

USE CASES

China, Singapore, Sweden,
World Economic Forum

China: Smart Supervision System for Urban Management

City Management
Execution Bureau

Challenge

Improve the efficacy and efficiency of city management in Pudong City and help manage the impact of informal street sellers operating across doors, setting up stalls, occupying roads to wash cars.

Solution

A Smart Supervision System was developed with GIS, wireless communications and information collection system, video surveillance system, mobile apps and other subsystems.

Pictures taken by citizens and officers to report violations are able to be digitally recognised, classified automatically in the system with warning signals and a work ticket sent in rapid sequence.

Impact

Street environment quality has been greatly improved. Field work amount of law enforcement officers has been greatly reduced, easing the administrative burden.

Outcomes

The first district with the system employed moved up five notches in a city-wide street environment management performance appraisal. A new innovative city management solution is being popularised across the city.

Lessons learned

Practical application scenarios are critical to magnify the value of technologies.

A pilot project is one of the best ways to support technology innovation.

Resources that can provide more detailed information:

- <https://baijiahao.baidu.com/s?id=1697162984515670241&wfr=spider&for=pc>
- <https://baijiahao.baidu.com/s?id=1719247899419410082&wfr=spider&for=pc>

China: High rise Glass Wall Management

Housing and Urban Rural
Development Commission
with AI companies

Challenge

To manage, maintain and prevent broken and falling windows in high rise buildings.

Solution

The Glass Wall Management Platform is well developed with 8 major functional modules, a digital map, speedy filing, gridded/cell management, dynamic update, smart forewarning, notification trace, visualized supervision and digital decision making.

Impact

A well-tuned algorithm to help manage the maintenance of glass walls has been developed using data from captured from 12,500 glass wall covered buildings. Efficiency in maintaining glass walls has been lifted by 90% by screening every 10,000 meters of glass wall using this algorithm, compared with manually scanning glass.

Outcomes

With large data accumulation from multiple dimensions, the management platform is able to draw a enriched profile for each building. Information including year of construction, material, structure, maintenance, etc. are well organized in the system. The platform classifies the buildings with glass walls into three levels, green, yellow and red, with corresponding management scheme.

Lessons learned

For traditional industries, we ought to working on thinking and practicing how to empower industries with new solutions.

Resources that can provide more detailed information (i.e. web pages)

- <https://sghexport.shobserver.com/html/baijiahao/2020/07/30/234088.html>
- <https://www.jianzhuj.cn/news/1001699.html>
- <http://www.chinajsb.cn/html/202108/09/22222.html>
- https://www.sohu.com/a/463268998_100204569

Singapore: Chatbots, Job Recommendations, Safe Distancing, and Drowning Detection

TEXT ANALYTICS FOR CHATBOT OF MUNICIPAL SERVICES FEEDBACK

Challenge	In order for residents to effectively report municipal issues via a chatbot, the bot needs to automatically identify the type of issue being reported from the feedback provided, extract details required to resolve the issue, and finally route the feedback to the agency which should handle the issue. This has to be done in real-time response for a positive user experience.
Stakeholders	Members of the public, Municipal Services Office (MSO), Municipal infrastructure agencies, GovTech
Solution	Deep learning and Natural Language Processing are used to build classification models which can predict the type of issue raised and the handling agency from MSO's past data. Named Entity Recognition is employed to extract the relevant details from the feedback.
Impact/ Outcomes	The chatbot achieved $\geq 85\%$ accuracy in all the three above-mentioned areas and manpower is saved from having to analyse these cases manually
Lessons/ Recommendations	The successful application of AI is not just about using the most sophisticated machine learning models. A tight feedback loop between the data scientists and MSO officers helped us to iteratively improve the training data quality to build more accurate models. Also, given the response time constraints, the balance between inference time and model accuracy had to be carefully managed and mitigating measures (e.g. post-processing rules) had to be used to make up for the shortfalls.
Resources	https://medium.com/dsaid-govtech/training-the-oneservice-chatbot-to-analyse-feedback-on-municipal-issues-using-natural-language-4302aa5a3946

JUMPSTART – JOBS RECOMMENDATION ENGINE

Challenge	To reduce the search costs and information gaps associated with the job search process
Stakeholders	Jobseekers, Career Coaches, Workforce Singapore, Ministry of Manpower, Jobseekers, Recruiters, GovTech
Solution	An AI-enabled platform with recommendation engines to offer job seekers more personalised and effective jobs and skills recommendations, based on factors like prior work experience, skill sets etc.
Impact/ Outcomes	To date, JumpStart has facilitated more than 8,000 job placements since product launch and more than 5,000 job placements in 2021
Lessons/ Recommendations	<ul style="list-style-type: none">• Consolidating resources into a central platform allows for efficient deployment of multiple DS models. These resources include centralised data, infrastructure and common utilities that can be reused by data scientists in building models.• Microservice approach allows for reusability across different products and domains, and provides lower barrier for integration in tech ecosystem (e.g. with other teams)
Resources	https://medium.com/dsaid-govtech/using-recommender-systems-to-improve-job-search-with-the-jumpstart-platform-cbfbb96913ca

SAFE DISTANCING@PARKS

Challenge	To deliver a near real-time map that shows the visitorship status at different green spaces across Singapore, to facilitate safe distancing during the height of COVID-19. The status was originally being updated from data collected by staff on the ground.
Stakeholders	Members of the public, National Parks Board, GovTech
Solution	The portal provides the public with live crowd density data in our parks, gardens, and nature reserves, for public to make informed decisions about where to go.
Impact/ Outcomes	Optimised manpower and time savings with less manual counting. The Safe Distance@Parks website received 620,000 monthly visits at its peak, enabling the public to enjoy park spaces while observing safe distancing.
Lessons/ Recommendations	Providing an operational deployment platform enabled the model to be developed and deployed within 3.5 days.
Resources	https://www.tech.gov.sg/media/technews/safe-distance-at-nparks

COMPUTER VISION DROWNING DETECTION SYSTEM

Challenge	To improve the detection of potential drowning incidents, especially passive drowning
Stakeholders	Members of the public, Sport Singapore, GovTech
Solution	Detection of possible drowning using AI based video analytics and Infrared technologies
Impact/ Outcomes	Achieved >80% detection accuracy and proven able to complement lifeguards in drowning victim detection and saving lives. Successfully saved one life during the pilot trial in 2018. Full scale deployment in public swimming pools ongoing.
Lessons/ Recommendations	The importance of conducting a trial - though the detection accuracy is good, the trial provided important reports on possible system limitations for lifeguards' awareness.
Resources	https://www.straitstimes.com/singapore/parliament-drowning-detection-system-to-be-implemented-at-11-public-pools-by-april-2020

Sweden: Analysis of Medical Information

The need to:

- increase the understanding of what is written in medical documentation based on WHO international structures for medical classification ICF.
- increase the uniformity of our medical texts to identify disabilities and activity limitations.

A digital solution that:

- finds important information in the supporting documents,
- interprets the medical information, and
- creates structure in the analysis to help practitioners

Solution: Analysis of medical information

- An AI solution that can be trained to understand medical information
- An interface that structures and presents the information

Analysis of medical information

The desired effect creates uniformity of analysis of medical analysis (legal certainty)

78010201	F	4. Bakgrund - beskriv kortfattat förlopp för aktuella sjukdomar Fluktuerande ångestbesvär sedan lågstadiet. Besvärerna har förvärrats sedan 12 års ålder fortsatt upp i tonåren. Inibänt visade sig besvärerna som ångestattacker och senare mer generell ångest. Har haft hög frånvaro i skolan sedan årskurs nio. Hoppade av gymnasiet efter tre månader. Efter traumatisk händelse i familjen blev ångesten ännu mer besvärande. har inte haft någon som helst sysselsättning, isolerar sig i hemmet. Remitterad till öppenvårdspsykiatri.
		5. Funktionsnedsättning - beskriv undersökningsfynd och grad av funktionsnedsättning (lätt, måttlig, stor, total) inom relevanta funktionsområden
		A Intellektuell funktion Allmänbegåvning är inte testad. Social isolering, undviker att gå ut på grund av ångestbesvär. Har aldrig arbetat eller studerat efter att ha hoppat av gymnasiet.
		Övergripande psykosociala funktioner Har stora svårigheter att beskriva sitt mående och aktuell livssituation. Tendens till konkret tänkande. Kan besvara korta frågor men den emotionella kontakten är klart begränsad. Har inga sociala kontakter utöver familjen. Man kan således misstänka svårigheter med social interaktion.
		Uppmärksamhet, koncentration och exekutiv funktion Begränsad förmåga att initiera, fokusera, behålla uppmärksamhet och på ett flexibelt sätt genomföra uppgifter. Svårt att hantera förändringar och att anpassa sig efter andra. Mycket stora igångsättningssvårigheter, tar inga initiativ på egen hand. Passiv livsföring. Svårt att upprätthålla vardagsrutiner.

Fonärlingsklassen

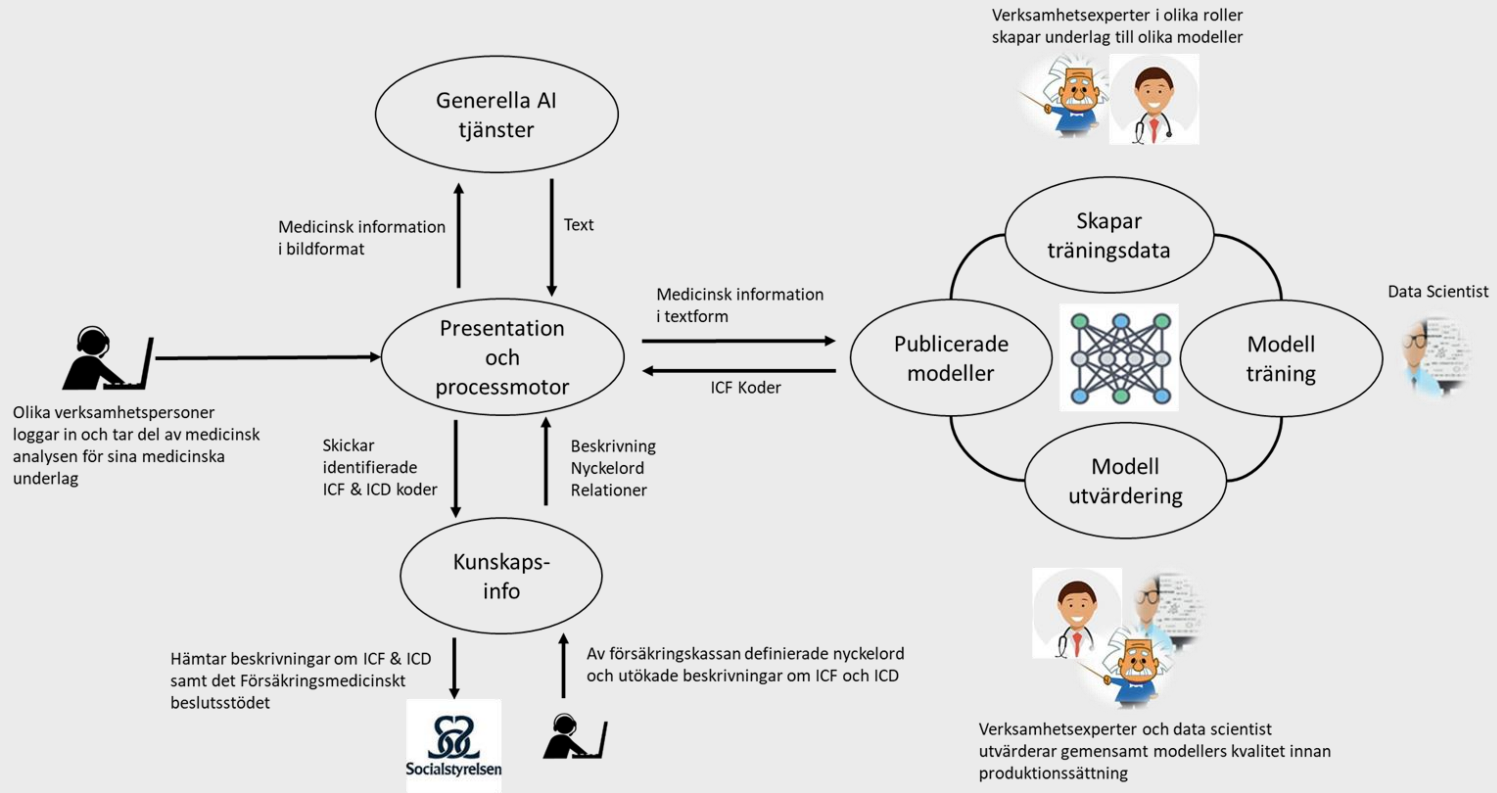


Image analysis: Analysis of medical information

Need:

To reduce the manual work of handling information contained in scanned forms.

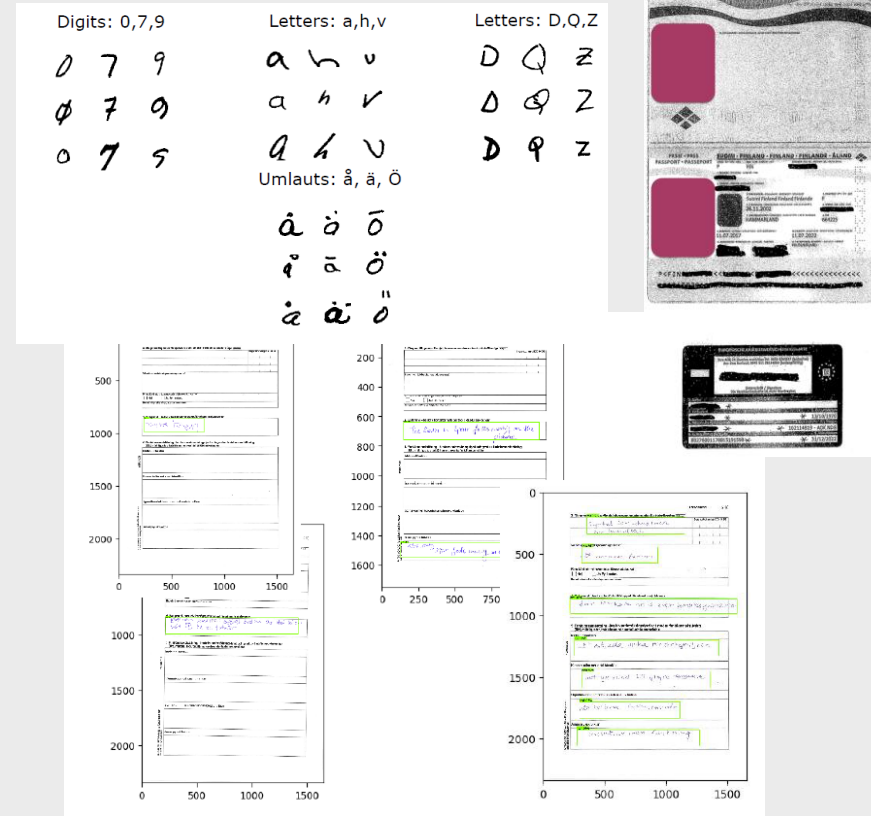
Agents analyse and write off information from scanned forms manually to enter other digital processes

Administrators also look for image objects in pictures (passport, driver's license, etc..) in documents received

Solution:

An AI solution that can be trained to identify and interpret information in images

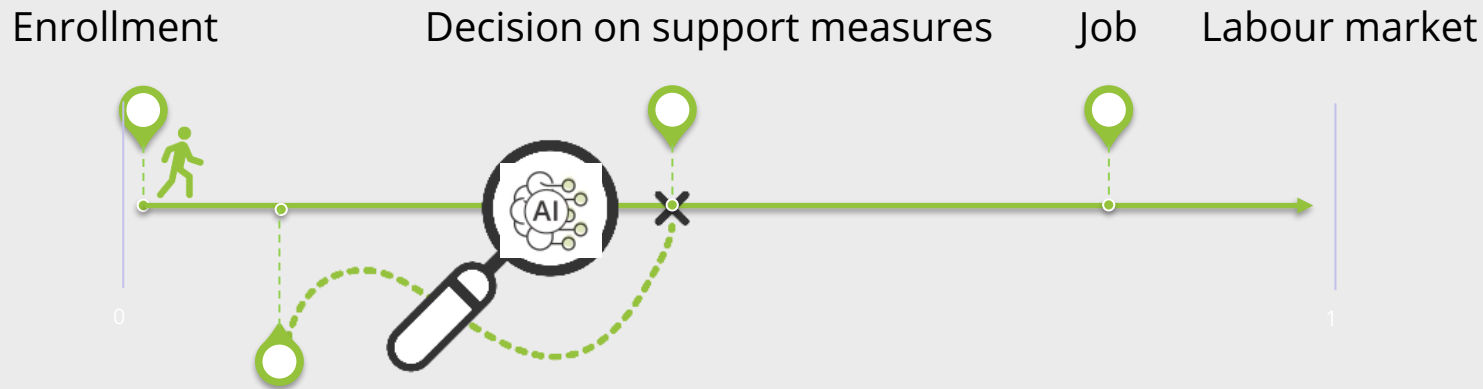
An AI solution that can interpret machine and handwritten text



Sweden: Assessment of a person's "distance" from the labour market

Swedish Public Employment Service

Assessment of a person's "distance" from the labour market



Assessment of a
jobseekers' distance
from the labour market

Assessment of a person's “distance” from the labour market

During the spring of 2019, the Swedish Public Employment Service developed a model that makes an individual assessment of jobseekers' distance from the labor market in the form of “probabilities to get a job within six months”.

The model is currently used in the assessment process in order to make it easier for administrators to identify job seekers' support needs.

Benefits: accurate, consistent and cost-effective labour market policy assessment

Language model

"To be successful in this position, it is required that you are self-sufficient, take initiatives and persistent. You are easy to cooperate with at all levels and enjoy giving good service.

Softskill

Softskill

Softskill

You are familiar with working consultatively and have a good attitude that creates trust in the organization.

Task

Softskill

We are looking for relevant university graduates with a focus on personnel queries or other education - combined with work experience that is relevant to the position."

Educational level

Competence

Language model

At the end of 2019, the Swedish Public Employment Service participated in a project with the aim of building a language model for Swedish authorities and thus promoting innovation in the field of language technology.

The result of this work was a language model with a general language-understanding adapted to our specific domain, which we subsequently can use in other projects focusing on language comprehension.

Examples of applications:

Analysis of job advertisements, to understand the skills needs in the labor market.

It downloads all job ads from other vendors and presents those ads in a similar way in the job bank and flags up sentences that could potentially be discriminatory or inappropriate in other ways in job postings

Benefits: Efficiency, quality, equivalence

Sweden: AI for Service Design in the Tax Agency

Using AI as a tool to make us better is a matter of trust

To meet the development in society and streamline operations, the Swedish Tax Agency needs to benefit from AI – with respect for people's privacy, legal certainty and equality.



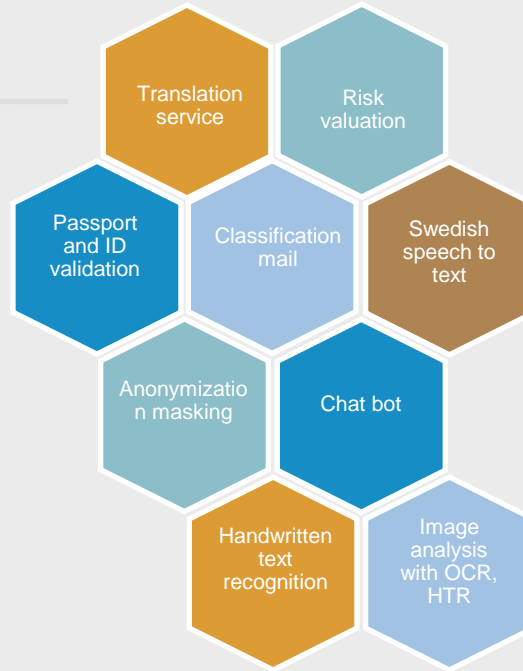
We are currently designing services so that we can internally become a

- more data-driven business (not only efficient but more relevant),
- more easily detect internal needs for digitization (we design a so-called needs-bot that scans internal information to detect new needs early),
- we design services to support both gender equality and equality in the organization, etc.

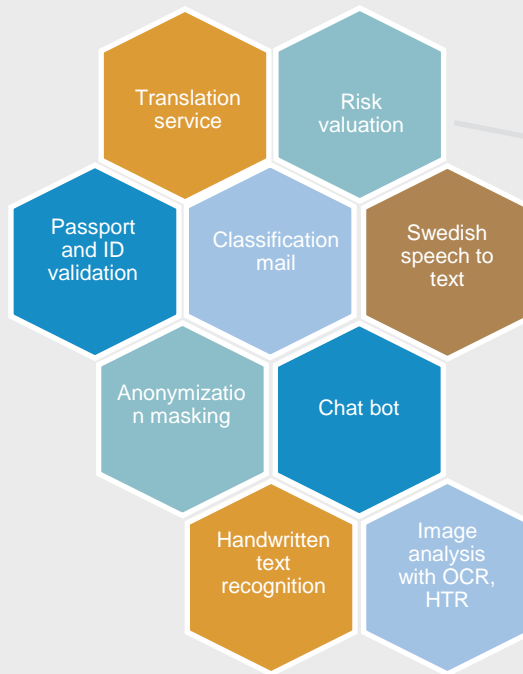
This is just the beginning of our use of a new powerful technology that above all can make us better in our business that "makes society possible" !

Examples of AI-driven services at the Swedish Tax Agency

Internal translation service used for the identification of languages and the translation of, in particular, incoming material.

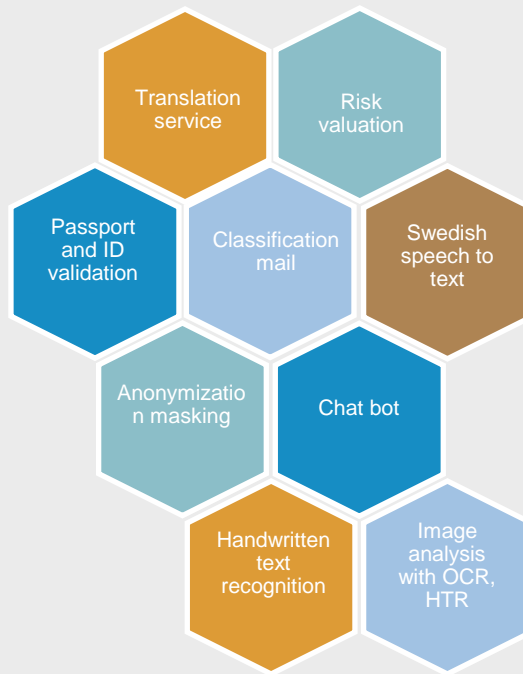


Examples of AI-driven services at the Swedish Tax Agency



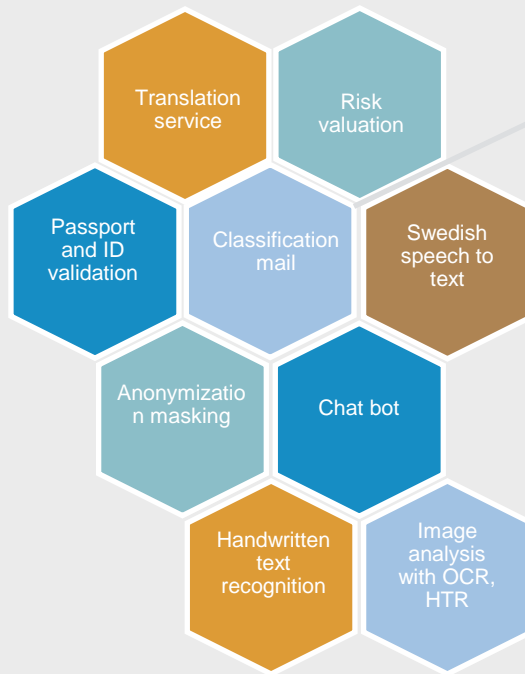
Used in a number of cases to make a machine-based risk assessment. E.g. in the case of business registration and special income tax. In addition to streamlining the risk assessment itself, extensive error handling, etc. is reduced.

Examples of AI-driven services at the Swedish Tax Agency



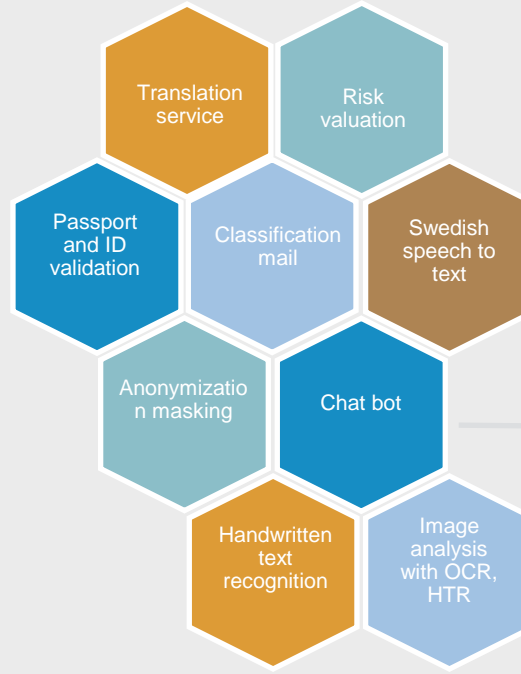
Internal transcription service. Used for subtitles of internal audio materials. E.g. for accessibility subtitling at recorded trainings, information sessions, etc. Saves extensive manual work in the important accessibility work.

Examples of AI-driven services at the Swedish Tax Agency



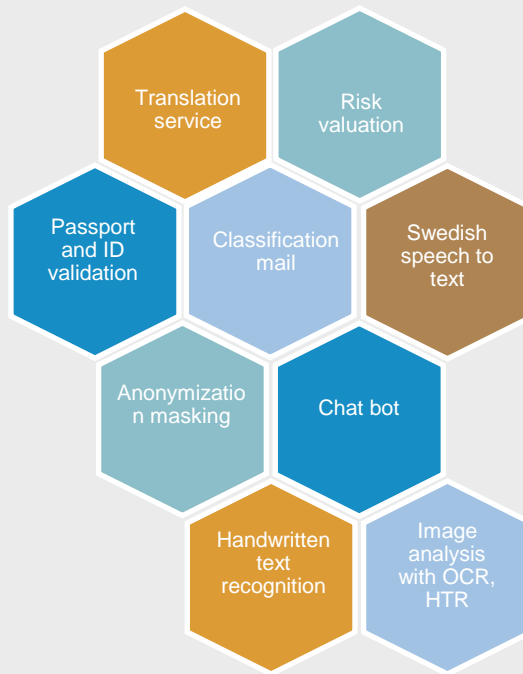
Classification of incoming mail. A service that ensures that the right recipient receives the email based on its content. Streamlines a very tedious manual sorting work, saves processing time and minimizes errors.

Examples of AI-driven services at the Swedish Tax Agency



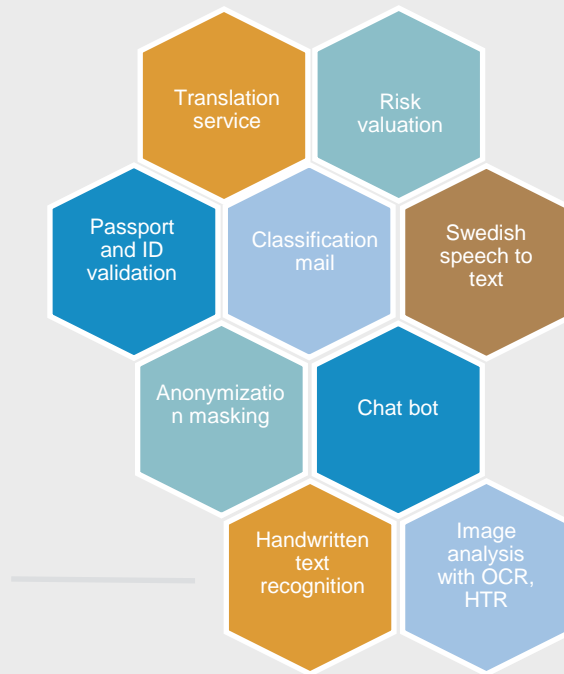
A chatbot that guides internal and external visitors to the website. From advanced search engine to a digital assistant.

Examples of AI-driven services at the Swedish Tax Agency



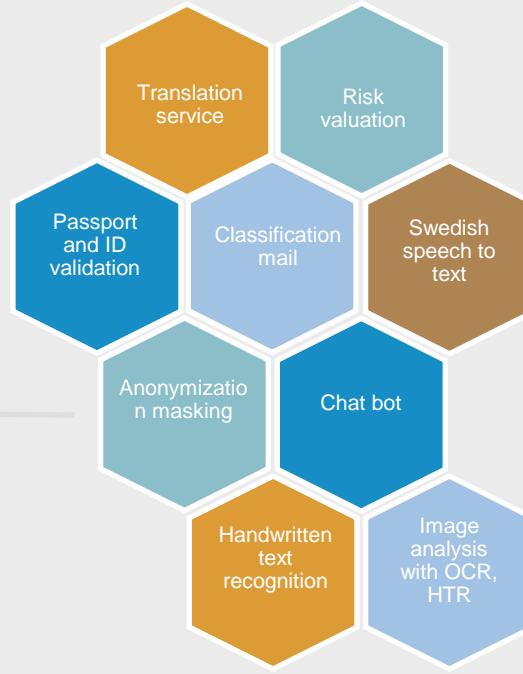
Internal OCR service.
Identifies text in images. Used
in stand-alone and in some
other AI-driven services, risk
assessment, passport and ID
validation, etc.

Examples of AI-driven services at the Swedish Tax Agency



Internal HTR service. Identifies and digitizes handwritten text in forms or images. Used independently and in some other AI-driven services, risk assessment, passport and ID validation, etc. A very comprehensive streamlining is to classify handwritten specific information and then automatically send it to the right agent. Reduces lead times, errors, etc.

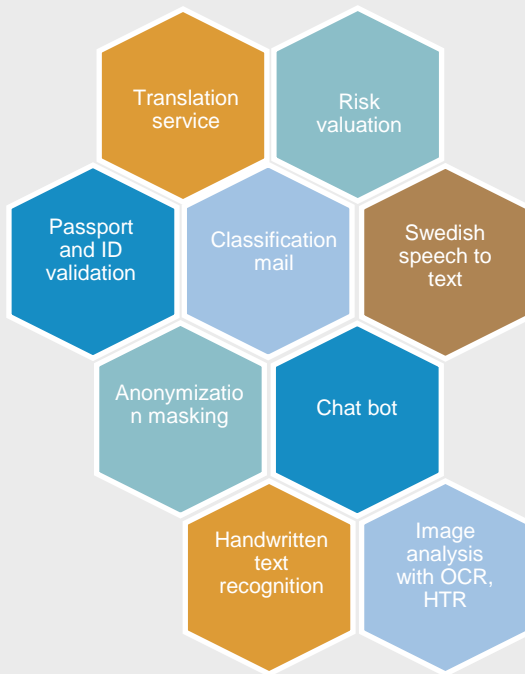
Examples of AI-driven services at the Swedish Tax Agency



Service for machine masking or anonymizing certain types of documents. Delete personal data, etc.

Examples of AI-driven services at the Swedish Tax Agency

Service to machine evaluate whether a passport or ID document is judged to be genuine or not.



**World Economic Forum:
Chatbots, Natural language
processing, Predicting
Population Growth and Criminal
Offences**

How is AI being used by the public sector?

United Arab Emirates

Smart Dubai offers a chatbot to help residents better understand and obtain city services

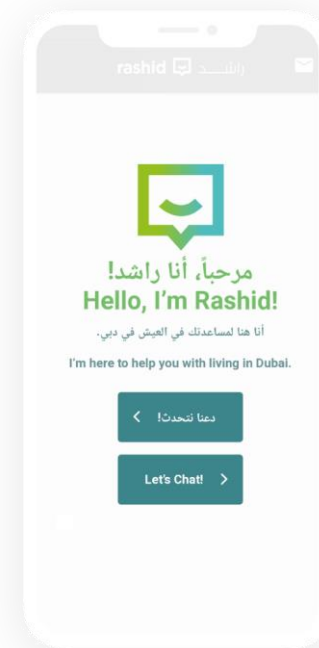
Challenge: Public's interaction with government offices

Situation: User research in Dubai revealed that there was frustration with the number of sources (e.g. websites) that had to be accessed to obtain information about different public services.

Action: Smart Dubai teamed up with IBM Watson to build and deliver a virtual assistant that acts as a single platform for information on public services.

Impact: Dubai residents can get all the information they need about public services efficiently, from a single source.

UNLOCKING PUBLIC SECTOR AI



How is AI being used by the public sector?

United Kingdom

The Ministry of Justice uses natural language processing (NLP) to identify patterns across prison reports.



Challenge: How to better manage prisons and react to incidents.

Situation: The prison service had thousands of pages of unstructured text detailing their inspections of prisons and other institutions. For a human to compare, this would have required substantial resources.

Action: NLP was used to group words with similar meanings, and a library specific to the common language used in prison reports was built. An 'intelligent search' tool was developed to identify trends across the reports, which enabled topic analysis.

Impact: The search tool informs data-driven decisions about prison inspections and policy.

How is AI being used by the public sector?

Uruguay

The Ministry of the Interior of Uruguay is using an AI system to predict where a criminal offence will be committed.

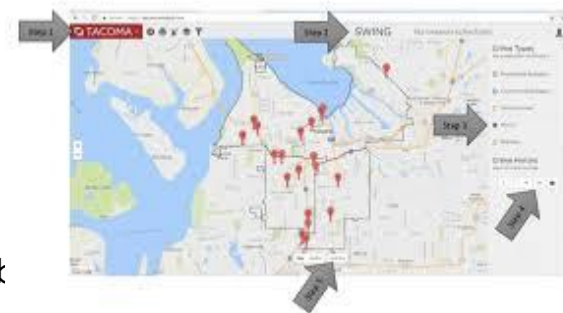
Challenge: Authorities are facing public pressure to better combat crimes such as armed robbery and pickpocketing.

Situation: Police reports summarize where those crimes are reported but it was difficult to learn from them, detect patterns and act on them in close to real-time.

Action: After a competitive tender process with 8 companies participating, the ministry acquired a licence from PredPol software. PredPol develops tailored maps highlighting sections where its assessment suggests there is a high probability that crimes will be committed.

Impact The maps can be accessed through an iPad or mobile phone and support decision-making. Police have seen a reduction in their target crimes when they use the programme.

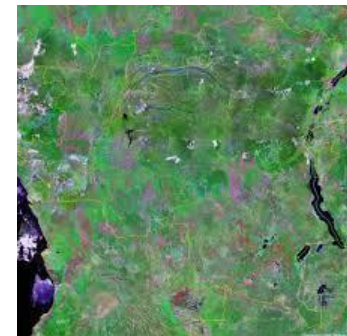
UNLOCKING PUBLIC SECTOR AI



How is AI being used by the public sector?

Nigeria, Zambia, Mozambique and Democratic Republic of the Congo

African countries use machine learning algorithms to better predict population growth.



Challenge: Conduct censuses in conflict zones with little data availability.

Situation: Countries need to understand population distribution to better plan services when conducting a census is difficult (e.g. in conflict areas).

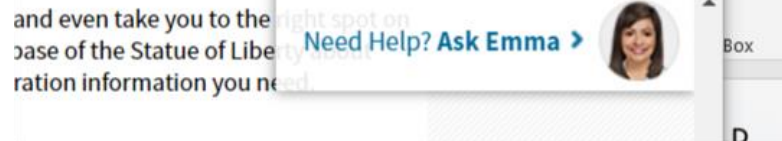
Action: A machine learning algorithm analysed satellite image data to identify features such as settlement boundaries, buildings, transport networks, waterways and industrial areas to predict the population density of an area.

Impact: A hybrid census model was developed and officials were able to better plan vaccination campaigns and the roll-out of other services.

How is AI being used by the public sector?

United States of America

Department of Homeland Security uses the chatbot EMMA to help with immigration requests.



Challenge: The department needed to deal with an increasing number of service requests.

Situation: More immigration requests were raised and the department wanted to handle them more effectively and efficiently, and saw an opportunity for automation and cost-saving.

Action: A chatbot that supports both Spanish and English languages was developed that provides responses in typed or spoken format.

Impact: The virtual assistant helps people with requests pertaining to immigration services, green cards, passports and any service offered by the department. Monthly, this bot handles more than 1 million interactions. Officers now can focus on more difficult cases and high-value work.