Fantasy CIO: How to choose an ERP for the paper/packaging industry

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INTRODUCTION:

The lifetime of a successful Enterprise Resource Planning (ERP) system easily exceeds a decade. Yet the selection and implementation of such a system is highly risky and quite expensive. We discuss here what to look for and what to avoid.

Dear reader, you are probably thinking "no, spare me, not another article written by a management consultant with an axe to grind, sprouting content-free generalities and talking about change management". Well, I am not a management consultant, I abhor generalities and have nothing to say about change management. The accusation that I am biased, though, would be hard to deny. But then again, I would say in my defence that, at my advanced age, one is conscious of legacy and I feel it's important, if immodest, to pass on lessons from a life spent in software for the paper/packaging industry. Bear with me while I fantasise that I am a newly appointed CIO in our industry, tasked with replacing an aging ERP system.

So, let's break it down. What are we looking for in an enterprise planning system (ERP) in our industry? There are four basic functional components, which are the sine qua non:

1. Order entry (if necessary complemented by order estimation)

2. Planning & scheduling: functionality that looks after both the geometric and time optimisation, translating production orders into workcentre schedules. I would also include logistics planning, which encompasses aspects such as truck / container loading, transport booking and routing and even core cutting optimisation (cut-to-length).

3. Manufacturing execution system (MES): functionality that displays the schedules, monitors / records production and provides data for invoicing. Depending on the needs, it may also load the trucks / containers with the finished goods and provide warehouse management.

4. Financials: the overarching financial accounting system

The interesting thing is that, even after 40+ years that I have been involved in this sector, there is no supplier anywhere in the world capable of providing in-house all above elements. On the one hand, the biggest corporate ERP suppliers such as SAP rely on external systems for at least (a) the geometric (trim) optimisation and (b) the MES. Time-scheduling functionality, even if provided by the same company is usually based on a separate code line. On the other hand, and as far as I know, none of the industry-specific suites

have their own financial software (which, in any case, tend to be region-specific, as anyone who has implemented such a system in Brazil (nota fiscal), or Germany will tell you).

In addition to these four core functions, there is a whole collection of what I would consider as auxiliary functionality, including but not limited to:

- Human resources
- Asset management and planned maintenance
- Customer relationship management
- Web portal
- Energy management
- Procurement
- Carbon reporting

Decision framing

My starting point as a new CIO in paper / packaging would be a recognition that our in-house capabilities have evolved. Gone are the days with a large and strong IT department that could be relied upon to integrate many disparate systems together, or even write software to fill known gaps. For better or worse, professional software development is now only viable in software companies.

A related consideration would be to recognise that, whether we like it or not, paper / packaging is not the sexiest and most attractive of industries. IT suppliers and highly-skilled people are not fighting

TrimChat ™

Is the waste trending up or down?

Weekly Aggregated Waste in kg (Connected Dots)

The trend in waste percentage over time, based on a 30-day rolling average, does not show a clear upward or downward trend.

The waste percentage fluctuates over time without a distinct pattern of increasing or decreasing consistently.

This indicates that the waste percentage is relatively stable, with variations occurring but no definitive trend in either direction.

to get a share of our budgets. Ambitious IT companies, if they are not Amazon or Microsoft, or a startup, are trying to sell to pharmaceuticals or financial services instead. My company, however large, needs to grapple with the challenges of recruiting and retaining IT staff.

Key supplier conditions

This would lead me to search for suppliers who must satisfy four conditions:

A. Industry knowledge and associated reference sites that are willing to vouch for the solution. This is so obvious that would normally not require elaboration, except that I keep being astonished by companies that forget it.

B. Local coverage: this is somewhat debatable, and it would depend on the specific circumstances of my own company (if the company comprised of a single plant in Greece, it would be unreasonable to expect local support). But equally, if the majority of the plants were in North America, I would rule out a vendor with an office only in India, however large that office and however good or cost-effective the software.

C. Long-term commitment and modesty: I guess this is best illustrated with a real example. I was peripherally involved in what was either the biggest or the second biggest SAP implementation project in North America in the late 1990's at Kodak (we were supplying the geometric optimisation). Multiple floors in massive buildings with cubicles populated by external and internal consultants as far as the eye could see. Like a tennis spectator, I observed a turf war being waged: a now-long-gone company called i2 was pitching its scheduling system. i2's system used a memory-based database and so could schedule many times faster than a conventional disk-based system such as SAP's.

Based on this technological advantage, i2 started pressing Kodak to forego SAP for this functionality; being California-based and not a little arrogant, i2 went as far as to say that they would also replace the material replenishment process (MRP) of SAP. At which point SAP, who was never going to cede a huge hole it its offering, got mad, developed remarkably rapidly its own distinct scheduling solution (APO) and basically forced Kodak to choose. Breadth won over the point solution and i2 was consigned to history (along with, irony of ironies, Kodak). The kludge that APO was remains to this day a poorly-integrated solution to the rest of the SAP suite (SAP is moving to a new architecture, also with a memory-based architecture, but now used throughout its solution, called S4/HANA; unfortunately, this requires a re-implementation, being a completely new solution…).

In researching this article, I interviewed the recently retired head of manufacturing at a prominent ERP supplier. He explained to me that generic ERP providers are 'defocussing functional specificity' (his words) as they are trying to battle against the cloud hosting solution providers, who are in 'hostage taking mode'; data, in their view, is more important than the application that generates it. After all, the argument goes, if you have the data, you can throw all sorts of data mining techniques at it.

Part of the evaluation in this regard would be to gauge the company's appetite for embracing modern technology that will have an impact on all our lives. For example, consider the generative AI dialogue produced by Tietoevry's recently-announced TrimChat, as shown in the box. I am impressed by the sophisticated statistical reasoning and the provision of a trend chart when that was not explicitly requested.

The long-term commitment of a company to a specific market is extremely hard to judge. With the mountains of cash available to private equity and to such conglomerates as Constellation Software (which owns 800+ software companies, including at least 5 in our sector), very few IT companies can be certain of who their owner will be in 5 years. The problem is that very often the playbook of these purely-financially-driven companies is simultaneously to increase fees and stop investing in the future evolution of the software.

D. Reasonable cost: I would sit down with my Board and explain to them that spending up to 2% of turnover pa on IT would be reasonable. Half of that would go to the peripheral functionality and infrastructure. The remaining half would be split into two parts: roughly one third set aside for the implementation / small specific projects and the remaining would go towards the subscription of the core system. Once agreement is obtained, I would use the resulting budget to filter out the candidate suppliers.

One thing that I would not be in favour is these immensely long spreadsheets with lots of detailed questions where the supplier can furnish an answer, which is then somehow marked by the team, with a synthetic score emerging. They take a very long time to create, but are only apparently objective. I would not be surprised if nowadays ChatGPT is not used to respond to them!

But in addition to these general principles, there are several smaller pitfalls to avoid and here, unfortunately, the argument ceases to be nicely structured and becomes a checklist of specific topics. Order entry: industry-specific order entry system or customised generic?

I've lost count of the times I've seen companies that chose a generic ERP system spend a fortune and waste time trying to configure it for our business. To us an order for an item is quite an obvious concept – yet the 25-year-old, fresh-out-of-business-school management consultant struggles to make the mental leap from the unique-product-code ID of widgets that he/she is familiar with. Ditto for understanding the implications of substituting a lighter grammage, or why the difference between the inner and outer core diameter of a reel is quite important to the end user.

Time scheduling

Our primary processes (paper machines, corrugators, non-digital printers) are not only expensive but cannot switch products instantly. This drives us into 'blocking' orders together, hence block scheduling. We still need finite scheduling for subsequent (finishing) operations), if any. Given that we cannot change our primary processes, I find it hard to comprehend how some suppliers provide scheduling software that, e.g., fails to move the constituent orders when a block is moved.

This is the 21st century, so I would not go without a system that can promise accurate delivery dates to our customers, ideally with the capability to handle multi-site and multi-stage operations sourcing from future production/semi-finished inventory/finished inventory (or a mixture).

Geometric / trim optimisation

This topic is close to my heart, having architected the system through which more than ¾ of North American paper production flows. Suffice it to say that there are fewer companies than the fingers of two hands authoring solutions in this area and less than half of them are credible global players.

Who issues the invoices?

The invoice is an interesting but deceptively simple document. It must reflect many of the business practices, such as commissions, discounts, agents, quotas, credit limits etc. Where does all this information come from, and which module generates the invoice?

Units of Measure

I would also probe about units of measure, as sometimes we sell by weight, sometimes by surface area, sometimes by reel / sheet count. For paper we talk about grammage, but in plastic film we use caliper instead. In North America widths are in inches, but sometimes these are fractions, sometimes they are in decimals. In a few cases we might even get the client to pay for some or all the waste, so the relation between the input size and the output sizes becomes quite complex. In all cases we are critically dependent on the (trade) tolerance on the quantity, without which our waste would be much higher (this does not stop us from having orders, placed by weight, with a ±5% tolerance that nevertheless translate to 10.6 reels).

Does the MES understand geometry?

At its simplest, does the MES support geometric traceability? In our plants, logical entities (orders) and physical ones (jumbo reels…) have a many-to-many relationship. We need to be able to display the schedules that will permit the operator to set the slitting knives; once the reels have been produced, we need to know which part of the parent reel they came from. This is fundamental and non-negotiable.

An advanced industry-specific MES would be able to do a lot more, e.g. understand quality characteristics of the different parts of the sheet and intelligently re-assign logical orders to maximise the utilisation of material, or dynamically replan truck loading based on actual weights, to mention just a couple of examples.

At this point it would be standard practice to end with an inspirational statement about the golden future that awaits those that are wise. Instead, I will conclude by saying, in my experience, choosing an ERP is difficult and risky; those that get it wrong will be punished by the market. Good luck!

The author:

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