COMMENTARY

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Digital Drivers in the RFA Industry

Applying new technologies to accelerate design, development, and decision-making

Key Takeaways

The Retail Footwear and Apparel (RFA) industry is under increasing pressure to accelerate the design of seasonal releases and address sustainability issues across the entire value chain.

Automated and visual processes are becoming key to successfully meet the challenges.

Success requires businesses in the RFA industry to adopt new technologies and working paradigms to meet the increasing speed of change and the need for personalized offerings in a sustainable manner.

RFA industry companies must optimize processes through digitally-driven decision making and automation with reduced executive (physical) handovers.

RFA industry businesses must integrate and digitally transform their end-to-end lifecycle instead of using stand-alone tools and siloed processes.

New technologies such as Generative AI and 3D modeling and simulation can be used to improve and accelerate the RFA industry's processes and decision making.

Retail Footwear and Apparel Industry Challenges

Businesses in the retail footwear and apparel (RFA) industry face many challenges ranging from the need for more rapid design and development supported by efficient manufacturing and logistics, to ensuring maximum sell through and customer retention. Overlaying these challenges are the increasing need to address eco and sustainability (e.g., reducing waste and unsold inventory) while maintaining copyright legality around the globe. Adding to the complexity is the geographical spread of the teams involved in the process, with design teams based primarily in North America and Europe and production and sourcing based mainly in Asia. This commentary looks at how new technology and technology-enabled solutions can improve and accelerate the design development phase of the RFA industry.[1]

"Newness" is a driving factor for the RFA industry. RFA industry businesses must update and align their seasonal offerings to meet ever changing customer expectations for new styles and "looks" on a more and more frequent basis. Designers must rapidly design, and tailor seasonal offerings based on widely varying demographics and trends. What is hot or "in" in one geography or age group may not appeal to

[1] Research for this paper was partially sponsored by ITC Infotech.

others in different locales and ages. RFA industry businesses must be able to spot and respond to demographic trends rapidly if they want to maintain and/or grow their market share and meet their profit goals. And RFA industry retailers need to provide a personalized experience for their customers. This has resulted in frequent, short offer cycles (Seasons).

As the number of seasons increases, RFA industry businesses must adopt to their customer's needs and expectations in the shortest possible time, with minimum cost and effort—while reducing the time to market. The key is to be agile (rapidly adapting to change). Agility means being able to make faster, more-informed decisions across all aspects of the industry, e.g., ideation of styles, fabrics, colors, patterns, geographical differences, trends and demographics, suppliers, etc.

Historically, the RFA industry has used paper-based documents to capture and manage business information and processes. This is a slow, siloed method prone to errors and delays and lacking in agility. To speed agile decision-making, RFA industry companies need to move to a digital (visual), connected planning design, development, and decision-making paradigm.

To create new seasonal offerings faster, RFA companies must be able to idealize, develop, create, view, and approve seasonal offerings more quickly. They need technology that can automatically generate designs and design options that can be visually reviewed so that decision-makers can select the designs with which to go forward into production and distribution. Increasing the agility of the design development processes also requires that roles involved in these processes (designers, suppliers, manufacturers, retailers, etc.) be able to interactively collaborate even when physically dispersed.

One of the major challenges is improving the sustainability of materials and manufacturing, distribution, and recycling processes throughout the RFA industry. Reducing material waste, reducing product carbon footprint and, most importantly, being able to recycle, reuse, and repurpose unsold or returned garments is rapidly growing in importance. RFA companies are being tasked with showing how they are becoming more eco-friendly. More importantly, they need to be able to substantiate their claims through a clearly understood digital footprint across the entire product lifecycle.

For each design, an RFA industry business must create complete, accurate, and validated copyright information. They must ensure that the design is not replicating another design and must document the design so it will be copyright protected in the future. Automatically creating and validating copyright information can save RFA companies significant time and expense.

Technologies That Are Accelerating the RFA Industry

There are many new technologies that can be used to accelerate RFA industry design and development. Generative AI and Visual Planning are examples of a technology and technology-based solution that deliver the capabilities needed to address RFA industry challenges.

Generative artificial intelligence (Gen AI) refers to applying deep learning to large language models (LLMs) that can generate text, images, videos, or other content based on the content of these models often in response to human prompts. Gen AI models learn the patterns and structure of their input training data and then generate new data that has similar characteristics. At a high level, generative models encode a representation of their training data and draw from it to create a new work that's similar to but not identical to the original data. Gen AI can be used to automated design and supporting content (e.g., bill of material (BOM), measurements and construction, etc.) generation.

Visual planning is a technology-based solution that applies visual media, e.g., charts, videos, dashboards, etc., to the review, planning and decision-making processes associated with a retailer's business strategy and roadmap, e.g., 3D-based planning. It provides users and decision-makers a quick and easy way to

view design offerings, schedule status and goals, and organize work. Benefits include faster review and comparison of designs, easy to spot bottlenecks, a more efficient working paradigm for users, enhanced clarity of information, and better communication and collaboration between individual and application systems.

Other digital technologies and solutions that have the potential of significantly improving efficiencies in the RFA industry include Virtual/Augmented/Mixed reality, 3D modeling and simulation, and photorealistic rendering and modeling.

Applying Gen AI to RFA Industry Design and Development

There are many functions to which Gen AI can be applied within the RFA industry. It can replace some functions and complement others. It is important to note that Gen AI is not intended to replace all the RFA industry roles. The creativity of humans will always be essential to the industry. However, Gen AI can complement and augment human resources. And it can "learn" from them as human-generated work is added to the LLMs that the Gen AI engines use to create their output.

First and foremost, Gen AI can be used to automatically generate fashion designs and variations—styles, sizes, fabrics, colors, patterns, and demographics (e.g., age, sex, and geographical variations). It can create visual images of each variation so that they can be easily reviewed and compared as part of an evaluation and selection process. Gen AI can create many more variations much faster than possible by human resources. This enables businesses in the RFA industry to create and evaluate more options and/or tailor a design to meet specific demographics, all in a significantly reduced timeframe.

Gen AI can be used to significantly improve process efficiencies in managing development components like BOMs, measurements, and cost sheets (to name a few). As an example, it can be used to analyze designs to identify the BOM components—materials, placement—and automatically create a Shell BOM (initial BOM). As the AI engine becomes more efficient, it can generate the complete BOM with minimum human interference. This information can then be fed automatically to cost models and manufacturing for production purposes.

Similarly, tracking is a key area within the development process that can gain from Gen AI based solutions. Trackers are the seasonal activity milestones and deadlines that need to be met. Currently, the majority of trackers are generally maintained in Excel-based spreadsheets with manually fed dates (targets and actuals). Even the currently available digital tracking platforms have some kind of manual intervention. Overall, the information is, at best, historical (past the event), or at worst inaccurate. Gen AI can help solve this issue with "predictive trackers" that analyze the historical values across selected KPIs—time to finalize Designs, time to get Samples approved, individual supplier efficiency, number of developments in the pipeline, etc., to "forecast" the likelihood that each development milestone will be completed on time vs. potential delay. This information can be used by relevant stakeholders to adjust their development plans and meet seasonal calendar deadlines

As Gen AI creates designs, it produces a visual image or model of the design. It can then apply multiple materials, colors, and patterns to each variation of the design. This visual content can then be used by reviewers and decision-makers to select which design variation will be produced and sold. The visual images can also be used as part of the visual planning process, in communication and collaboration with manufacturers, suppliers, and retailers, and as part of retail sales and marketing assets.

One of the most tedious and detail-oriented tasks in the RFA industry is generating the appropriate copyright content for each design and verifying that each copyright does not violate any other copyright. Gen AI can automatically create the required copyright content for each design based on pre-defined

templates. It can then search pertinent databases to ensure the legality of the copyright. This can significantly speed up copyright processing while reducing the cost and resources required to ensure compliance.

Additionally, Gen AI can support personalization options for each design variation by identifying if, where, and how a design might be customized to meet geographic or individual demands, e.g., add or remove specific design elements like collar, zipper, etc. Gen AI can also be used to support customer service by augmenting help desks by responding to customer enquiries, etc.

Visual Planning Accelerates Informed Decision Making

Visual planning is an emerging capability that can significantly speed up the RFA design and develop process by transforming a numerical exercise to a more visual activity.

As design moves from 2D to 3D, the 3D artifacts can be used to present a more visual representation of the plan vs. actual review. Typically, merchants provide guidelines on how they want the seasonal line to look—high level design inputs, target pricing, etc. As the Design takes shape, the 3D artifacts can be interposed with the information provided by merchants to give a more visual representation to the line. This will greatly speed up the process of review and adoption or rejection of design offerings. Using visual modes of fashion designs speeds up the pre-season review and selection process, enabling an RFA industry company to shorten the time to review and select the new seasonal offerings. Reviewers and decision-makers can visually compare many more variations in a significantly shorter timeframe. This process can be extended right from the initial black and white sketch review to the line finalization, with the intermediate stages of adding fabric, color, size, etc.

This capability enables designers and decision-makers to provide design direction—inspirations, palettes—that can then be quickly incorporated into updated designs. This visual capability continues throughout the review of style options (styles, color, fabric, patterns) and accelerates the decision processes at every level.

In conjunction with 3D models, visual planning can be used to develop and view store display options (e.g., which designs, fabrics, etc., to put on mannikins on the store floor, rack layouts, etc.).

ITC Infotech: Advanced Solutions for the RFA Industry

ITC Infotech is a leading global business solution and technology services provider, enabling future-ready IT Services for its clients. ITC Infotech's dedicated Retail PLM practice has the breadth and depth of expertise to help RFA businesses realize the full potential of their digitalization initiatives. Through its deep domain expertise and extensive implementation experience in the RFA industry, it provides the necessary thought leadership and direction to help its clients digitally transform their businesses to achieve maximum productivity and profitability.

ITC Infotech's team of RFA industry experts deliver both functional and technical services that help clients define an optimum digital transformation roadmap and then works closely with them to bring their transformation to fruition. Using its proven library of industry use cases, business and category specific accelerators, and ready to deploy point solutions, ITC Infotech's implementation experts are able to maximize ROI for their clients by significantly reducing time from project initiation to production go live use.

ITC Infotech has also established multiple partnerships with leading technology companies to ensure access to the base framework required to build next gen solutions using AI and 3D. These partnerships

help ITC Infotech leverage the core solutions (e.g., LLMs for Gen AI) to build frameworks that can easily be aligned with client specific use cases and solution needs.

Summary

The RFA industry faces increasing challenges in accelerating its design and development processes. More, and shorter seasons require faster ideation, development, and production of new fashions that must meet widely different consumer demographics. To address these challenges, RFA businesses must be able to make better, faster, more-informed decisions at all phases of their business. They need to be able to quickly generate, review, and select designs (including fabrics, patterns, colors) while collaborating with their manufacturing partners and insuring copyright legality. Additionally, RFA industry retailers need to be able to visually design their retail layouts as well as create marketing and sales materials that will appeal to their target customers.

New and emerging digital technologies such as Gen AI, 3D modeling, and visual planning provide the tools necessary to address these challenges and enable RFA businesses to undergo the digital transformations required to achieve and maintain success in today's highly competitive global markets. These technologies can automatically generate and compare fashion design options, create and validate copyright information, and provide information in visual paradigms that improve and accelerate planning and decision making.

CIMdata recommends that RFA industry companies include ITC Infotech technology, solutions, and services when evaluating their needs for creating modern, technology-driven RFA industry design and development environments and processes.

About CIMdata

CIMdata, a global strategic management consulting firm, provides services designed to maximize an enterprise's ability to design, deliver, and support innovative products and services. For more than forty years, CIMdata has provided industrial organizations, providers of digital technologies and services, and investment firms with world-class insight, expertise, and best-practice methods on a broad set of product lifecycle management (PLM) topics and the digital transformation they enable. CIMdata also offers research, subscription services, publications, and education through certificate programs and international conferences. To learn more, visit www.CIMdata.com or email info@CIMdata.com.