딥러닝 기반 문서 인식

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Needs and Goal

❖ Necessity

- The market for electronic documents is gradually increasing.

CARGS 8.0%

33,864 | 36,302 | 39,279 | 42,500 | 45,985 | 49,756
2015 | 2016 | 2017 | 2018 | 2019 | 2020
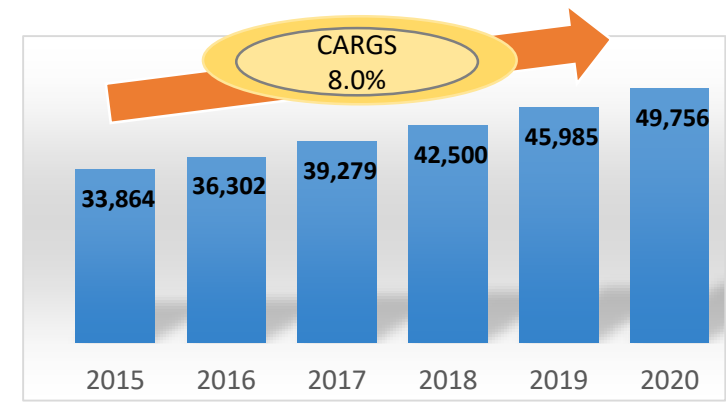
- There are many cases typing documents at companies or public institutions.

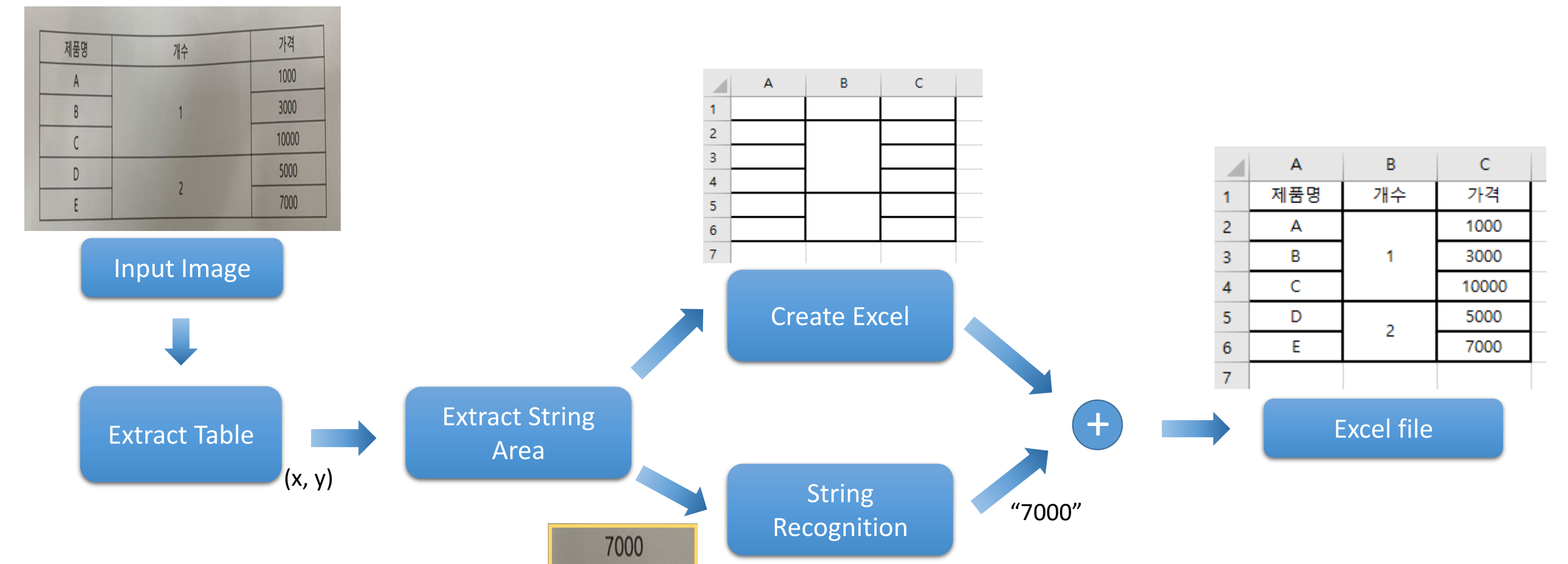### ❖ Goal

Development of document recognition module based on deep learning Error rate less than 5%
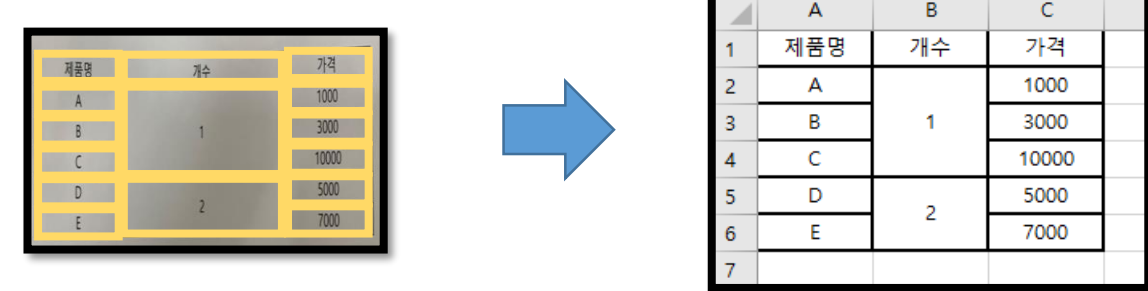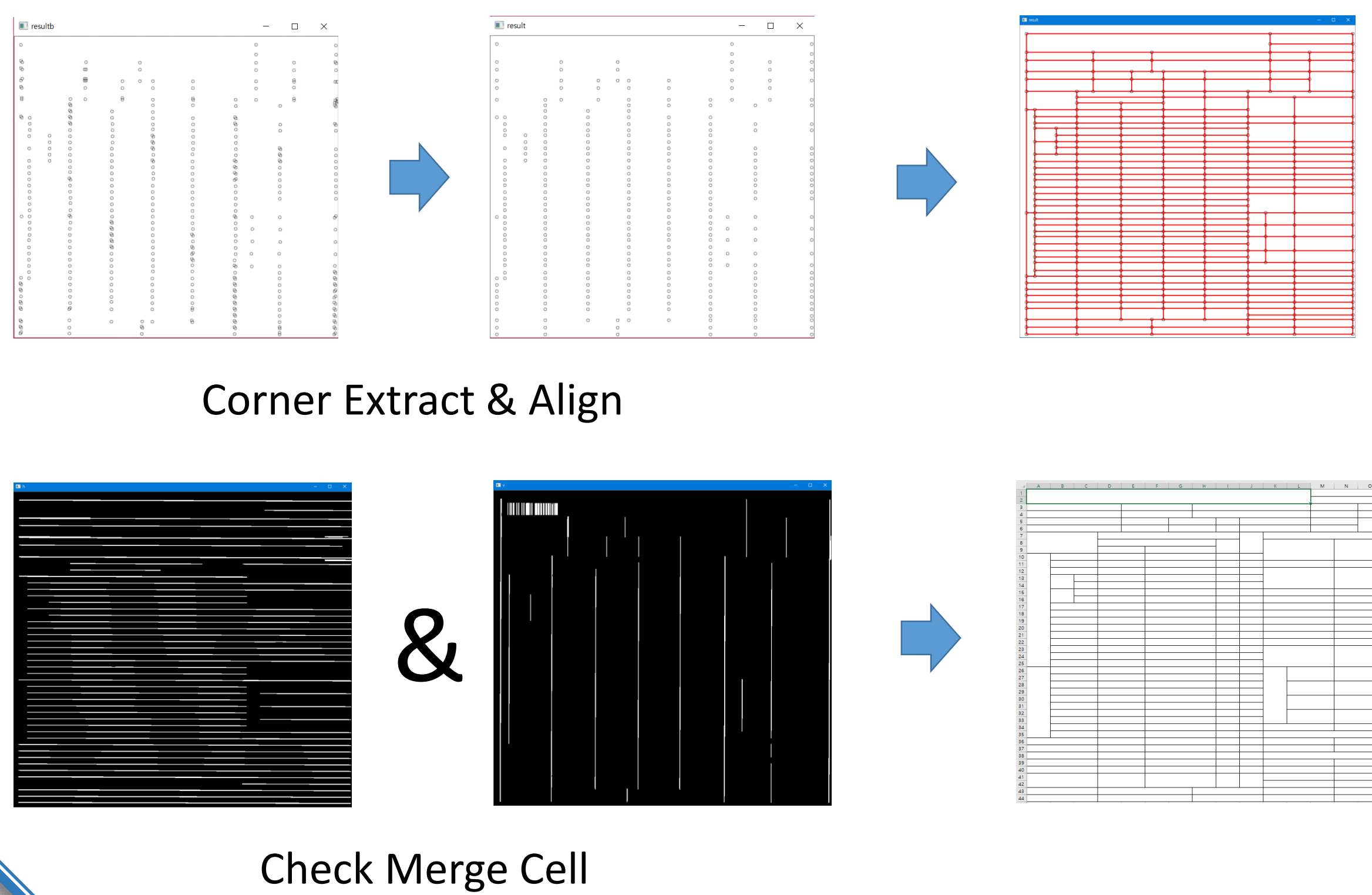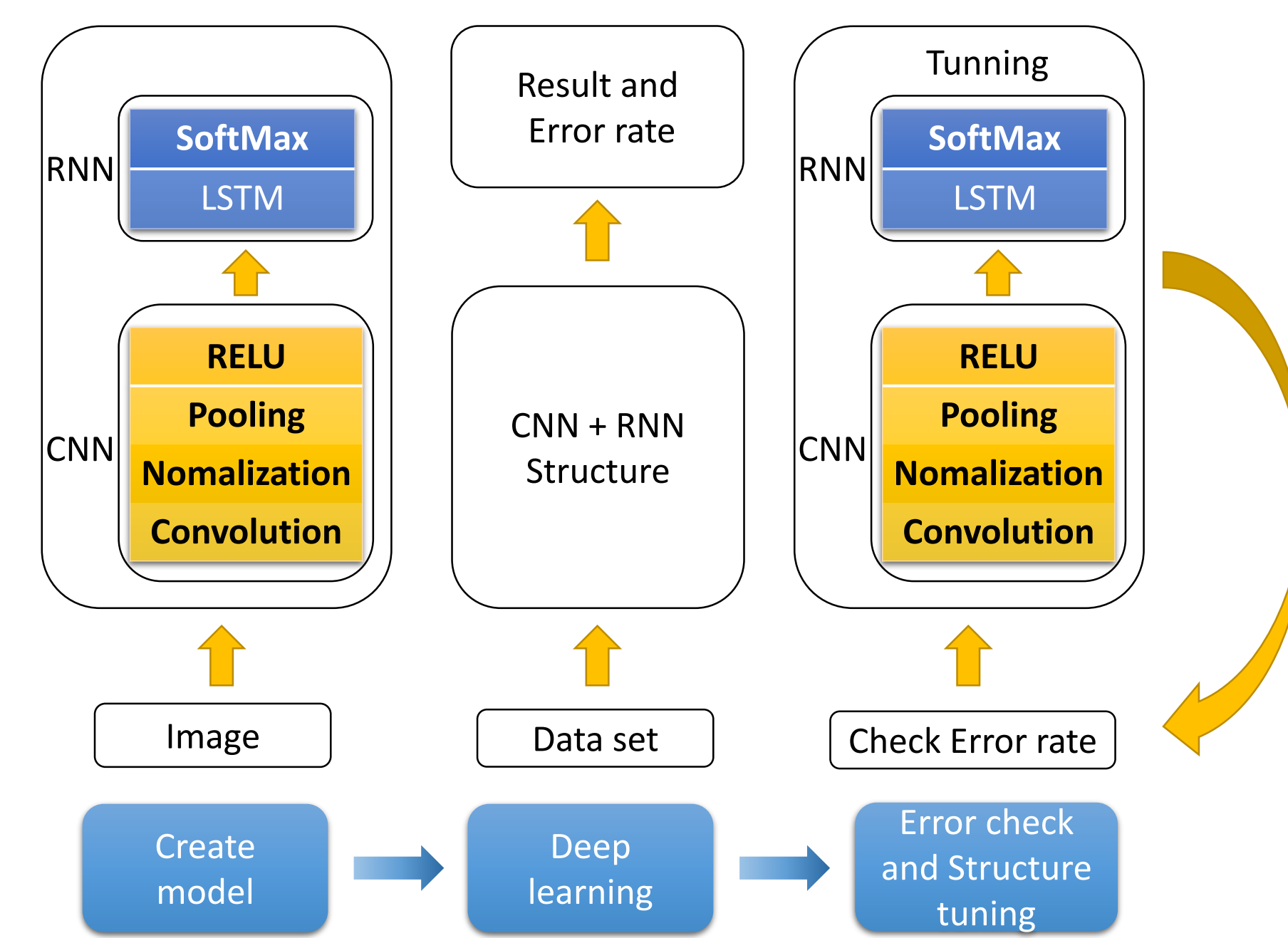
0.75 blocks ≤ 15 blocks * 0.05

System Structure

Input Image → Extract Table (x, y) → Extract String Area → Create Excel / String Recognition → "7000" → + → Excel file

Detailed Structure

❖ Extract Table

Corner Extract & Align

Check Merge Cell

❖ String Recognition

RNN: SoftMax / LSTM
CNN: RELU, Pooling, Nomalization, Convolution
Image

Result and Error rate
CNN + RNN Structure
Data set

Tunning
RNN: SoftMax / LSTM
CNN: RELU, Pooling, Nomalization, Convolution
Check Error rate

Create model → Deep learning → Error check and Structure tuning

"tesseract"

❖ Merge

7000 → Insert to model

Extracted Block Coordinate Value:
(2, 1, 3, 2) (2, 1, 2, 3)
(6, 1, 7, 8)
(2, 5, 4, 6) (2, 3, 4, 6)
(2, 8, 2, 10)
(9, 1, 9, 10) (6, 8, 10, 19)
(1, 7, 3, 5)

Deal with cell using Openpyxl library
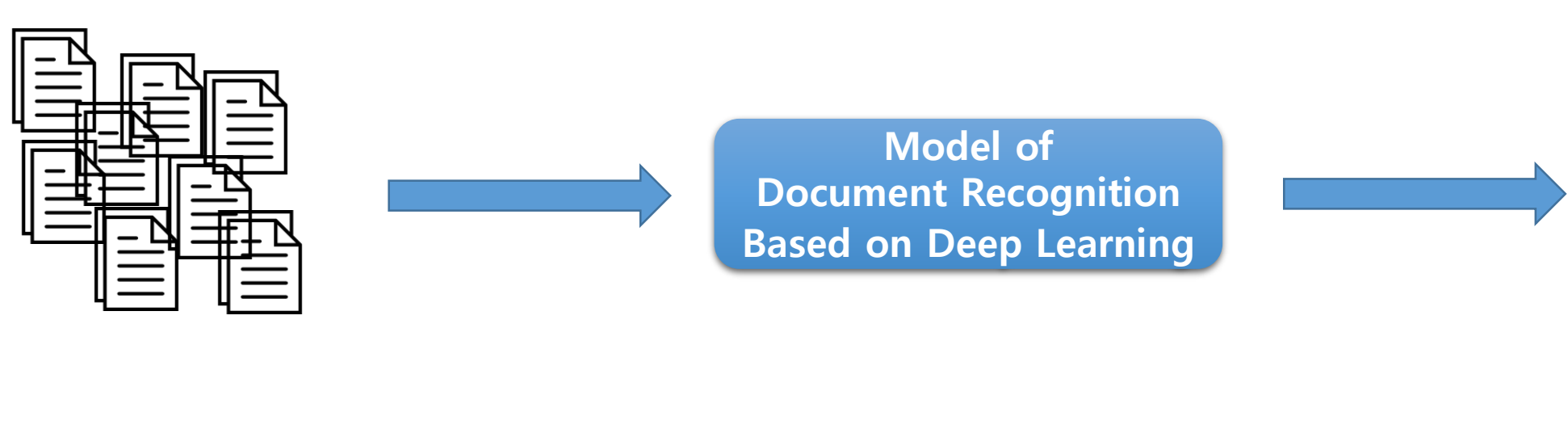
Result

<CASE 1>

<CASE 2>

<CASE 3>

Uses & Improvement

❖ Uses

- Insurance cost request to insurance companies
- Request a loan to the bank
- work assistant of company

Model of Document Recognition Based on Deep Learning

❖ Improvement

Accuracy improvement through stored format of database
- Extract of accuracy improvement

Result including error → Corners → DB → Extract Most similar table → 100% Extract