

**Sphinx**



# **Sphinx Digital Printing Numbering System**

**Sphinx numbering system (SNS)**



**Sphinx**



# Introduction

## Why do we use digital printing numbering?

We use digital printing numbering for essential functions like **counting**, **sequential order**, **quantifying**, and It is also the base for the **authenticity verification and traceability** for valued and secured documents or objects.

## Difference between Fixed or variable number

A fixed number can be a fixed **date**, a **commercial product barcode**, which is usually a **static number** added as a text on a **document/product label**, etc. A variable number have a dynamic nature.

Variable numbering **mandatory** for all valued and secured documents, ensuring authentication and full traceability throughout the document lifecycle (pre-personalization and personalization).

## Variable Numbering Systems

A **variable number** is a **must** on all **valued or secured document** in the **pre-personalized** phase after manufacturing and also in the **personalization** phase.

Variable numbering is a challenging task for any printing press!



# Sphinx



## Sphinx numbering system (SNS) overview

**SNS** is an **integrated numbering system used for printing** that generates sequential, non-sequential, or randomized (text, hashed, or encrypted numbers) in any combined format (alphanumeric, QR codes, barcodes, etc.).

The **SNS** has its own **customer and order management module** for a seamless work order generation.

A print template is designed according to the required **numbering type, size, format, method of printing, and quantity**.

**SNS** generates a **preview PDF** document to ensure the template respects the requirements.

The job orders can be split into **batches** and printed through **one or multiple printers** in addition to a printing index sheet.

A **high speed scanner** then verifies the **readability, sequence, and count** of numbered documents for **quality assurance**.

When **batches** are successfully **verified**, a label printer prints both quality assurance and packaging labels. Print labels are used for traceability and distribution processes.

A robust reporting engine to provide full visibility into all operations. The engine generates detailed reports for **internal review, client delivery, or quality audits**.

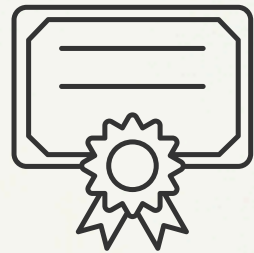
**SNS** security **logs all actions** for all users' interventions, and **control user access** using a token and 2-Factor authentication system to **restrict system misuse**, beside that the system runs in a secured environment.



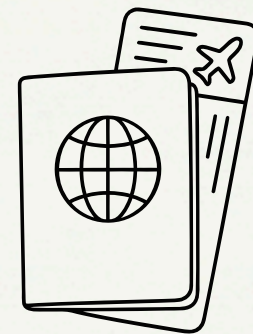
# Securing valued documents

SNS use cases are for valued and secured documents (tickets, certificates, bonds, visa stickers, IDs, passports, etc.).  
It facilitates the challenges that faces small to large scale printing presses.

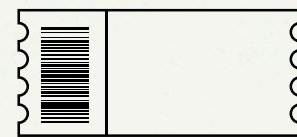
## DOCUMENTS AT RISK



Certificates  
& Bonds



Travel & Identity  
Documents

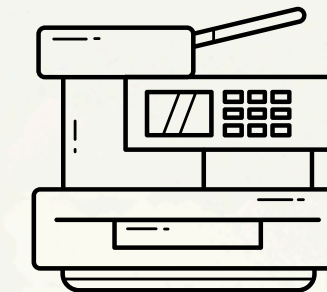


Vouchers

## PERSISTENT THREATS



Counterfeiting



Unauthorized  
Duplication



Tracking &  
Auditing Errors


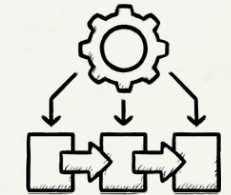
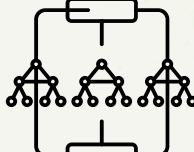
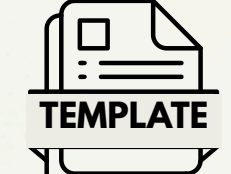
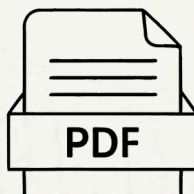
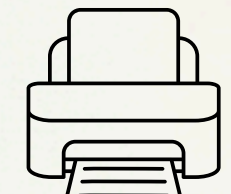



## Beyond Sequential Numbers

Traditional numbering is insufficient. Secure documents require encrypted, unique numbering schemes, often as a 'PrePerso' number applied before final personalization.



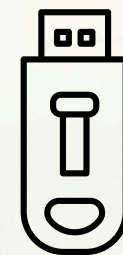
## The Goal: Secure the physical secured document

- 1. Secure unique number for pre-person identification
- 2. serialization for traceability

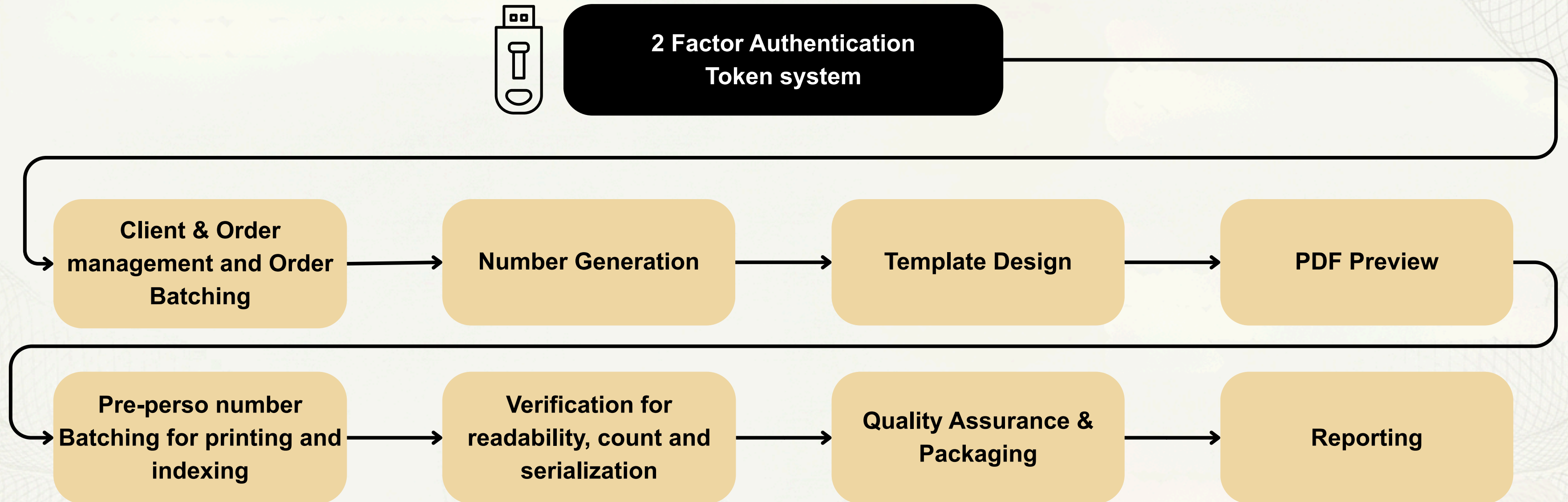
1	 <p><b>System Access Control</b> The process begins with strict user management and system access control using two-factor authentication (2FA) that uses a token system</p>	2	 <p><b>Order Management and Batching</b> Management of order data and jobs batching.</p>
3	 <p><b>Number Generation</b> Generates a unique number and a serial number in any combined format (alphanumeric, QR codes, barcodes, etc.)</p>	4	 <p><b>Flexible Template</b> Templates can be designed with multiple elements, "Barcodes, and QR codes" with accurate positioning</p>
5	 <p><b>PDF Preview</b> Generates a preview PDF document to ensure the template respects the requirements</p>	6	 <p><b>Printing Controls</b> Batching, supports multi printing machines, printing indexing slips</p>
7	 <p><b>Verification &amp; Scanning</b> Documents are scanned in batches to check for readability, sequence, and count</p>	8	 <p><b>Quality Assurance &amp; Labeling</b> When batches are verified, a label printer prints both quality assurance and packaging labels</p>
9	 <p><b>Comprehensive Reporting</b> Integrated reports for production, customer activity, quality control, and document status queries.</p>		



## System Workflow (From Design to Distribution)



**2 Factor Authentication  
Token system**





# Step 1: Client & Order Management

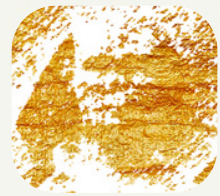
When creating a **new work order**, you can define the **core parameters**: Order Name, Description, and Total Quantity required (e.g., 2,000,000 units).

The system intelligently batches the total order quantity into sequential jobs.

The image shows a form for creating a new work order. It contains the following elements:

- Client Selection**: A dropdown menu with a downward arrow.
- Order Name**: A text input field.
- Description**: A larger text input area.
- Total Quantity**: A text input field containing the value "2,000,000".
- Create Order**: A button at the bottom of the form.

Two arrows point from the "Client Selection" dropdown to the "Total Quantity" field, indicating a dependency or relationship between these two fields.



## Step 2: Number Generation

The software features **specialized number generation logic** that generates sequential, non-sequential or randomized (text, hashed or encrypted numbers) in any combined format (alphanumeric, QR codes, barcodes, etc.).

**The customer can provide his specific numbers to be printed** It is essential for massive, multi-part projects.

### Number Generation Type

- Sequential
- Non-Sequential
- Randomized

### Format Selection

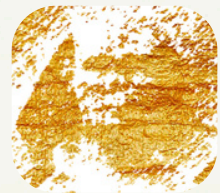
- Alphanumeric
- QR Code
- Barcode
- Hashed
- Encrypted

### Custom Number Input

Enter specific numbers here

### Generate

```
1dd1i665062d18817
1230655122312893
1455605183106489
1165515148417082
1227515182217697
dd1df5619d1F663
d221678082218661
```



## Step 3: Designing the Print Template

The template is the master design for each printed sheet. It defines the physical layout dictating how many items are placed on the page and their arrangement.

### A) Template Definition - Key Parameters (Example)

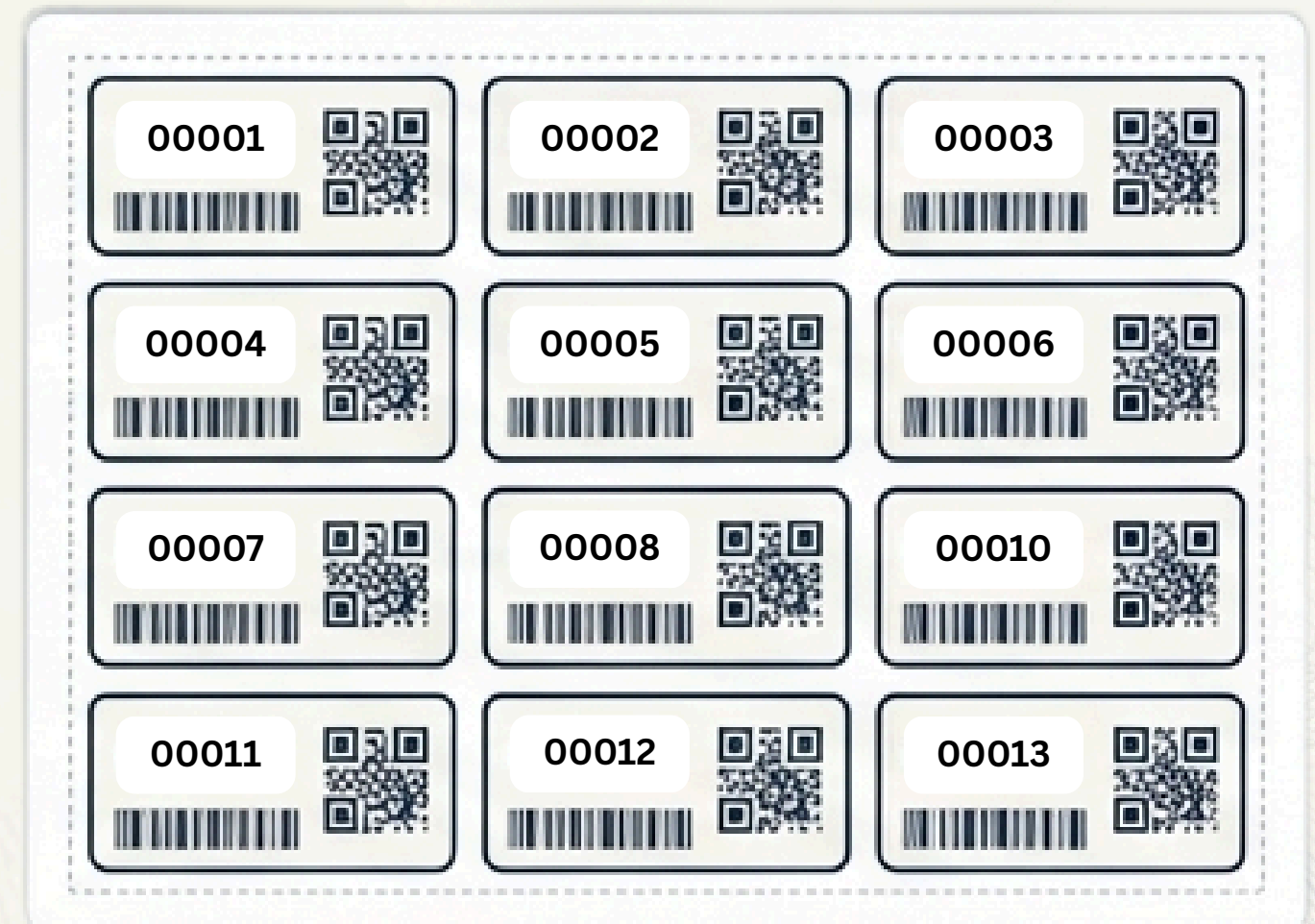
Template Name: A unique identifier for the design.

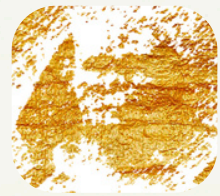
Grid Structure: Number of Rows & Columns  
(e.g., 4 rows x 3 columns = 12 items per sheet).

Paper Size: Any required format (e.g, A3, A2, Custom size)

Type of printing: Standard or non standard collating.

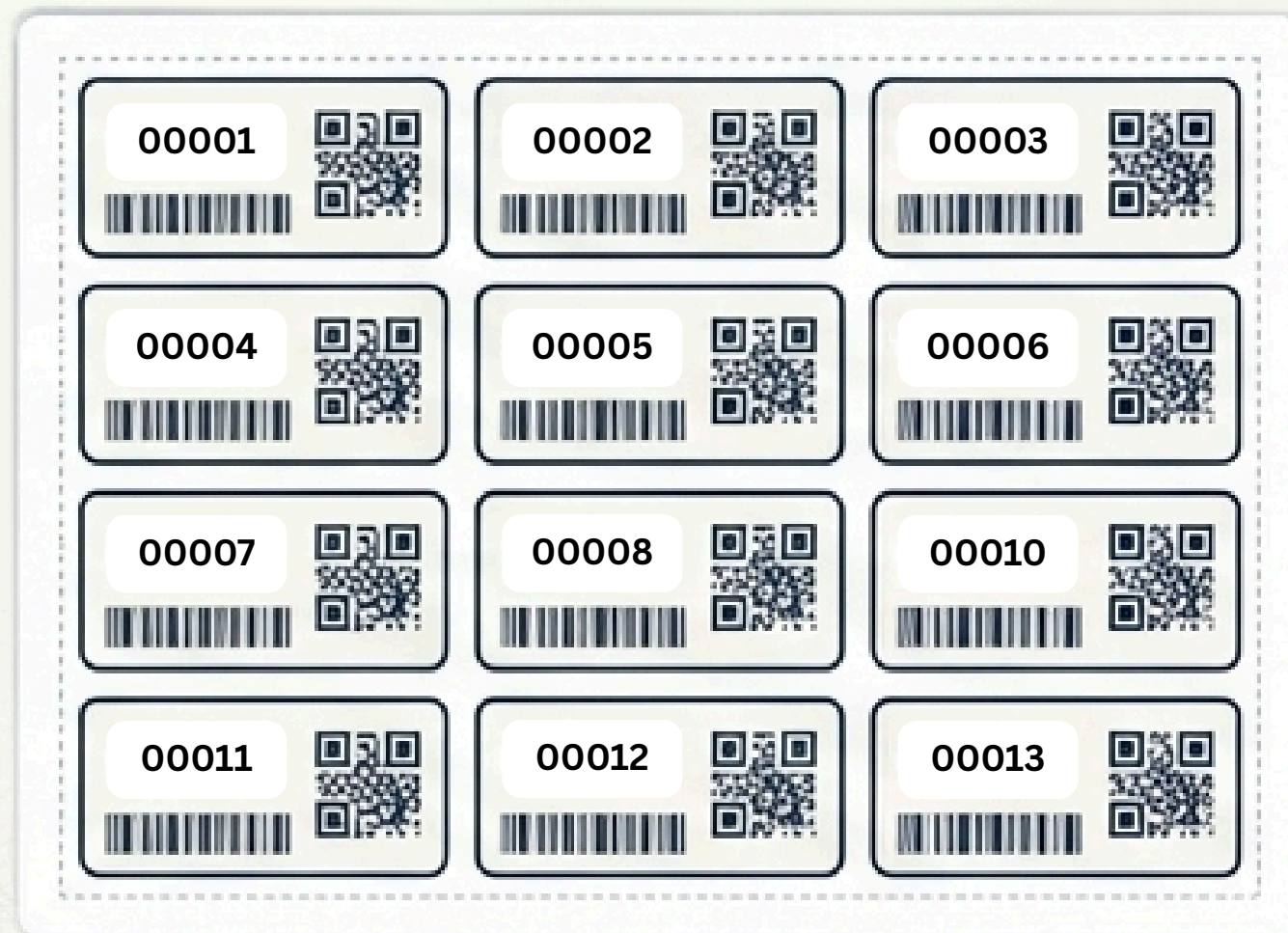
Batch Descriptor: A name for the printed batch.



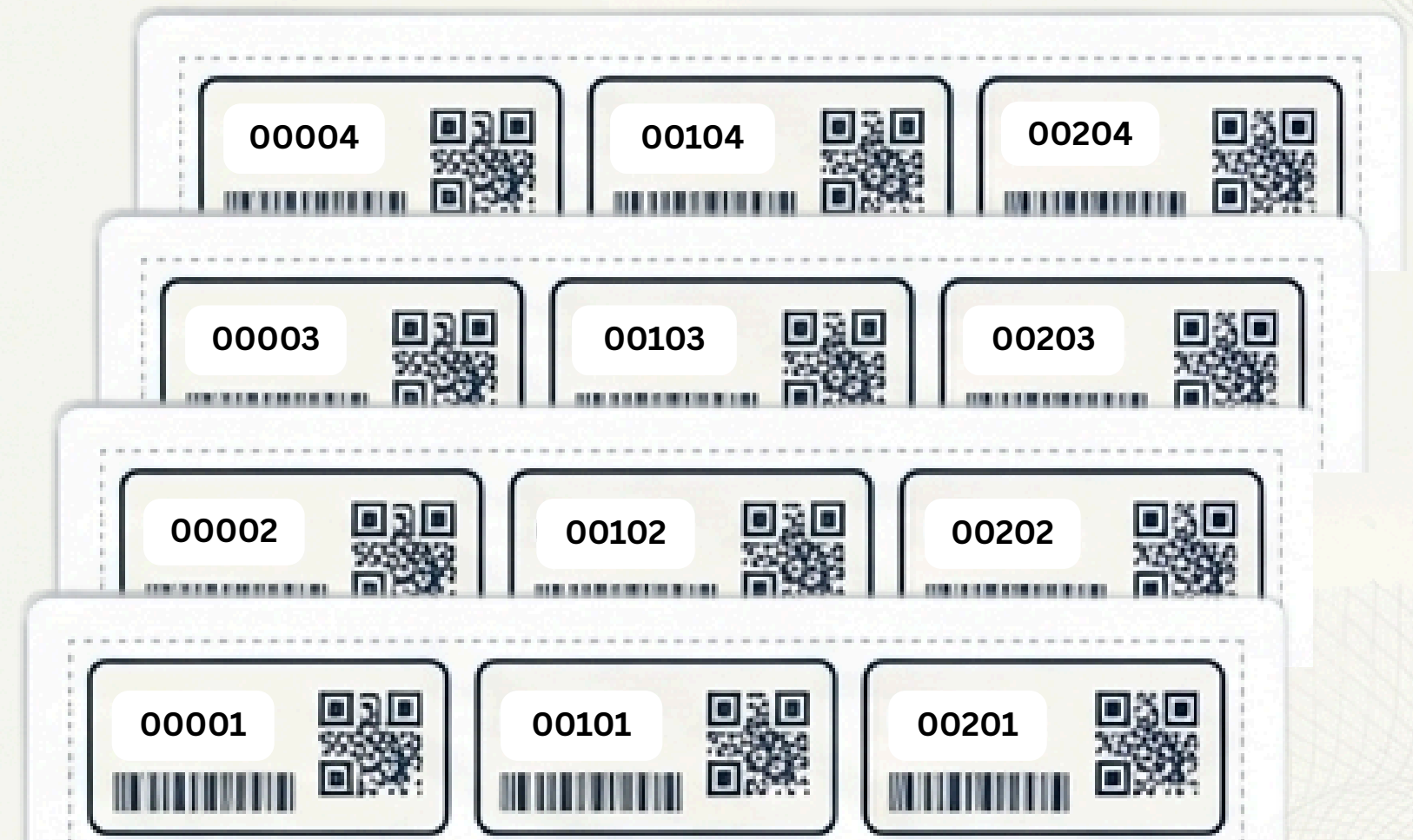


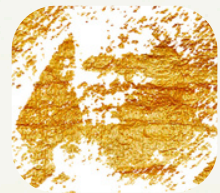
# Step 3: Designing the Print Template

**Non-standard Collating**



**Standard Collating**





## Step 3: Designing the Print Template

### B) Composing and Customizing Print Elements

Each item on your template can contain multiple or independent elements. There is full control over the type, position, and properties of each one. A sequential or a random order can be used

#### Example

##### Element Types

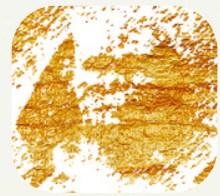
- Text & Numbers
- Barcode
- QR Code

Name: Document No.  
Position: X: 5mm, Y: 10mm  
Font: OCR-B  
Size: 12pt  
Checksum  Enabled  
pattern: non sequential  
Padding: 6 digits, leading zeros

Name: Barcode\_ID  
Position: X: 5mm, Y: 25mm  
Format: Code 128  
Orientation: 0° (Horizontal)

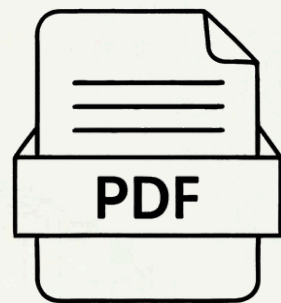
A0001B

Name: QR\_Verifier  
Position: X: 40mm, Y: 15mm  
Data: Document No. + Checksum



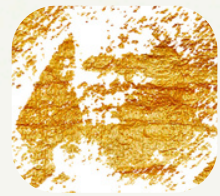
## Step 4: Document Preview

SNS generates a preview PDF document to ensure the template respects the requirements.



Sheet no: 101 | Job no: 1 | Template Name: Certificate\_V2

A000123  	A000124  	A000125  	A000126  
A000127  	A000128  	A000129  	A000130  
A000131  	A000132  	A000133  	A000134  



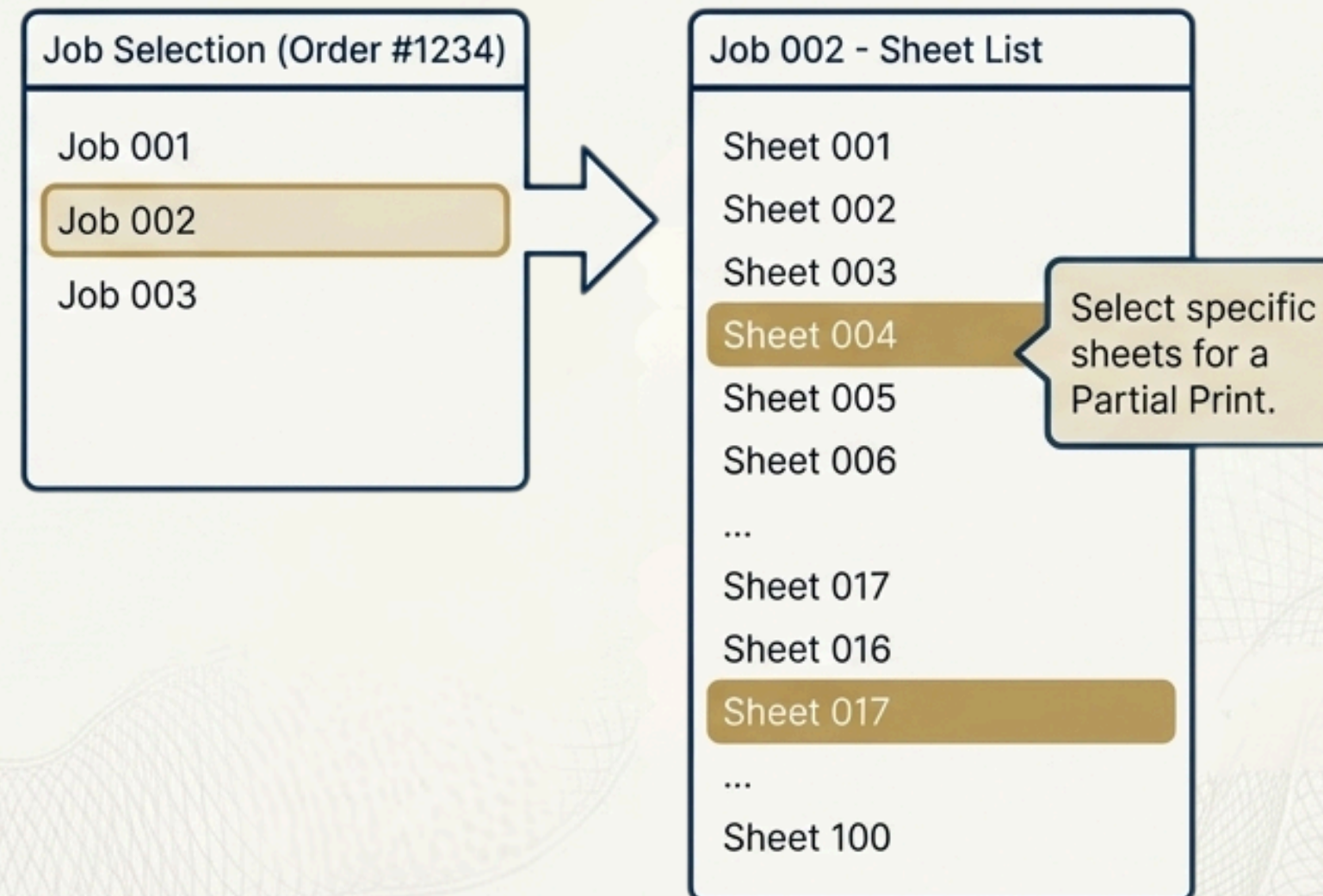
## Step 5: Printing

### A) Managing and Executing Production Print Runs

SNS provides a centralized interface for managing all printing operations. Select the client, order, and specific jobs to be printed. The system gives you precise control over what and which gets printed.

#### Flexible Printing Options

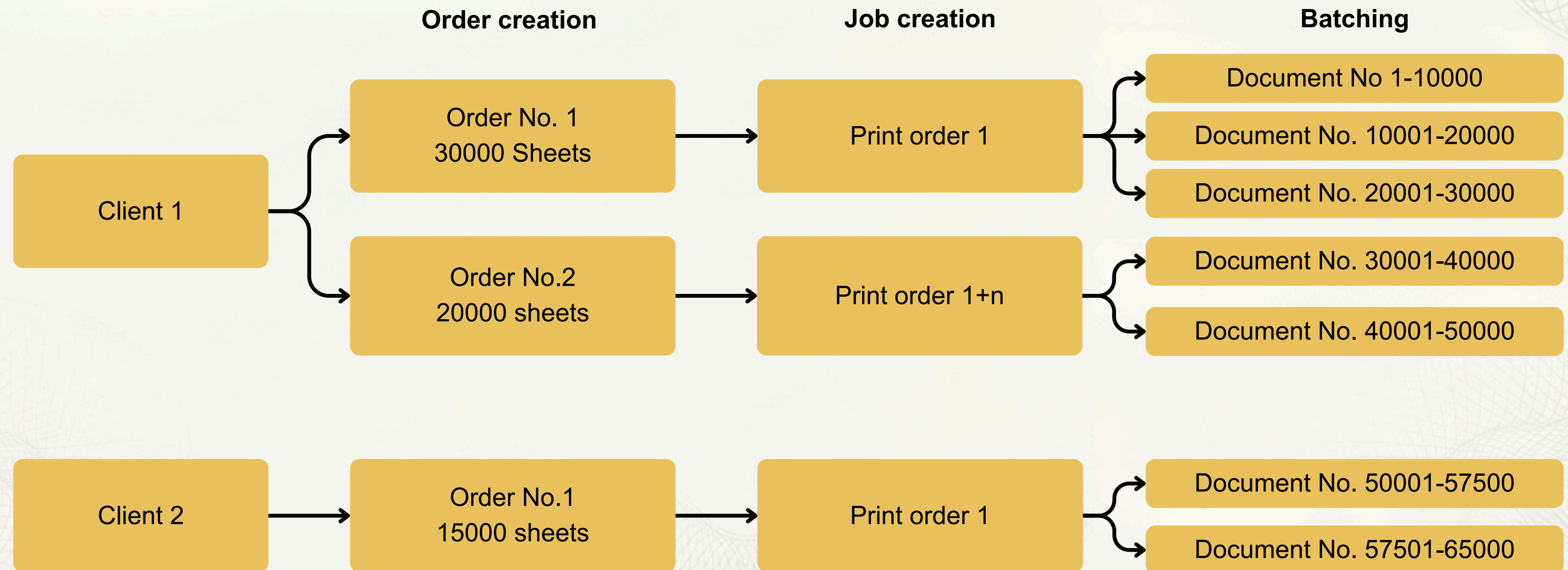
- **Print Entire Job:** Print all sheets within a selected job or multiple jobs.
- **Partial Print:** Select and print only specific, individual sheets from a job (e.g., reprinting a damaged sheet).
- **Print Index:** Generate and print an index sheet for a job, providing a manifest of all numbers contained within.
- **Print to PDF:** the exact output in a PDF file before committing to physical printing.

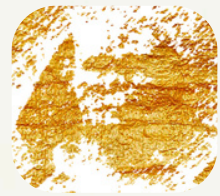




## Step 5: Printing

### B) Print order batching example

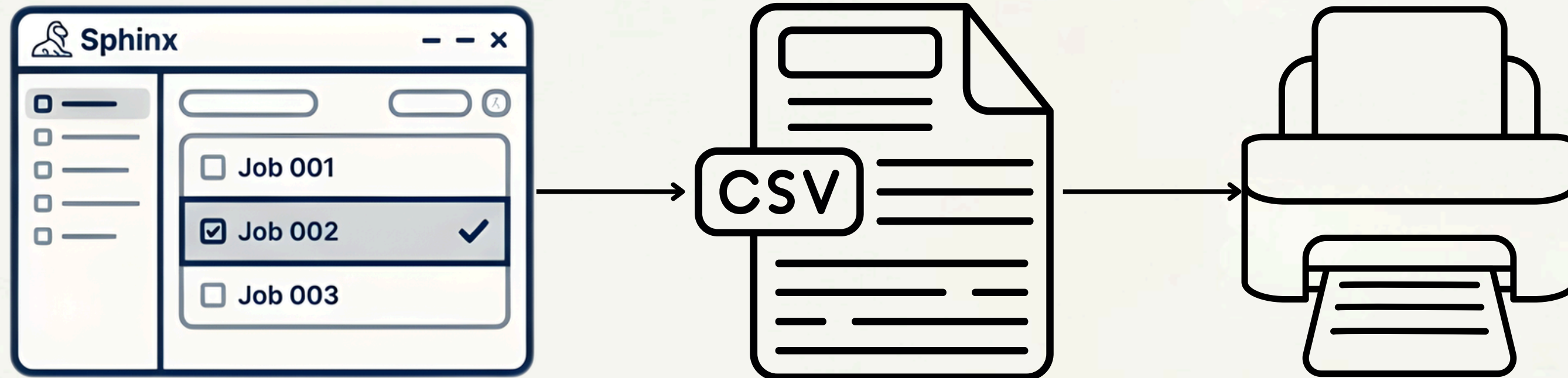




## Step 5 : Printing

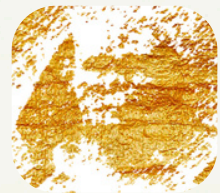
### C: Exporting Data

The system is designed for modern production environments. All numbering data for any job or sheet can be exported directly to a CSV file. This allows for seamless printing with digital printing presses and easy integration with other systems (eg. ERPs etc).



### Export Capabilities

- Export data for a single sheet.
- Export data for an entire job.
- Export data for a complete job order.

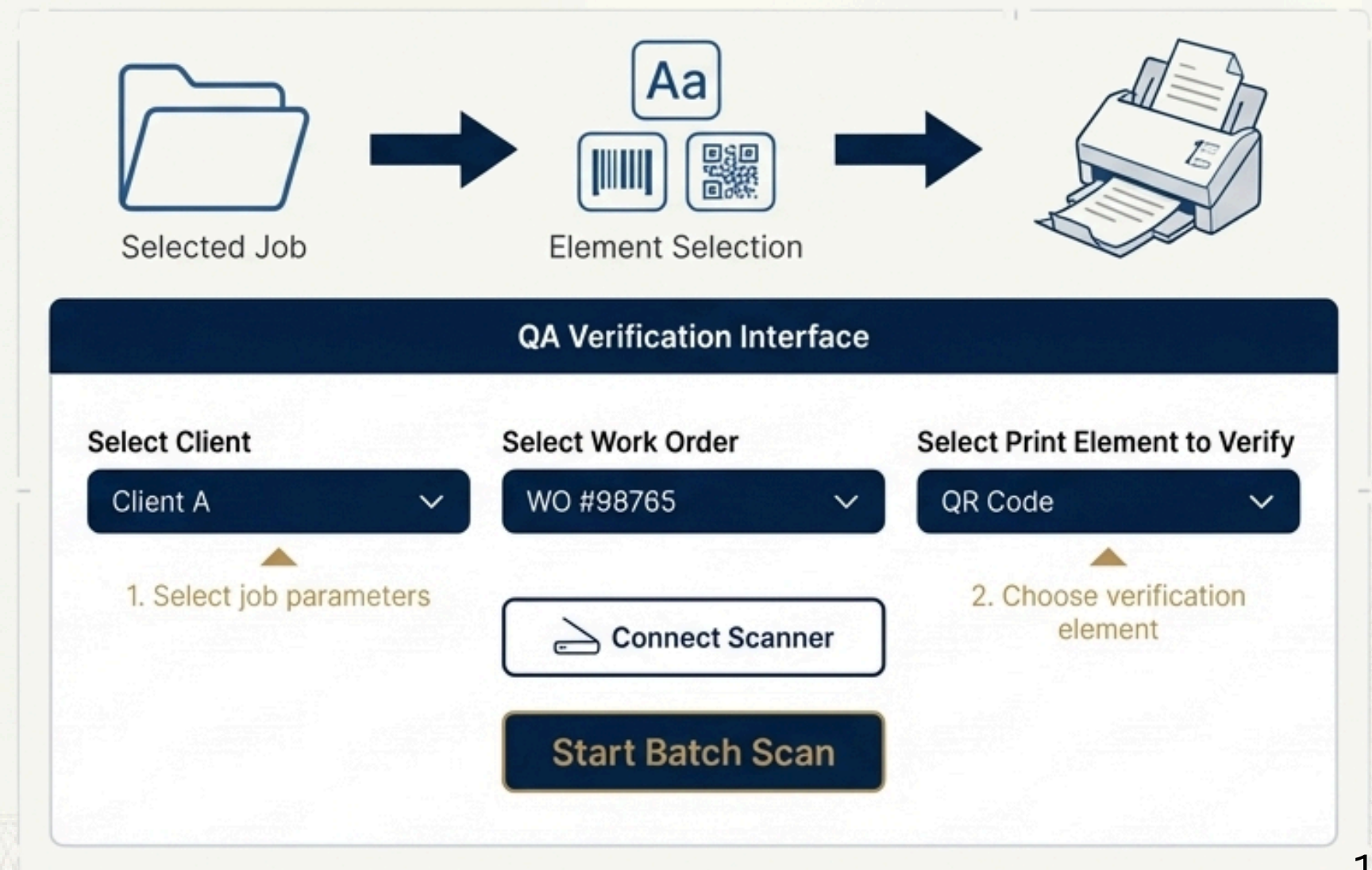


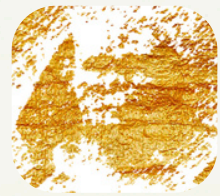
## Step 6: Ensuring Highest Accuracy with QA Scanning.

After printing, the QA module closes the loop by verifying the printed batches. Using a document scanner, the system reads each printed item and validates it against the printed data generated by the system.

### A) The QA Verification Process

- 1. Select Job & Element:** Choose the client, work order, and the specific printed element you wish to verify (e.g., the QR code, the barcode, or number).
- 2. Choose Scanner:** The system allows you to choose from a multiple scanner configuration.
- 3. Scan Documents:** Place the printed sheets or cards into the scanner and initiate the batch scan.





## B) Instant Validation and Anomaly Detection.

Upon scanning, the system performs an immediate check. The system confirms if the document belongs to the correct job, is in the correct sequence, and is free of errors.

### Scan Results

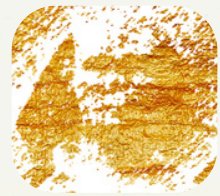
**Success:** A successful scan confirms the integrity of the item, and its data is displayed for review. The system logs a valid read.

**Failure:** The system will flag anomalies such as:

- Incorrect or unreadable numbers.
- Documents belonging to a different job.
- Duplicate or out-of-sequence items.
- Unreadable, missing or blank documents.

Item #	Read Data	Status
101	864-291	✓ VALID
102	864-292	✓ VALID
103	864-293	✓ VALID
104	953-012	⚠ FLAGGED - MISMATCH
105	864-294	✓ VALID
106	864-292	⚠ FLAGGED - DUPLICATE
107	864-295	✓ VALID
108	864-296	✓ VALID

Highlights items that are unreadable, out-of-sequence, or belong to a different job.

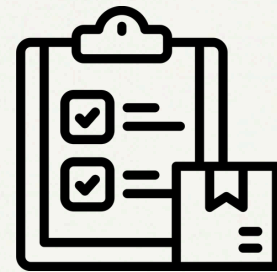


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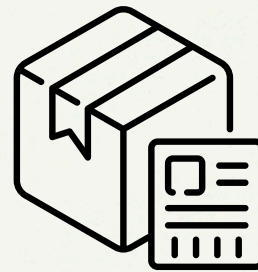


## Step 7: Quality Assurance and packaging

When batches are successfully verified, a label printer prints both quality assurance and packaging labels. Print labels are used for traceability and the distribution processes.



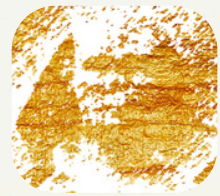
Index Slip



Packaging label



Quality assurance label



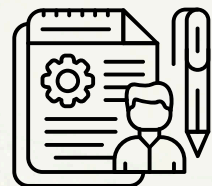
## Step 8: Comprehensive reporting for operations

Sphinx includes a robust reporting engine to provide full visibility into all operations. Generate detailed reports for internal review, client delivery, or quality audits.



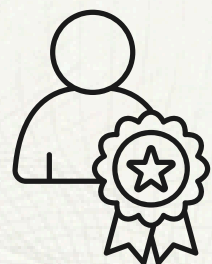
### Jobs Report

View all details and jobs associated with a specific Work Order.



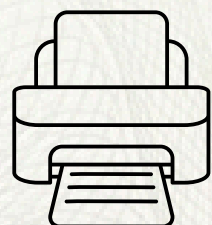
### Client Report

Display a summary of all data related to a client.



### Quality Report

A log of all QA scanning activities, filterable by user and work order.



### Print Report

A complete history of all print operations performed.

### Search Functionality

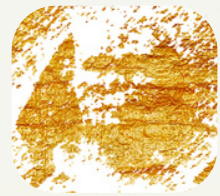
The system also includes a high-speed search tool to instantly locate a single printed sheet by its number within a specific work order and display its complete data.

#### Search for Card

Select Work Order

Enter Card Number

**Find**



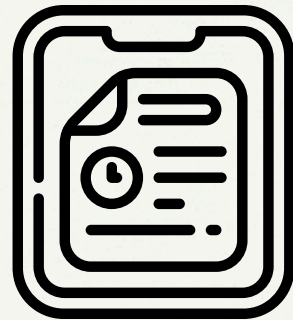
**Sphinx**



# Security features

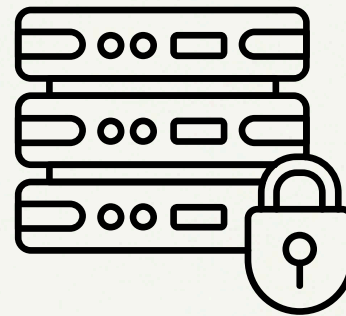
The system helps printing presses **trace and log** all users actions, jobs and clients orders in a secure environment. The system has a **user control system** which dictate **user privileges** using a **token system** using a **2 factor authentication**.

## Action logging



Logging all actions and interventions made by admins and users

## Secured environment

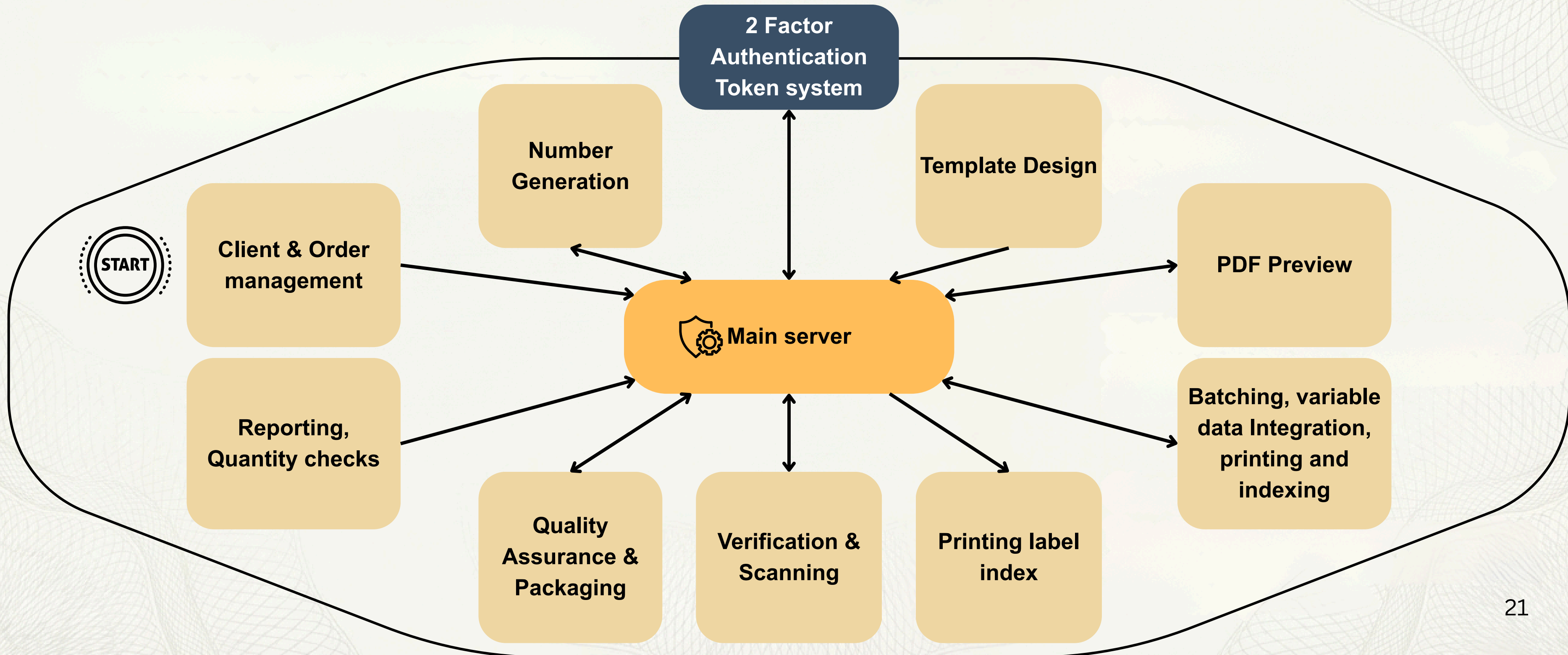
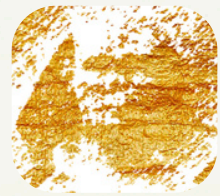


All actions are authorized and registered by a secured server

## 2 Factor Authentication



User privileges are decided using a token system to restrict system misuse.





**Sphinx**



# Thank You

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