

# A Complete Model of the Supermarket Business

**Frank Steeneken and Dave Ackley**

## Introduction

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

The method used to develop this Supermarket Model is a collaborative adaptation of an earlier technique called "Integrated Modeling Method." That method showed how every business enterprise has the same inherent system structure. This new supermarket model incorporates basic elements of that method, with major improvements and a much clearer understanding of how a supermarket business operates in today's world-wide market environment.

## Scope and Focus of the Supermarket Model

A supermarket business enterprise is a large, very complex structure, involving many component entities:

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

A 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 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 for sale to local customers.

The 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 and trucks, or the equipment they employ.

The model identifies key parameters that are involved, but this generic 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 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.

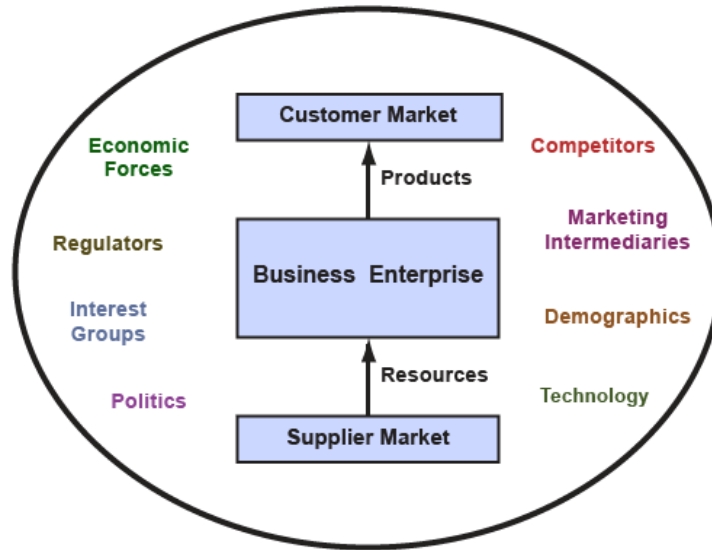


Figure 1: Business Enterprise

## What is a Supermarket?

A 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, and finally selling the supplier's products to local customers. Figure 2 shows the general flow of stock from suppliers, through the supermarket business to local customers.

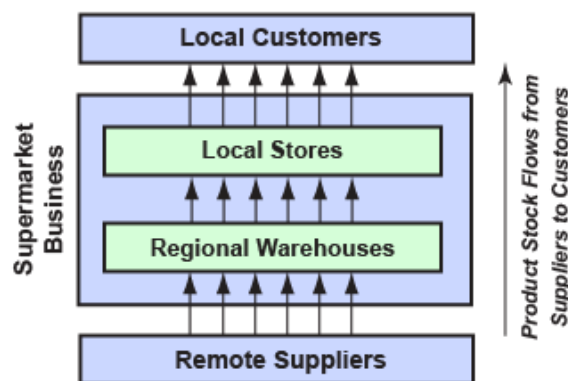


Figure 2: Supermarket Business

A supermarket's *customers* are primarily local residents and small businesses that periodically need to replenish their stock of household products. A supermarket's *suppliers* are primarily producers of household products that are established far from the locations of their final customers. In effect, the supermarket provides a virtual marketplace that brings remote suppliers together with local customers. Given this arrangement, the supermarket "product" is its supply chain.

## How is the Supermarket Model Structured?

The model portrays a 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 supermarket supply chain. Figure 3 identifies these business entities as subsystem layers of the model, and defines the functional activities they perform.

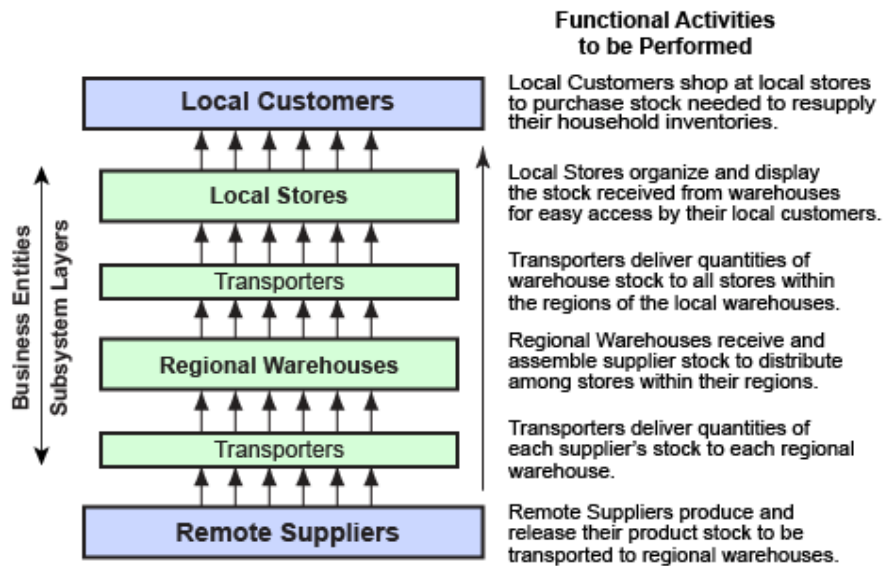


Figure 3: Functional Activities

This sequence of business entities provides an initial breakdown to define the structure of supermarket subsystem layers. To complete the overall structure of the supermarket model, the structure of subsystem layers is overlaid with a sequence of four core processes, which represent the life-cycle of a supermarket business. Figure 4 shows the four core processes in a time sequence, overlaid on the previously-described subsystem layers.

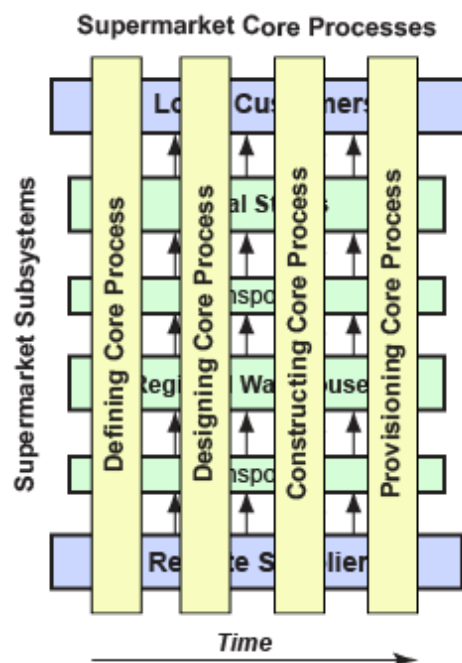


Figure 4: Core Processes

The core process sequence begins by *defining* the business concept in terms of a detailed set of 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 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 supermarket's business enterprise product.

### Developing Details of the 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 3) into the sequence of Basic Functional Steps that bring product stock from remote suppliers to local customers. As shown in Figure 5, these steps describe the essential supply chain of the supermarket business.

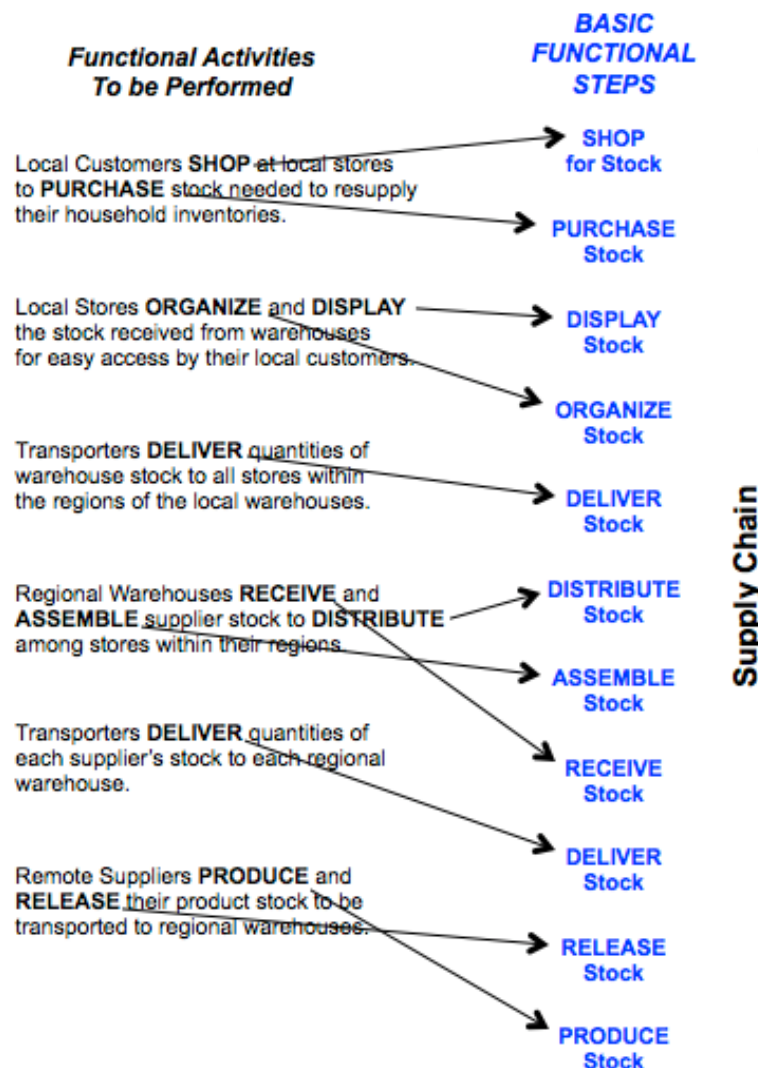


Figure 5: Supply Chain

As the blue Basic Functional Steps column shows, the physical properties of the supplier Stock remain unchanged throughout the sequence of subprocess 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 6, the terminology shifts from *action 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, and how it is being accessed.

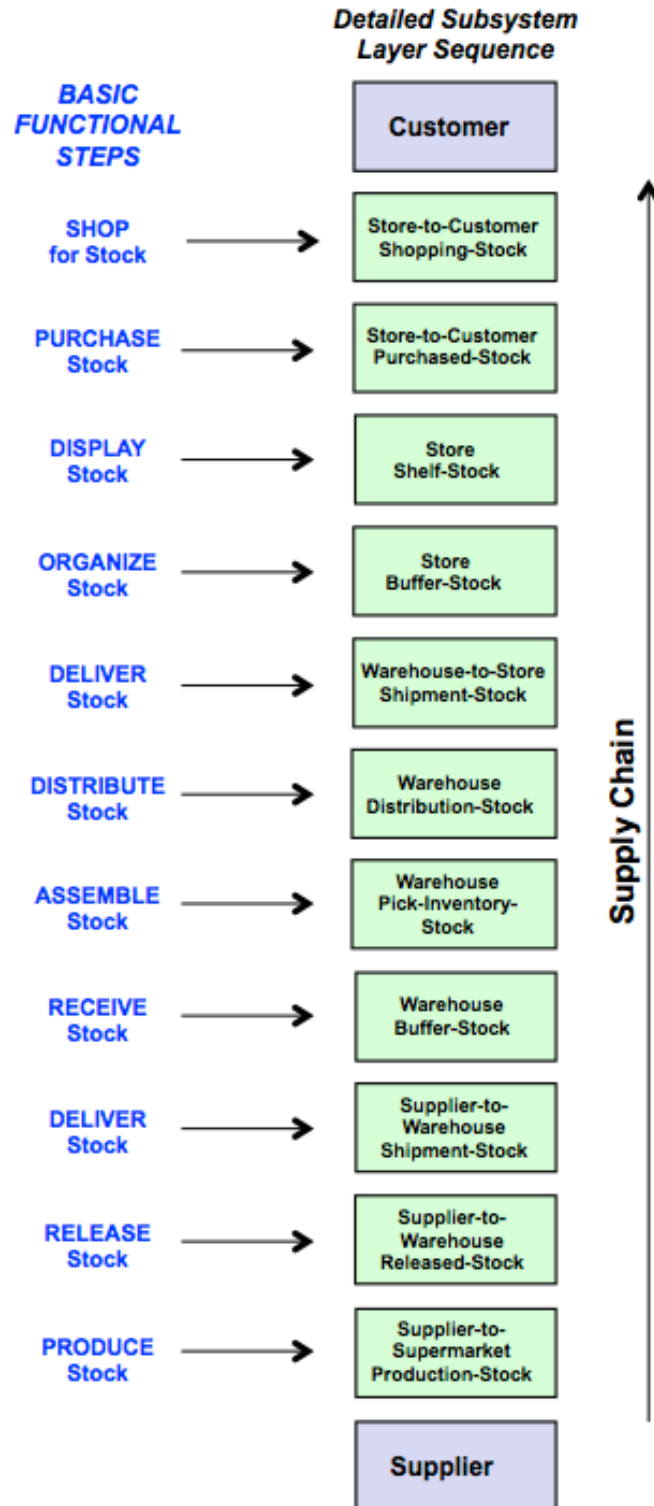
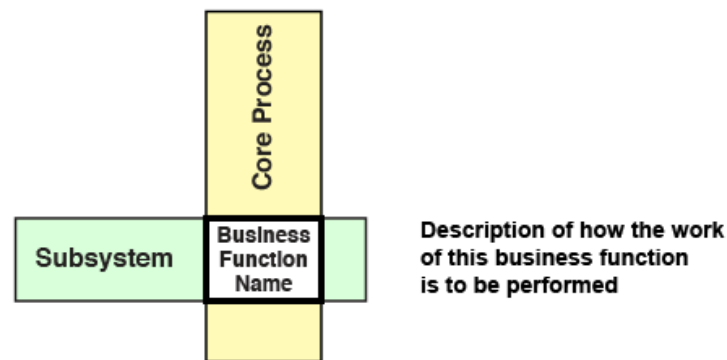


Figure 6: Subsystems

The more detailed subsystem structure of Figure 6 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 work to be performed, the resulting array of subsystem/core process intersections displays the entire set of business functions of the supermarket business enterprise.

Using this subsystem structure, each of the four core processes will be added sequentially to the subsystem structure to create a diagram of the 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 7 illustrates how the business functions are to be identified and described:



**Figure 7: Business Function**

In the 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 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 purpose of this supermarket model is to clearly portray how the work performed in a 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.

## Implementing the Defining Core Process

Figure 8 provides a breakdown of the Defining Core Process into business functions that match the supply chain sequence of functional steps 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.

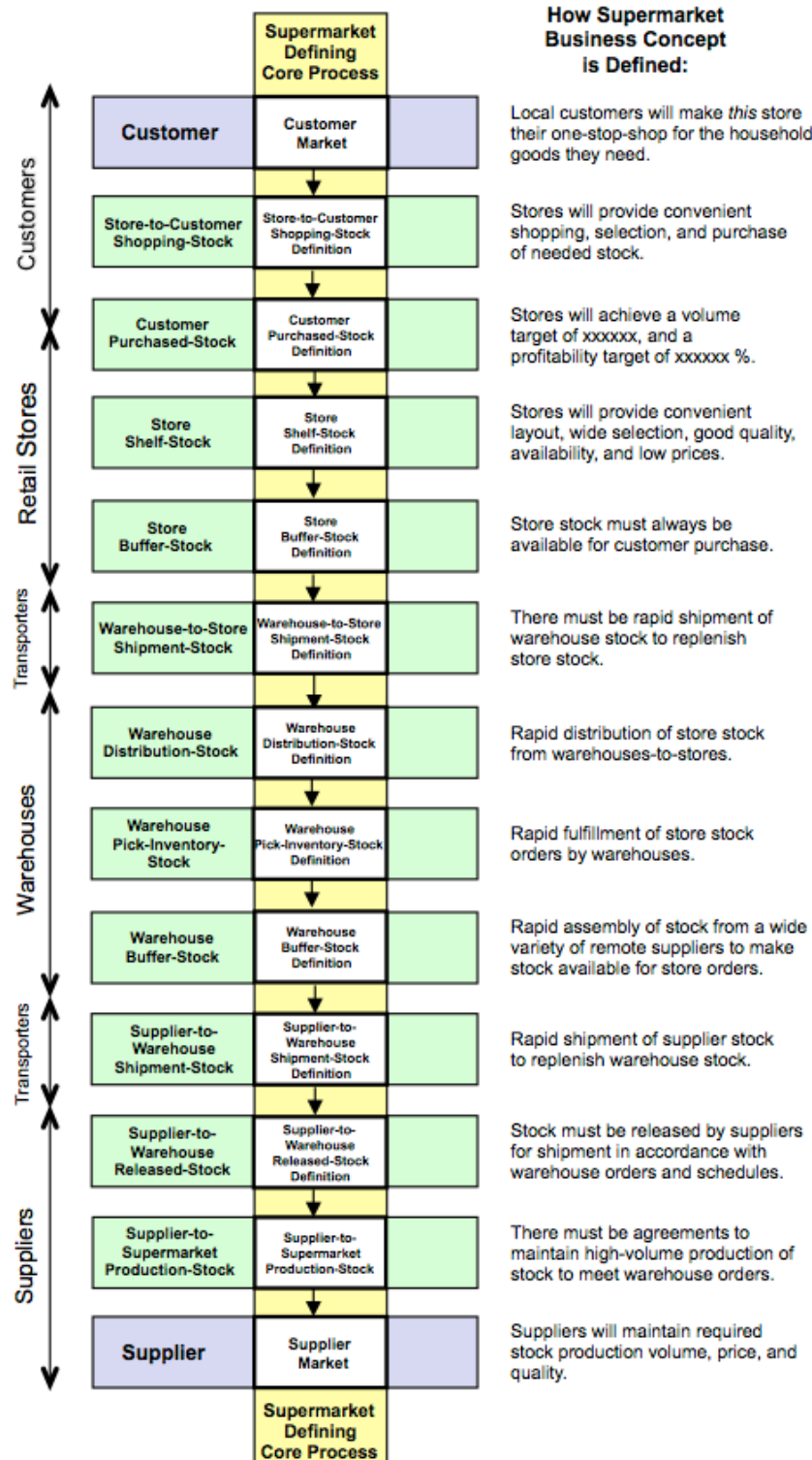
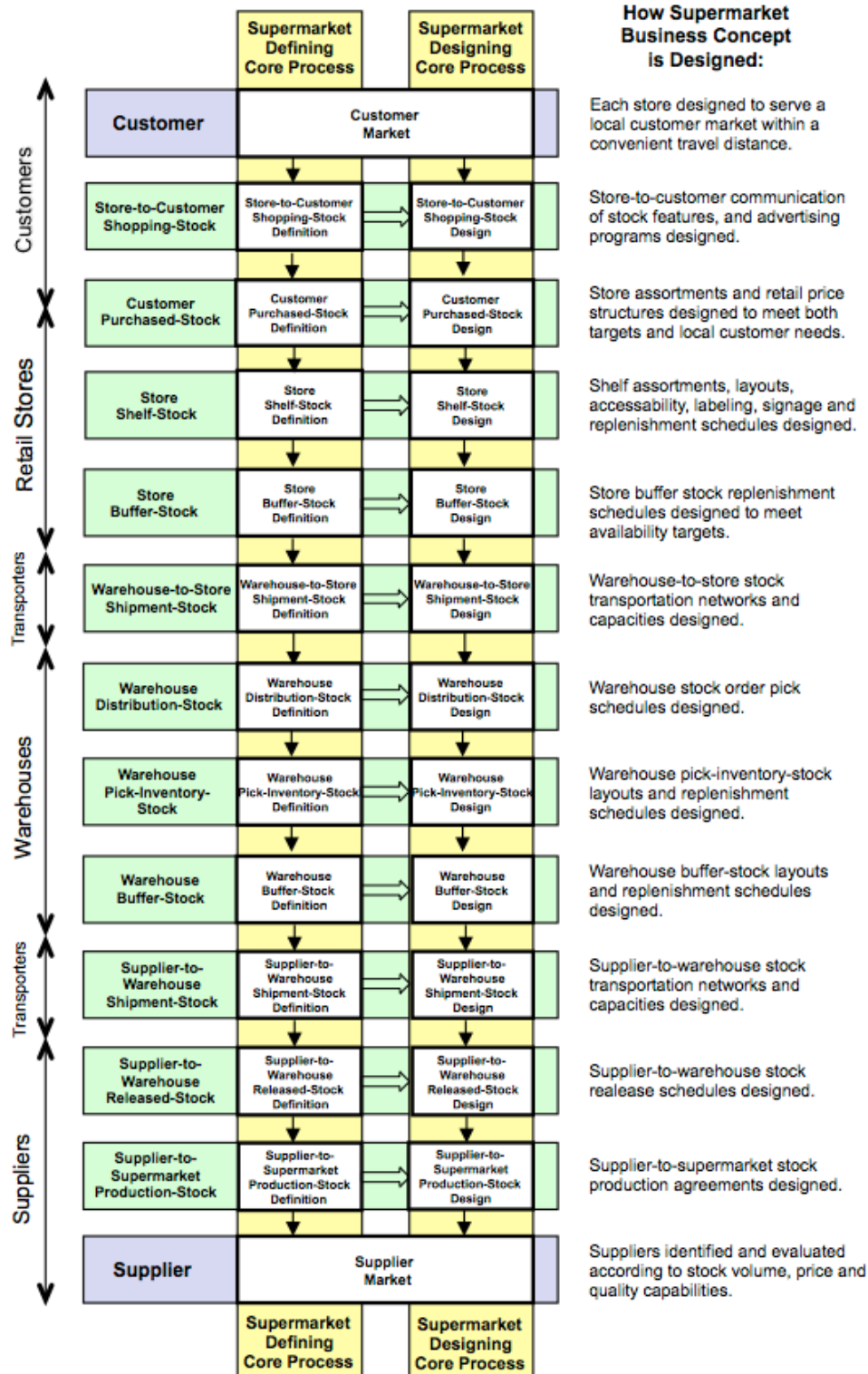


Figure 8: Defining Core Process



## Implementing the *Designing Core Process*

In Figure 9, 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 9: Designing Core Process



## Implementing the *Constructing Core Process*

Based on the previous Figure 9 comprehensive structural design framework, Figure 10 shows how the individual subsystem units are *constructed* to carry out their role within the integrated supplier-to-customer work-flow sequence.

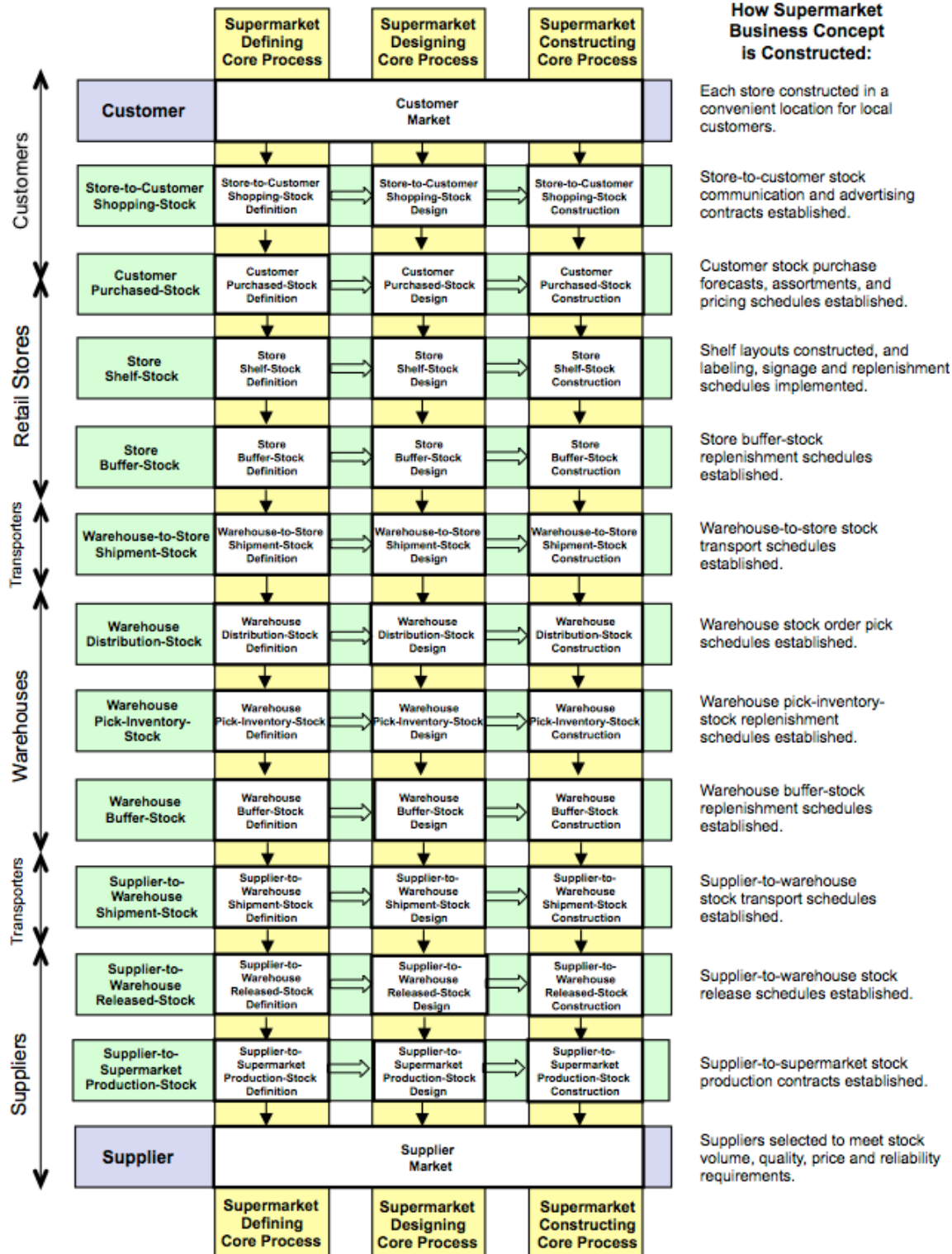


Figure 10: Constructing Core Process

## 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 requirements. Note that In Figure 11 the arrows between the provisioning business functions proceed upward. This is because the *provisioning* core process column portrays the physical flow of stock, from suppliers to customers.

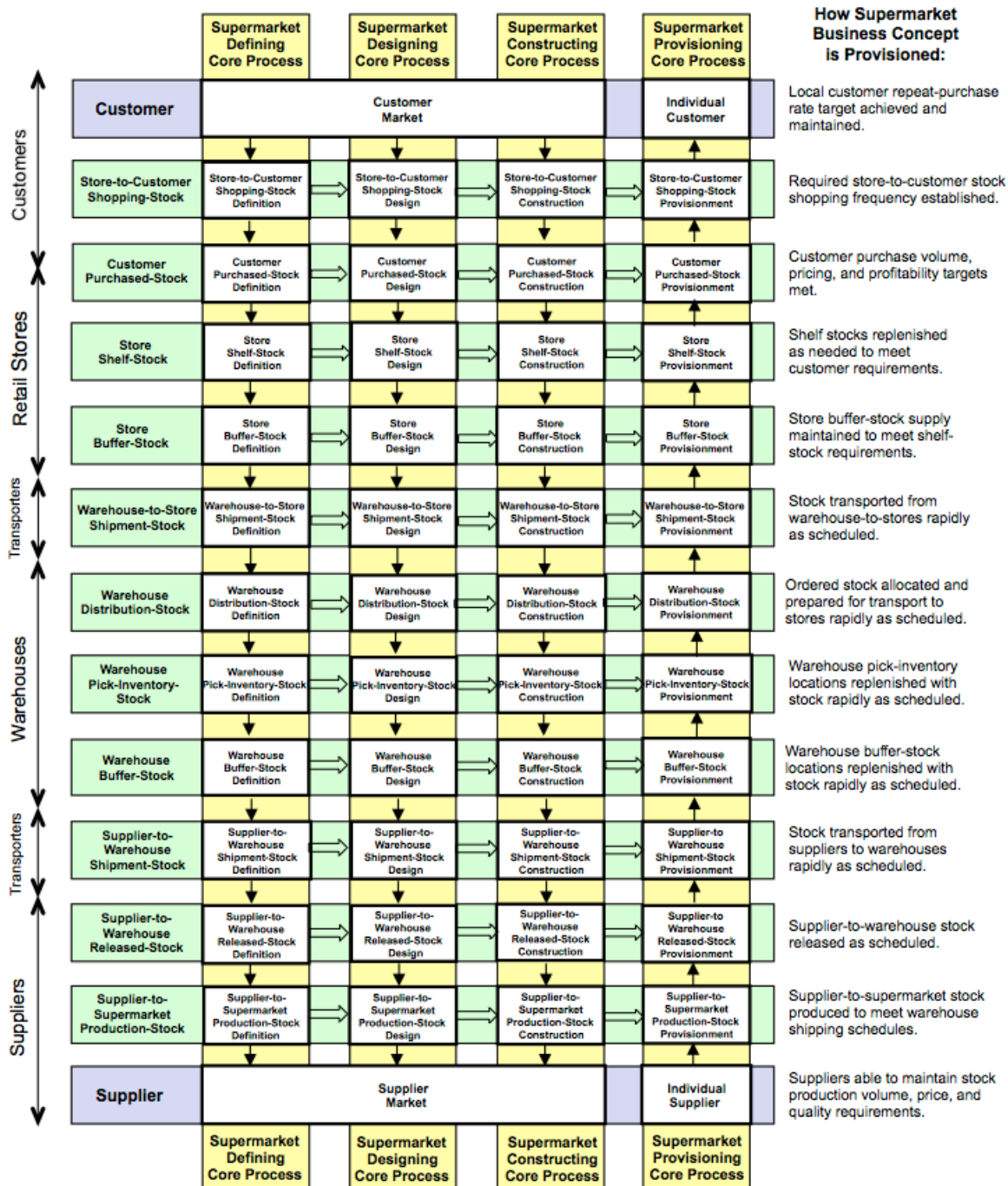


Figure 11: Provisioning Core Process

## The Addition of a Supporting Core Process

The four core processes (defining, designing, constructing, and provisioning) embody the basic product life-cycle of a supermarket business. Figure 12 shows how a partial fifth core process is added to portray how each store 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 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 at the store.

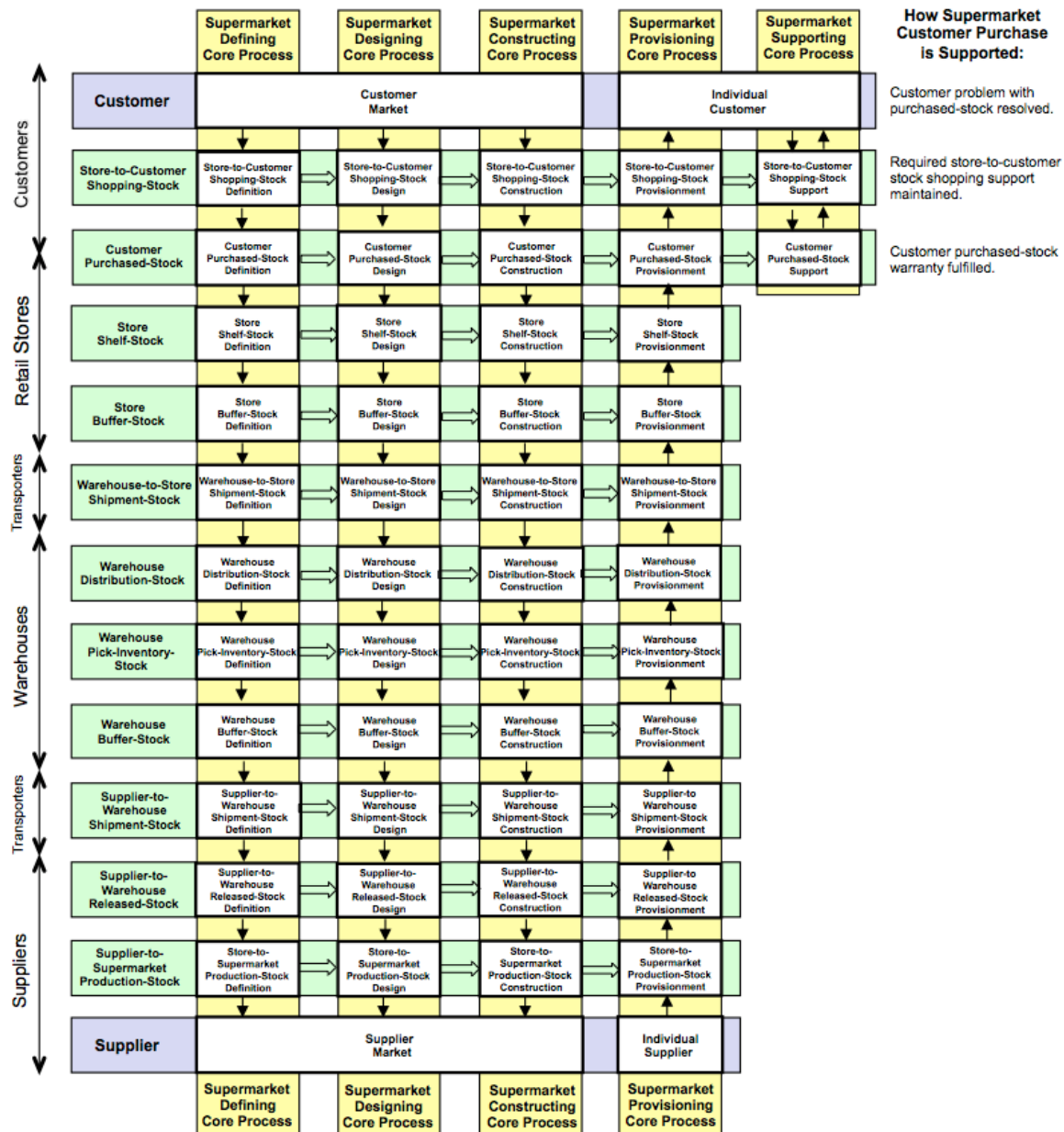


Figure 12: Supporting Core Process

## Application of the Supermarket Model

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

The unique features of different types of supermarkets may vary, depending on size, location and stock assortment. Further, differences in core process structure may vary with a given 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 supermarket model. This allows the standardized supermarket model to be employed as a baseline template for understanding and defining all supermarket situations.

Example 1: The supply chain of a 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 2: The supply chain of a supermarket that acquires perishable stock to be delivered directly to its stores by local suppliers might eliminate the warehouse subsystem layers for that portion of its business.

## 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 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.

## How Business Functions Relate to Organization Charts

The 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 supermarket model's structural framework can be mapped to those found on the company's organization chart, as indicated in Figure 13. A company's organization chart typically shows a hierarchy of lower level organization units whose responsibilities have evolved over time. The 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.

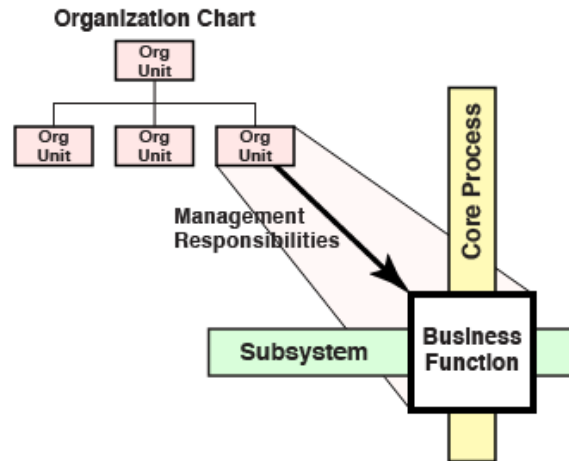


Figure 13: Mapping Org Unit to Business Function

The supermarket model's functional structure could be employed by ERP software providers, whose current views are often based on business functions derived from an organization structure. Providing them with a more accurate view of the inherent structure of a supermarket business could make their solutions much more powerful.

## Conclusion

The supermarket model defines the inherent system structure that is common to every supermarket business.

It provides an architectural framework of function and workflow that can be applied to better understand and improve a supermarket's business performance.

By identifying the supermarket's complete core process and function structure, this model provides a highly efficient tool for more accurate business process identification, improvement and design.

## Authors

**Frank Steeneken** is a Business Process Architect working in the Netherlands. Frank has 27 years of experience in the field of business process management, requirements engineering and system analysis. He has worked for consulting organizations across different industry verticals and has extensive experience with supermarket process modeling. Frank holds a BS in civil engineering. He can be reached at [frank.steeneken@gmail.com](mailto:frank.steeneken@gmail.com).

**Dave Ackley** is 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 holds a BS in electrical engineering, an MBA, and a PhD in business administration. He can be reached at [dave@ackley.com](mailto:dave@ackley.com).

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