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Laboratory sample tracking and management

Automates laboratory sample tracking from registration through disposal, ensuring chain of custody, storage compliance, and real-time inventory management across all research stages.

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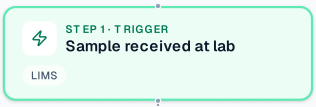
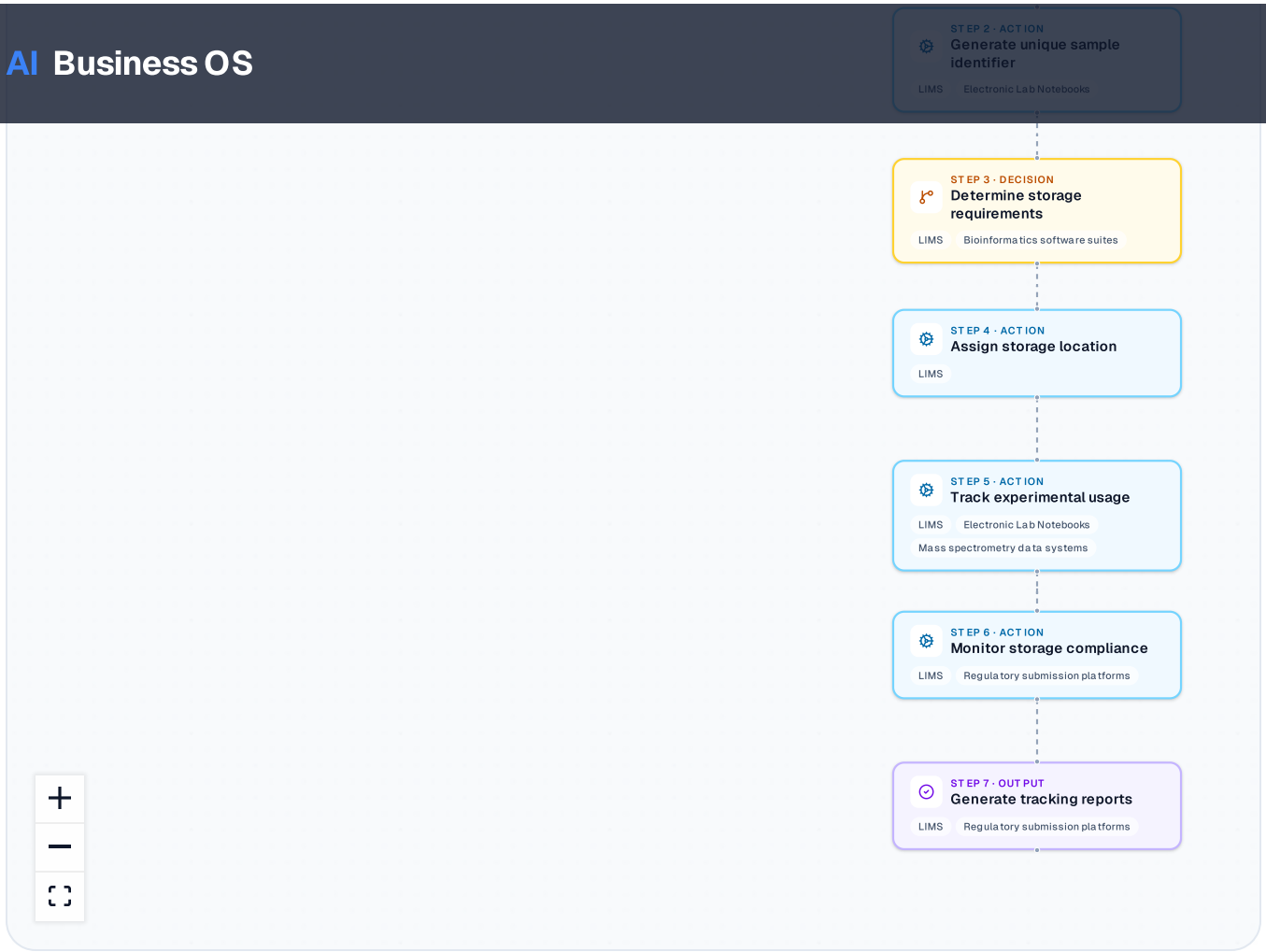
WORKFLOW TRIGGER
New biological sample arrives at laboratory receiving station

Visual Flow

Each node represents an automated step. Connections show how data and decisions move through the workflow.





Step-by-Step Breakdown

Detailed explanation of each automated stage in the workflow.

1

TRIGGER

Sample received at lab

Laboratory technician scans incoming sample barcode or manually enters sample information into the system. Sample metadata including source, collection date, and handling requirements are captured.

2

ACTION

Generate unique sample identifier

System automatically creates unique sample ID with embedded metadata and generates corresponding barcode labels. Sample information is logged in electronic lab notebook with timestamp and receiving technician details.

LIMS | Electronic Lab Notebooks

3

DECISION

Determine storage requirements

System evaluates sample type, stability requirements, and planned experiments to determine optimal storage conditions. Routes samples to appropriate storage facility based on temperature, security, and access requirements.

LIMS | Bioinformatics software suites

4

ACTION

Assign storage location

System automatically assigns specific storage location based on available capacity and sample requirements. Updates inventory management system and sends location details to laboratory staff mobile devices.

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5

ACTION

Track experimental usage

System monitors sample aliquoting, experimental consumption, and remaining quantities through integrated lab equipment. Updates chain of custody records and experimental associations in real-time.

LIMS | Electronic Lab Notebooks | Mass spectrometry data systems

6

ACTION

Monitor storage compliance

System continuously tracks storage conditions, expiration dates, and regulatory requirements. Sends automated alerts for temperature excursions, approaching expiration, or compliance violations.

LIMS | Regulatory submission platforms

7

OUTPUT

Generate tracking reports

System produces comprehensive sample tracking reports including chain of custody documentation, storage history, and experimental usage summary. Reports are formatted for regulatory compliance and audit requirements.

LIMS | Regulatory submission platforms

Outputs

- Complete sample chain of custody documentation
- Real-time inventory status reports
- Regulatory compliance tracking records

Key Metrics

- Sample location accuracy rate
- Storage compliance percentage
- Average sample retrieval time

Tools & Integrations

- LIMS
- Electronic Lab Notebooks
- Bioinformatics software suites
- Mass spectrometry data systems
- Regulatory submission platforms

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