

The logo for ASTRI, consisting of the letters 'ASTRI' in a bold, white, sans-serif font. The letters are contained within a dark blue, semi-transparent circular shape that has a slight gradient and a soft shadow, making it stand out against the background. The background itself is a complex composition of various shades of blue and cyan, with overlapping circles and geometric shapes.

Document Management and Processing

文件管理和處理

Dr Arvin Tang

Director of the Multimedia Systems
and Analytics in Artificial Intelligence
and Trust Technologies division

ASTRI Form Processing - Handwritten Chinese Recognition

Commercial OCR

6. Industry Co-applicant (applicable to collaborative projects)

Company Name (Chi)

(Eng)

Name of Contact Person

Post Title

Address

Tel Fax

E-mail

Webpage

A scanned document

ITF Form 3.6 (revised in July 2017) P. 5

Printed Characters

香港應用科技研究院

ASTRI


>95%


>96%

Hand-Printed Characters

2978 1234

astri.com.hk



<50% (on-premise)
>93% (on cloud)


>93%

Handwritten Characters

陳大文

工程師



<10% (on-premise)
>75% (on cloud)


>87%

Full Page Handwritten OCR and form recognition



Writing is my passion and hence, I write letters to the Editors of some English dailies published in India as well as the Gulf Nations, one of which is Sultanate of Oman where I worked as an English teacher. Though I type letters on my own and send the same to the Editors, owing to my penchant for writing something in my own handwriting, I write the day-to-day events of my life in a diary. By the way, my last hand-written letter, the most useful one as well, was the one I wrote to my former research supervisor

Writing is my passion and hence, I write letters to the Editors of some English **dailies** published in India as well as the Gulf 'Nations', one of which is sultanate of **Man** Where I worked as an English teacher, Though I type letters on my own and send the same their Editors, owing to my penchant for writing something in my own handwriting, I **wish** the day to day events of my life in a diary. By the way, my last hand-witter letter, the most useful one as well, was the one I wrote a my former research supervisor

祝你生于热烈,永不彷徨
为了一句梦想,走遍万重山岗
祝你不落俗套,赤诚浪漫
无需长大,为英雄与魔法或童话
祝你一生明朗,无惧岁月冗长
在诗人的无尽夏里,温柔且倔强
“万事万物,如愿以偿”
——摘自网络

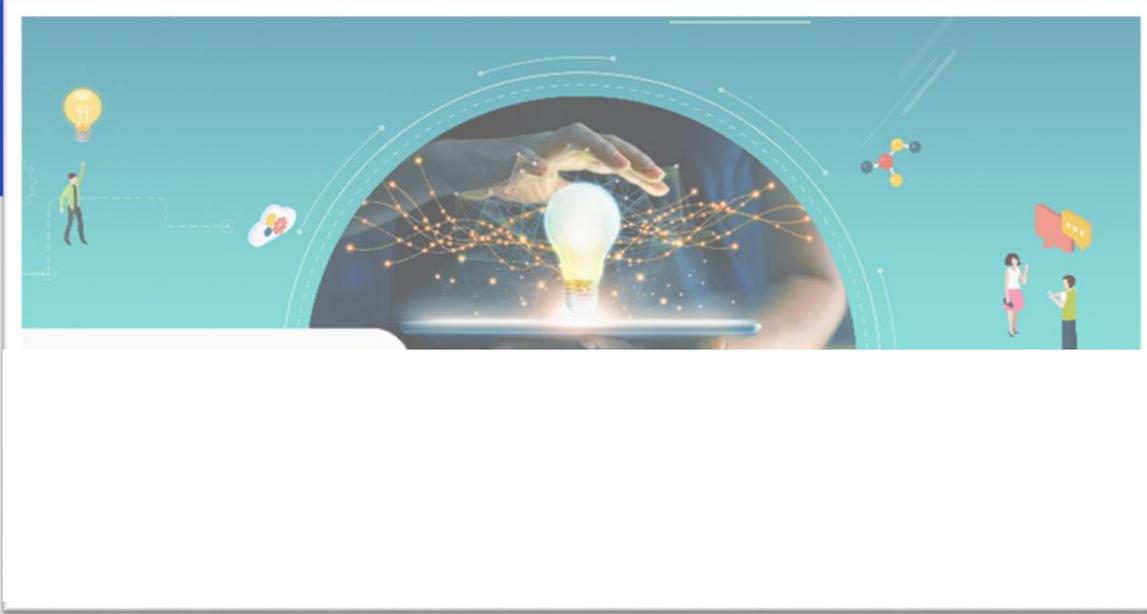
祝你生于热烈,永不彷徨
为了一句梦想,走遍万重山岗
祝你不落俗套,赤诚浪漫
无需长大,为英雄与魔法或童话
祝你一生明朗,无惧岁月冗长
在诗人的无尽夏里,温柔且倔强
“万事万物,如愿以偿”
——摘自网络

Processing time reduced by **70.0%**

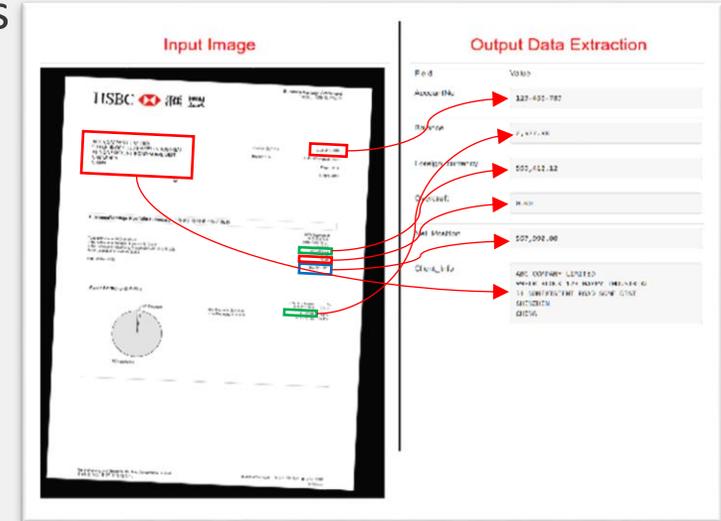
- Cover 6,000 Chinese characters
- Traditional / Simplified Chinese
- Per Character Accuracies are:
 - ~87% for handwritten Chinese characters and
 - ~92% for handwritten cursive English characters
- different commercial clients, including government departments
- The result can be exported in MS Word format



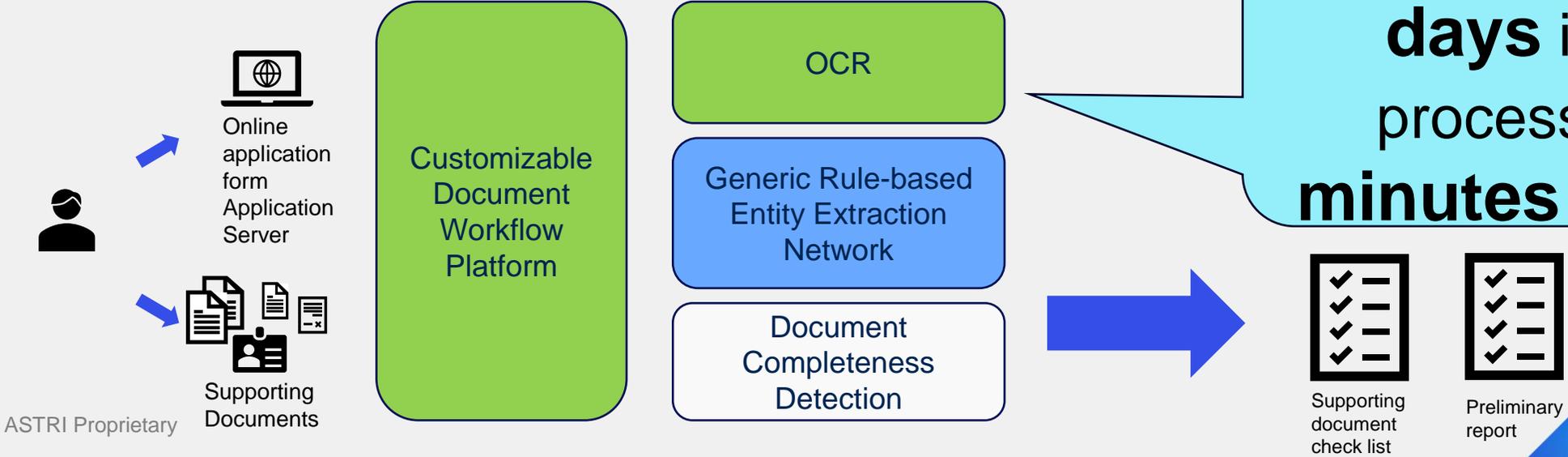
Customizable Document Workflow Platform (CDW)



- Application forms can be filled as digital forms nowadays. However, even supporting documents are submitted electronically through web-portal, apps or email, etc., most of them are scanned documents or even camera captured documents. OCR is still unavoidable.



AI saved from **5 man-days** into **2 hrs** AI processing plus **10 minutes** human review!



Processing time reduced by

58.3%

Issue Date:

1. Font Size/Type
2. Layout position

Account Number:

1. Font Size/Type
2. Layout position

Deposit/Withdrawal/Balance in transaction Table:

1. Font Size/Type
2. **Sequential calculation**

Manipulated inspection: **detect scanned images are being processed** through image processing software (e.g. MS Paint)

AI-generated images: **detect images are generated by AI image generators** (e.g. Midjourney and Stable Diffusion)

AI Document Fraud Detection

Logo:

1. Identify bank statement type

Owner name:

1. Font Size/Type
2. Layout position

Owner Address:

1. Font Size/Type
2. Layout position

Details in transaction Table:

1. Font Size/Type

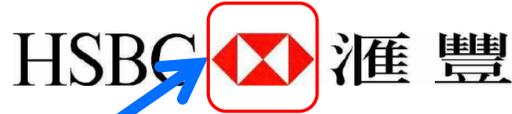
Dates in transaction Table:

1. Font Size/Type
2. **Sequence**



312,123.11

The ratio is calculated to indicate how the variation is.
Font variation = $\frac{\Delta C}{C} \times 100\%$



Statement of Account 戶口結單

The Hongkong and Shanghai Banking Corporation Limited
香港上海滙豐銀行有限公司

MR TANG MAN MAN
FLAT 1707, KAI KAI HOUSE
KAI KAI COURT
28 KAI KAI ROAD
KOWLOON BAY KLN

Statement date 結單日期	Page 頁
17 December 2022	1 of 2
Account number 戶口號碼	
098-818081-18081	

Hong Kong Dollar Statement Savings
港元結單儲蓄戶口

Account Number : 098-8180
戶口號碼

Currency HKD
貨幣

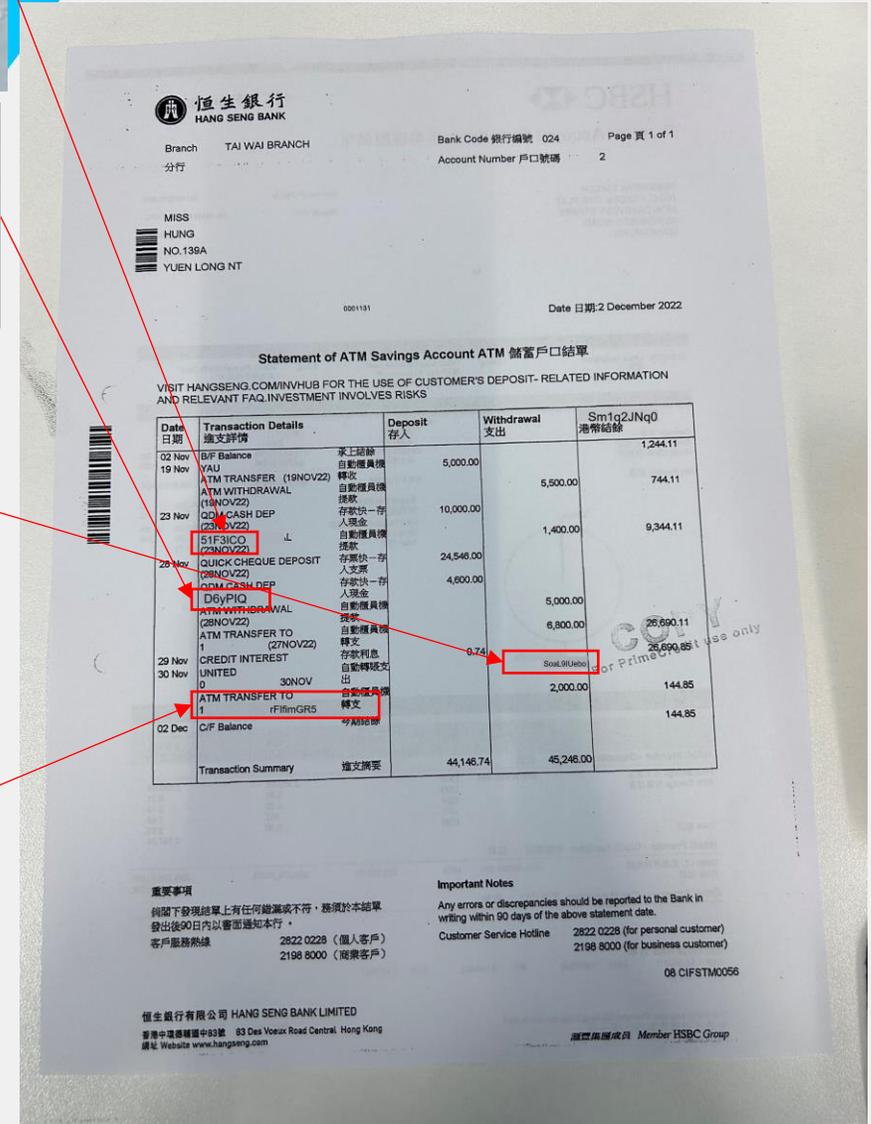
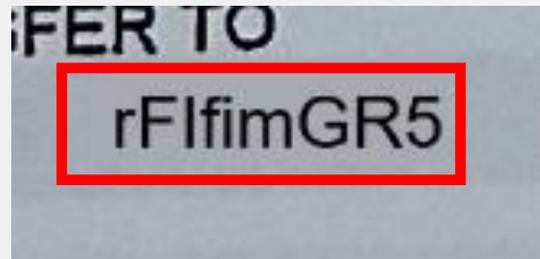
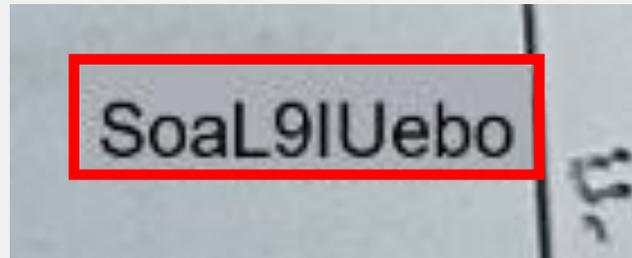
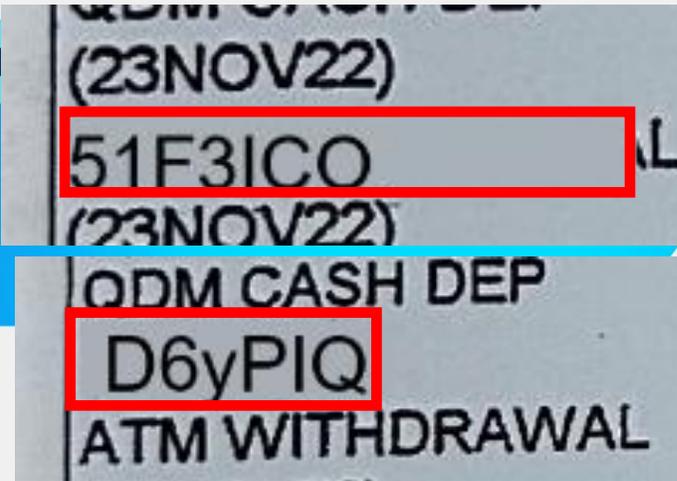
Date 日期	Transaction Detail 進支詳情	Deposit 存入	Withdrawal 支出	Balance 結餘
18-Nov	2022 B/F BALANCE 承前轉結			213,329.17
21-Nov	ATM WITHDRAWAL (20NOV22) 櫃員機現金提款		20,000.00	193,329.17
25-Nov	ATM WITHDRAWAL (25NOV22) 櫃員機現金提款		20,000.00	173,329.17
28-Nov	ATM (28NOV22) 櫃員機轉帳支出		15,000.00	
	TRANSFER 191-8-07			
	CREDIT INTEREST 利息收入	64.62		158,393.79
30-Nov	CHEQUE DEPOSIT MACHINE 入票易	80,000.00		238,393.79
	(30NOV22)			
1-Dec	4966-0405 轉帳支出		2,187.00	
	NC0150593963(01DEC22)			
	5185-4200 轉帳支出		4,932.00	231,274.79
	NC0150594716(01DEC22)			
5-Dec	ATM (03DEC22) 櫃員機轉帳支出		50,000.00	181,274.79
	TRANSFER 098-838			
7-Dec	ATM (07DEC22) 櫃員機轉帳支出		50,000.00	131,274.79
	TRANSFER 098-838			
13-Dec	LEUNG 轉帳支出		7,500.00	123,774.79
	HC122C12143 12DEC			
17-Dec	C/F BALANCE 今期結餘			123,774.79

Manipulated image

Detect abnormal intensity changes

Identify the regions

Provide scores per detected regions



Working conditions:

(a) DPI Sensitivity:

- Optimised for a **300 DPI** A4 image **grayscale/color**.

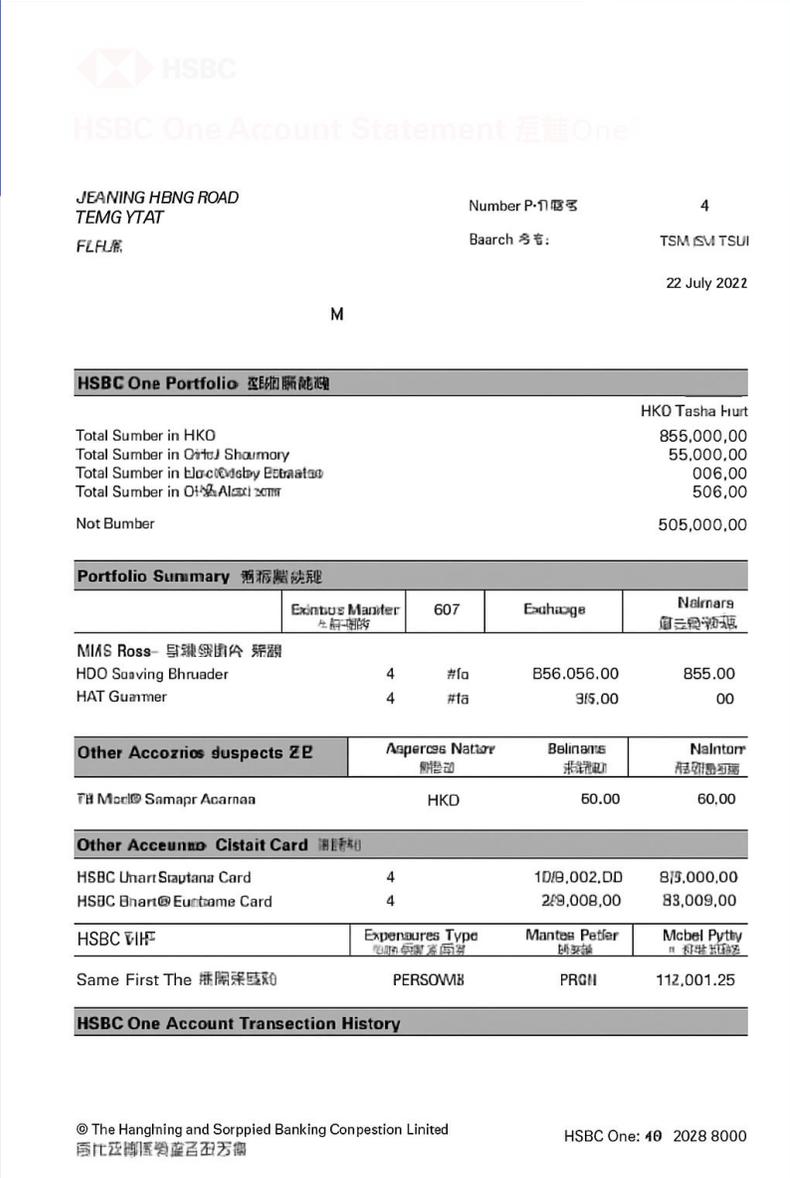
(b) Background Requirements:

- The uniform color background images without noise cannot be processed reliably due to a lack of texture reference for tamper detection. In other words, the white backgrounds are too clean to provide traces for tamper detection.

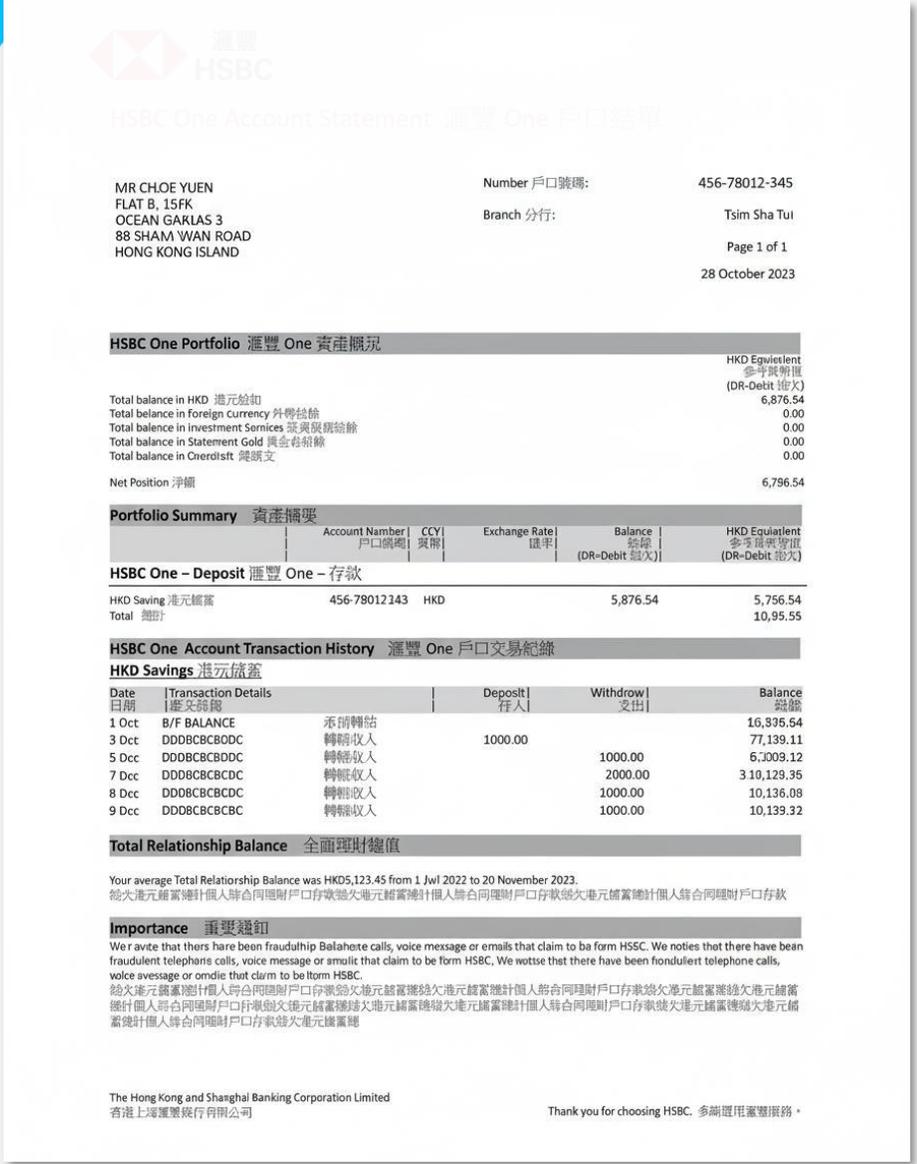
(c) Physical Defect Sensitivity:

- Folds, stains, shadows, or scanning imperfections may be falsely predicted as tampered regions, increasing false positive rates.

AI-Generated Images (examples)



Prompt: Create a visual sample bank statement using the format and style of the provided reference. The image should include a randomly generated name and address, while maintaining realistic and authentic design elements. All the replaced characters should be able to be recognised as regular characters.



Desktop Automation

Supporting documents

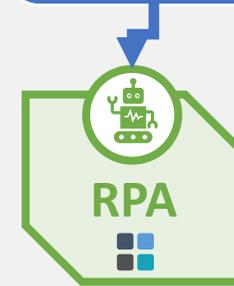
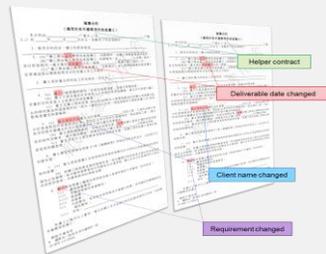
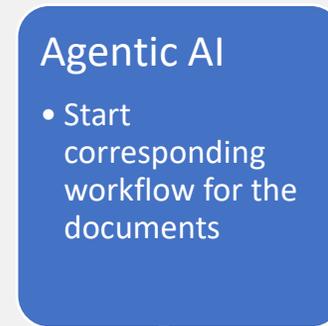


Application forms



emails

An End-to-end desktop automation system for officers to handle different situations in a fast response.



Send email



Notice salesperson



Notice vendors

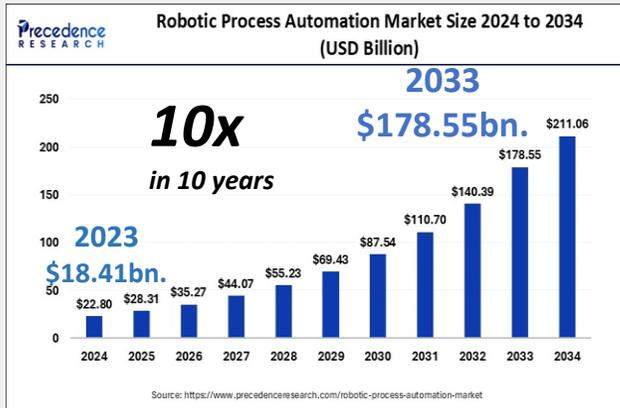


Form-filling

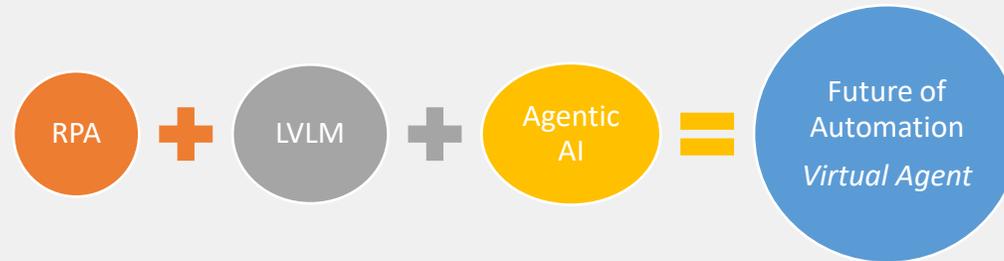
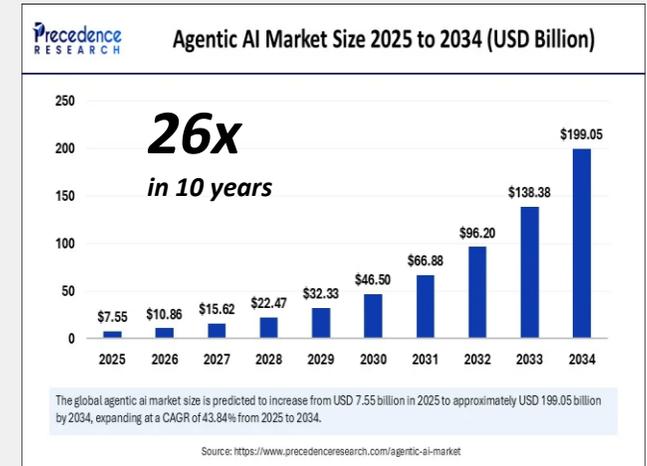


For a simplified RPA version, 2 months is needed to combine to a product for deployment.

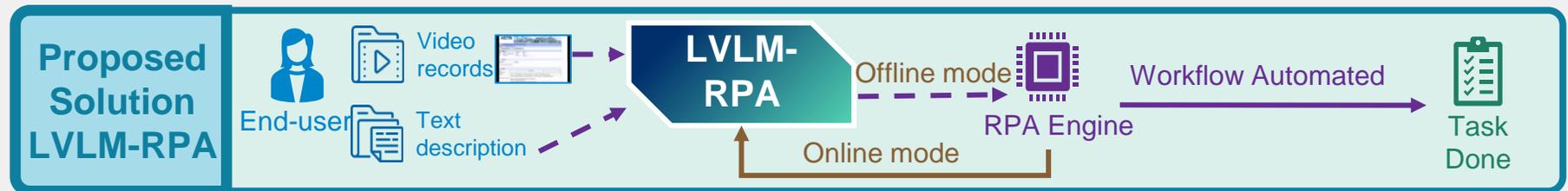
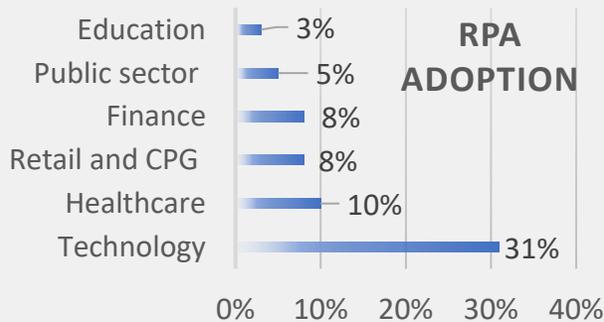
AI-driven Desktop Automation



<https://www.precedenceresearch.com/agentic-ai-market>



<https://www.precedenceresearch.com/robotic-process-automation-market>



0-1:

1. reduce preparation work
2. speed up RPA coding
3. Handle exception cases intelligently

1-N:

1. Expand to unserved sectors
2. Collaborate with SIs or RPA vendors
3. Prebuild some features for potential clients

ASTRI

www.astri.org



ASTRI.org



astriinnovation



Hong Kong Applied Science and Technology Research Institute
