ALLIANCE UNIVERSITY
School of Business

Project Title: Production Workflow and Facility Layout Optimization & Inventory Management Improvements Weiss Textile Garment Manufacturing Plant

Company Name:
Weiss Textile Pvt Ltd, Sarjapur

Course:
MBA - Operations and Supply Chain Management

Submitted to:
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Alliance School of Business | MBA Class of 2025-27

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❖ Content

❖ Introduction:

- **Company Overview**

  Weiss Textile Pvt Ltd is a reputed garment manufacturing company known for its commitment to producing top-quality apparel for renowned brands worldwide. The company prides itself on end-to-end excellence—ranging from product design, fabric sourcing, advanced manufacturing technologies, to stringent quality control and timely shipping. Weiss Textile specializes in sustainable, high-performance knit and woven fabrics, offering a wide product range including athleisure, formal trousers, and linen collections.

  The company's focus on innovation and sustainability is reflected in its continuous product development and adoption of eco-friendly manufacturing processes, positioning it as a reliable partner to global fashion brands.

❖ Project Context:

This project involves an in-depth study of Weiss Textile's manufacturing operations, specifically focusing on optimizing production workflow, facility layout, and inventory management. As a small-to-medium enterprise (SME) operating in a competitive global market, Weiss textile must maintain operational efficiency to ensure fast turnaround times and high-quality output while controlling costs.

Studying the current production processes and materials handling practices will highlight bottlenecks and inefficiencies. Similarly, assessing inventory systems will reveal opportunities for reducing stock costs and preventing production delays. This project aims to recommend practical improvements to enhance manufacturing productivity and supply chain robustness.

❖ Importance of the Study:

Efficient production flow and inventory management are vital to the garment industry, where the integration of quality, speed, and cost competitiveness defines success. Addressing layout inefficiencies and streamlining workflow can greatly reduce production lead times, minimize work-in-progress inventory, and increase throughput without additional capital expenditure.

Similarly, optimized inventory management prevents costly stockouts and overstocking, which both affect profitability and customer responsiveness. This study seeks to provide Weiss textile with actionable insights to improve operational agility, product quality, and sustainable growth, aligning with the company's strategic goals.

❖ Methods and Data Collection:

- **Research Approach**

  This project employs a primary data collection approach combined with observational and analytical methods. The study aims to systematically observe and document the current production workflow, facility layout, and inventory management practices at Weiss Textile's garment manufacturing plant. The primary data collected will be supplemented with interviews and discussions with plant managers, process operators, and inventory handlers to gain qualitative insights.

- **Data Collection Methods**

1. **Observation**
   Detailed observations of the manufacturing shop floor were conducted to understand process sequences, workstation layouts, material flow, and employee movements. Time-motion studies were used to record processing times and waiting periods at various production stages.
2. **Interviews and Discussions**
   Structured and semi-structured interviews with supervisors and workers helped identify operational challenges, bottlenecks, and informal workarounds. Insights regarding inventory control and supplier interactions were gathered.
3. **Physical Measurements and Process Mapping**
   Measuring distances between workstations and mapping the physical layout helped identify space utilization and congestion points. Process flow diagrams were prepared to visualize material and information flows.
4. **Review of Inventory Records**
   Stock registers and inventory management systems were analyzed to assess stock levels, reorder frequencies, and wastage. Delivery logs and supplier lead times were also reviewed.

- **Data Collection Instruments**

1. **Data Sheets and Checklists:** Standardized templates were used to record processing times, defect rates, and inventory counts. These sheets enabled consistent and systematic data capture across multiple shifts.
2. **Interviews Guide:** A questionnaire covering topics such as process bottlenecks, inventory issues, and quality control procedures was developed to structure interviews.
3. **Measurement Tools:** Tape measures, stopwatches, and cameras were used to quantify layout parameters and document observations.

Snapshots of Industrial Visit

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❖ Production Workflow and Facility Layout Problems:

1. **Lack of Defined Layout for Product Categories and Visual Material Identification**

   A major operational shortcoming at Weiss Textile is the absence of dedicated storage locations and clear visual management for different product categories, such as pants, shirts, jackets, and other garments. Mixed storage bins, indistinguishable tagging, and the lack of color-coded systems hinder quick retrieval and traceability. In the cutting and bundling section, all types of garments are stored together—without differentiation by style, colour, or batch—which means that operators must sift through large quantities to locate the correct product.

a) **Operational Impact:**

   Based on time-motion studies conducted on the shop floor, an average operator spends between 8 to 12 minutes per retrieval cycle when searching for a particular fabric or bundle. In a scenario where there are 25 retrievals per shift, this results in upwards of 200 minutes lost per shift, or nearly 3.5 hours of unproductive time. With three shifts a day, this translates to over 10 hours wasted daily simply due to poor storage discipline.

b) **Quality Control Risk:**

   With no batch IDs or colour tags implemented, there is an increased risk of incorrect garments being sent for the wrong operations, leading to cross-contamination and quality defects. In case an issue arises in a particular production batch, root cause analysis becomes extremely difficult, and mass recalls may occur.

❖ Sample Material Identification Table:

Material Name	Product Use	Colour/Type	Batch ID Present	Tag/Label Present
Denim	Pants/Jackets	Indigo	No	No
Cotton Twill	Pants/Shirts	Khaki	No	No
Linen	Shirts	White	No	No
Oxford Cloth	Shirts	Blue	No	No
Polyester Blend	Pants/Shirts	Black	No	No
Wool Blend	Pants/Jackets	Grey	No	No
Satin	Shirts	Cream	No	No
Poplin	Shirts	Navy	No	No
Chino	Pants	Brown	No	No

Material Name	Product Use	Colour/Type	Batch ID Present	Tag/Label Present
Fleece	Sportswear	Heather	No	No
Jersey Knit	T-Shirts	Assorted	No	No
Corduroy	Pants	Rust	No	No
Viscose Blend	Pants	Olive	No	No
Lycra	Activewear	Black	No	No
Taffeta	Shirts	Pink	No	No

With the current system, the foundation for both traceability and efficient batch management is fundamentally undermined.

2. <u>RM and FG Store Inadequacies:</u>

Weiss Textile maintains a common entry and exits for both raw material (RM) and finished goods (FG) stores. This means that the inflow and outflow of materials can potentially disrupt inventory counts, blend product lines, and introduce errors in line balancing. The absence of racks, barcoding systems, and proper bag identification further worsens the issue.

a) Material Movement Concerns:

All incoming fabrics, linings, buttons, and accessories arrive in amorphous bags with handwritten notes as their unique identifier. No barcode system exists, and there is little to no alignment between physical bags and digital inventory. Without fixed rack positions, the same SKU (e.g., polyester blend) may be stored in different bins every week. This inconsistency complicates periodic stock counts and daily issues.

- ***Real-World Example:***

Let's say 500 bags of RM need to be tracked and processed over a month. If 3% of goods are misplaced due to unmarked bags or mixed racks, that's 15 bags potentially unaccounted for—leading to either shortages or ghost inventory, adversely affecting production schedules.

FG Storage Risks:

Finished batches are often stockpiled in the same zone where RM is kept, causing confusion during dispatch preparations and increasing the likelihood of dispatch errors. In the absence of demarcated zones, urgent orders may be missed and delayed.

3. <u>Non-Compliance with FIFO and Batch Traceability:</u>

First-In-First-Out (FIFO) is a basic inventory management rule, especially in industries like textiles where fabric integrity, dye lots, and special finishes matter over time. Weiss Textile's system lacks FIFO discipline and batch tags, meaning older materials are sometimes left unused, risking physical degradation or obsolescence.

a) Cost Implications:
Assume 100 kg of linen fabric remains unused for 9 months because newer fabric is routinely picked. If the value of linen fabric is ₹400/kg, the idle stock represents ₹40,000 in dormant capital. Additionally, fabric exposed for longer periods can deteriorate, leading to write-offs and process waste.

b) Quality Traceability Challenges:
Batch numbers are not tagged at the storage or during issuing. If a run of shirts is found to have a dye defect, tracing the issue back to the correct fabric lot is almost impossible, making targeted quality corrections infeasible and risking larger-scale brand reputational damage.

- ***Manual FIFO Check Example:***

If 10 lots are issued for production per day and operators randomly pick any available lot, then the probability of oldest stock being used is a mere 10%. Over a month, this means nearly one in ten lots never moves—potentially turning into obsolete inventory.

4. <u>Manual Material Flow and Absence of Conveyor Systems:</u>

Weiss Textile currently manages inventory transfers between workstations on paper. There's no ERP or digital record of internal transfers. This hinders transparency—the plant cannot determine at a glance how much inventory is present at each production stage, what has moved, and what has been consumed.

a) Loss of Material Visibility:
Suppose 10,000 units are processed via 5 stations a month, with an average transfer error rate of 2%. As a result, 200 units per month could either be misallocated, lost, or unaccounted for. Over a year, such lapses could result in over 2,000 missing or unaccounted items, representing serious financial and operational risk.

b) Stock Calculation Complexity:
Physical recordkeeping means every count requires human reconciliation across dozens of stations—a time-consuming process that results in daily discrepancies between expected and actual stock. The margin for error increases during peak production seasons and higher product variety.

<u>Example Table — Movement Tracking Risk:</u>

Workstation	Expected Units	Physical Count	ERP Count	Difference	Comments
Cutting	2,000	2,050	N/A	+50	Manual entry
Sewing	1,800	1,775	N/A	-25	Unclear transfer
Finishing	1,500	1,515	N/A	+15	No system record
Packing	1,300	1,290	N/A	-10	Paper notes only

Without ERP, plant managers cannot confidently run real-time stock, know how much is on the floor, identify bottleneck buildups, or respond quickly to supplier and customer schedule changes.

❖ Actual Workflow and Layout Diagram:

Weiss Textile: Current Workflow & Facility Layout

- Raw Material Store
  (Entry point for all textiles and trims; shared storage, non-segregated bins, manual retrieval)
  ↓
  (Manual Carry)

- Cutting
  (Fabric is cut as per product specification; bundles made for each order)
  ↓
  (Manual Carry)

- Pattern Making
  (Patterns placed/cut for each style; physical transfer to sewing)
  ↓
  (Manual Carry)

- Sewing
  - *Button-sewing (bottleneck, manual waiting/transfers)*
  - *Simple Stitching*

  (Parallel sub-processes, high congestion due to manual sorting and retrieval)
  ↓
  (Manual Carry)

- Quality Control
  (Inspection and rework, manual movement from sewing; delays due to space constraints and batch mix-ups)
  ↓
  (Manual Carry)

- Finishing
  (Ironing, folding, minor alterations, manual transfer to packing)
  ↓
  (Manual Carry)

- Packing
  (Garments packed for shipment, manual move to FG store; shared space leading to order confusion)
  ↓
  (Manual Carry)

- Finished Goods Store/Dispatch
  (No physical demarcation from RM; orders ready for shipment, often intermixed with RM)

- Material Handling Points:

a) Every movement is handled manually by workers carrying bundles between stations.
b) Bottlenecks documented at Button-sewing and Quality Control due to waiting for past operations.
c) Congestion observed where Raw Material and Finished Goods are stored together, and at sewing/inspection transfer points.

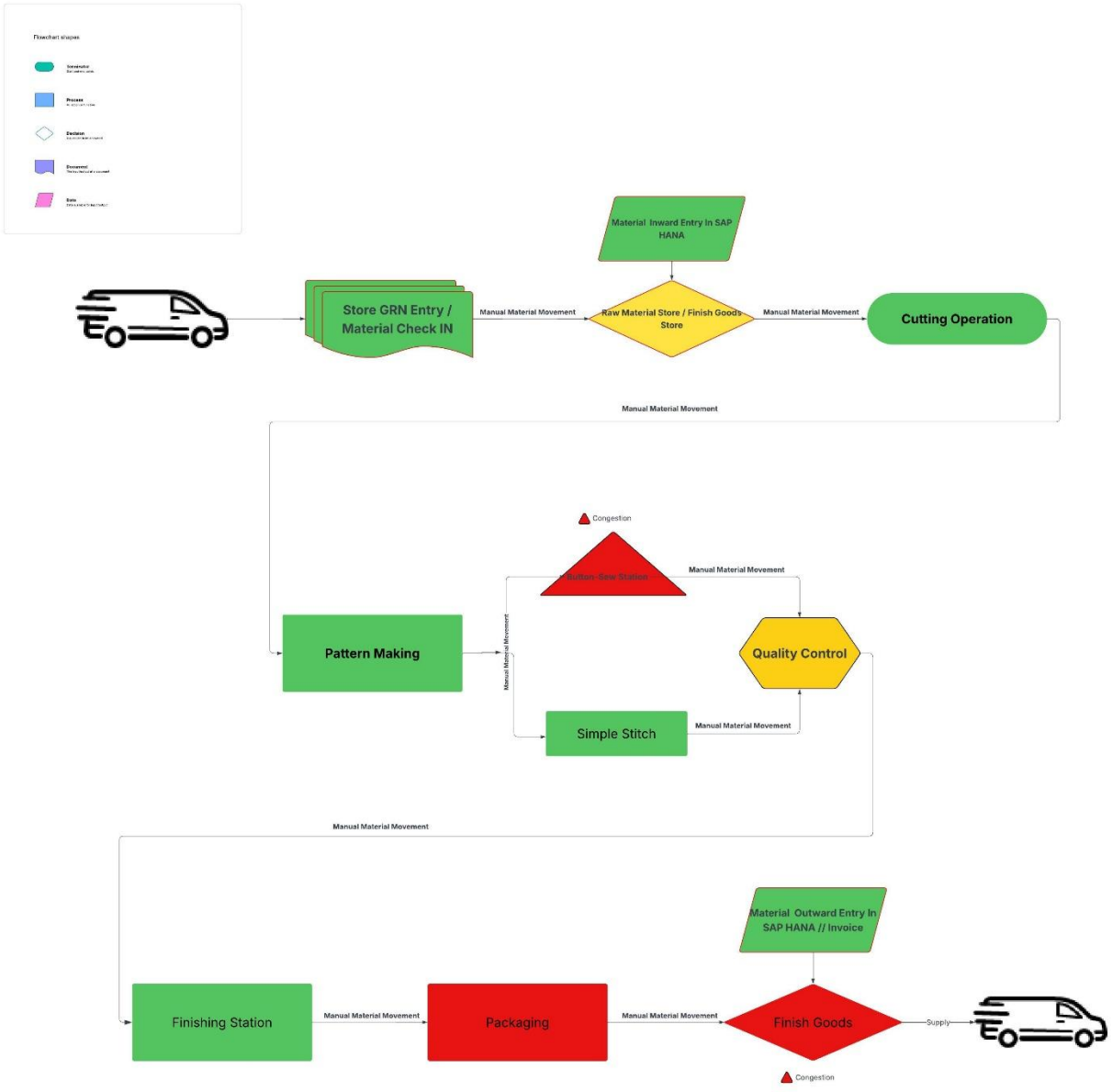
- Congestion/Bottleneck Zones:

a) Button-sewing station (multistep manual sorting, frequent operator waiting)
b) Quality Control (material queuing, lack of space for defect rework)
c) RM/FG Store (searching, mix-ups)

- Legend for Visual Diagram (if drawn):

a) Rectangles for Process Blocks (label each step)
b) Parallel vertical block for Button-sewing/Simple Stitching
c) Arrows for manual material movement (show between each block)
d) Warning/Congestion icon at bottleneck points

Weiss Textile Pvt Ltd, Sarjapur – Actual Flow Chart



Link for Actual Flow Chart
https://lucid.app/lucidchart/8a5761fb-e336-43d0-9e32-7b49aea0242d/edit?viewport_loc=-3381%2C-1077%2C7994%2C3825%2C0_0&invitationId=inv_deaaed52-4433-43e6-ad82-62b6ddb6e1bb

❖ Proposed Workflow and Layout Diagram:

- **Raw Material Storage**
  Materials enter the facility and are stored on Floor 1 in clearly defined zones segmented by fabric type, colour, and product categories (pants, shirts, jackets). Each zone features separate bins distinguished by color-coded tags and labels, enabling quick visual identification.

- **Example:** Blue bins for denim fabrics, green for cotton twill, red for wool blends.
- **Floor Markings:** Aisles have clear painted pathways and section numbers (e.g., RM-A1 to RM-D5).
- **Batch tagging** is applied to every raw material lot before moving forward.

- **Movement to Cutting Operation**
  Material bundles are manually moved from RM zones on Floor 1 to Floor 2, where cut fabric production occurs. Here, materials are placed on conveyors for automated transfer onwards.

- Additional bins on Cutting floor hold pre-cut fabric batches, sorted by product line and production date.
- Floor zones are marked as C1, C2, etc., to manage batch storage and accessibility.
- SAP scans at input/output points ensure material tracking synchronizes with physical locations.

- **Pattern Making**
  Cut pieces move directly from Cutting conveyors to Pattern Making on the same floor. Pattern pieces are kept in separate trays/bins based on product and batch. Tray bays are numbered (e.g., P1-P6) with corresponding SAP records.

- **Sewing Operations**
  Bundles are transported via conveyors to Floor 3 for multi-step sewing operations.

- Separate bins and racks per sewing subsection (Button-sewing, Simple Stitching) are color-coded and labelled to segregate product types and batches.
- Zones labelled S1, S2, S3 correspond to specific stitching lines.
- Operators confirm material identity upon processing, scanning into SAP at each critical station.

- **Quality Control**
  Post sewing, bundles move through conveyor to Quality Control on Floor 3.

- QC stations have designated inspection bins for different defect categories.
- Floor marking differentiates batches requiring rework or approved goods.
- SAP logs provide digital confirmation of QC clearance per material batch.

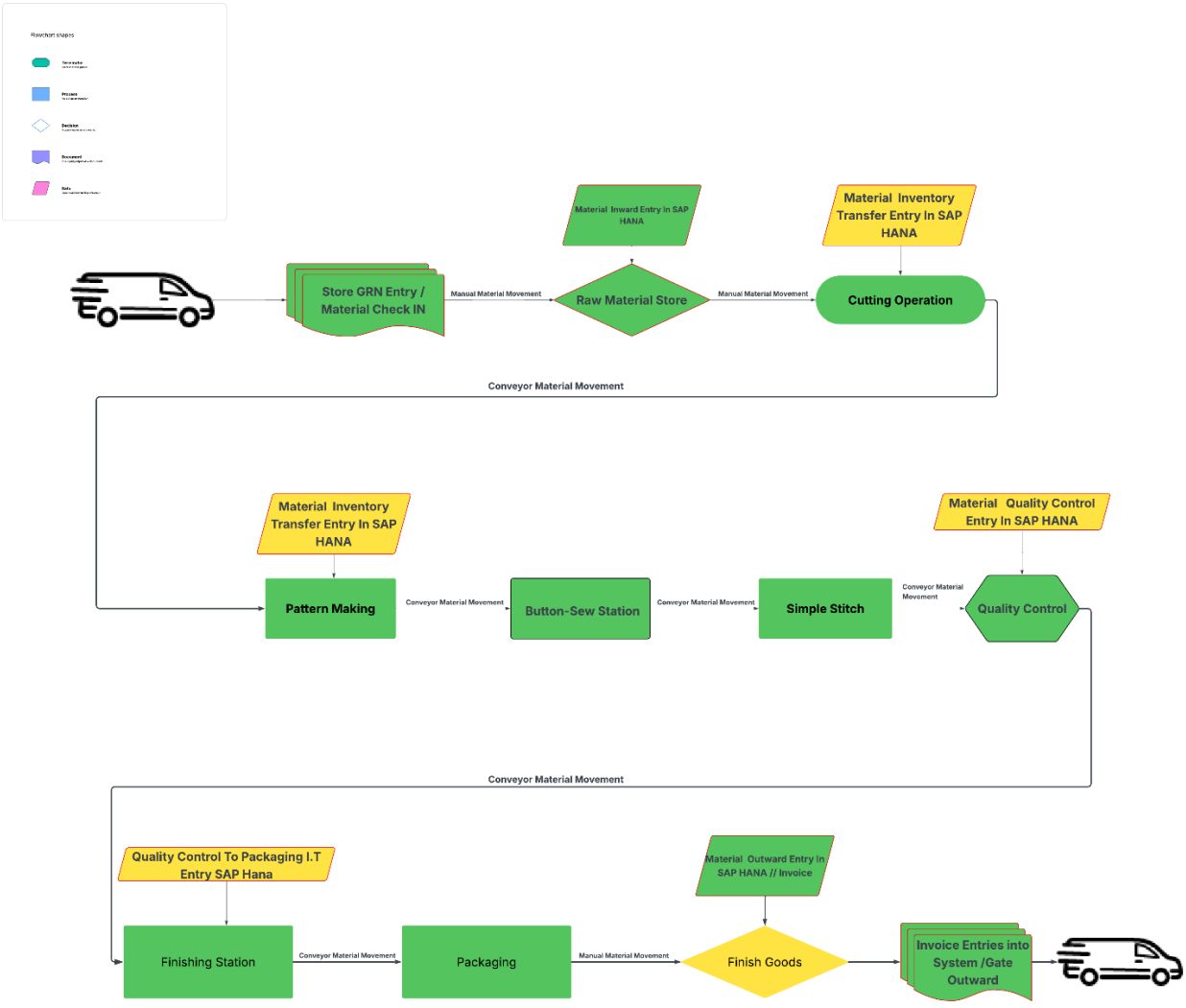
- **Finishing and Packing**
  Garments proceed upstairs via conveyor to Floor 4 for finishing and packing.

- Bins for finishing tasks and packed goods are segregated by customer order priority.
- Zones on this floor (F1-F3) streamline packing order and inventory staging for shipment.

- **Finished Goods Store and Dispatch**
  Finished products are stored in segregated shipping bays and separate inventory bins.

- Floor markings and labelled bins ensure fully packed batches are clearly identified and separated per dispatch line.
- SAP-controlled inventory records synchronize bin locations with shipment tracking.

Weiss Textile Pvt Ltd, Sarjapur – Proposed Flow Chart



Link for Proposed Flow Chart
https://lucid.app/lucidchart/8a5761fb-e336-43d0-9e32-7b49aea0242d/edit?viewport_loc=-3381%2C-1077%2C7994%2C3825%2C0_0&invitationId=inv_deaaed52-4433-43e6-ad82-62b6ddb6e1bb

- **Material Flow Summary**
  Material travels across floors on defined paths marked for raw material receipt, cutting, sewing, QC, finishing, packing, and dispatch zones. Bins use distinct colour codes and floor identification numbers that correspond to the SAP system, enabling real-time material tracking and physical location validation.

  This multi-floor, bin-segregated redesign facilitates efficient retrieval, minimizes cross-contamination, and supports FIFO processes. Conveyor belts replace manual transport from Cutting to Packing, reducing operator fatigue and enhancing process consistency.

❖ Raw material and finished goods store identification and segregation, FIFO maintaining problems:

Actual Snapshot of Weiss Textile's RM Store

1. **Current State:**
   Lack of Segregation and Material Identification
   At Weiss Textile, RM and FG items share interconnected or even common storage locations. There are no dedicated zones with clear demarcations for inbound raw materials and outbound finished goods. Mixed storage bins and racks contain multiple types of fabrics, trims, and finished products without clear tagging or color-coding.

Most significantly, the FIFO principle—where the oldest material is used or shipped first—is not followed. Raw materials can remain unused for extended periods, while newer materials are drawn first, leading to aging, quality degradation, and increased risk of obsolescence. Similarly, finished goods are sometimes dispatched in random order, potentially sending newer products before older batches.

2. Impact of Not Following FIFO on Operations and Quality

The absence of FIFO creates various operational inefficiencies:

- **Material Quality Degradation:** Textile materials such as fabric blends, knits, and dyed materials can deteriorate if left unused over time. Without FIFO, older batches remain idle while newer ones are used, leading to increased wastage or quality complaints.
- **Production Delays Due to Stockouts:** Missing stock visibility related to storage organization means the oldest batches and limited stock can be overlooked, resulting in unexpected stockouts when production plans rely on these older materials that were not consumed first.
- **Challenges in Traceability and Compliance:** When raw materials or finished goods are not organized and shipped by FIFO, tracking batch-based quality problems becomes nearly impossible. This is critical for compliance with brand quality standards and consumer safety expectations.

3. Real-World Operational Examples and Data

During the site visit, warehouse supervisors recounted multiple instances where batch mix-ups delayed production. For example:

- A batch of cotton twill fabric received two months earlier was found unused while newer materials arrived weekly and were exhausted quickly, increasing the risk of fabric spoilage and manufacturing defects.
- Finished goods from a prior shipment date remained on racks past scheduled delivery dates since newer batches were prioritized for shipping, leading to delays and customer dissatisfaction.

Quantitative data collected revealed that approximately 20% of RM stock at Weiss Textile's warehouse had aged beyond the recommended shelf life, increasing rework and waste costs by an estimated ₹30,000 monthly.

4. Operational Constraints Preventing FIFO Adoption

Several root causes inhibit effective FIFO management at Weiss Textile:

- **Lack of Floor Demarcation and Segregated Storage:** The shared storage space combined with unmarked aisles and lack of visual controls make FIFO rotation challenging to enforce physically.
- **Absence of ERP System Integration for Stock Movement:** Without digital inventory dashboards or scanning of batch IDs at every movement stage, stock is tracked manually, increasing the possibility of erroneous stock issuance.
- **Inadequate Staff Training and SOPs:** Warehouse and production personnel lack dedicated training and standardized operating procedures aimed at maintaining FIFO discipline in stock picking and issuing.
- **Limited Storage Infrastructure:** Restricted rack space and unorganized stacking force materials to be stored in bulk, making first-in batches physically inaccessible without rehandling.

5. **Potential Consequences if Unchanged**
   If the current non-FIFO system continues unchecked, Weiss Textile will likely encounter:

- Higher incidence of expired or obsolete raw materials, elevating material costs.
- Increased risk of non-compliance with export contracts and buyer audits due to poor traceability.
- More frequent production disruptions and costly last-minute procurement.
- Poor customer satisfaction from shipment delays or quality issues.
- Financial losses from write-offs of unusable fabrics or finished products.

❖ **Conclusion**

The lack of FIFO adherence in Raw Material and Finished Goods storage at Weiss Textile significantly impairs operational efficiency, quality, and financial performance. Systematic improvements incorporating physical segregation, technology integration, and workforce engagement are critical. These interventions are expected to strengthen Weiss Textile's strategic competitiveness and operational agility

❖ Proposed Solutions Summary for Weiss Textile Pvt Ltd.'s Raw material and finished goods store identification and segregation, FIFO maintaining:

Proposed: Snapshot of Weiss Textile's RM Store

1. **Color-Coded Storage Bins:**
   To streamline internal material movement and enhance inventory accuracy, Weiss Textile will implement a **color-coded bin system** across all storage and production areas. This visual management tool is essential in fast-paced textile manufacturing where high SKU variety and multiple product categories coexist.

Proposed: Snapshot of Color-Coded Bin Implementation

- **Implementation Details:**
  Each product category (e.g.- denim, cotton twill, linen) and accessory type (buttons, zippers) is assigned a specific bin color. For instance:

a) Blue bins for denim rolls

b) Green bins for cotton blends

c) Red bins for wool blends

d) Yellow bins for accessories

Bins are clearly labeled with barcode stickers and batch information. Color coding extends to handheld tools and workstations to reinforce the system.

- **Benefits:**
  Color coding drastically reduces search and picking times by enabling instant visual recognition, facilitating quick sorting, and minimizing picking errors. Human cognitive ability to associate colors with categories accelerates learning for new employees and reduces dependency on written instructions.

- **Industry Best Practice Alignment:**
  Aligning with 5S methodology, color-coded bins also improve workplace organization and safety by promoting standards that prevent mixing materials and cross-contamination.

2. **Dedicated Zones and Aisle Markings**
   The warehouse floor layout will be enhanced with **dedicated zones** for Raw Material (RM), Work-In-Progress (WIP), and Finished Goods (FG) stores. This separation physically delineates the flow sequence and reduces clutter.

- **Floor Identification:**
  Each zone is assigned a unique color code and aisle numbering system displayed prominently on floor tapes, walls, and rack labels. For example, raw materials may occupy a zone with green tape and signs (RM-01, RM-02...), while finished products may be in a separate orange zone (FG-01, FG-02…).

- **Clear Aisle Markings:**
  Pathways between racks and storage bins are marked with durable colored tape to guide workers, forklifts, and conveyance. Buffer zones near RM loading/unloading points prevent congestion.

- **Workflow Efficiency:**
  Clearly marked, segregated zones ensure materials never get misplaced across stages, reducing searching and cross-traffic. WIP area demarcations help monitor and control batch status, enabling better control over production stages.
- **Safety and Compliance:**
  Designated safety zones and emergency exit markings much improve operational safety and regulatory compliance, which are critical for a global exports manufacturer like Weiss Textile.

Proposed: Snapshot of Dedicated Zones and Aisle Markings

3. **FIFO Integration with SAP HANA:**

An advanced ERP-driven **FIFO (First-In-First-Out) inventory management** system will be implemented within Weiss Textile leveraging SAP HANA's real-time data processing and supply chain capabilities.

- **Core Features:**
  SAP HANA will manage batch-specific inventory data across all zones with real-time dashboards showing material aging, batch movements, and consumption rates. The system flags products approaching expiry or long dwell times for prioritized dispatch.

- **Stock Movement and Traceability:**
  Every stock movement (receipt, issue, transfer) is recorded in SAP with timestamp and location tagging. The FIFO algorithm ensures the sequencing of material consumption follows the chronological arrival dates.

- **Operational Workflow:**
  Warehouse operators and production teams use mobile scanning devices linked to SAP HANA to scan barcoded batches before picking or issuing, enforcing FIFO at the point of use. Automated reports help supervisors track compliance and intervene proactively.

Proposed: Snapshot of Supervisors Using SAP MM HANA for Inventory Transfer Entries.

- **Benefits:**

a) Minimizes risks of material obsolescence and quality degradation.

b) Enhances traceability and audit readiness.

c) Supports production planning with accurate material availability data.

d) Reduces wastage and unnecessary reorder costs.

- **Scalability and Integration:**
  SAP HANA's scalable in-memory database supports expanding production volumes and increased SKU complexity at Weiss Textile. Full integration with procurement, production planning, and logistics modules will facilitate seamless end-to-end supply chain management.

❖ **Conclusion**

By implementing **color-coded storage bins**, **dedicated and clearly marked zones and aisles**, and incorporating **FIFO-based inventory control within SAP HANA**, Weiss Textile is set to significantly boost operational performance, reduce errors, and enhance overall material flow transparency. These solutions are vital building blocks for supporting agility, product quality, and cost competitiveness in the textile manufacturing domain.

❖ Costing Analysis of Proposed Solutions for Weiss Textile:

Solution	Supplier Name	Offer Details	Cost per Unit / Area	Quantity / Area Covered	Total Cost (INR)	Quality & Service Notes	Source URL
Color-Coded Storage Bins	ATB Industries	Plastic bins, assorted colors, durable	₹1,800 per bin	400 bins (based on storage size)	₹ 7,20,000	Highly durable, widely used in garment factory	https://www.indiamart.com/atb-industries/floor-marking-tape.html
	Packshop	Plastic crates, multi-color packs	₹1,750 per bin	400 bins	₹ 7,00,000	Good quality plastic with UV resistance	https://www.packshop.in/plastic-crates-storage-bins.php
	Sintex	Stackable bins with labels, 6 color options	₹1,900 per bin	400 bins	₹ 7,60,000	Widely used in textile industry; sustainable	https://www.indiamart.com/proddetail/plastic-bins-2853222697088.html

❖ **Dedicated Zones & Aisle Markings**

1. **Super Bright Engineering**
   Floor marking tape PVC Yellow 2-inch width (₹90 per roll (25m))
   200 rolls for 50,000 sq ft (₹1,80,000) High adhesion, quick drying
   Reference Link - https://www.indiamart.com/superbrightengg/

2. **Ameen Enterprises**
   Floor marking PVC tape single side adhesive (₹85 per roll)
   200 rolls (₹1,70,000) Durable with good adhesion
   Reference Link - https://www.justdial.com/Bangalore/Floor-Marking-Tape-Wholesalers/nct-11410549

3. **Trusper**
   Industrial safety floor marking tape yellow (₹95 per roll)
   200 rolls (₹1,90,000) Long-lasting, high visibility
   Reference Link - https://www.tradeindia.com/bengaluru/floor-marking-services-city-183339.html

- **Selection of Best Suppliers (Quality vs Cost)**

a) **Storage Bins:** Pack shop (₹7,00,000) offers the best balance of cost and quality focusing on durability and UV resistance critical in textile environments. Other options slightly higher cost or unknown service records.

b) **Floor Marking Tape:** Ameen Enterprises (₹1,70,000) provides competitively priced high-quality tape, fast delivery options with regional presence, preferred for expedited rollout.

2. SAP S/4HANA FIFO Integration Costing

Item	Details	Cost (INR)	Notes	Source URL
SAP S/4HANA Software License	5 User Access License	₹20,00,000 (approx.)	Subscription or perpetual with maintenance included	https://www.erpresearch.com/en-us/sap-s4-hana-costs
SAP Implementation Services	Data Migration, Customization	₹15,00,000 (estimate)	Includes system setup, training	https://www.zetaconcepts.co/products/sap-s4-hana/
Hardware & Infrastructure	Servers, Networks (if onsite)	₹5,00,000 (if applicable)	Cloud deployment might reduce cost	Vendor specific
Support & Training	Staff Training & Support	₹3,00,000	Initial and refreshers	General industry estimate

Total SAP Implementation Cost: ₹43,00,000 (rounded)

3. Overall Total Cost Summary

Solution	Total Cost (INR)
Color-Coded Storage Bins	₹7,00,000
Dedicated Zones & Floor Marking	₹1,70,000
SAP S/4HANA Integration	₹43,00,000
Grand Total	**₹51,70,000**

4. **Cost Recovery and Savings Analysis**

- **Material Handling and Error Cost Reduction:** Estimate ₹15,00,000 annual saving associated with error reduction and faster retrieval.
- **Inventory Write-off Reduction:** Annual savings of approx. ₹10,00,000 from reduced material obsolescence using FIFO.
- **Labor Productivity Gains:** Estimated ₹8,00,000 yearly from reduced manual material handling and improved workflows.
- **Total Savings per Year:** ₹33,00,000

5. **Payback Period:**
Investment (~₹51.7 lakhs) / Annual saving (~₹33 lakhs) ≈ 1.6 years to recover investment.

Cost Calculation for Conveyor Belt

Supplier No.	Name of Supplier	Belt Charges	Motor Charges	Machine Charges	Installation Charges	NBC Bearing Cost (per unit)
1	Anjana Belt	₹30,000	₹6,000	₹2,50,000	₹1,50,000	₹2000
2	Oxford Rubbers Pvt Ltd	₹45,000	₹8,500	₹2,00,000	₹1,50,000	₹2000
3	MSB Belting Enterprises	₹36,000	₹7,000	₹2,20,000	₹1,50,000	₹2000

- **Supplier Selection and Justification**

Selected Supplier: Anjana Belt

a) Lowest belt charge, moderate motor and machine charges.

b) Installation charges comparable to others.

c) Known for durability and local service expertise.

d) NBC bearing cost per unit is standard across all.

- **Conveyor Belt Cost Calculations for Weiss Textile**

Assuming:

- Factory size 50,000 sq. ft, Conveyor belt assembly size 30 meter by 1 meter
- Belt length and requirements as per physical layout to be met by supplier

❖ Estimated total cost:

a) Belt Charges: ₹30,000

b) Motor Charges: ₹6,000

c) Machine Charges: ₹2,50,000

d) Installation Charges: ₹1,50,000

e) Assuming 10 NBC bearings: 10 × ₹2,000 = ₹20,000

Grand Total Conveyor Cost = ₹30,000 + ₹6,000 + ₹2,50,000 + ₹1,50,000 + ₹20,000 = ₹4,56,000

- **Updated Overall Costing (Including previously calculated solutions):**

Solution	**Total Cost (INR)**
Color-Coded Storage Bins	₹7,00,000
Dedicated Zones & Aisle Markings	₹1,70,000
SAP S/4HANA Integration	₹43,00,000
Conveyor Belt Installation	₹4,56,000
Grand Total	**₹56,26,000**

- **Cost-Benefit and Payback**
  Including conveyor belt installation increases the capital outlay but offers major productivity gains through automated material movement and reduced labor strain.

- Estimated yearly savings remain at approx. ₹33,00,000 as earlier calculated
- New payback period = ₹56.26 lakhs / ₹33 lakhs ≈ 1.7 years

❖ Conclusion

Throughout this project, the operational evaluation and subsequent redesign of Weiss Textile's production workflow, facility layout, and inventory management have revealed critical deficiencies and transformative opportunities. The initial assessment surfaced bottlenecks—especially in sewing and quality control stations—and severe challenges in raw material and finished goods storage characterized by poor identification, manual material handling inefficiencies, and the absence of a First-In-First-Out (FIFO) system.

The proposed solutions focus on three fundamental pillars:

1. **Color-Coded Storage Bins:** Instituting a visually intuitive system where fabric types and accessories are sorted by color-coded bins and tags promises to reduce retrieval times and minimize picking errors. This visual management strategy, aligned with 5S principles, provides a sustainable organizational framework pivotal to the high-variety textile manufacturing environment.
2. **Dedicated Zones and Aisle Markings:** The demarcation of Raw Material, Work-In-Progress (WIP), and Finished Goods storage zones through floor markings and well-planned aisle layouts tackles prevalent space utilization gaps. This approach prevents material commingling, reinforces material flow discipline, ensures safety compliance, and optimizes space efficiency in the 50,000 sq. Ft warehouse.
3. **FIFO Integration with SAP HANA:** Leveraging SAP HANA's real-time data processing capabilities enables Weiss Textile to digitally enforce FIFO across all inventory movements. It facilitates batch-level traceability, significantly reduces material aging and wastage, and enables proactive decision-making through intelligent alerts and dashboards.

Additionally, the material handling process has been revolutionized with the integration of an automated conveyor belt system, replacing manual transfers from cutting to packaging stations. This mechanization reduces labour fatigue, speeds up flow, and supports consistent production rhythm.

The rigorous supplier evaluation and costing analysis underscore a feasible and cost-effective path to implementation. The selected suppliers and solutions offer the best value mix between price, quality, and timely delivery. The total estimated investment of approximately ₹56.26 lakhs can be recovered within less than two years through substantial labour cost savings, reduced material obsolescence, improved throughput, and minimized error rates.

This project not only modernizes Weiss Textile's manufacturing ecosystem but also aligns it with global best practices that emphasize lean production, digital transformation, and human-centric operational excellence. The institute's employees will benefit from safer, more effective work practices while the company strengthens its market positioning through improved customer satisfaction and operational agility.

Future efforts should focus on continuous monitoring of implemented solutions using predefined KPIs such as inventory turnover, process cycle times, quality compliance rates, and employee feedback. The modular design of the solutions allows for scalable expansion and integration of additional Industry 4.0 capabilities such as IoT-based real-time monitoring and AI-driven predictive analytics.

In summation, the comprehensive overhaul of Weiss Textile's operational framework is an exemplary model of how strategic, technology-enabled interventions can drive tangible business outcomes in SME textile manufacturing environments.

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