

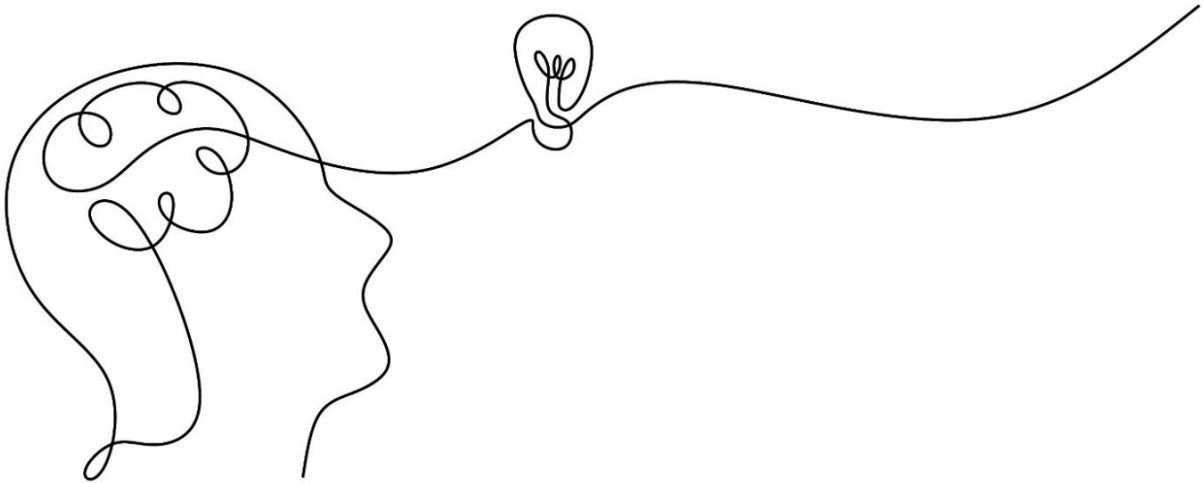


Software Success Begins with the Right Architecture

A white paper from Greycoat Software

SOFTWARE SUCCESS BEGINS WITH THE RIGHT ARCHITECTURE

Understand the layers!



Understanding the purpose and content of the three functional layers of software employed in a business is key to procuring, purchasing and implementing a successful system.

Your software architecture can be grouped into three key layers:

- 1) the accounting layer,
- 2) the operational layer, and
- 3) the marketing layer.

Each layer has its own language, and differs remarkably in terms of goals and implementation strategies, as we will describe.

Note that the three layers correspond to the three key functions of every business: Finance, Operations and Marketing/ Sales. Just as it's important to achieve harmony and dialogue in these separate functions, the same is true for the software supporting them.

In this paper, we will look at the characteristics of each layer in more detail, but also indicate problems that follow from a poor architecture, and provide pointers on building a good software foundation in terms of software vendor selection and mandate. Not getting this right can cause issues affecting your operational efficiency for many years.

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The Accounting Layer

The functionality of the accounting software layer is described in an abstract, highly defined language, the language of debits, credits, account numbers, responsibility centers, accruals, cut offs, and universal transactions. The main data paradigm is the ledger, in the form of a General Ledger, with a Balance Sheet and Income Statement, and also in terms of subledgers, chiefly *Accounts Receivables, Accounts Payables and Payroll*.

The accounting layer will recognize customers, product groups, vendors and employees within its subledgers, but not carry extensive detail beyond this.

A key goal is to use a universal language that provides a consistent standard for evaluating performance and investment decisions across multiple operations. Build an accounting layer that is too unique to one operation and that consistency and comparability of profits and results can be lost.

The Operations Layer

The operations layer is the software layer used to get things done, to perform: orders are fulfilled, inventory is produced or built or purchased, and material movement and operations are scheduled. This software layer is built using the highly specific language of a particular operation. In the construction and hardscaping materials sector Greycoat serves, the operational layer recognizes job sites, material and delivery prices, zone tables, truck numbers, government levies, fuel surcharges, material specifications, product costs, product to inventory mapping tables and mixes, and literally hundreds of detailed pieces of information covering the order fulfillment cycle. (That cycle consists of these steps: quotations -> data setup -> order management -> dispatch -> weigh out -> invoicing. Functions may also address the production and purchasing cycle: Forecasting -> Resource requirements -> Production scheduling or Purchasing -> Inventory.)

The Marketing or CRM Layer

The marketing layer typically includes a descriptive web site, more and more with a web based store front, as well as a customer portal. Other software may be provided for a retail operation like a landscape materials yard, and direct sales support including a CRM system.

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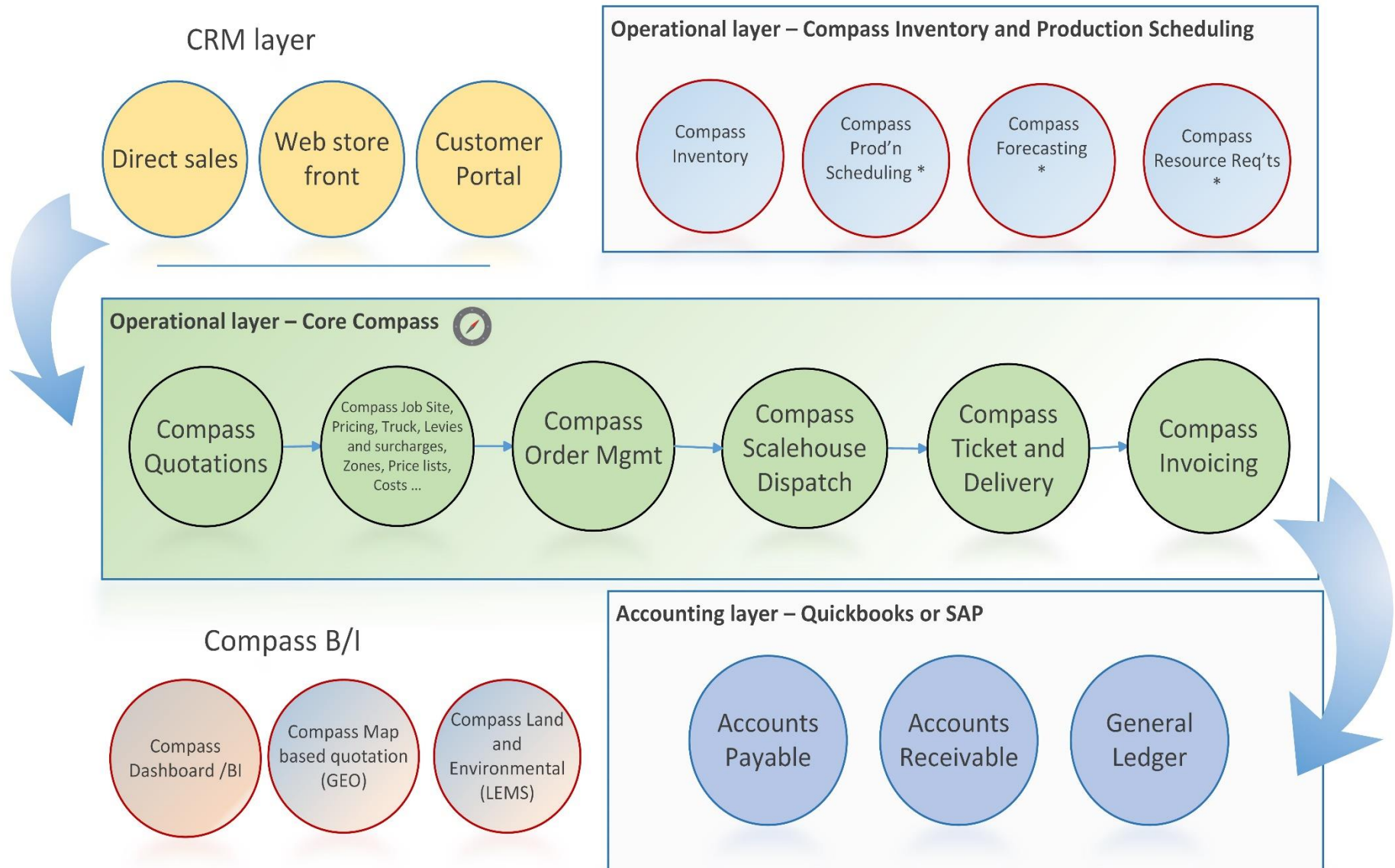
These functions tend to be highly customized to the sales methods of a particular operation, even moreso than the Operations layer. While the business logic in this layer is often simple, and the table definitions rudimentary, the marketing and sales layer often contains unique features relating to the culture and the USP of each business organization.

Software Architecture Diagram

The diagram on the next page arranges the key functions of a modern software system for a hardscaping or construction materials producer or distributor according to the three key layers.

Information flow and database design is critical to running a successful and well functioning business.

Note that the accounting layer can be updated at various critical points by the Operations software. The diagram uses a couple of large arrows to show the direction of information flow, but the actual flow is significantly more complex.



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B. Understand the key characteristics of each layer

Accounting software is generic

Because of its generic nature, software used in the accounting layer tends to be nationally or internationally branded, widely sold software. Consistent functionality across multiple operations and accounting firms is a priority with this layer of software. More complex accounting software comes with multiple currency handling and ledger consolidation built in. Smaller stand alone businesses can use popular brands like Sage, Quickbooks and Zoho Books that do not have this level of functionality.

Accounting software consultants and vendors typically understand the software they sell, and accounting functionality generally, but they do not need to know the specifics of the operations of the client using the software.

Stay in your layer!

Be careful in customizing or adapting software in the accounting layer to the operational needs of the business. In construction and materials production, a common mistake is to price and invoice in the accounting layer of the software. Because of the complexity of pricing, including delivery, levies, surcharges and taxes, not to mention competitive quoted prices, the Invoicing function is best performed in the operational layer.

Compass software provides a full fledged invoicing module for our target market including many features unique to the delivery and sales of hardscaping and construction materials.

Another common failing is the use of generic order entry and pricing in combination with a weigh scale program. This can work in a single depot or pit operation but this configuration becomes very limiting as the company grows.

Compass provides a fully integrated, central database system including Orders (optional), Job Site Pricing, Cash sales extension, Truck Assignments and/ or Scheduling, all of which drive the weigh out function in a smooth, fully integrated fashion.

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Fully integrated and widely accessed operational database

The operations layer should function using a single, fully integrated database across all locations. (Remote locations may use replicas.) The Accounting software can reside on a different database altogether, as long as operational aspects are kept out of the accounting layer. Traditionally, the two layers have been integrated using an import/export model to move invoices and trucker payments into the accounting layer. These days the use of a REST API can achieve integration in real time between the two layers. (Provided in programs like Zoho Books, but not in older programs.)

Beware of the 'two truths' problem.

The overall combined database structure needs to provide a single truth or a single version of any given event. Avoid redundancies between the three functional layers.

A software system that is not properly layered might calculate a delivery ticket extension at time of sale, in the operations layer, and then recalculate totals and/or taxes in the accounting layer, differently then presented on original documents. A well designed system will calculate all amounts, extensions, subtotals, surcharges and taxes in the Operations layers and then pass these to the accounting layer. This also has the advantage of allowing the publication of shipping and sales results in real time, rather than waiting for a "catch up" in the accounting layer.

Also, all levies, taxes, fuel surcharges, delivery zone management and other details should be contained in the operations layer and not duplicated in the accounting layer. Duplication of these calculations leads to differences in sales results which can be difficult to resolve, and require support from two or more distinct software vendors to resolve.

Avoid expensive software modifications in the accounting layer

By purchasing Compass software, already programmed to meet the operational needs of your business, expensive programming can be avoided. Some companies have literally taken years to customize generic accounting software to support an operations' needs. This also imposes an expensive software support and maintenance burden on the organization, and often extra licencing costs as well. The Accounting layer of the software should be as generic, consistent, robust and simple as possible. An ideal multi-operation structure would have a consistent

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Chart of Accounts and functionality across all units. Adhering to this standard simplifies investment and profitability analysis, and ongoing co-ordination with accounting firms and Head Office, and makes it easier to find help trained in the use of your accounting program.

Software written specifically for your type of operation can handle production, ordering and shipping details in the operations layer. Software of this type is often described as 'vertical market' software. Our Compass ERP software is the ideal choice for the Operations layer for producers and distributors of construction and hardscaping materials. Your software vendor will keep your software up to date on regulatory requirements affecting billing, levies and taxes.

The operations software should provide integration features to create a variety of revenue and cost transactions posted to the accounting layer for Ledger reporting, but also for payment collection and payment of suppliers, as well as bank reconciliation.

One layer, one responsibility

When an erroneous result is generated by your software, whose responsibility is this from a software verification or correction perspective? Clear demarcation between the major layers makes it easy to determine who to call to support the program, hopefully with a warranty coverage. Compass provides warranty and upgrade coverage for all its software.

Empower your teams

Empower your delivery team with a deep, full featured program facing the customer and their needs: delivery target times, quality product, correct quantities and accurate pricing and invoicing.

Empower your production team with a high service level inventory, few or no stockouts and with production scheduling and capacity fitting.

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Empower the Accounting team to accurately pay suppliers and truckers, collect payments and pay employees. The Accounting data ideally should be linked to supporting information in the Operational layer.

Empower your Sales and Marketing team with tools that display your product and service to best effect.

Each area needs the best software program available to support their mission, yet working together in harmony.

The Accounting team is best served by brand name, generic accounting software, providing Business Intelligence and other state of the art features.

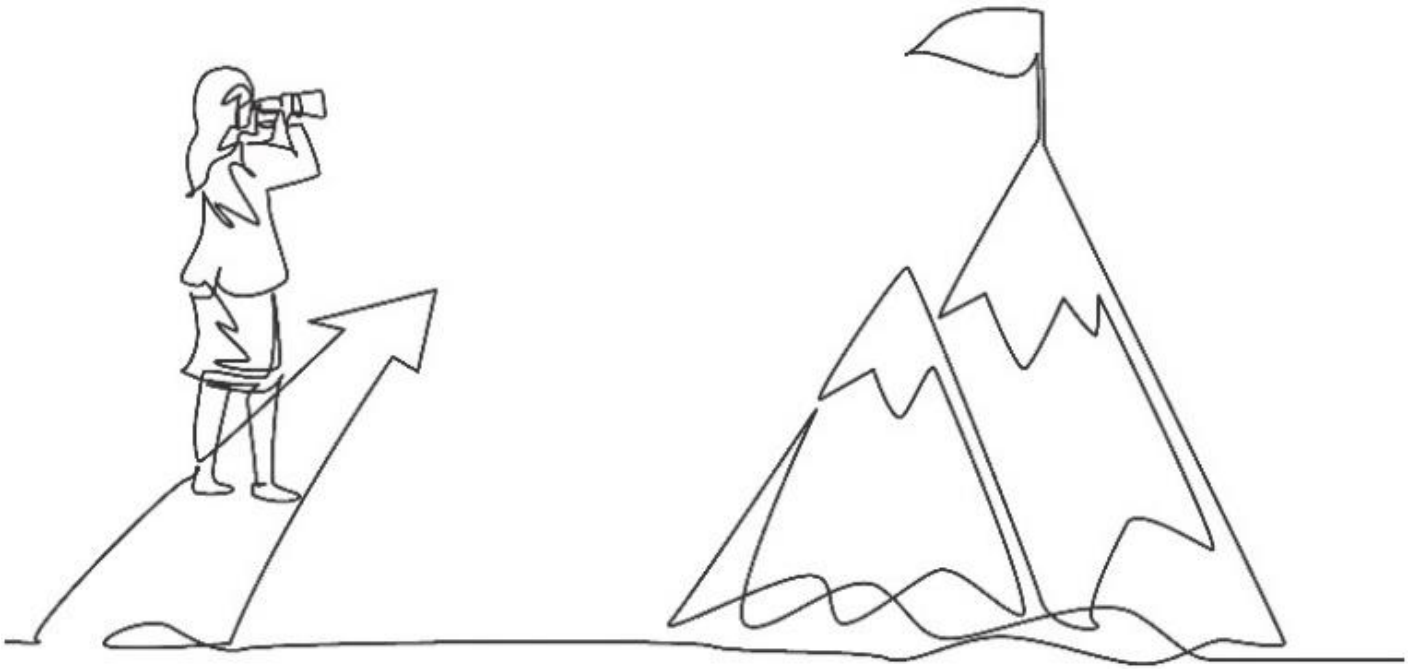
The Sales and Marketing team is best supported by brand name CRM software, but also a custom developed web site and optionally, a web based store front.

The Operations team is best served by vertical market software focused on the industry segment or segments in which you operate. (And Greycoat Compass specifically serves construction and landscaping material producers, including aggregate, asphalt, various stone work, mulches, block, readymix, pavers and other products.)

Support of HTAP (Hybrid transaction-analytical processing)

Compass production modules, including Inventory, and properly integrated accounting modules, support HTAP which allows drill down to supporting operational information and correction and reposting for any errors found.

Greycoat provides HTAP support within its inventory module and also with accounting packages linked to Compass through a REST API. For example, you can manage overdue payment calls in an advanced software package such as Microsoft Business Central or Zoho Books which show you an open item Receivables list, and view and correct the original ticket information, within the same program.



Contact Information

We are here to help. Please visit our web site:

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