-channel supermarket situations.

Example 1: The supply chain of a multi-channel supermarket that extends national coverage of its online business by using its retail stores might eliminate the fulfillment center subsystem layers from its supply chain.

Example 2: The supply chain of a multi-channel supermarket that serves its online and offline customer market independently might eliminate the fulfillment store subsystem layers for its business.

Example 3: The supply chain of a multi-channel supermarket that encourages its customers to switch between online and offline channels might integrate the store subsystem layers with the fulfillment store subsystem layers and eliminate the fulfillment center subsystem layers.

Example 4: The supply chain of a multi-channel supermarket that acquires much of its stock from outside its own country might have additional steps in its supply chain for greater bulk shipping, customs receiving and bulk warehouse storage.

Example 5: The supply chain of a multi-channel supermarket that acquires perishable stock to be delivered directly by local suppliers to its stores, fulfillment stores and fulfillment centers or a selection of these, might eliminate the warehouse subsystem layers for that portion of its business.

## Multi-Channel Supermarket Business Functions

Each intersection of a subsystem with a core process forms an essential *business function*. These business functions define the business capabilities and actions that are required to satisfy the original business concept.

Each business function embodies characteristics of both a core process and a subsystem. The core process dimension breaks down into a set of sub-processes that defines the sequence of work steps to be conducted in this portion of the supply-chain. The subsystem dimension defines how resources and schedules are applied to accomplish that work.

## Business Function Decomposition

The overall sequential flow of work performed by each core process determines the flow of work as it encounters its sequence of business functions. In that context, the work performed by a given business function is viewed as a *sub-process* of the overall core process and details of the work *within* the business function appear as lower-level activities within that sub-process.

The multi-channel supermarket model provides a framework that clearly defines all business functions that are essential to the company's product life cycle and operation. Each of these well-defined business functions can then be decomposed into lower levels of detail using well-established process modeling methods and techniques.

## Management and Control Systems

Although the producing processes are inherently common to all multi-channel supermarket businesses, there is great variation in their management and control systems. The purpose of this multi-channel supermarket model is to clearly portray how the work performed in a multi-channel supermarket business is structured, apart from the way it is managed and controlled. To provide this clarity, feedback loops and control systems are not shown on these diagrams.

## How Business Functions Relate to Organization Charts

The multi-channel supermarket model's subsystem/core process matrix can be applied to help realign a company's organization structure with its inherent functional

structure. This framework provides a tool for reassigning management responsibilities toward the more clearly defined business functions.

The business functions that are defined within the multi-channel supermarket model's structural framework can be mapped to those found on the company's organization chart, as indicated in Figure 29.

A company's organization chart typically shows a hierarchy of lower level organization units whose responsibilities have evolved over time. The multi-channel supermarket model's matrix can bring to light any fragmentation of a function across multiple organization units, as well as ambiguous paths of authority over essential functional work.

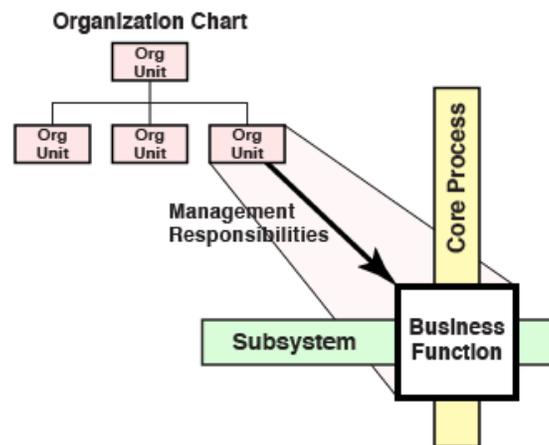


Figure 29: Mapping Org Unit to Business Function

## Conclusion

The Multi-Channel Supermarket Model:

- Is an adaptation of the Supermarket Model (Steeneken and Ackley, BPTrends.com, January 2012).
- Defines the core processes that make up the life cycle of the multi-channel supermarket business.
- Identifies all producing business functions that are required and how they work together to produce the multi-channel supermarket product.
- Provides a system view of the entire multi-channel supermarket business, separate from its organization structure.
- Defines the inherent system structure that is common to all multi-channel supermarkets.
- Provides an architectural framework of function and workflow that can be applied to better understand and improve a multi-channel supermarket's business performance and organizational alignment.

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## Authors

**Dave Ackley** was the founder of Ackley Associates, an Oregon consulting firm specializing in advanced modeling methods. Through years of consulting with a wide variety of businesses, he developed a template-based Integrated Modeling Method that greatly reduced enterprise model development time and cost. Dave held a BS in electrical engineering, an MBA and a PhD in business administration. Dave is sadly deceased in 2013 during development of the Multi-Channel Supermarket Model.

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