جـامعـة الحـسن الثـانـي بالدار البيـضـاء
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UNIVERSITÉ HASSAN II DE CASABLANCA

University
Mohammed VI
Polytechnic

# Artificial Intelligence & Frugal Innovation Empowering Resilience & Social Connection

**Social Service Summit 2-3 July 2025 Singapore**

**Professor Aawatif Hayar**
**Expert in Frugal Social Smart Cities**

# Outline

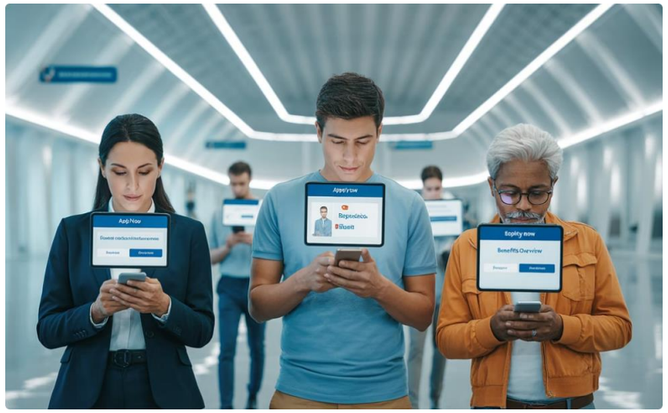
- Welfare state models and features
- AI-powered Social Service
- Frugal Social approach
- Morocco Social State Vision and illustrations
- Perspectives of AI-powered Frugal Social CCPS

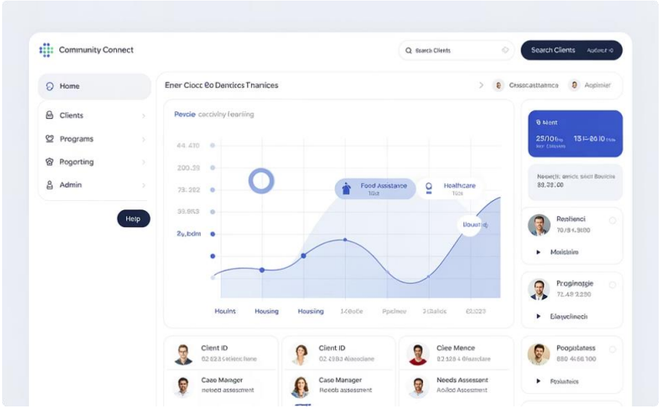
# Comparison of Welfare Models: Key differences

| Model | Key Countries | Core Features | Main Logic | Funding Source |
|---|---|---|---|---|
| **Scandinavian** | Sweden, Norway, Denmark | Universal coverage, generous benefits, strong state role in redistribution | Social-democratic: Equality-focused, public trust | High taxes |
| **German** | Germany, Austria, Netherlands | Insurance-based, status-preserving, tied to employment | **Conservative-corporatist: Status** quo | **Payroll contributions** |
| **French** | France, Belgium, Luxembourg | Mix of universal and occupation-based benefits, centralized state control | **Hybrid:** Universalist with hierarchy | Taxes + Social contributions |
| **Anglo-Saxon** | UK, US, Canada, Australia | Means-tested benefits, limited state intervention, market reliance | Liberal: Minimal safety net | General taxation |

- ❑ Comparative framework: four main welfare models: Scandinavian, German, French, and Anglo-Saxon
- ❑ Welfare states are not monolithic
- ❑ They differ significantly in their logic, structure, and responsiveness to shocks
- ❑ Each of these models reflects distinct institutional philosophies
- ❑the institutional DNA of each model determines how resilient it is, how it adapts to digital transformation, and how effectively it fosters social connection in a disrupted world

# What Is Digitalization of Social Services?






## Definition

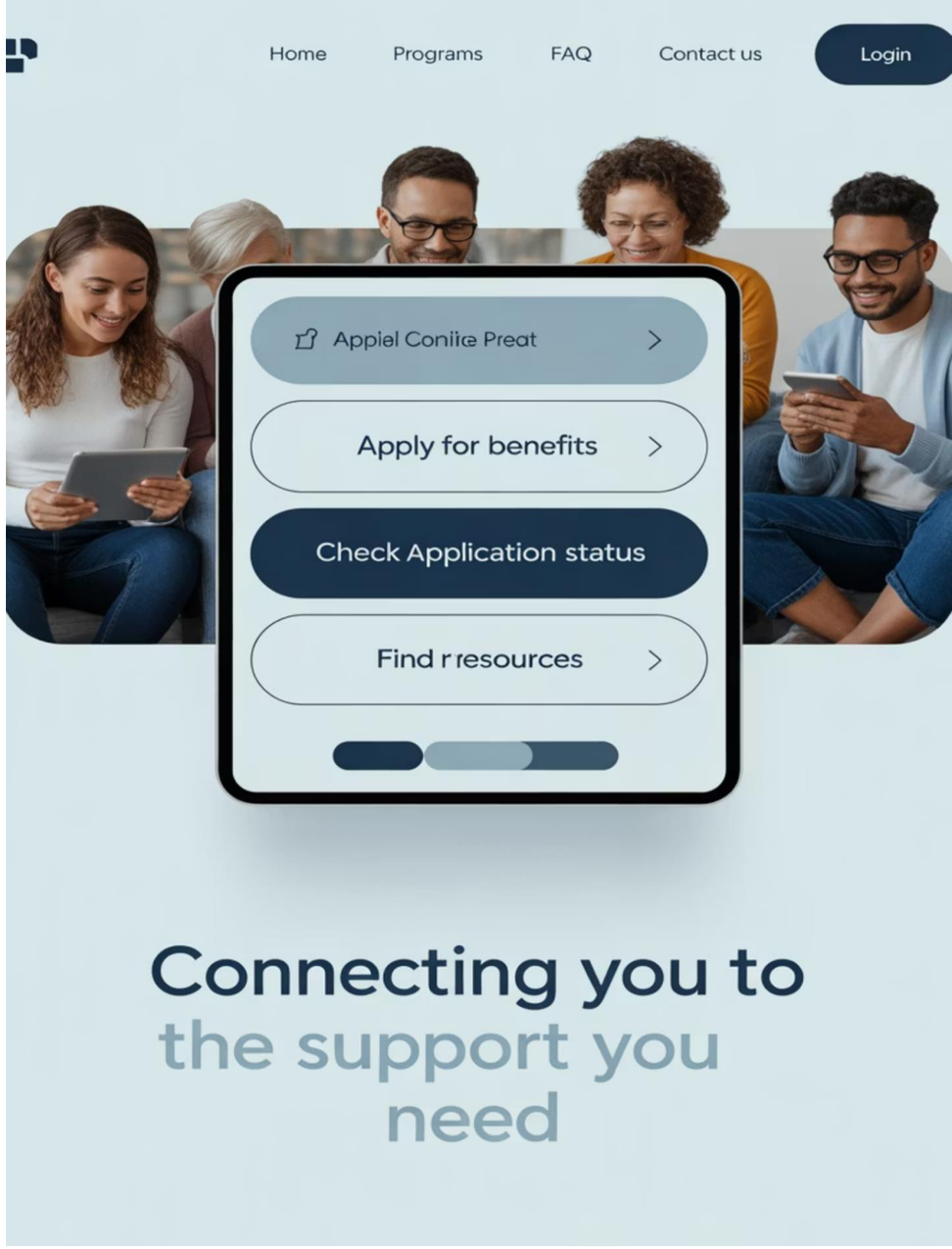
*Digitalization of social services is the systemic integration of digital technologies to restructure how public welfare is accessed, delivered, and governed , shifting from paper-based, siloed models to data-driven, user-centered platforms. (Fountain, 2001; Banks, 2020)* "paradigm shift in statecraft"

*Digitalization is not the automation of forms, it's the systemic redesign*

*Digital platforms, when built with intention, remove barriers. They extend services to remote areas, reduce waiting times, personalize benefits, and restore dignity to the most vulnerable*

## Key Elements

- Integrated digital platforms
- User-centered design
- Data-driven decision making
- Accessible service delivery




**Artificial intelligence enters as both a disruptor and an enabler**

**AI-enabled digital systems can turn bureaucratic processes into human-centered experiences, building not just efficiency, but trust**

# Pioneers: From Practice to Theory

## Dick Schoech's Thesis

*Technology is not an operational tool; it is a systems design challenge.*

1. Created the first peer-reviewed journal (Computers in Human Services **1985**, now Journal of Technology in Human Services)
2. System architecture before interface

In Human Services Technology (1999), Schoech demonstrated that digitalization must begin with service system modeling: → map workflows, define decision rules, then build tech around that.

Digital transformation must serve professional ethics and social justice.

## HUSITA's Contribution

Founded in **1988:** first global research network on IT in human services

First global academic cohort to formalize the digital social services field

Advocated digitalization as public infrastructure, not private outsourcing

Reframed tech in social services as a governance tool, not just service delivery support

**This approach is now mainstream in how we design AI systems. It's what the OECD (2022) calls "human-centric AI"**
**We think about AI not as a plug-in, but as a reimagining of the welfare state**

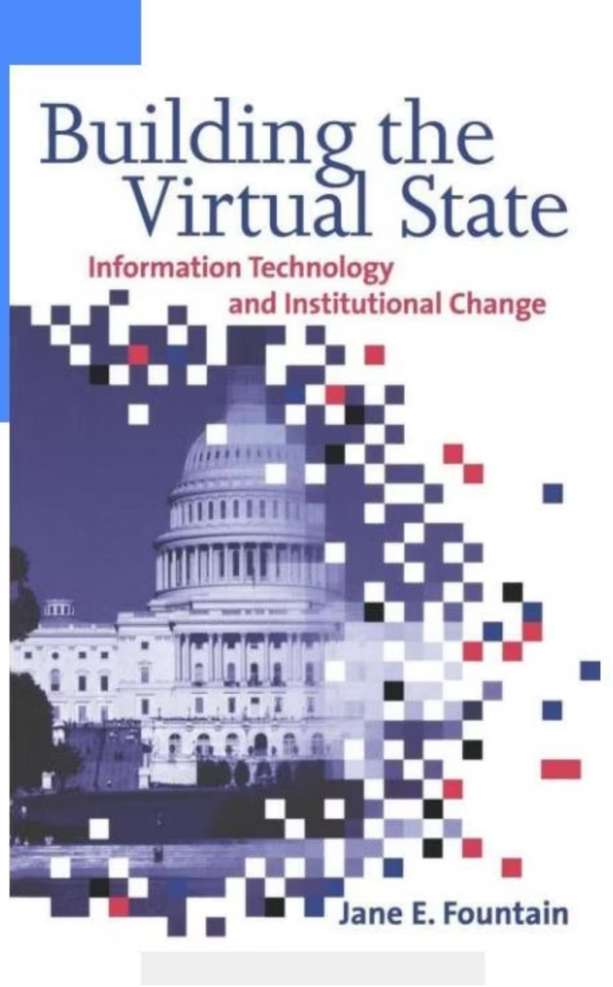
# The Institutional View

## Jane Fountain's Thesis

> Technology alone does not transform the state, institutions enact technology through their own logic.

Building the Virtual State (2001): introduces the Technology Enactment Framework

- Digital reforms must align with bureaucratic norms, power structures, and culture
- Platformization of welfare must be institutionally embedded, not just technologically enabled




## Relevance to social services

Her framework underpins modern digital welfare governance (e.g. Estonia, India) by explaining why interoperability, data exchange, and service redesign succeed or fail.

**Today, as governments deploy AI in service delivery, we must ask:**
**is the institution ready? Are its decision-making rules transparent enough to be automated?**
**Fountain's work reminds us that resilience isn't about bouncing back; it's about reconfiguring systems so they're stronger next time**

# Case Study: Estonia's Digital Welfare reimagined

Estonia rebuilt its welfare state digitally after independence in the 1990s. Rather than digitizing legacy systems, it created a fully integrated digital public infrastructure: **now cited as a** global benchmark for its digital government, cybersecurity, and innovative approach

## Digital ID

Citizens use a single digital identity to access all public services securely.

## X-Road

Launched 2001: Backbone of Estonia's public data exchange. Links over 52,000 organizations and enables over 2.2 billion transactions annually across agencies (health, welfare, tax, education).

## Once-only principle

Citizens provide personal data once; all agencies access it as needed: legally protected and technically enforced.

## Online welfare

99% of public services are digital and accessible 24/7.

## Efficiency impact

Saves over 1.345 years of admin time per year; digital signatures alone save each citizen an estimated 5 workdays annually.

## Recognition

Ranked #6 globally in the OECD Digital Government Index (2023).

**But again, the lesson from Estonia is not about the tools, it's about the will to reimagine governance.**
**And that is our challenge,  and our opportunity,  as we build more connected, intelligent, and humane societies**

# Traditional social services delivery vs. Digital approach

## Traditional Model

- Access: In-person, limited to office hours
- Geographic constraints
- Role of Social Workers: Frontline case managers
- Manual record keeping

## Digital-Augmented Model

- Access: 24/7 via platforms and mobile apps
- Improved rural access
- Role of Social Workers: Augmented by data insights
- Focus on high-need cases


**Digital Augmented Social Service Model is not about replacing people**
**It’s about freeing up human capacity where it matters most**
**It’s a shift from managing scarcity to designing for inclusion, dignity, and social connection**

# Singapore's Smart Nation Model: Focus on Social Services

2014. H. E **Prime Minister Lee Hsien Loong** launched the Smart Nation Programme Office to drive the national effort to transform Singapore into a Smart Nation and harness digital innovation for public good.

1

Social service delivery is enhanced through platforms like the LifeSG app, offering one-stop access to citizen services (e.g., family benefits, healthcare).

2

Data integration via platforms like the Social Service Net (SSNet) helps agencies coordinate and tailor social assistance efficiently.

3

Targeted support programs use predictive analytics to identify vulnerable populations (e.g., ComCare for low-income support).

4

Focus on digital inclusion through training for seniors and low-income groups to reduce digital and social divides.

5

Emphasis on data security and user trust as key pillars in delivering e-social services.

# Singapore Digital Inclusion, Health and Social Support

## 99%

### Online Accessibility

As of 2023, approximately 99% of government services can be completed online, streamlining access to essential services such as healthcare, housing, and education.

## #1

### Global Leader

Singapore ranks first worldwide for digital inclusion, reflecting its commitment to ensuring all citizens benefit from technological advancements.

## 100%

### Assistive Technology

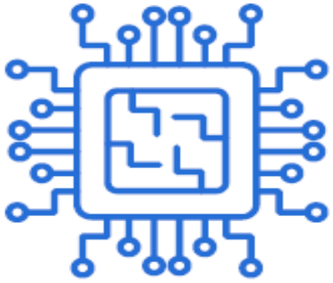
Implementation of robotics and assistive technologies to support seniors and individuals with disabilities, enhancing mobility and independence.

AI-Powered Social Service

# What is AI ?

Initially conceived to mimic human intelligence, AI has evolved over time in a way that differs from its original conception. The discussion about AI has shifted towards practical applications across nearly every sector, making an impact in people's daily lives. The key factors behind these unexpected achievements were mainly the increase in computing power, explosions in data, and improvements in algorithms that led to the rapid development of a new generation of AI that has impacted entire economies and societies.

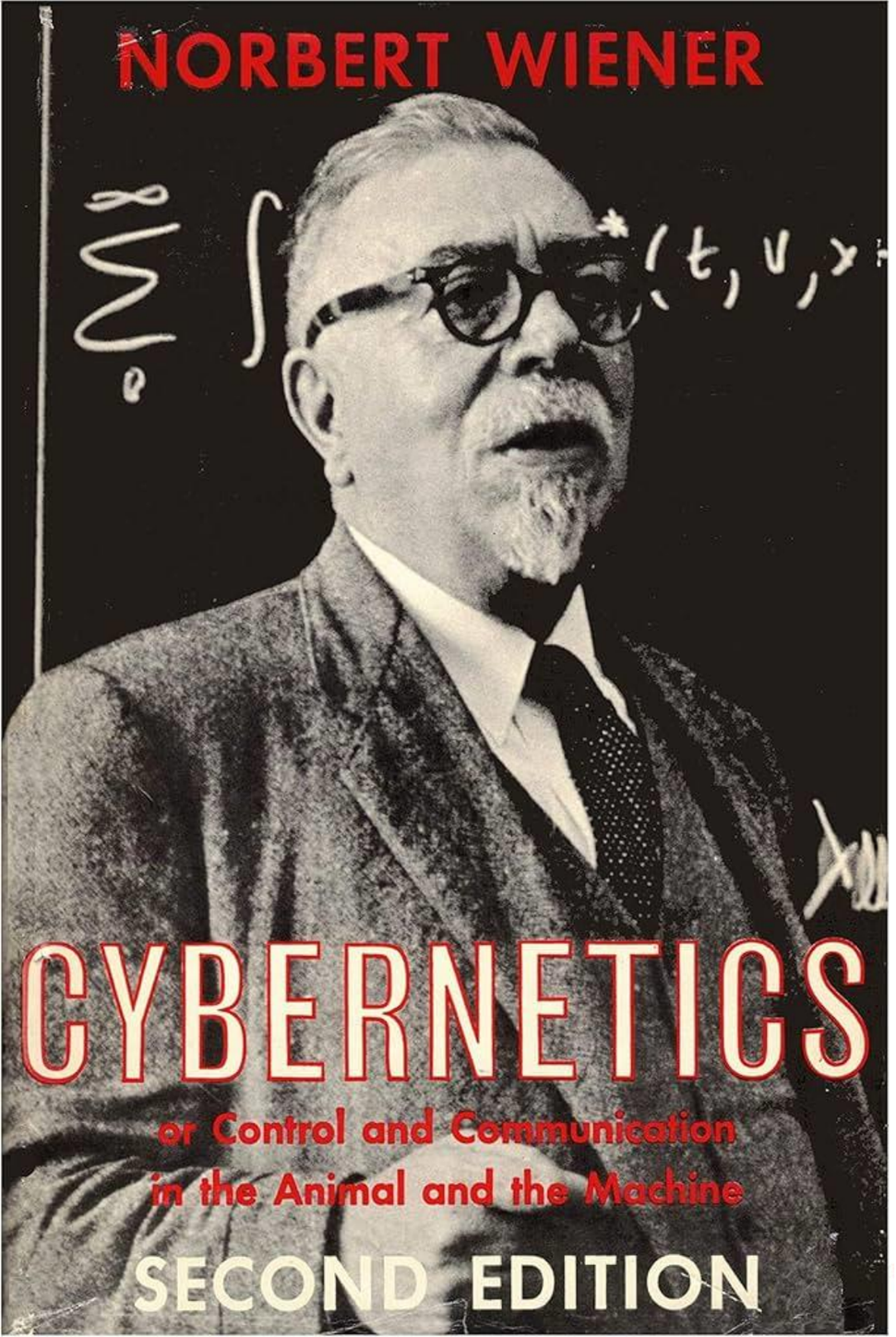
Data

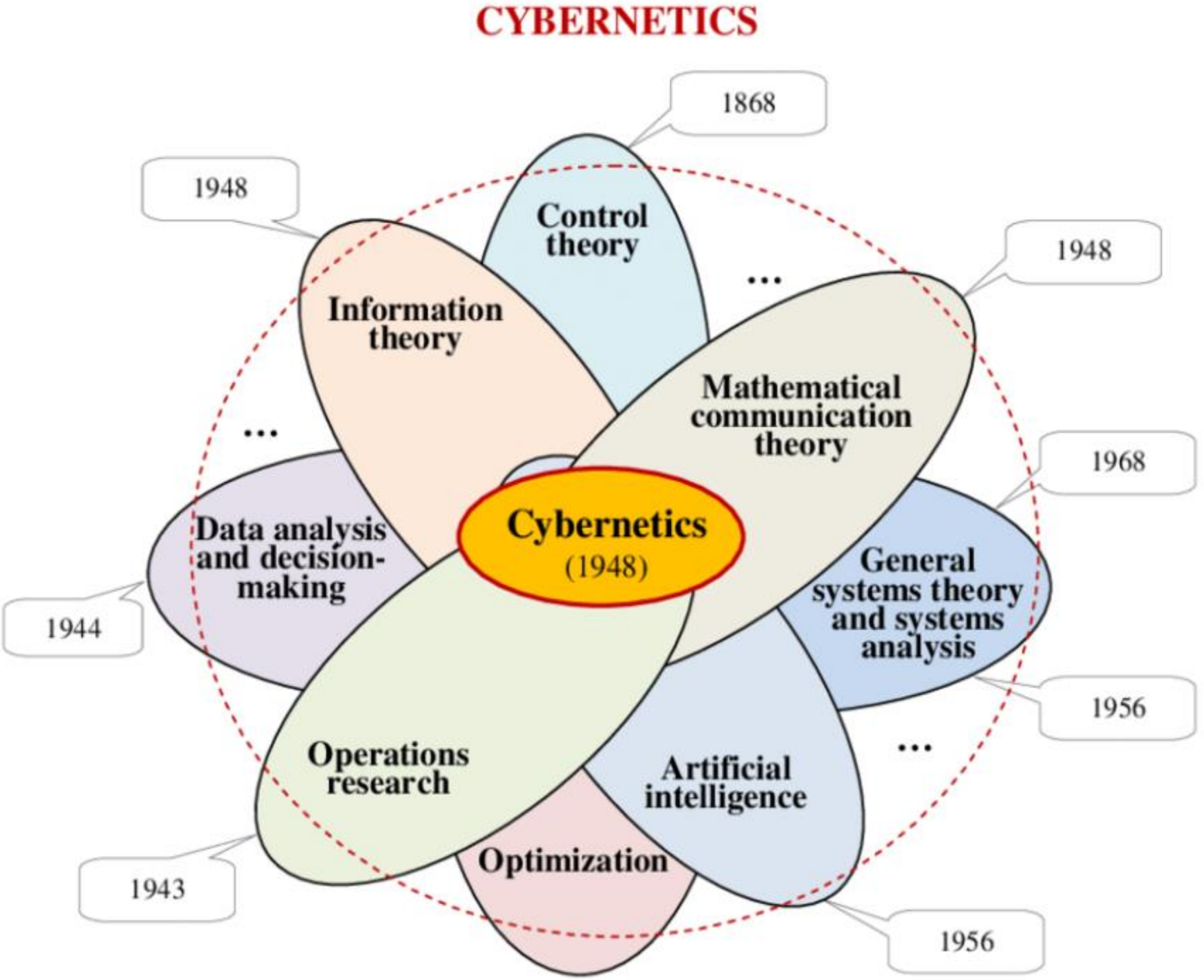


Computing Power

Algorithms

> "As soon as it works, no one calls it AI anymore"
>
> John McCarthy




Macy Conferences 1942-1953
organisées à New York par la Fondation Macy à l'initiative du neurologue Warren McCulloch, le mathématicien Norbert Wiener

# 1956 Dartmouth Conference: The Founding Fathers of AI

John MacCarthy

Marvin Minsky

Claude Shannon

Ray Solomonoff

Alan Newell

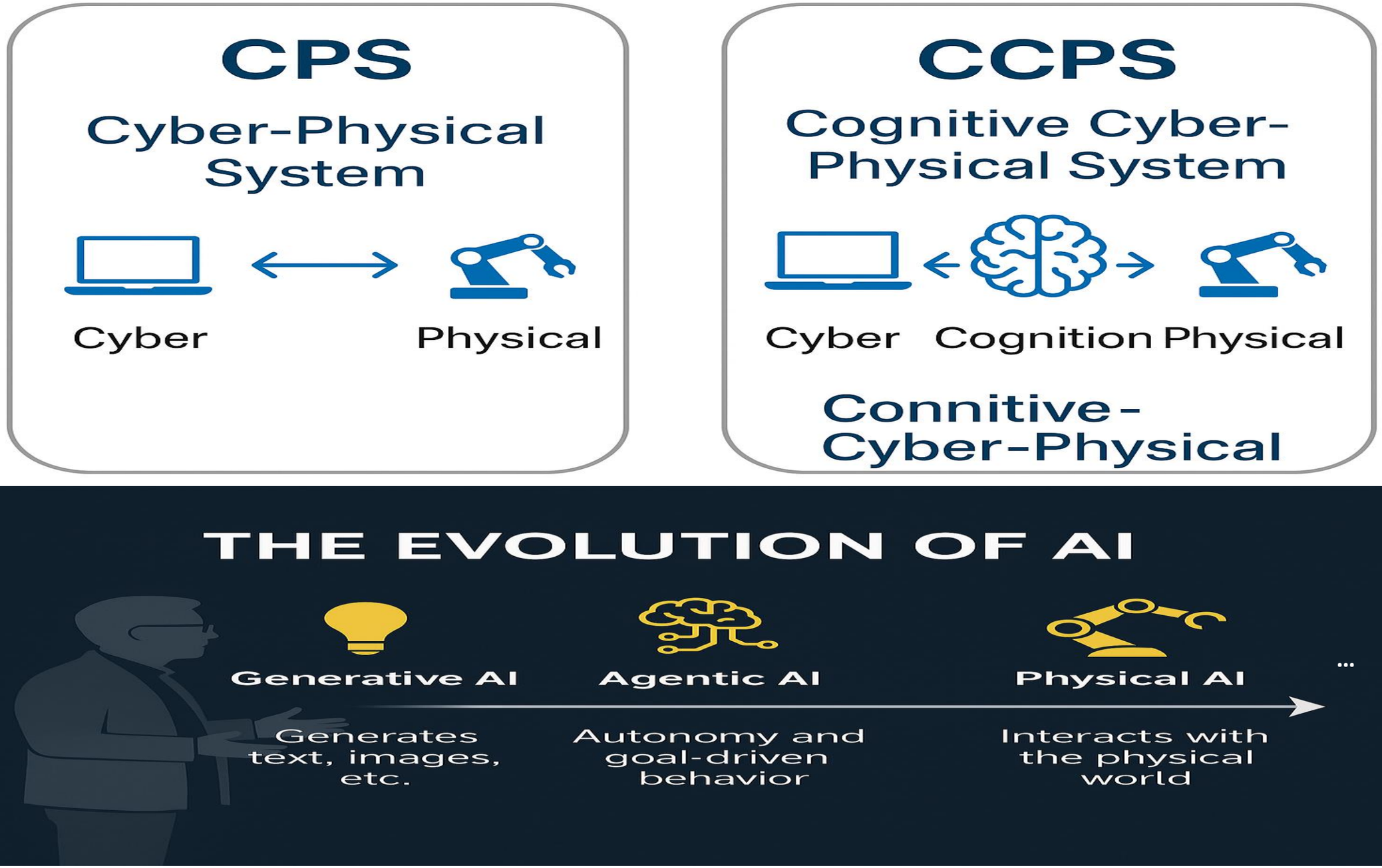
Herbert Simon

Arthur Samuel

Oliver Selfridge

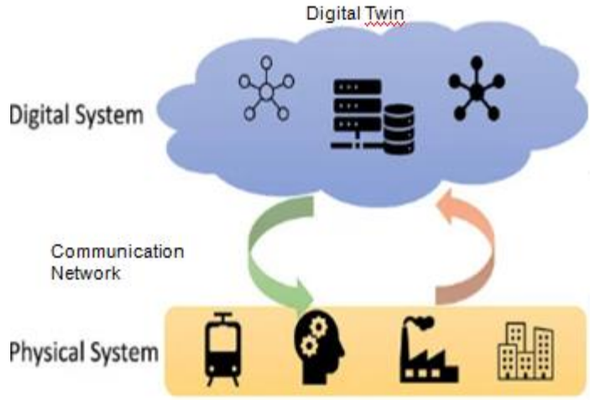
Nathaniel Rochester

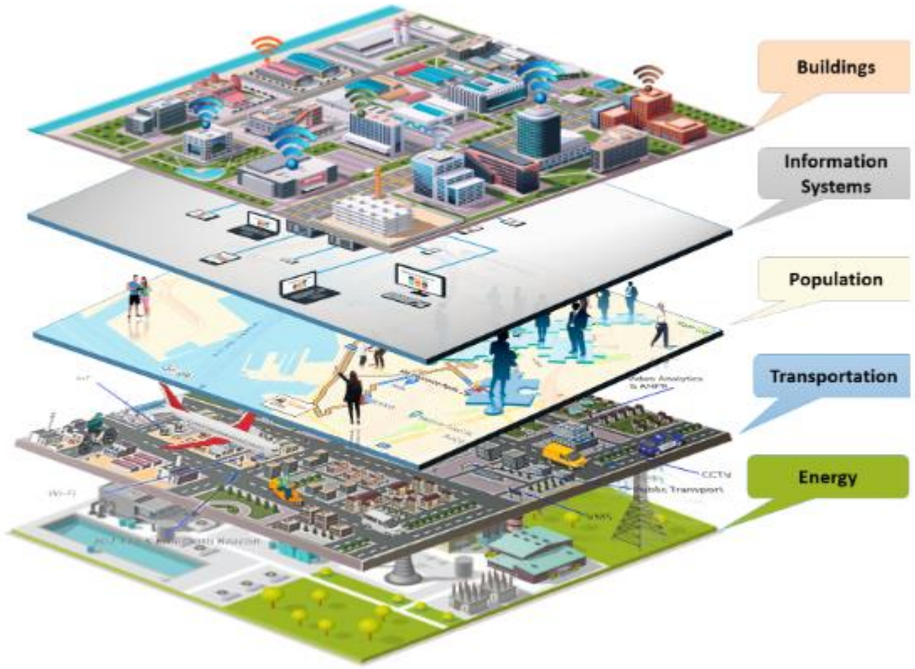
Trenchard More


CPS
Cyber-Physical System
Cyber
Physical
CCPS
Cognitive Cyber-Physical System
Cyber
Cognition
Physical
Connitive-Cyber-Physical
THE EVOLUTION OF AI
Generative AI
Agentic AI
Physical AI
...
Generates text, images, etc.
Autonomy and goal-driven behavior
Interacts with the physical world

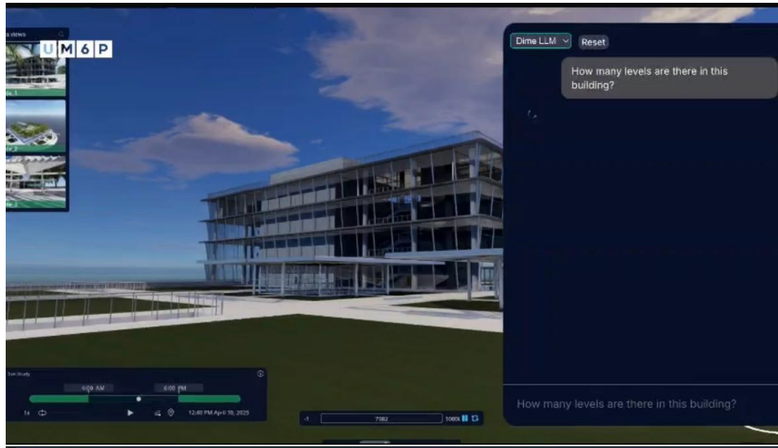
# Augmented Cities/Spaces/Citizens Digital Twin

SMART CITY DIGITAL TWIN

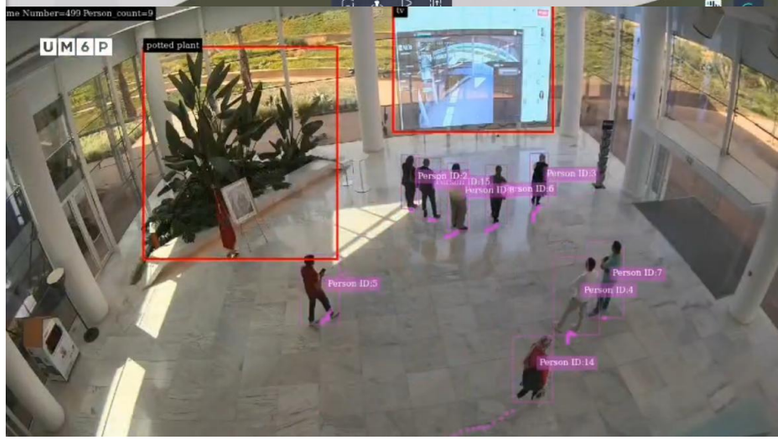








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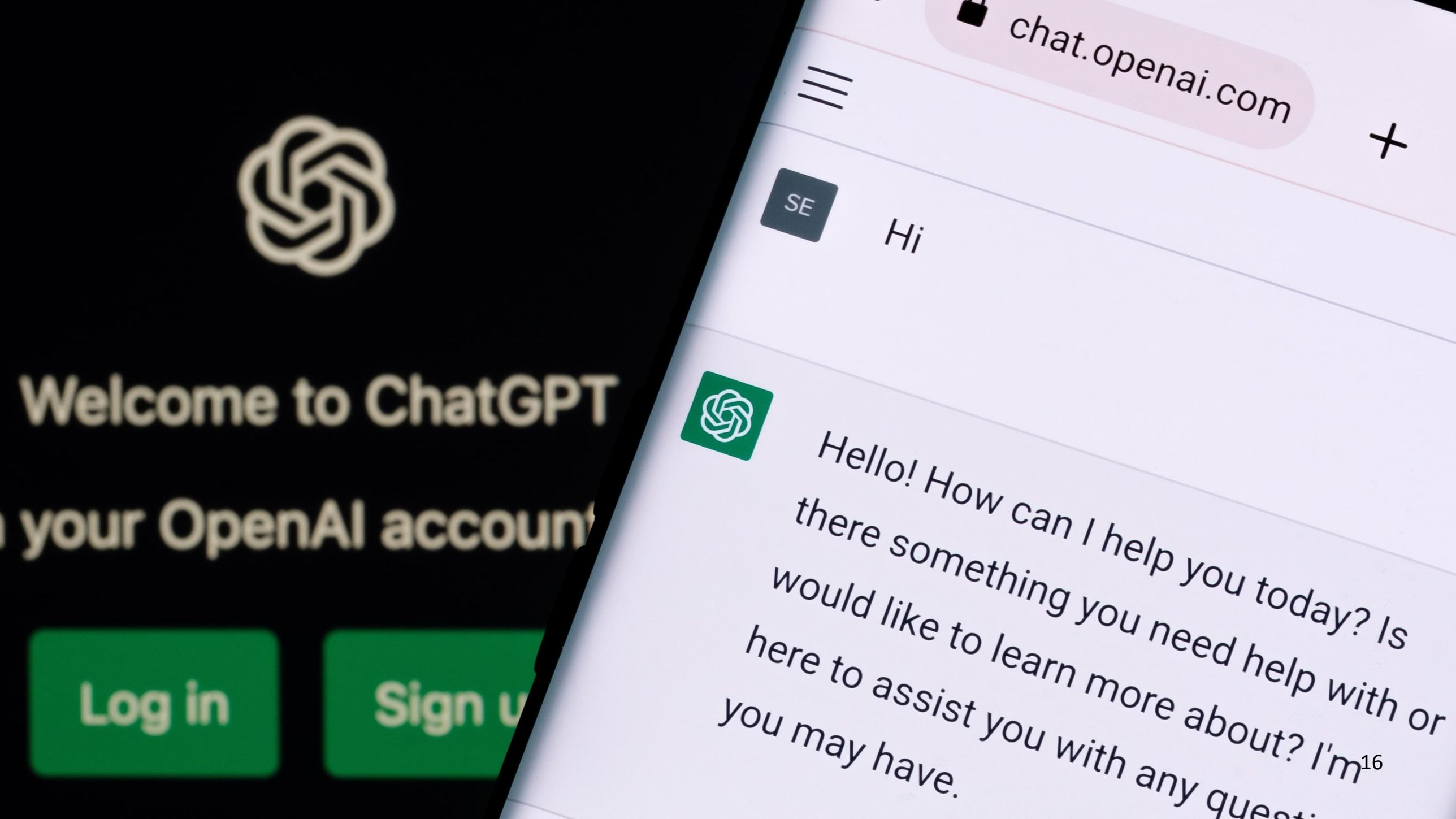
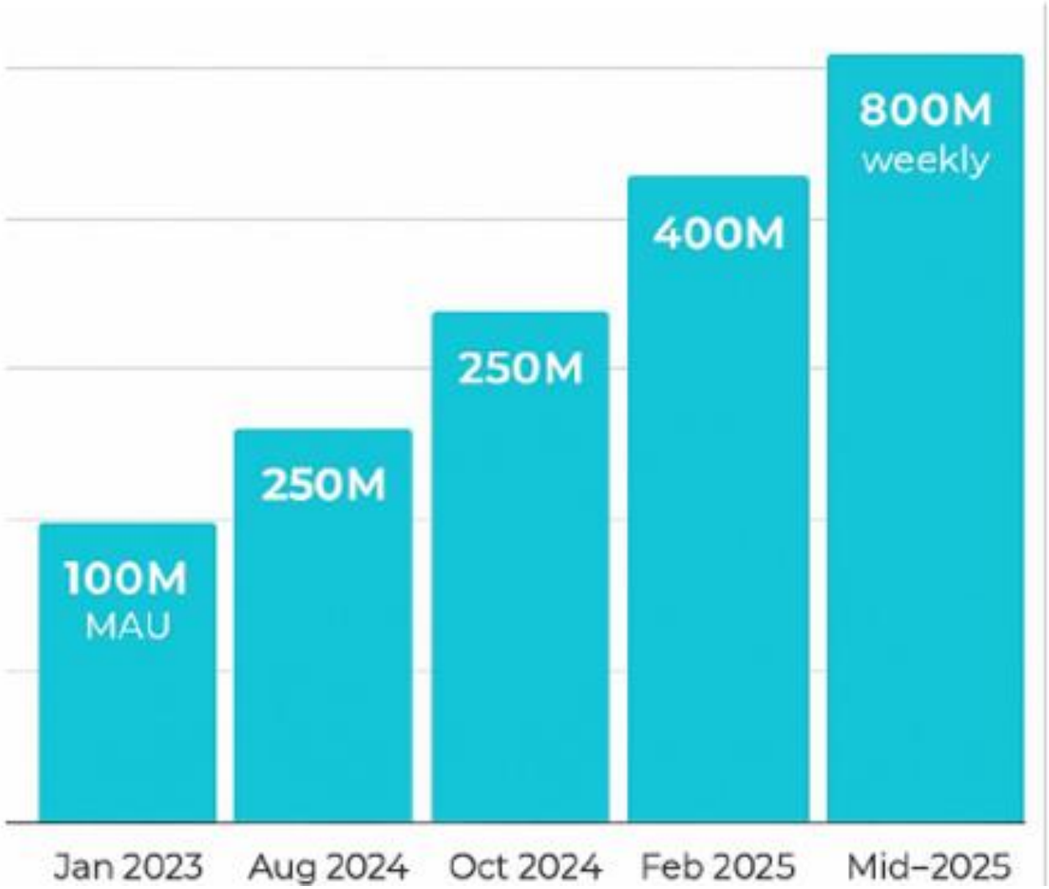
SMART CAMPUS DIGITAL TWIN @UM6P


Welcome to ChatGPT
your OpenAI account
Log in
Sign u
chat.openai.com
SE
Hi
Hello! How can I help you today? Is there something you need help with or would like to learn more about? I'm here to assist you with any
you may have.

# ChatGPT Growth 2023-2025




Source: ChatGPT

# AI-Powered Social Service: The Future

1. **Artificial Intelligence (AI) is reshaping how social services are delivered - improving reach, efficiency,**
2. **and personalization while allowing human social workers to focus on empathy and case complexity.**
3. **Predictive Analytics: Identify at-risk individuals before crisis hits.**
4. **Automated Case Management: AI bots assist in triage and follow-up.**
5. **Natural Language Processing: Understand citizen needs via chatbots and voice interfaces.**
6. **Real-Time Monitoring: Sensors detect signs of social or health vulnerability.**
7. **Data-Driven Decisions: AI enables personalized and evidence-based interventions.**

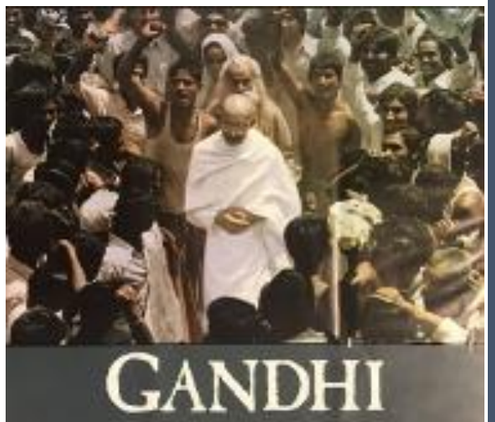
# AI-Powered Social Services: Key Risks

1. **Bias & Discrimination: AI trained on biased data can reinforce inequality and marginalize vulnerable groups**
2. **Privacy Concerns: Sensitive social data may be misused or exposed without strong safeguards.**
3. **Transparency Issues: Many AI systems lack explainability, making decisions hard to audit.**
4. **Over-Reliance on Automation: Risk of replacing human judgment in complex social contexts.**
5. **Fragmented Systems: Poor data integration can lead to ineffective or duplicated interventions.**
6. **Digital and social Exclusion: Those without access to skills for digital tools may be left behind,Rely on AI and robots and less empower human capital, Loss of social bonds**
7. **Energy consumption in AI Servers**

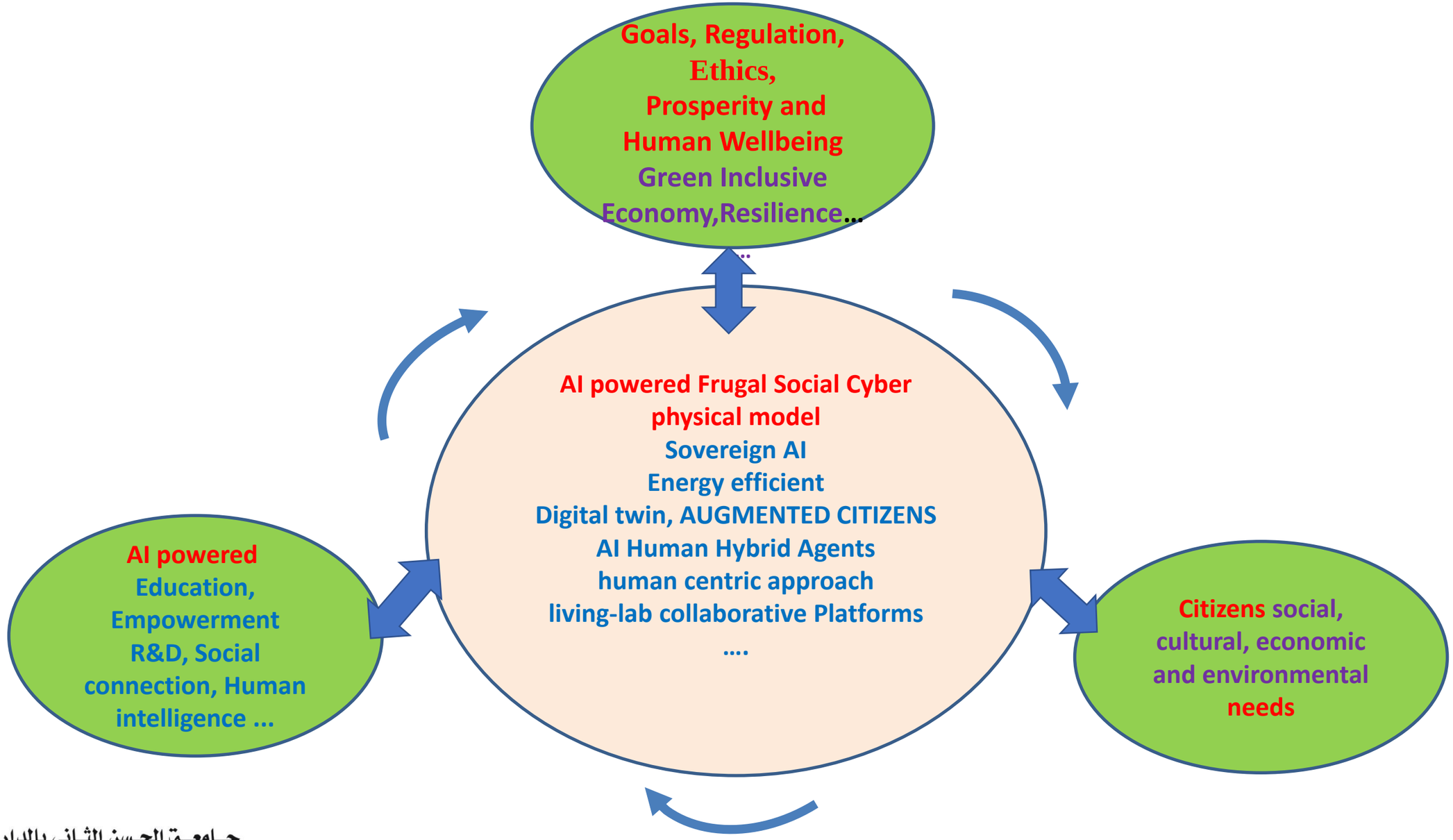
# Frugality based approach
# Frugality الاقتصاد أو التعفف

Frugality is the quality of being frugal, sparing, thrifty, prudent or economical in the consumption of consumable resources such as food, time or money, and avoiding waste, lavishness or extravagance.

Frugality is a philosophy of intentionally using one's own energy, time, and strength with purpose and restraint, to create value without excess. It also means using just what you need, no more, in a way that respects and preserves the environment.

# AI powered Frugal Social CCPS Innovation Process




Source : Pr. Aawatif HAYAR, frugal Social smart Approach since 2014

# Morocco Social State Model: The Royal Project for the Generalization of Social Protection

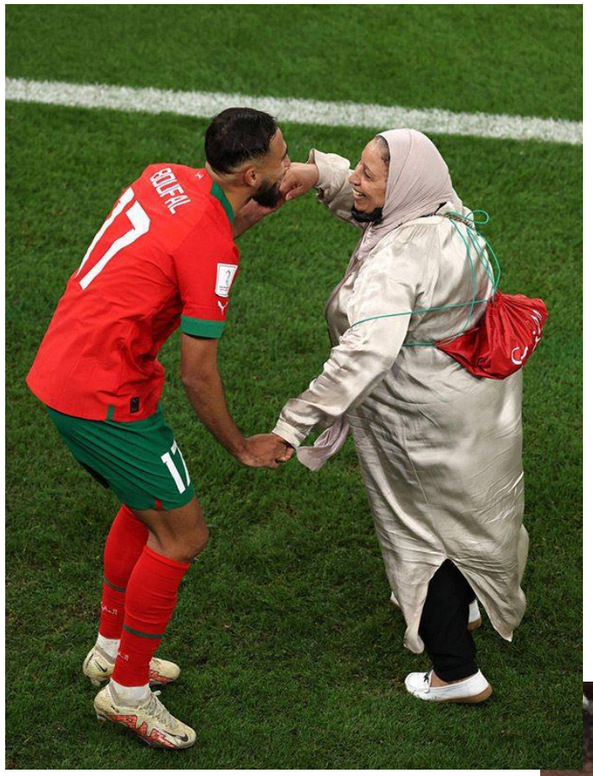
- In addition to big National Initiatives such as national Initiative for Human Development (2005), Constitution (2011), NDM (2021), King Mohammed VI launched on April 14, 2021 the Generalization of Social Protection system. It represents an important step towards the promotion of justice and social equity.

- Generalization of Social Protection system: Health care secured for all Moroccan since 2022 through AMO (Mandatory Health Insurance – Assurance Maladie Obligatoire) and AMO TADAMON (Solidarity based system covered by the state for 10 Millions vulnerable citizens)

- Generalization of Social Protection system: 2024, more than 4 Millions families identified through RSU (Unified Social Register digital database) receive monthly Cash transfer launched in December 2023

His Majesty King Mohammed VI May God Assist Him

# Solidarity and strong social bonds are deeply rooted in Moroccan culture,
# FIFA WORLD CUP in QATAR, 2022



# Solidarity and strong social bonds are deeply rooted in Moroccan culture, Hawz Earthquake 2023


# Digitization driven social public policy: GISSR example, Green Inclusive Smart Social Regeneration strategy

## GISSR …to empower people

Strategy

Pillars

Levers


Smart and inclusive social environment

Equality, empowerment and leadership

Family, value system, sustainability

Pillar 01

Pillar 02

Pillar 03

LEVER 01 - DIGITITALIZATION

LEVER 02 – GOVERNANCE & CONVERGENCE

LEVER 03 - QUALITY

LEVER 04 - SOCIAL INNOVATION

LEVER 05- TERRITORIAL EXECUTION

LEVER 06- Partnership


**GISSR is based on SDG**

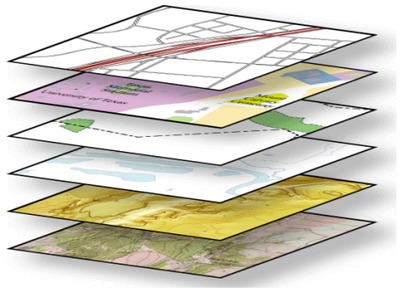
**+**

**Community-based Values and Ethos (Social Bonds, Family, …)**

# GISSR جسر- ONE STOP SMART SOCIAL DESK

# Green Inclusive Smart Social Regeneration strategy

## Social Mapping



## Social Barometer


## Dashboard GISSR


Labeling

Business Model

ODD



### New Concepts of Social Services

- Family, Gender Equality, Social Inclusion
- Welcome, listen, guide, inform, diagnose, support
- Service exchange, accessibility, proximity, mediation, social integration
- Digital services, social innovation, training, capacity building

### References

Common framework of social nomenclature

ISO Standards 9001, 26001, 21001,27001, …

Catalog of permanent/transversal social services

Law 55-19 on the Simplification of Procedures

Lawi 09-08 on Data Privacy

Security

Cybersecurity 26

Digital Portal GISSR
Backoffice

**Social Mapping**

**Data Analysis Based Social Services Deployment**

**Territorial Equity**

**Accelerate SDGs Achievement**
**sDgs 1, 2, 3, 4, 5, 8 10, 11, 16, 17**
**SDG 5**
**Gender Equality**

**Digital Dashboard**

**2021 → 496.000 users**
**2023 →1.200.000 users**

# AI powered Women and Youth Entrepreneurship

University Mohammed VI Polytechnic

- Funding entrepreneurship programs that focus on women
- Offering mentorship by experienced entrepreneurs, investors, and other professionals who can provide guidance and support
- Creating networking opportunities for women entrepreneurs to connect with other entrepreneurs, investors, and professionals in their industry
- Providing education and training programs to help women entrepreneurs develop the skills they need to succeed
- Advocating for policy changes such as tax incentives, access to capital, and other resources.

**Women Empowerment & Leadership online training program**
**Women enrolled through digital platforms for training on soft skills and languages**


**In 2025 Um6P has demonstrated its Digital Twin Smart Campus aiming to develop AI powered use cases including Social Connection e-learning Platform targeting Women and Youth in collaboration with Benguerir Prefecture**

GISSR
GREEN INCLUSIVE SMART SOCIAL REGENERATION

# AI powered Social & Care services for People with Disabilities

## Handicap Smart Card

Digital identification and service access for people with disabilities

## WHO Standards

Based on World Health Organization Standards for accessibility and inclusion

## Digital Integration

Connected to social services database for streamlined support delivery

Pr. Aawatif HAYAR, Social Summit Singapore 2025


La plateforme d'obtention de la carte PSH
Personne en situation de handicap

## Bienvenue Mohammed Amine

Veuillez remplir ce formulaire à fin de completer vos informations personnelles

### Inscription

#### Données personnelles

Sexe : Homme

Situation familiale : Célibataire

N° CNIE / Carte de séjour : A000000

Date de naissance : 00/00/0000

Lieu de naissance :

**Handicap Smart Card**

#### Coordonnées

Numéro de téléphone : 06000000

E-mail : example@gmail.com

Ville :

Code Postal : 10000

Adresse :

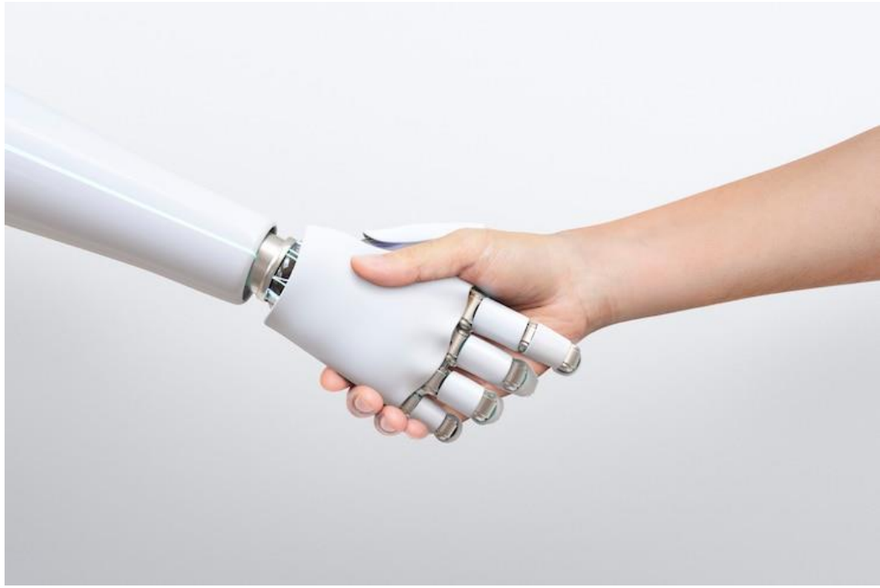
Valider votre inscription

- **PSH**
  - Authentification & Préinscription
  - Mail D'activation
  - Inscription
  - Demandes - Form (Nouvelle Demande)
  - Demandes - Liste (Néant)
  - Demandes - Liste
  - Demandes - Fiche
  - Demandes - Fiche (Suivi De La Demande)
  - FAQ (Foire Aux Questions)
  - Aide-Et-Support-Technique
- **CMP**
  - Authentification
  - Tableau De Bord
  - Demandes - Liste
  - Demandes - Fiche
- **ASSISTANT COAPH**
  - Authentification
  - Tableau De Bord
  - Demandes - Liste

جسر GISSR
إدماج اجتماعي مبتكر و مستدام
GREEN INCLUSIVE SMART SOCIAL REGENERATION

# Key Takeaways: Frugal AI, Social AI, Sovereign AI

1. **Frugal innovation principles ensure sustainability and accessibility**
2. **Human connection remains central to effective social support**
3. **AI can transform social services when applied thoughtfully**
4. **Cultural context must guide technology implementation**
5. **Technology is not the ultimate goal; delivering human value is**



**The future is hybrid: Artificial Intelligence Enhancing Human Potential**

# Thank you for your attention

# شكرا على إنتباهكم

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