

# Integrated business planning and digital transformation - paper and packaging industry

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## INTRODUCTION:

In the paper and packaging industry, numerous business planning decisions, both large and small, are made daily throughout the business cycle. Each decision, regardless of size, holds the potential to create or destroy value. Ideally, every key decision variable would be readily accessible and evaluated collectively. Such an approach would lead to optimal decisions that maximize profit while satisfying customer needs. However, in reality, most decisions are made with incomplete or, at best, outdated information. This leads to a bias towards familiar and measurable factors, potentially resulting in skewed conclusions..



Consider, for example, a mill that decides to produce a more environmentally friendly product requiring different raw materials to meet market demand and increase order volume. Or a mill aiming to enhance energy efficiency by altering the production cycle for all its grades. In these scenarios, costs are traditionally calculated by estimating machine speeds, raw material costs, transition expenses, etc., with margins applied to determine pricing.

But how can we dynamically understand the downstream impact on service levels, inventories, warehousing, and the efficiency of downstream equipment? What insights are needed regarding future order patterns to determine the frequency of runs, or whether production should be based on a make-to-stock basis requiring quick-turn inventory?

Failing to incorporate all variables in a simultaneous analysis risks sub-optimal results and potentially incorrect conclusions regarding costs and pricing. It also overlooks the need for assessing more scenarios.

Even with all necessary information available, the complexity of analysis often surpasses the capabilities of spreadsheets. More efficient tools are required to allow analysts more time to effectively evaluate scenarios.

Imagine, though, making decisions by considering far more variables than we can currently comprehend, using intelligent tools

to explore all plausible options. Each option would be optimized based on key business drivers and presented in financial metrics, a universal language that everyone understands.

With today's technology and real-time data availability, this level of integrated business planning and digital transformation is increasingly within reach.

### Digital Transformation: The Path Forward

How do we achieve digital transformation, a topic widely regarded as a priority and the future of business?

A 2022 PwC survey revealed that 60% of executives consider digital transformation their most critical growth driver, with digital capability being central to {business} integration.



**Figure 1:**  
**Packing line.**

Dynatrace defines digital transformation as “the process of changing how an enterprise leverages technology, people, and processes to improve business performance and adopt new business models. This transformation is cultural and impacts every aspect of a business, including sales, marketing, operations, and customer service. It often involves a shift towards modern cloud technologies.”

Many companies across various industries are striving to integrate digital technology into all facets of their business. Their objectives are to enhance customer satisfaction and retention, create opportunities for operational efficiency and performance, and adapt to rapidly evolving market conditions. This involves overcoming traditional obstacles by replacing legacy technologies and moving away from siloed organizational structures that hinder continuous improvement.

Companies are embarking on this journey by focusing first on primary infrastructure enhancements in areas such as human resources, accounting, finance, and enterprise IT. These enhancements bring unprecedented data support to these back-office functions. Key improvements include better manufacturing execution systems (MES) - not a new concept but vital for operations - and upgrades to customer-facing systems like enterprise resource planning (ERP) and customer relationship management (CRM).

For industries including paper, packaging, and tissue, the pursuit of digital transformation seems inevitable. But is digital transformation alone sufficient? How effective is digitalization without the tools to meaningfully interpret the data in making improved operational and financial decisions for our industry? Take energy efficiency improvements as an example: how can one discern and comprehend its impact on the broader process?

The crux of the matter is that digital transformation, while providing more real-time data, does not inherently facilitate the understanding of this data, summarize its financial implications, or aid in making informed decisions. Digital transformation merely supplies a plethora of varied real-time data, which, when utilized by advanced processes and tools, can become truly transformative.

**Integrated Business Planning (IBP)**

Integrated Business Planning (IBP) is emerging as a crucial concept in the paper and packaging industry. It represents the most advanced level of sales and operations planning (S&OP), encompassing both operational and financial planning across tactical and strategic business levels.

S&OP has been a staple since the 1980s, optimizing operational metrics like throughput, inventory levels, and on-time shipments. However, it was initially limited by spreadsheet reliance and a lack of comprehensive optimization engines.

IBP elevates this process by incorporating crucial financial metrics into scenario evaluations. It broadens the scope of cross-functional participation beyond traditional S&OP, intertwining planning with execution to prevent disappointing results. The tools and technology linking plans to execution are now enhanced by digital transformation.



**Figure 2: Cartonboard production.**

**IBP Characteristics:**

1. **People, Process, and Technology:** Implementation transcends typical IT projects, integrating best practice S&OP processes and cutting-edge technology. This liberates personnel to focus more on scenario planning and managing deviations, fostering cross-functional collaboration and technological efficiency.
2. **Optimal Results Across the Board:** IBP takes a demand-driven approach, contrasting with the traditional supply-focused method in our industry, optimizing results across sales, operations, and supply chains.
3. **Unified Tactical Business Plan:** A single, regularly updated plan spanning 3 to 18 months balances supply and demand, driving support function requirements and closely tied to execution with feedback for future planning.
4. **Scenario-Driven Planning:** Selections from multiple feasible scenarios are optimized based on key operational and financial metrics, facilitated by technology enabling more scenario assessments than possible with spreadsheets.
5. **Business-Wide Metrics:** Selected plans are measured by comprehensive metrics to enable continuous improvement.
6. **System Integration:** Real-time data on costs, inventory levels, order statuses, etc., are integrated typically with ERP and MES systems, providing constant updates.
7. **Output Provision for Dependent Processes:** Crucial for finance teams, these outputs inform the most accurate future financial performance projections.



**Figure 3: (Left) Sprint planning.**  
**Figure 4: (Right) Results.**





**IBP Features:**

1. **Advanced Forecasting:** Continuous end demand forecasts using statistical models, machine learning, customer intelligence, and market projections, shifting the paper industry’s focus from supply to demand.
2. **Demand and Supply Balance:** Achieved across all production sites, constrained by available resources.
3. **Scenario Planning and Selection:** Optimized on key metrics to produce a unified S&OP, focusing on service, costs, and profitability while minimizing inventory, changeovers, and waste.
4. **Dynamic Customer Allocation:** Reserving machine time for forecasted customers.
5. **Execution Capability:** Creating and managing a block schedule to execute the chosen plan.
6. **Real-Time Plan Updates:** Adjusting the plan as market and supply chain conditions change within the S&OP period.
7. **Detailed Inventory Planning:** Advanced statistical analysis for safety stock levels and automatic replenishment orders.
8. **Immediate Customer Response Capability:** Providing real-time stock availability or production dates.
9. **Accessible Analytics:** Tailored analytics available to all organizational levels.

These features can be adopted fully or gradually, depending on priority needs. Ideally, these IBP features are managed within one integrated system, ensuring seamless transitions from demand-supply balancing to scenario evaluation, then automatically to production and inventory planning.

**IBP Implementation Example – A Case Study**

Implementing Integrated Business Planning (IBP) is a challenging yet rewarding endeavor.

To illustrate this, let’s examine the IBP journey of the RDM Group, the leading producer in the recycled cartonboard business and the largest producer in Italy, France, the Netherlands, Scandinavia, and in the Iberian Peninsula, with 10 mills and 4 sheeting centers across Europe.

Before IBP, the RDM Group faced challenges managing cross-site supply chain operations and efficient communication among planning teams. The lack of visibility and consistent data hindered quick, fact-based decision-making. Servicing multiple countries, the Company struggled to balance demand and supply effectively within and across its mills and regions.

**Figure 5: (Above left) IBP Processes.**

**Figure 6: (Above) (Insert) Realtime inventory view with future projection and warehouse finished sheet products.**

The initial integrated process proceeded slowly partly because of the COVID pandemic and the acquisition of additional companies, further complicating the manual process.

To overcome these challenges, the RDM Group sought an integrated digital solution with specific criteria:

- Achieve optimal demand and supply balance, resulting in a unified “one number” plan (S&OP).
- Flexibly execute and re-optimize the production schedule and inventory replenishment as orders, forecasts, and operational conditions change between S&OP cycles.
- Integrate financial aspects into S&OP during what-if scenarios to determine the optimal solution rather than relying solely on operational metrics.
- Employ the tool’s what-if capabilities for strategic decisions, such as acquiring another mill.

The selected tool, in this case, I-Plan, transformed the company’s planning process, enabling quick, accurate forecasts and supply plans. It allowed the planning team to develop multiple options and regularly select the optimal plan across operational and financial metrics in all S&OP cycles.

The tool proved invaluable when an unexpected fire shut down one of their mills for a year. Production was reallocated to other mills/machines in the group.

By addressing critical needs, the RDM Group fostered collaboration across its operations, centering around a unified one-number plan.

**Implementation Challenges**

The implementation process never comes without its challenges. Still reflecting the previous case study, regarding personnel, middle management planners and the staff across various sites had a limited understanding of the project. Effective change management was needed to alleviate their concerns, allowing them to focus on implementation. The central S&OP team also required extra staffing to manage the increased workload.

Cross-functional collaboration is vital to establish a common objective and build trust. However, as RDM Group experienced, such collaboration is not often natural in an organization and requires hard work to achieve a successful implementation. For example, it was critical to plan to work side-by-side with finance.



**Figure 7: Stressed project manager.**

Marco Pellegrini, IBP and Customer Service Director said, “We considered from the beginning the involvement of the finance team as a must so as to achieve an integrated process and not remain in silos.”

On the process front, establishing proper business processes was crucial before fully implementing IBP. For instance, a system to control order intake across the company was necessary to execute the chosen demand-supply plan effectively. As Pellegrini stressed, “Do not underestimate the execution part, align [to your plan] and stay aligned, control order intake, and measure your deviations” to preserve and increase control over your optimized plans and, ultimately, your profitability.

The role of executive champions in the IBP implementation was vital in setting the stage for these changes. They also faced the task of reconciling the centralized nature of the new IBP process (“one number plan”) with the existing structure, where mills operated as individual profit centers. Moving forward, mills were directed to focus on operational targets for the organization’s overall benefit.

Technological challenges were also significant. Firstly, the number of ERPs and mill systems needed streamlining to reduce interface complexity and harmonize master data. Secondly, during the period when IBP processes were in place, but planners were limited to using MS Excel, a more robust technological solution was urgently required. Spreadsheets proved inadequate for handling forecast creation, demand-supply balance, and the numerous scenarios required by the S&OP team.

Data standardization and definition also posed challenges. It was necessary to standardize definitions and cleanse data across all sites, ensuring harmonized data for all IBP steps. This was critical for efficient system operation and, in turn, maximizing the efficiency of those managing the process.

#### **IBP Benefits**

Integrated Business Planning (IBP) has proven to be a game-changer for the paper and packaging industry, offering numerous benefits that enhance operational efficiency, financial performance, and strategic agility.

#### **Key Benefits:**

1. **Enhanced Demand-Supply Alignment:** With IBP, companies have successfully navigated through the turbulent times of COVID-19. The ability to reallocate demand and supply effectively, especially during unforeseen events like mill fires, has been pivotal. This strategic flexibility ensures continuity and efficiency even in challenging circumstances.

2. **Improved Lead Times:** IBP enables companies to optimize their production and distribution processes, leading to significant improvements in lead times. This optimization directly impacts customer satisfaction by ensuring timely deliveries.
3. **Inventory Reductions:** By aligning production more closely with demand, IBP helps companies reduce excess inventory. This not only frees up capital but also minimizes storage costs and risks associated with overstocking.
4. **Increased Service Levels:** The improved forecasting and planning capabilities of IBP result in higher service levels. Companies can anticipate customer needs more accurately, leading to better product availability and customer satisfaction.
5. **Financial Performance:** Several experiences highlight how IBP contributes to better financial planning and performance. Integrating financial aspects into operational planning helps in making more informed and profitable decisions.
6. **Scalability and Growth Management:** IBP supports businesses in scaling operations and managing growth effectively. For example, it facilitates the smooth integration of new acquisitions, ensuring the expansion does not disrupt existing operations.

#### **Specific examples :**

During the COVID-19 pandemic, IBP enabled paper companies to swiftly adjust their operations in response to fluctuating market demands and supply chain disruptions.

#### **IBP and Future Developments**

As the paper and packaging industry evolves, IBP is poised to advance, embracing new challenges and opportunities.

#### **Emerging Trends and Developments:**

1. **Scenario Planning for Structural Changes:** Companies are increasingly using IBP’s scenario planning capabilities for managing structural changes such as acquisitions, introducing new product lines, and justifying process improvements. This proactive approach enables businesses to assess the potential impacts and benefits of such significant changes before implementation.
2. **Integration with Advanced Analytics and AI:** The future of IBP includes deeper integration with advanced analytics and artificial intelligence. This integration will enhance forecasting accuracy, optimize resource allocation, and automate decision-making processes, leading to more efficient and effective planning.
3. **Sustainability and Environmental Considerations:** As environmental concerns become more prominent, IBP will likely incorporate sustainability metrics. This integration will help companies in making decisions that are not only financially sound but also environmentally responsible.
4. **Customization and Flexibility:** Future developments in IBP will focus on offering more customized solutions tailored to specific industry needs, allowing for greater flexibility and adaptability to unique business challenges and market dynamics.

5. **Real-time Data and IoT Integration:** The integration of real-time data and Internet of Things (IoT) technologies will make IBP more dynamic and responsive. This will enable businesses to respond quickly to changes in market conditions and operational challenges.
6. **Collaborative and Cross-Functional Planning:** IBP will evolve to facilitate more collaborative and cross-functional planning processes, breaking down silos within organizations and promoting a more integrated approach to business planning.

The future of IBP in the paper and packaging industry is one of continuous innovation and adaptation. By embracing these emerging trends, companies can stay ahead of the curve, ensuring resilience, competitiveness, and sustained growth in a rapidly changing business environment.

**Conclusion: Embracing Integrated Business Planning for Future Success**

The evolution of the paper and packaging industry underscores the imperative need for Integrated Business Planning (IBP). As demonstrated through practical examples and industry insights, IBP stands as a strategic necessity to navigate the complexities of today's business landscape.

**Investing in People and Processes:** The success of IBP hinges on more than just technological advancement; it requires a fundamental shift in how companies approach planning and decision-making. This means investing in training and development to ensure that staff at all levels understand and can effectively contribute to the IBP process. Equally important is the evolution of organizational processes to support a more integrated, collaborative approach. It's about creating a culture that values proactive planning, cross-functional cooperation, and continuous improvement. Marco Pellegrini concluded from his IBP experience at RDM Group, "Work first on your organization, people, then on your business processes, and then on digital transformation including technology."

**Leveraging Modern Tools:** The case of RDM Group, alongside others in the industry, clearly illustrates the transformative power of IBP when paired with advanced digital tools. These tools enable companies to synthesize vast amounts of data, run complex scenarios, and make informed decisions that balance operational efficiency with financial performance. Investing in these technologies is not just a step towards modernization; it's a strategic move to stay competitive in a rapidly evolving market.

**A Continuous Journey:** IBP is not a one-time initiative but a continuous journey of adaptation and improvement. As the industry faces new challenges and opportunities, from sustainability pressures to market fluctuations, IBP provides the framework to respond effectively. Companies that commit to this journey are better positioned to manage growth, navigate uncertainties, and seize new opportunities. In conclusion, the paper and packaging industry stands at a crossroads where traditional approaches to planning and decision-making are no longer sufficient. The implementation of IBP, backed by a commitment to people, processes, and modern tools, is not just beneficial but essential. The companies that embrace this integrated approach will lead the industry forward, achieving resilience, efficiency, and sustainable growth in an ever-changing business world.



**Figure 8: Looking ahead: future AI robot.**



**Figure 9: Integrated papermill**



**Figure 10: Integrated paper and packaging**



**IBP has no equal in justifying digital transformation. As Jack Cheesbrough, Operations Director at I-Plan, states, "IBP may be the only digitalization project you need."**