DISCOVERY STAGE DOCUMENT

2.1 As-is Analysis of Price Tag Management Subprocess within "Prepare" stage of sales business-process.
Discovery Stage Document for Electronics Retail Chain.

Project: integration of Electronic Shelf Labels (ESL) for Electronics retailer.
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2.2 Objective.

To analyze and document the current manual price tag replacement subprocess within the "Prepare" stage of the sales business-process, identify operational bottlenecks, quantify time and resource variability, and establish baseline metrics for automated ESL implementation evaluation.

2.3 Scope of Analysis.

In Scope:
- Price tag management subprocess within "Prepare" stage of sales process
- All involved roles: Salesperson (primary), Store Admin, Store Director, Cashier.
- Current tools: ERP system, browser in PC admin panel, printers, ink, paper, scissors and other supplies with risks related to them
- Time measurements and process variability analysis

Out of Scope:
- Other "Prepare" stage activities (cleaning, self-preparation, etc.)
- Remaining sales business-process stages
- Checkout and payment processes

- Inventory management and restocking operations
- Technical development of the ESL system or PDS integration (covered later)

2.4 Current Process Analysis. (Based on author's work experience and informal stakeholder discussions)

Key Process participants:

Role	Involvement in Price Tag Process	Own "Prepare" Duties
Salesperson	Reviews ERP, print/cut/place tags, verify price accuracy	Visual product merchandising, product alignment, cleaning
Cashier	Helps print and cut tags when not engaged with primary duties	Prepare and open the register, verify financial reports
Store Admin	Performs full tag cycle and coordinates store associates, covers salesperson, and cashier if needed	Check all KPI reports and share them, and other store updates with management. Tracks updates in Company and informs the Team about them.
Store Director	Occasionally joins cutting/placement, verifies pricing	Repeated from Store Admin's but with other reports.

Clarifications:

While formal responsibility for price tag replacement is often assigned to the salesperson, during major revaluations such as the start of the month, promo launches or ends, brand-specific updates, the task becomes shared operational subprocess within the "Prepare" stage.

In those scenarios, all staff may take direct action: printing, cutting, replacing tags, verifying prices accurately. This collaboration happens when physical workload and timing outweigh formal job descriptions.

- The official model looks like: Salesperson does > Cashier assists > Director/Admin checks and validate.

- The real model: "One for all and all for one", with the note that only salespersons and admins usually walk the floor to place tags.

Process Role Flexibility:

- All preparation tasks (ERP access, printing, cutting) can be performed by any available staff member

- Floor placements are primarily done by Salesperson, occasionally Admin or even Director. Cashier excluded due to duties

- Actual task assignment depends on current workload and staff availability rather than formal job descriptions

2.5 Current Process Description (As-Is).

Manual Price Tag Replacement Subprocess:

This subprocess starts before the store opens (for clients) focuses on the printing and replacing price tags for revaluated products. Although initiated by the salesperson (direct duty), it is common for all available staff to assist during peak loads.

Step-by-Step Flow:

1. ERP Access and Revaluation Selection – Store associate logs into the ERP system, navigates to "Revaluation" section, and identifies which have "For retail" mark. Associate opens each revaluation batch and review what formats of price tags are needed;

2. Admin Panel Interaction – The revaluation number is copied from ERP and pasted into the browser-based admin panel. Based on filters, the system returns only actual products present in store stock;

3. Label printing – Tags are printed on paper;

4. Manual Cutting – Printed labels are manually cut using scissors. Also, promo price tags may require yellow paper or/and ad wobblers;

5.   Product Walkthrough – Store associate physically moves through the store to locate target items and their old tags;

6.   Inventory Adjustment – If a product is misplaced, or missing – it's fetched from the store storage, unpacked and shelved on the correct place;

7.   Tag Replacement – Old price tags are removed and replaced with the new printed. Attention is paid to correct placement, paper color, format and wobbler if needed;

8.   Confirmation – Completion is often confirmed verbally. Store management may casually verify that the process is finished (based on trust and mutual responsibility). Sometimes this informal approach may occasionally lead to mistakes.

Additional Notes:

●   Each revaluation batch may contain a lot of products, but filters reduce that to the actual items.

●   Promo campaigns, brand-specific offers, etc., may lead to multiple revaluations per week, repeating the process for the same products (sometimes for each).

●   Errors such as using white instead of yellow paper/incorrect format, may require reprinting and redoing certain price tags.
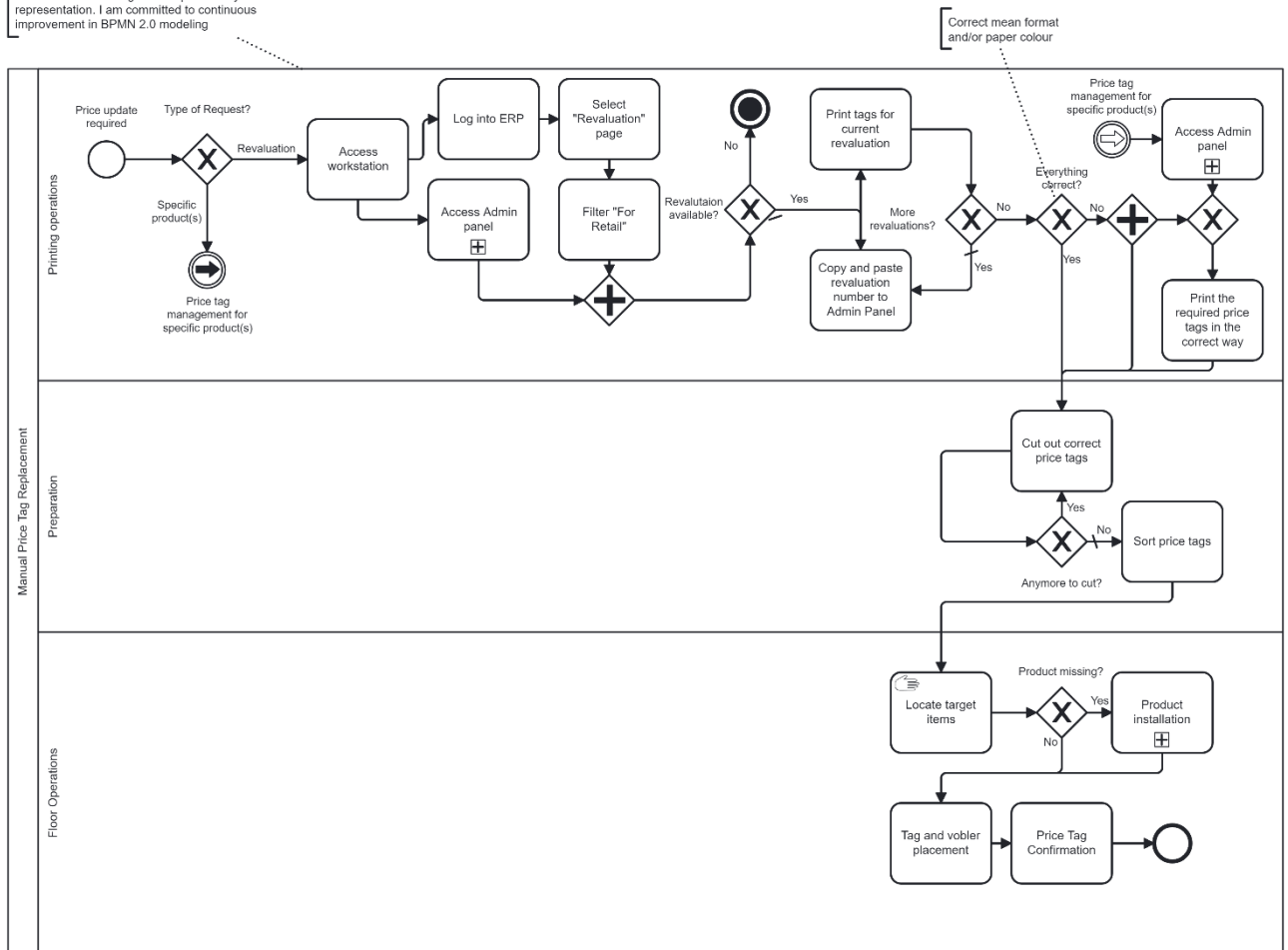
2.6   As-Is BPMN diagrams:

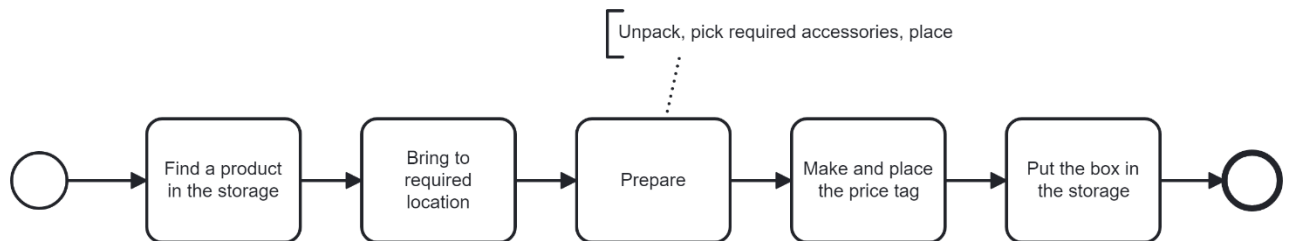Image 1 – Manual Price Tag Replacement As-Is BPMN Diagram
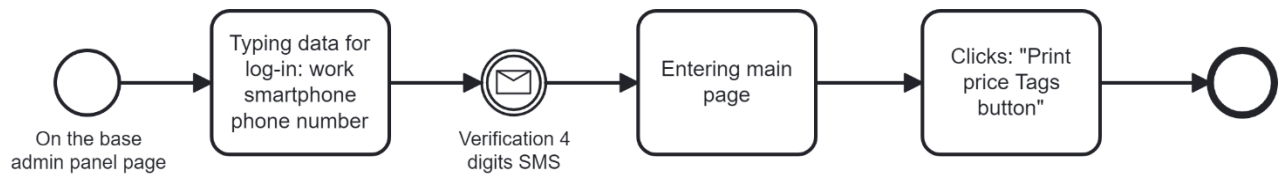

Image 2 – Product installation subprocess

Image 3 –Access Admin Panel Subprocess Diagram

2.7 Time Analysis and Process Variability.

Based on operational observations, the manual price tag replacement subprocess demonstrates significant time variability depending on revaluation volume, promo activities and operational context.

Scenario-Based Time Analysis:

Scenario	Time Range	Key Factors	Frequency
Minimal Updates	5-15 minutes	≤10 tags, quick print and place	Occasional
Standard Daily	≤35 minutes	Regular price adjustments, ≤20 tags	Most days
Major revaluation	1.5+ hours	Month-start, promo/brand specific revaluations: ≥30 tags	Monthly/Seasonal
Interrupted Process	Unpredictable	Customer priority, delivery assistance, urgent tasks	Frequent

Process Step Time Distribution:

Process Step	Time Range	Main Variability Drivers
ERP review and revaluation selection	2-10 minutes	System performance, number of active revaluations
Admin panel data entry	5-20 minutes	Copy-paste, quick selection, validation for future printing workflow
Label printing and cutting	5-35 minutes	Printer queues, paper changes, manual cutting fatigue
Store walkthrough and placement	5-40 minutes	Walking distance, product location accuracy, interruptions
Inventory adjustment (when needed)	5-20 minutes	Storage accessibility, product unpacking requirements

Peak Load Impact Scenarios:

- Major revaluations: requiring 1.5≥ hours of dedicated attention, across different categories with special formatting requirements and wobblers installation.

- Seasonal Transitions: Holiday pricing adjustments affecting multiple product lines

- High Customer Traffic Days: Process competes with customer service priorities, creating delays

Factors of Variability:

- Staff availability and role flexibility during peak periods

- Equipment reliability (printers, scissors, paper supply)

- Product displacement requiring storage retrieval

- Incorrect price tags necessitating reprinting cycles

- Multiple revaluations for the same products during the period

Operational Impact:

The high variability creates unpredictable workload distribution, with some days requiring minimal price management (5-15 minutes) while others demand several hours (1.5≥), significantly impacting other "Prepare" stage activities and customer service availability.

2.8   Key Finding and Pain Points.

Based on the observed subprocess, staff feedback, and time variability analysis, the following critical issues and pain point have been identified:

Operational Pain Points:

1.   High Manual Labor Load - Manual price tag operations - from ERP navigation to printing, cutting, and placement - consume up to hours during peak periods, significantly impacting daily operations.

2.   Staff Role Disruption - All available employees may be pulled into tag management, disrupting their primary duties (cashier operations, KPI reporting, product merchandising, cleaning, customer service).

3.   Repetition & Redundancy - Some products undergo multiple rounds of revaluation in a single week due to promotions, rollbacks, or formatting corrections requiring the entire process to be repeated for identical items.

4.   Format/Paper Mistakes - Incorrect use of paper color or tag format leads to wasted materials and repeat printing/cutting cycles, increasing operational costs and reducing staff efficiency.

5.   Physical Fatigue & Resource Inefficiency - Prolonged walking, cutting, and manual handling leads to employee fatigue, inconsistent price tag quality, and inefficient allocation of staff resources.

6.   Informal Verification Process - Process completion is typically verified informally through trust-based verbal confirmation, increasing the likelihood of missing price tags or incorrect placements.

7.   Price Mismatches at Checkout - When customers encounter incorrect pricing (old tags not replaced), Ukrainian consumer law requires honoring the displayed price, leading to direct revenue loss or customer conflicts at checkout.

8.   Customer Service Delays - While price tags are being updated, customer-facing staff become partly unavailable, resulting in reduced customer engagement and slower assistance response times.

9.   Compromised Store Readiness at Opening - During periods of significant revaluation, store staff may be unable to complete all price tag updates before opening hours. This necessitates tagging work to continue while customers are present, leading to suboptimal store presentation, missing or incorrect price tags, and negative initial customer experience.

Impact Summary

Category	Impact
Staff Time	Up to 1.5≥ hours/day lost on manual subprocess operations
Material Costs	Wasted paper, ink cartridges, scissors
Error Risk	Manual input/output errors, price tag mismatches
Customer Experience	Price confusion, checkout conflicts, delayed assistance
Business Risk	Revenue loss from honoring outdated displayed prices

Strategic Implications:

The identified pain points demonstrate that the current manual price tag management subprocess creates substantial operational inefficiencies, increases business risk exposure, and negatively impacts customer experience. These findings provide strong justification for automated ESL implementation to eliminate manual bottlenecks and ensure pricing accuracy.

2.9   Current System Limitations.

Despite staff coordination and adaptive teamwork, the existing paper price tag management system presents multiple limitations across technology, process, and resource domains.

1.   No Real-Time Price Synchronization: ERP system is not directly connected to physical price displays - every price change requires manual intervention and multi-step processing.

2.   No Error Validation: The system does not detect format errors, incorrect paper selection, or missed products. Mistakes are discovered only after printing or during checkout.

3.   No Mobile Support for retail price: Tag reassignment or verification requires laptop with scanner and access into ERP system, limiting floor-level operations and real-time adjustments.

4.	Fragmented Workflow Tools: ERP and Admin Panel operate as separate systems requiring copy-paste operations between platforms, increasing risk of human error and data entry mistakes.

5.	Linear, Sequential Workflow: Tasks such as printing, cutting, and placing tags cannot be parallelized from the beginning, making the process inherently slow and inflexible during peak periods.

6.	Equipment Dependency (occasionally): Printer, cutting tools, and finite paper supply create single points of failure that can halt the entire process.

7.	Supply Chain Risks: White and yellow paper, and ink supplies may be unavailable during critical periods, particularly during promotional campaigns when demand peaks.

8.	Competing Priority Management: Staff must balance price tag replacement with primary responsibilities, resulting in divided attention and increased error probability during multitasking scenarios.

9.	Limitation Impact Summary: The current price tag management system is non-scalable, error-prone, labor-intensive, and operationally fragile. It relies heavily on human reliability, creates workflow bottlenecks, and introduces unnecessary business risks in critical retail operations.

10.	No Digital Infrastructure: Current paper-based system lacks any digital connectivity, requiring future implementation of Zigbee mesh network infrastructure via ESL Base Stations for automated price management.

System Readiness Assessment:

These limitations demonstrate that the current manual system has reached its operational capacity and cannot effectively support business growth, promotional complexity, or operational efficiency requirements. The identified constraints provide clear justification for automated ESL implementation.

2.10   Economic Impact Analysis and Quantified Cost Breakdown.

Author's Slogan - "From manual chaos to Automated Clarity".

The current paper-based process is time consuming, error=prone, and unscalable. Implementing an ESL system will eliminate manual labor, reduce human error, and free up staff for higher-value activities such as customer service, and generally improve the efficiency of the store, and therefore the company.

Baseline Staff cost Structure

Role	Days/Month	Hours/Day	Hours/Month	~Salary/Month (UAH)	~Hourly Rate (UAH)
Salesperson	22	12	264	45 000 ₴	170,5 ₴
Cashier	22	12	264	26 000 ₴	98,5 ₴
Admin	22	8	176	30 000 ₴	170,5 ₴
Director	22	8	176	40 000 ₴	227,3 ₴

Daily Operations

Role	~Involevment (%)	~Time/Day (min)	~Time/Month (hours)	~Cost/Month(UAH)
Salesperson	70%	24,5	9,4	2 041,7 ₴
Cashier	10%	3,5	1,5	126,4 ₴
Admin	10%	3,5	1,3	255,2 ₴
Director	10%	3,5	1,3	328,1 ₴
Staff	100%	35	13,5	2 751,4 ₴

Major Revaluation

Role	~Involevment (%)	~Time/ Day (min)	~Time/ Month (hours)	~Cost/Month(UAH)
Salesperson	50%	50	19,2	4 166,7 ₴
Cashier	20%	20	8,7	722,2 ₴
Admin	20%	20	7,3	1 458,3 ₴
Director	10%	10	3,7	937,5 ₴
Staff	100%	100	38,8	7 284,7 ₴

Additional Operational Costs

Cost Category	~ Monthly Cost (UAH)	Description
Materials	25 000 ₴	White/yellow paper, cartridges
Equipment (wear & tear)	5 000 ₴	Printers repairing, Scissors, logistics expanses
Pricing error looses	3 000 ₴	Dismount for price mismatches
TOTAL	33 000 ₴	-

Total Price Tag Management Costs

Operation Type	Time/ Month	Costs/ Month	Total staff time %
Daily	13,5	2 751,4 ₴	1,4%
Major	38,8	7 284,7 ₴	4,1%
Total	52,3	10 036,1 ₴	5,6%

Salesperson example of Time Distribution Analysis

Activity	~Time %	Hours/Month	Optimization Potential
Price tag Management & Merchandising	25%	69	Will eliminate 95% of this time
Breaks	8%	22,08	x Regulatory
Direct Sales	15%	41,4	Can be Increased
Customer consultations	40%	110,4	Can be Increased
Other tasks	12%	33,12	x Administrative

ESL Implementation Economic Impact

Saving Source	Monthly Savings (UAH)	Annual Savings (UAH)
Price tag labor costs	10 036,1 ₴	120 433 ₴
Materials & supplies	33 000 ₴	396 000 ₴
Pricing error losses	3 000 ₴	36 000 ₴
TOTAL	46 036,1 ₴	552 433 ₴

Comparison: As-Is vs To-be (ESL Future State):

Dimension	Current Process (As-Is)	Future State (To-Be)
Price updates	Manual: ERP>copy>Admin Panel> Print>Cut>Manual Place	Automatic: PDS> ESL
Price tag formats and paper	Manual format selection, paper color, frequent reprints	Digital – always accurate
Staff involvement	Often All staff engaged for hours	Minimal: occasional reassignment only
Time Spent	35-90+ minutes per day	~5 minutes, smartphone QR-scan reassignment
Customer Experience	Errors, old price tags and conflicts within it	Always synced, accurate pricing
Risk Exposure	High, revenue loss from price mismatches	Near-zero, with proper sync

2.11 Short Summary and Next Steps.

The comprehensive As-Is analysis provides compelling evidence that the current manual price tag management system has reached its operational limits and poses significant business risks. The quantified costs, identified inefficiencies, and strategic implications clearly justify investment in ESL automation. The transition from manual to automated price management represents not just an operational improvement, but a strategic transformation that will enhance customer experience, optimize staff productivity, and position the retail chain for sustainable growth in an increasingly competitive market.

Project Recommendation: proceed with ESL implementation planning and vendor evaluation, targeting pilot deployment within x days of project approval.