# RecallLink: Cross-Border Recall Monitoring Database for Korean Product Safety Agencies

IMEN891K Term Project

2026. 10. 22.

Team Glory (Team 08)
[Junhui Park, Huisun Eom, Seungah Lee, Shinyeong Lee, Gyujin Park]

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01

# Introduction

Recall Concept

Problem Background

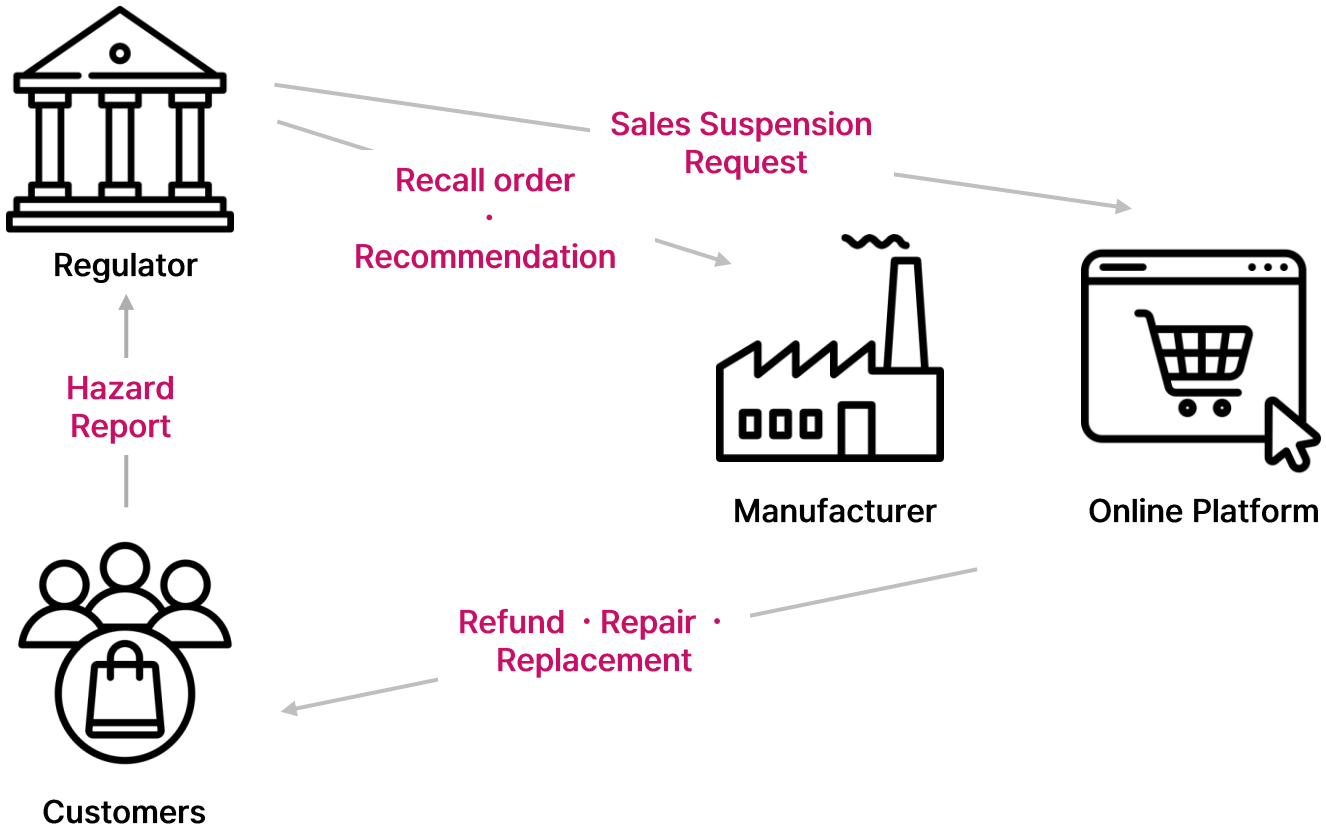
Project Objective

# Introduction



## What is a Recall?

- When a product is found unsafe, product safety authorities issue a recall order or recommendation.
- Manufacturers and sellers stop sales and take corrective actions, while consumers may receive refunds, repairs, or replacements.



# Introduction



## Recalled products continue to circulate in the Korean market

- Overseas products continue to circulate in South Korea, even after sales-blocking measures.
- In 2026, 70.9% of overseas recalled-related blocking cases involved products being redistributed.

### '안전성 문제' 해외 리콜 제품들, 국내에서 버젓이 팔렸다

입력 2026.04.16 21:11
수정 2026.04.16 21:12

정유미 기자 youme@kyunghyang.com

**가전·화장품 등 1396건 유통 차단**

해외에서 안전성 문제로 리콜된 제품들이 국내에서 버젓이 유통되고 있어 주의가 요구된다.

한국소비자원은 지난해 국내에서 유통 중인 해외 리콜 제품 1396건에 대해 유통 차단 등 조치를 취했다고 16일 밝혔다.

소비자원에 따르면 최근 3년간 해외 리콜 제품 시정조치 수는 2023년 983건에서 2024년 1336건, 지난해 1396건 등으로 해마다 늘고 있다. 지난해 시정조치된 제품 중 국내 유통이 처음 확인된 것은 826건으로 전년보다 43.2% 증가했다.

### 해외리콜제품 막아도 또 팔려…올해 차단 71% 온라인 재유통

재유통 차단 5년새 10배…음식료품·아동용품 등 생활제품 899건 달해

최수빈 기자 | 기사입력 : 2026/09/15 [12:22:00]




**올해 8월까지 재유통 차단 321건, 70.9%**
**동일 판매자 반복판매 여부도 확인 못해**
**"플랫폼 직접 모니터링·반복 판매자 관리를"**

[동아경제신문=최수빈 기자] 해외에서 안전 문제로 리콜된 제품이 국내 온라인 플랫폼에서 판매가 차단된 뒤에도 다시 유통되는 사례가 급증하고 있는 것으로 나타났다. 특히 올해 들어서는 해외 리콜제품 판매 차단 건수 가운데 10건 중 7건이 한 차례 차단된 제품의 '재유통'인 것으로 집계됐다.

<연도별 해외 리콜제품 국내 유통·차단 현황>

| 구분 | '21년 | '22년 | '23년 | '24년 | '25년 | '26년 8월 | 합계 |
|---|---|---|---|---|---|---|---|
| 최초 차단건수 | 382 | 600 | 473 | 577 | 826 | 132 | 2,990 |
| 재유통 차단건수 | 58 | 207 | 513 | 759 | 570 | 321 | 2,428 |
| 합계 | 440 | 807 | 986 | 1,336 | 1,396 | 453 | 5,418 |

# Introduction

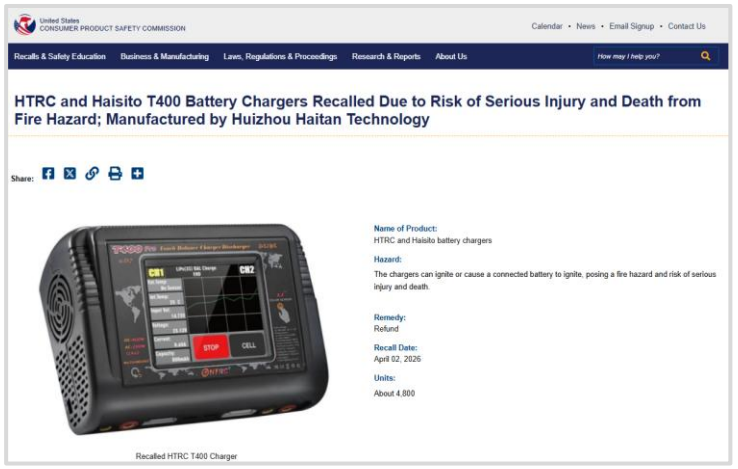


## Recalled products continue to circulate in the Korean market

**CPSC Recall**
U.S. product recall
Date: 2026.04.02.

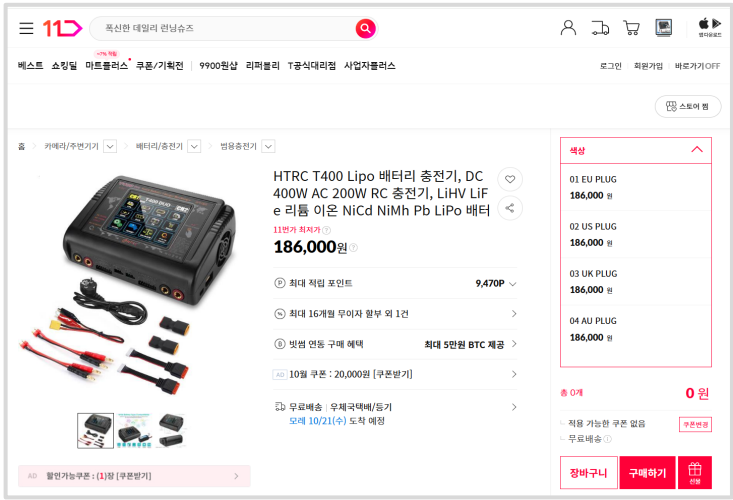
**Consumer24 Notice**
Recall information
Date: 2026.06.30.

**11street Listing**
Listing observed later
Date: 2026.10.22.





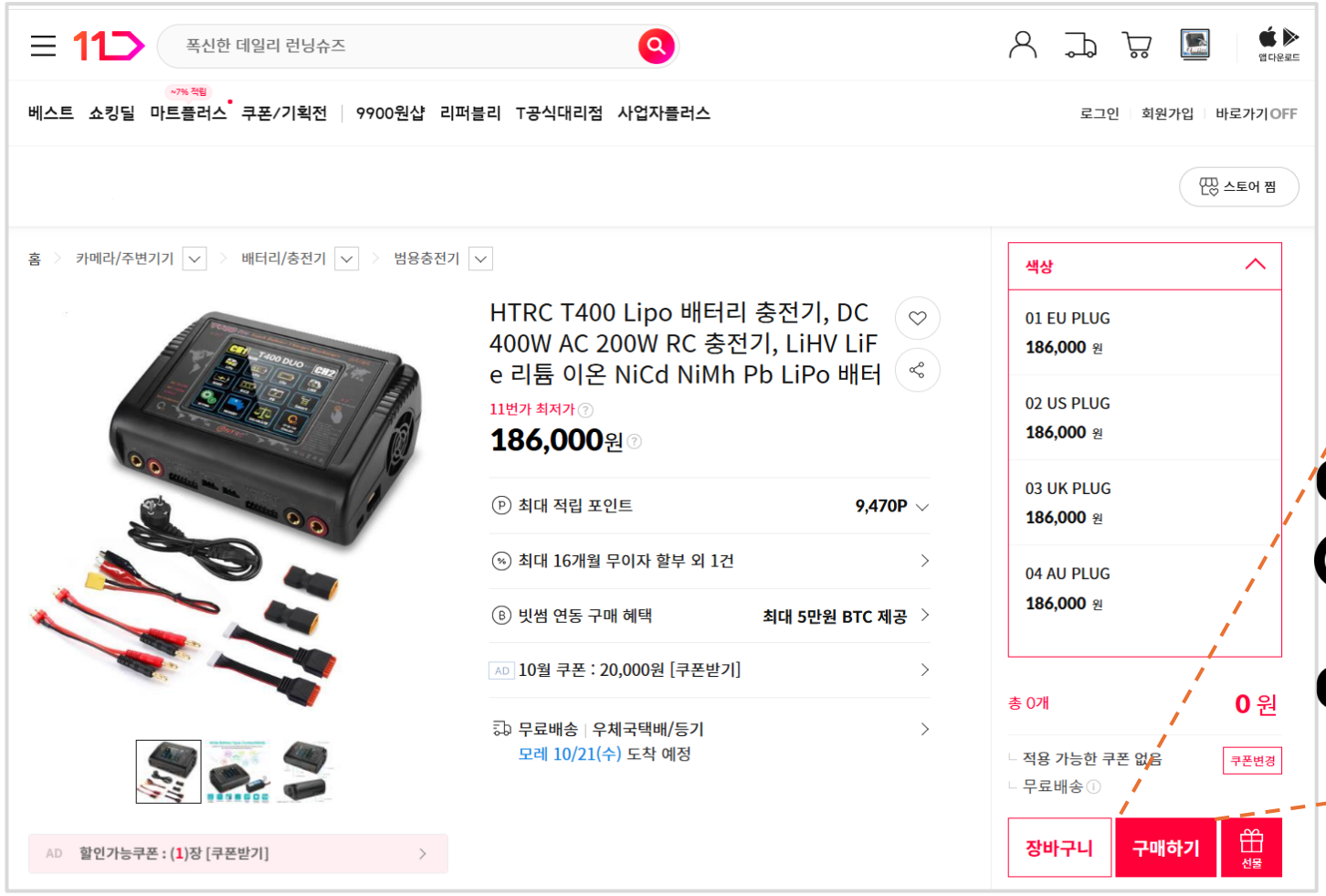




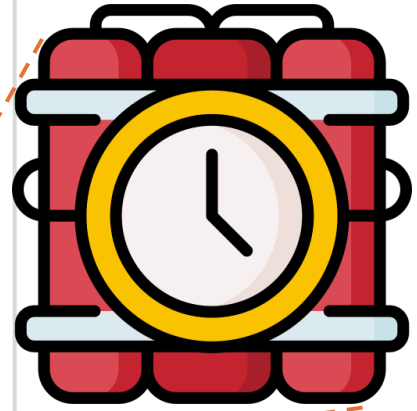
# Introduction



## Recalled products continue to circulate in the Korean market




"Add to cart.
Add fire risk"



# Introduction



## Why do recalled products remain on the market?

- Recalled products may remain accessible to Korean consumers due to two key gaps in the current product safety monitoring system.

### 1. Recall Sales-Blocking Gaps



- Product safety agencies share recall information with UPSS for sales blocking.
- Some recalled products remain listed or reappear online.

### 2. Cross-Border Screening Gaps



- Korean customs authorities conduct safety screening of cross-border shipments.
- Limited product information can hinder the identification of recalled products.

# Introduction



## Existing gaps in the sales-blocking system for recalled products

- In South Korea, the UPSS aims to prevent recalled and unsafe products from being sold.
- Regulatory Agencies provide product safety information to UPSS, which shares it with retailers to support sales blocking.

국가기술표준원
Korean Agency for Technology and Standards

식품의약품안전처
Ministry of Food and Drug Safety

기후에너지환경부
Ministry of Climate, Energy and Environment

**Regulatory Agencies**
Safety Inspection

대한상공회의소
KOREA CHAMBER OF COMMERCE AND INDUSTRY

위해상품 판매차단 시스템
Unsafe Product Sales Prevention System

**System Operator**
KCCI/UPSS



**Retailers**
Sales Blocking

# Introduction



## Existing gaps in the sales-blocking system for recalled products

- Despite monitoring efforts by product safety authorities and automated hazard-data sharing via UPSS, recalled products conti nue to be relisted on online marketplaces.
- Existing monitoring systems still face challenges in effectively detecting and preventing the online sale of recalled products.




**Regulatory Agencies**
Safety Inspection

**System Operator**
KCCI/UPSS

**Retailers**
Sales Blocking

# Introduction



## Limitations of cross-border product safety screening

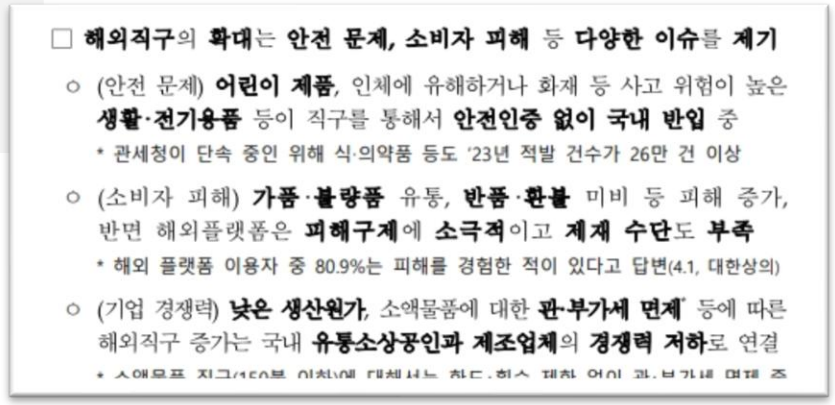
- Cross-border e-commerce raises consumer safety concerns, as some products enter South Korea without domestic safety certification.
- Early detection of recalled products is needed to reduce risks before purchase.



관세청 Korea Customs Service

### Recall Detection Gap

- Limited product information
- Not all overseas recalled products can be identified [1]



□ **해외직구**의 **확대**는 **안전 문제, 소비자 피해** 등 **다양한 이슈**를 **제기**

○ (안전 문제) **어린이 제품**, 인체에 유해하거나 화재 등 사고 위험이 높은 **생활·전기용품** 등이 직구를 통해서 **안전인증 없이 국내 반입** 중

* 관세청이 단속 중인 위해 식·의약품 등도 '23년 적발 건수가 26만 건 이상

○ (소비자 피해) **가품·불량품** 유통, **반품·환불** 미비 등 피해 증가, 반면 해외플랫폼은 **피해구제**에 **소극적**이고 **제재 수단**도 **부족**

* 해외 플랫폼 이용자 중 80.9%는 피해를 경험한 적이 있다고 답변(4.1, 대한상의)

○ (기업 경쟁력) **낮은 생산원가**, 소액물품에 대한 **관·부가세 면제** 등에 따른 해외직구 증가는 국내 **유통소상공인과 제조업체**의 **경쟁력 저하**로 연결



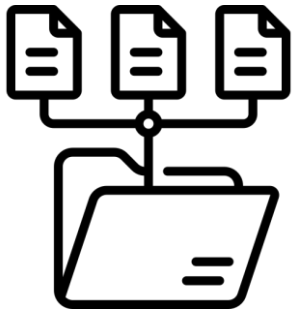
[1] Source: Joint Government Ministries. (2024, May 16). Measures to strengthen consumer safety and enhance business competitiveness in response to the growth of cross-border e-commerce [Government policy report] Government of the Republic of Korea.

# Introduction



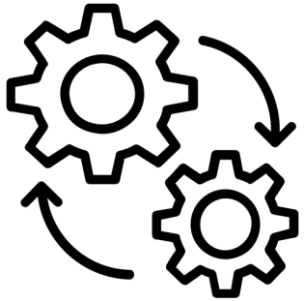
## Automated Recall Product Monitoring System

Build an integrated database and web-based system to automatically detect internationally recalled products that remain listed or reappear on Korean online marketplaces



### Integrated Database

Connect international recall data with online listings



### Automated Detection

Automatically identify potential matches using images and text



### Web-based Monitoring

Display flagged listings and supporting evidence



### Support Agencies

Support government agencies in reviewing and taking action

02

# Framework

Pipeline | Data Collection | Matching Strategy

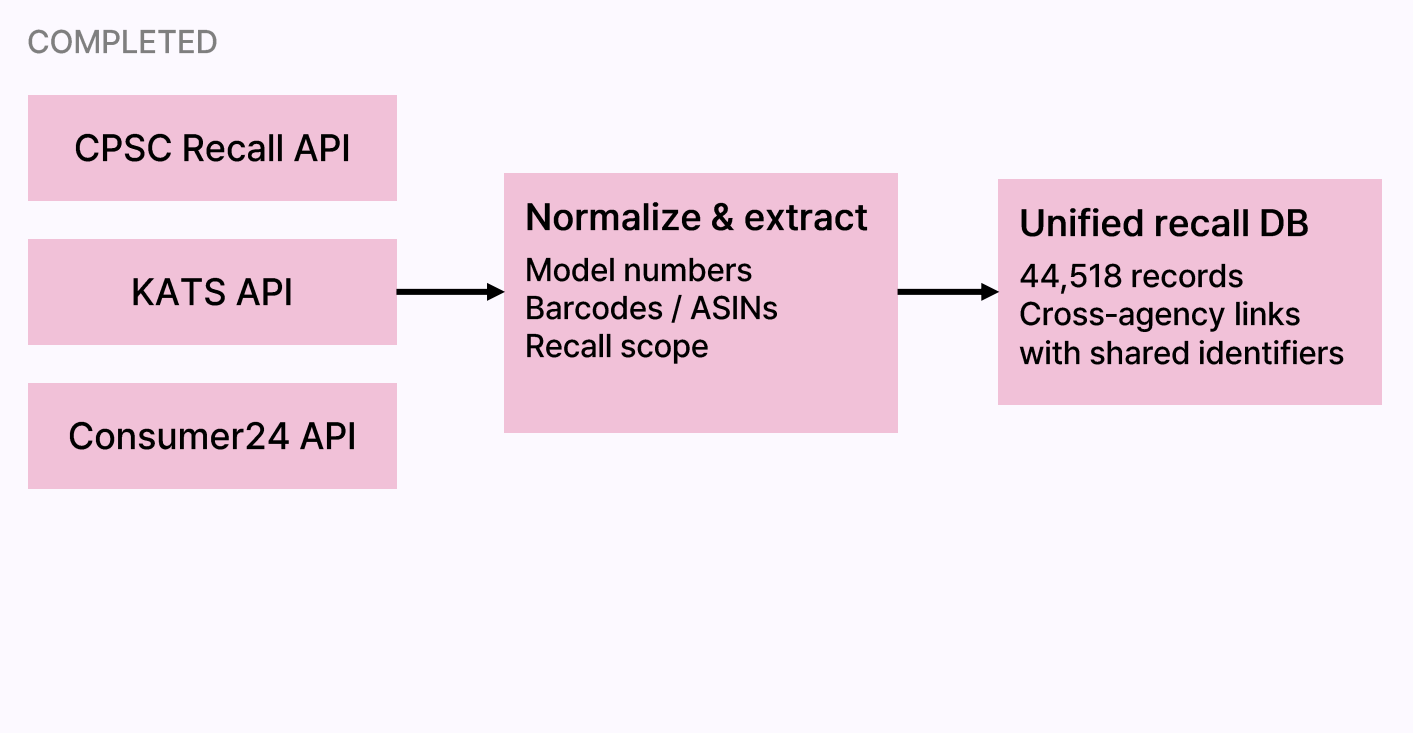
# Framework



## From Recall Notices to Review Candidates

- Link notices across agencies first, then compare with Korean listings.

Completed  Planned



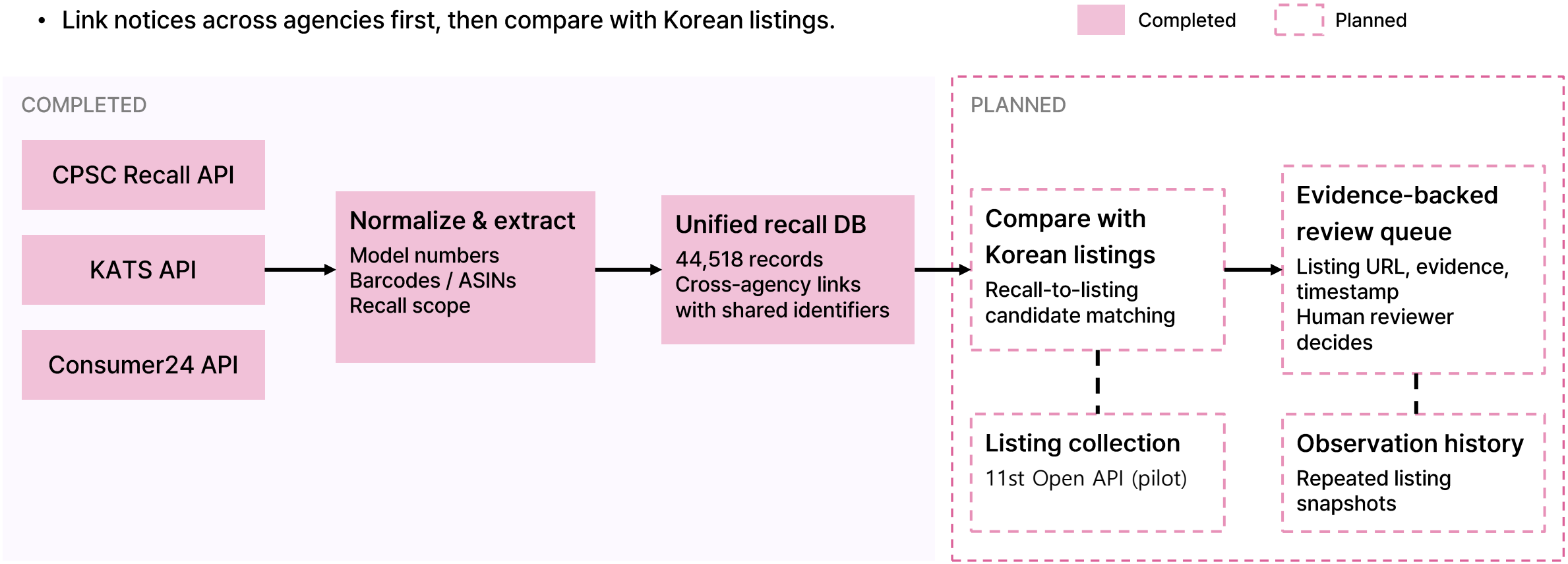

*Output: Potential matches for human review, with supporting evidence.*

# Framework



## From Recall Notices to Review Candidates

- Link notices across agencies first, then compare with Korean listings.




*Output: Potential matches for human review, with supporting evidence.*

# Framework



## Three Public Recall APIs → One Recall Database

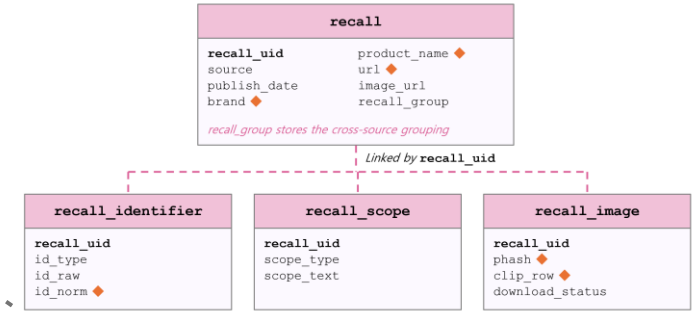
- The same recall appears in several agencies; each source adds a different piece of evidence.

**CPSC (U.S.)**
Original notice + photos

**KATS Overseas Recalls**
Korean product names

**Consumer24 (KCA)**
Barcodes, lot / date scope

**44,518**
recall notices in one recall DB

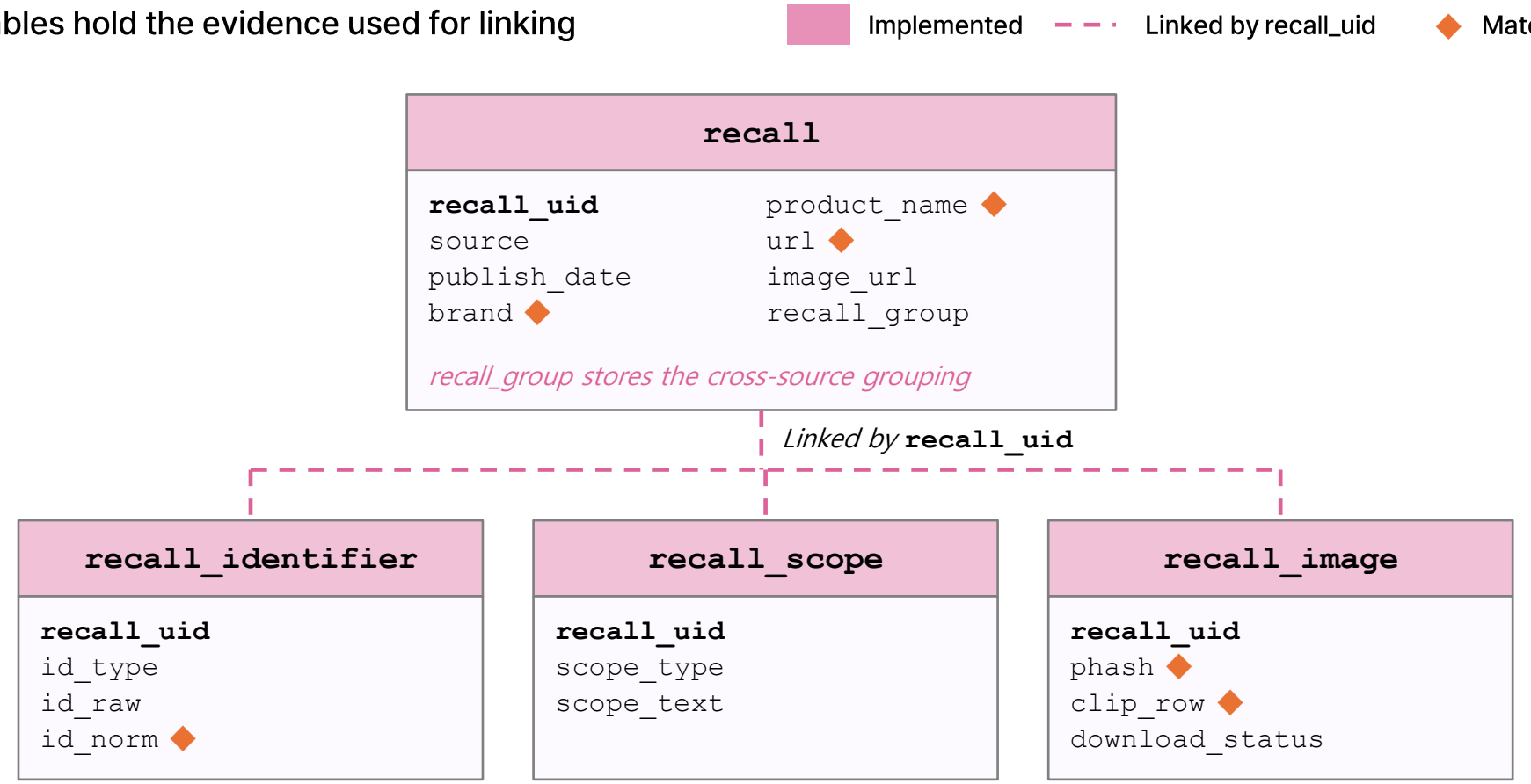


# Framework



## Recall Database: Records and Matching Evidence

- Per-record tables hold the evidence used for linking




*Current prototype: primary-key and foreign-key constraints are not yet declared.*

# Framework



## Three Public Recall APIs → One Recall Database

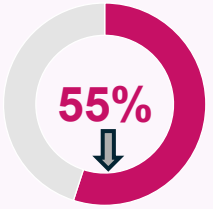
- The same recall appears in several agencies; each source adds a different piece of evidence.

**CPSC (U.S.)**
Original notice + photos

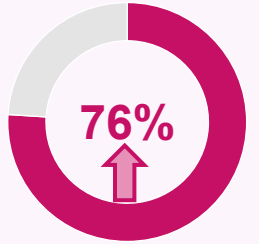
**KATS Overseas Recalls**
Korean product names

**Consumer24 (KCA)**
Barcodes, lot / date scope

**44,518**
recall notices in one recall DB




have a model no. or barcode




have a product photo

**→ Text alone misses about half photos fill the gap**

# Framework



## One Image Pipeline, Two Matching Tasks

- Text first: exact model no. / barcode. Images help when a listing title has no model no.

Completed | Pilot | Planned

**Photos**

Recall photo

Listing photo

**IMAGE FEATURES**

**pHash (64-bit)**
Same photo?
reused or near-identical

**CLIP (ViT-L/14)**
Same product?
visually similar

**TASK 1 / COMPLETED**

**Recall photo ↔ recall photo**

Same recall from two agencies: tests the matcher where the answer is known

**80%**

right product in top 10
(2,886 queries)

**TASK 2 / PLANNED**

**Listing photo ↔ recall photo**

Ranks listing candidates; model no. and recall scope confirm them

Final: 11st listings

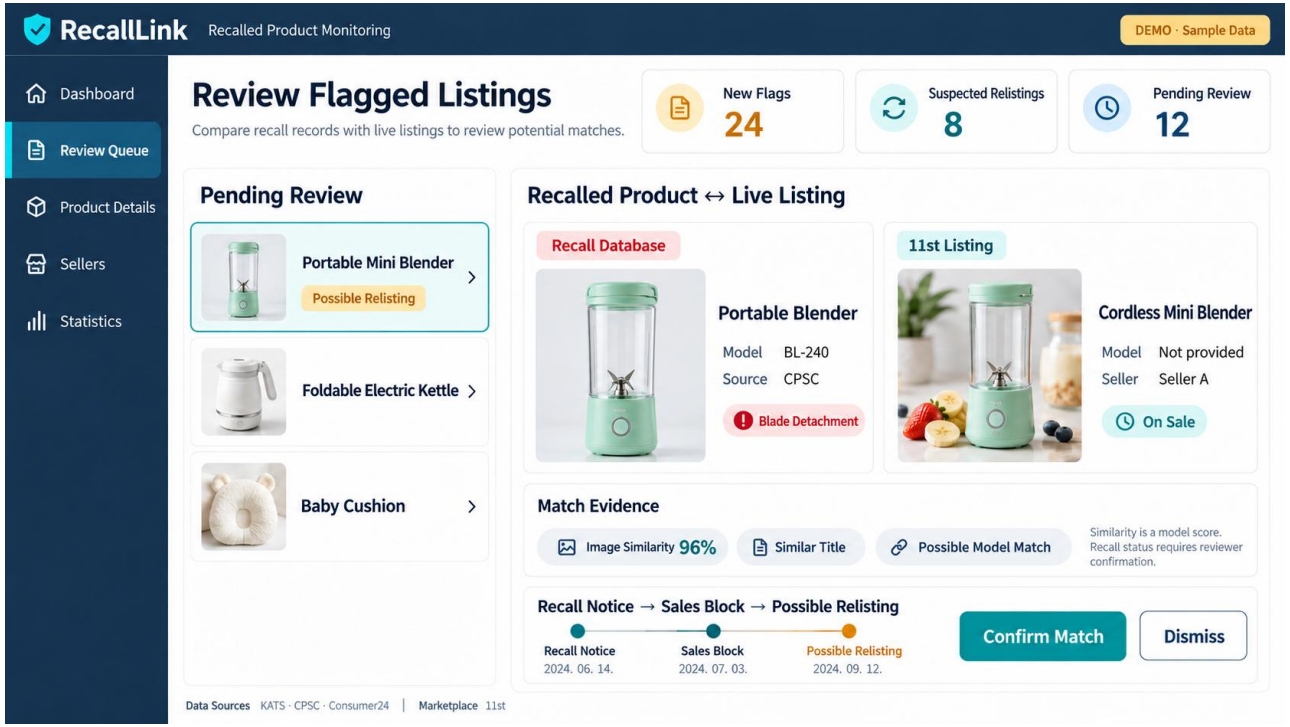
*Similarity alone does not confirm a recall; text, recall scope, and human review decide.*

# 03

# Expected Results and Impacts

# Expected Results and Impacts

## Proposed Web-Based Monitoring Dashboard




Conceptual UI mockup - illustrative data

### Recall Detection

Earlier detection; Identify recalled products shortly after listing, reducing consumer exposure

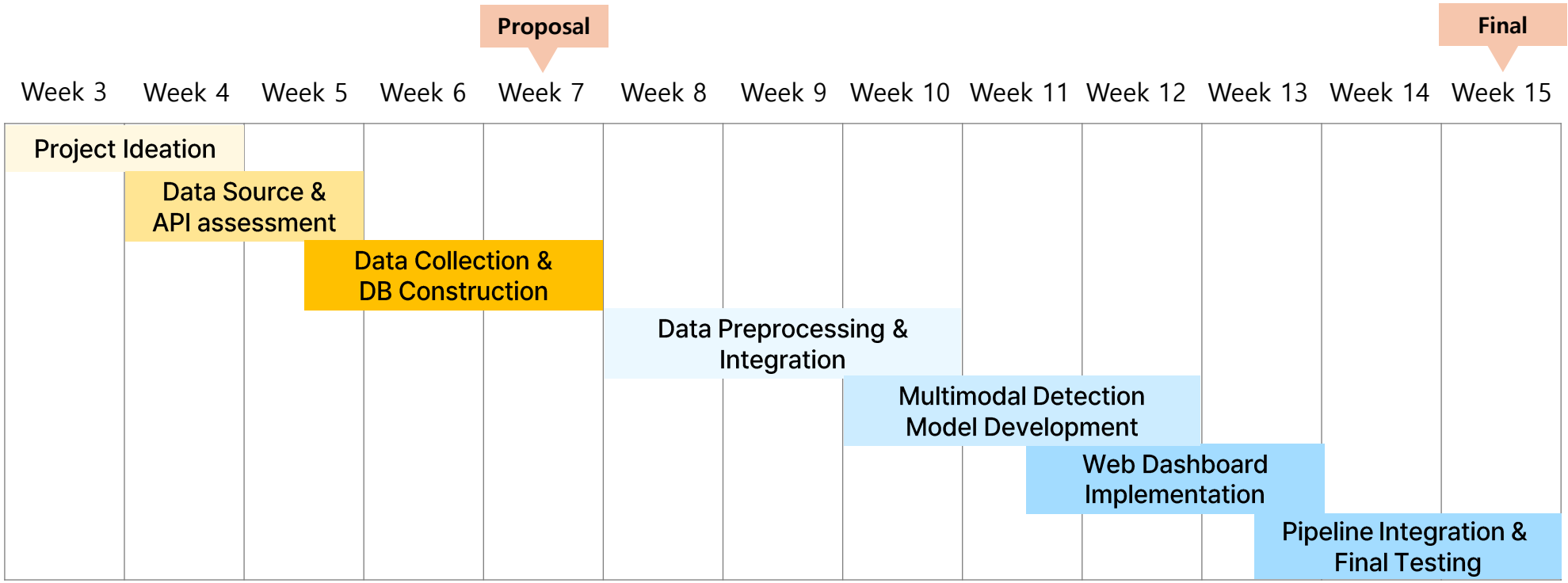
### Multimodal Matching

Fewer detection blind spots; Detect recalled products with missing or modified identifiers using images and text

### Monitoring & Review

Efficient monitoring; Prioritize flagged listings for review, reducing manual monitoring efforts

# Future Plan




## Proposal

- Problem Definition & Objectives
- System Architecture & DB design
- Data Feasibility & Preliminary Results

## Final

- Integrated Data Pipeline
- Detection Model & Evaluation
- Web Dashboard & Live Demo

# Thank you

Thank you for listening to the presentation

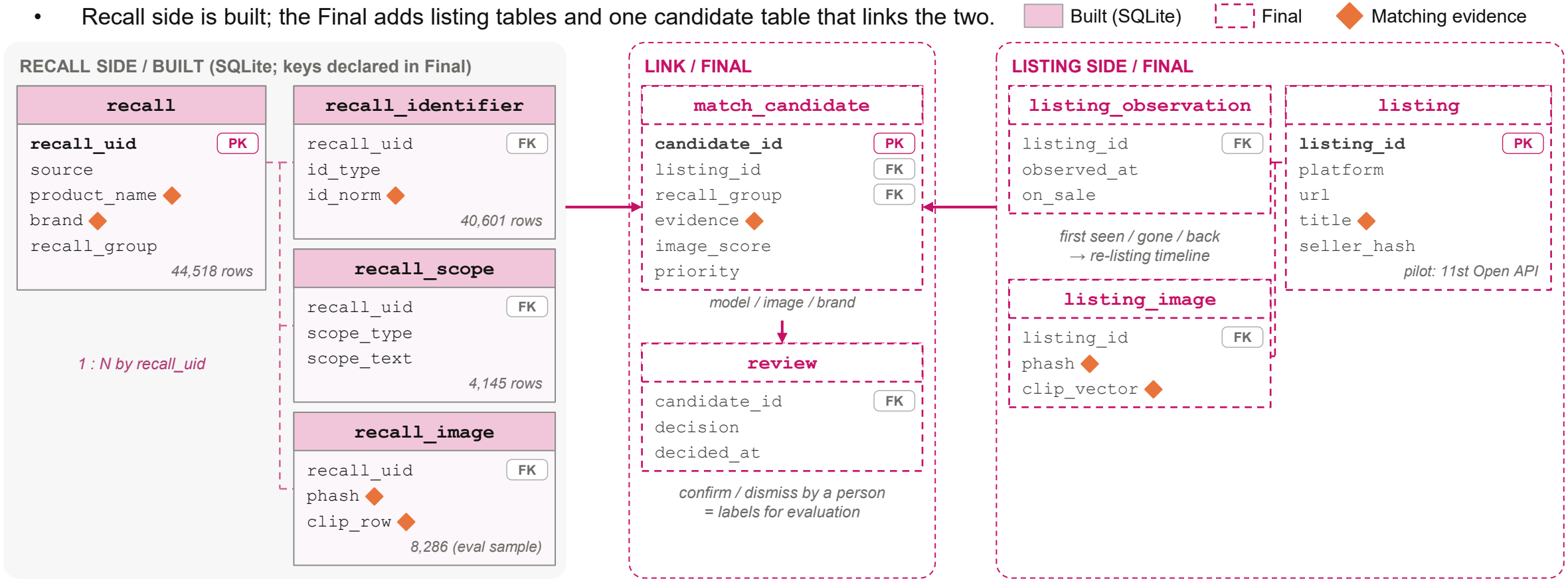
Pohang University of Science and Technology

2026. 10. 22.  Presenter : Junhui Park

# Appendix

## Database Design: Recall Evidence ↔ Korean Listings

- Recall side is built; the Final adds listing tables and one candidate table that links the two.




**Final in PostgreSQL:** PK / FK declared / CLIP vectors in pgvector / raw API JSON kept as JSONB / 11st: minimal fields under API terms, sellers hashed

# Appendix

## Data Overview & Motivation

### Integrated DB Description

| Source | Key Text Identifier Columns | Text Coverage | Image Column | Image Coverage |
|---|---|---|---|---|
| **CPSC** | ProductUPCs | **42%** | Images | **100%** |
| **KATS (Foreign)** | recallModelName, recallBrandName | **60%** | imageUrl | **74%** |
| **Consumer24** | modlNmInfo, aditfield13 *(Barcode/ASIN)* | **41%** | recallImgUrls | **83%** |
| **Integrated DB** | **Cross-Agency Key Identifiers** | **~50% Avg** | **Integrated Media DB** | **76% (34K)** |

### Why Image Matching?

1. Text Identifier Deficit
   - 40–60% of recall records lack explicit text identifiers
   - Pure text matching leaves cross-agency blind spots.

2. High Image Availability
   - 74–100% of records contain high-quality product images.
   - Visual features serve as a vital secondary anchor for unlinked records.

3. Downstream Marketplace Reality
   - E-commerce APIs often lack structured model or barcode fields.
   - Re-sellers frequently alter product titles but reuse original manufacturer photos.

# Appendix

## Data Collection: Three Recall APIs

- 44,518 source records from three agencies, each with its own record ID.

Completed  Planned

| Source | Role | Records | Source record ID | Fields used for integration |
|---|---|---|---|---|
| **CPSC Recall API** | U.S. recall notices | **891** | Recall ID / original URL | Product description, extracted model IDs, recall URL, images |
| **KATS Overseas Recalls** | Overseas recall notices | **33,400** | `fRecallUid` | Model, brand, original recall URL, images |
| **Consumer24 (service 0501)** | Consumer-safety notices | **10,227** | `recallSn` | Product and model descriptions, source URL, images |
| **Total source records** | | **44,518** | *Source records — not unique products* | |

PLANNED

Next source: 11STREET product-search API (pending)

so far: 30 manually checked listings — a sample, not a detection rate

**Kept separate**

SafetyKorea domestic recalls use `recallUid`; not in the 44,518 total

# Appendix

## U.S. Consumer Product Safety Commission (CPSC)

### Datasets

| Category | #Fields | Key Features | Description & Notes |
|---|---|---|---|
| Identification | 2 | RecallID, RecallNumber | Unique recall ID and official recall publication number |
| Product | 7 | Products, ProductUPCs | Product name, model, type, category ID, unit count, and UPC barcode |
| Manufacturer & Supply Chain | 7 | Manufacturers, Importers, Retailers, ConsumerContact | Manufacturer, origin country, importer, distributor, retailer, and consumer contact info |
| Recall Details | 6 | Title, Hazards, Injuries, Remedies | Recall title, hazard descriptions, incident/injury reports, and remedy options |
| Recall Status | 2 | RecallDate, LastPublishDate | Official recall announcement date and last publication date |
| Metadata & Media | 4 | URL, Images, Inconjunctions | Source URL, product image URLs with captions, and joint international recall links |

# Appendix

## Korean Agency for Technology and Standards (KATS)

### Datasets (Domestic)

| Category | #Fields | Key Features | Description & Notes |
|---|---|---|---|
| Identification | 1 | recallUid | Unique recall ID for domestic records |
| Product | 8 | recallProductName, recallBrandName, | Product name, brand, model, category, barcode, and certification number |
| Manufacturer | 8 | makerName, recallCmpnyName, | Manufacturer name, origin country, company name, contact, and business registration ID |
| Recall Details | 5 | harmDscr, accidentCaseDscr, publishActionDscr | Hazard descriptions, incident cases, and consumer remedies |
| Recall Status | 4 | publishRecallVol, recallStaDate, recallEndDate | Total recall quantity, start date, and end date |
| Metadata & Media | 2 | publishDate, recallFiles | Announcement date and attached file/image URLs |

# Appendix

## Korean Agency for Technology and Standards (KATS)

### Datasets (Foreign)

| Category | #Fields | Key Features | Description & Notes |
|---|---|---|---|
| Identification | 1 | fRecallUid | Unique ID for each overseas recall record |
| Product | 5 | recallProductName, recallBrandName, recallModelName | Product name, brand, model name, and item counts |
| Manufacturer | 2 | makerName, makingCntryName | Manufacturer name and country of origin |
| Recall Details | 5 | violatedDscr, accidentCaseDscr | Violation descriptions, incident cases, and corrective actions (Text) |
| Publication | 3 | recallPblshOrgnName, recallUrl | Publishing agency name, issuing body, and source URL |
| Metadata & Media | 3 | publishDate, signDttm, imageUrl | Announcement date, registration timestamp, and image URL |

# Appendix

## Consumer24 (Operated by the Korea Fair Trade Commission)

### Datasets

| Category | #Fields | Key Features | Description & Notes |
|---|---|---|---|
| Identification | 2 | recallSn, cntntsId | Unique recall serial number and portal source menu ID (KCA, KATS, MFDS, OECD) |
| Product | 4 | productNm, bsnmNm, modlNmInfo, aditfield13 | Product name, company name, model info, and product details |
| Manufacturer | 1 | makr | Manufacturer name |
| Recall Details | 5 | shrtcomCn, recallSe, injuryCauseResult, cnsmrGhvrTips, | Defect description, recall classification, hazard cause, consumer action tips, and publication date |
| Recall Status | 1 | recallBgnde | Recall execution start date |
| Metadata & Media | 2 | infoCreatUrl, recallImgUrls | Source URL and product image URLs (for visual similarity search) |